



THE ROLE OF COOPERATIVES TO SUSTAIN SMALL FARMS IN ORGANIC AGRICULTURE: THE CROPP CASE

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1. Introduction

For years, the impact that businesses have on the environment is being analysed, due in part to the actions of governments and their concern for sustainability. One of the sectors that have a huge impact on it is the agriculture.

This industry accounts for the greatest environmental impact: impacts on water, air quality, climate, soil and bio-diversity (Mari Walls, 2006).

According to United Nations, within the food and beverage industry, agriculture accounts for almost 50% of greenhouse gas emissions created by the food supply chain (Pimentel, 1995). Besides, nitrogen fertilizers which are used to help the plants to grow, cause water pollution and are the single largest cause of nitrous oxide emissions. So it is an important sector to analyse when we are talking about sustainable industries.

Over the years there have been studies and projects to reduce its problems, and control all the problems that it causes. One solution that emerged about 80 years ago is the organic agriculture. But with industrialization the problem of how to implement organic practices on farms emerged. Nowadays, there are two main types of farms: family farms and corporative firms. As we will see, the implementation of organic agriculture in each of these has some advantages and disadvantages.

The aim of this paper is to analyse how small farms and corporative firms are managed and which of them can best implement organic agriculture. Thus, I will focus on the implementation of organic practices on family farms, analysing how cooperatives can help to combat the inconvenience that this entails.

To make this study, I have used a methodology based on a case study. This has helped to explain in a practical sense how the establishment of a cooperative is a type of business that helps the implementation of organic agriculture in an efficient and viable way.

First, I analyse the main environmental problems of agriculture, and the benefits of the implementation of organic agriculture. Second, I explain management of small farms and agribusiness, and how to implement organic practices in both businesses. Third, to demonstrate the feasibility in terms of business management, the specialization in this type of agriculture, I analyse a case. This case involves the analysis of the company

"Organic Valley", which is a cooperative born 30 years ago and specialized in organic agriculture and the sale of organic products.

2. The agriculture and its impacts on the environment

Since its discovery, agriculture has had a great impact on the environment because people have altered the earth to meet our needs (Walls, 2006). Thus, it is from the twentieth century when these problems increase, since an increase of the population is produced [*"During twentieth century, world population increased from 1.65 billion to 6 billion"* (United Nations, 2012)]. With this increasing demand for food also increases, and thus their production. Meanwhile resources remain limited.

That's when governments and companies start to have more control over this sector, due to the environmental problems that were already important, now they become a serious environmental problem. There is a growing use of pesticides, fertilizers and other chemicals to accelerate plant growth and thus meet demand more quickly.

There are many environmental problems associated with agriculture, but in this paper we analyse the most relevant.

2.1. Soil erosion

Soil erosion is a major environmental issue caused by agriculture. In the last half of century, almost one-third of the world's arable land has been lost by this problem, and it continues growing each year (EEA¹, 2003)

Although erosion has occurred since human beings are exploiting the land, it is in recent years when this problem has become in the most important, and the most damaging issue caused by agriculture. This is due mainly to the increase in agriculture worldwide as a result of the increased in the demand of food.

With regard to United Nations (1995), about 80% of the world's agricultural land suffers moderate to severe erosion, and 10% suffers slight to moderate erosion.

¹ European Economic Association

According to a study made by Stewart about the Soil Degradation in 1990, in that century, and around the world, “*about 12x106 ha of arable land are destroyed and abandoned annually because of nonsustainable farming practices*”. This number is worse nowadays because of the rapid world population growth and the loss of land.

Regard to the latter factor, the loss of land is because, according to the WWF (2001) organization, around 50% of the world's habitable land has already been converted to farming land, causing deforestation and overgrazing. These factors, along with the mismanagement of the land, causes the increases of the soil erosion.

This translates into a loss in biodiversity (problem which will be discussed below), and a reduced agricultural productivity of the land. What at the same time leads to a need to convert more land into cropland.

However, this problem is trying to be controlled by the use of large amounts of fertilizers and pesticides, which help to reduce erosion, but negatively affect the environment. The continued use of these chemicals increases the pollution and health problems, destroying natural habitats and contributing to high energy consumption and the emergence of unsustainable agricultural systems (Pimentel, 2003).

In addition, erosion is also a major cause of deforestation (WWF, 2001). As I have mentioned above, forests are being cut down to turn this land into cropland and to satisfy the increased demand.

Besides, farmers remove vegetation that protects soil from erosion to cultivate other plants. And they use heavy machines for tilling the soil, which deteriorates the soil and contributes to erosion.

On the other hand, soil erosion also contributes to the increase in other environmental problems, such as biodiversity and greenhouse gas emissions with the use of pesticides. Issues that have been mentioned before and that they will be discussed in the following points.

But it also causes an increased amount of water required. With erosion, water hardly penetrates into the soil, so the land loses nutrients. To solve it, farmers have to use more water, which translates into the reduced of crop productivity (Pimentel, 2003).

2.2. Biodiversity

According to the Convention on Biological Diversity (CBD, 2005), biodiversity on the agriculture is defined as:

“Agricultural biodiversity (or also known as agrobiodiversity) is a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agricultural ecosystems, also named agro-ecosystems: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes.”

Analyse the problems of biodiversity caused by agriculture is important if we are talking about sustainability because biodiversity is the basis of agriculture. It is the origin of all crop and livestock species that currently exist, as well as varieties that today there are (Lori, 2000).

Biodiversity provides ecosystem services on farms, such as pollination, fertility and nutrient enhancement, and water retention, helping to the agriculture to be more productive and being sustainable (CBD, 2005).

In terms of environmental sustainability, biodiversity contributes to the soil and water conservation, and the maintenance of soil fertility and biota². In addition, it helps the adaptation of species diversity in a changing environment, such as the high temperatures, drought and their resistance to disease and pests (CBD, 2005).

However, even though biodiversity conservation must be integrated with agricultural practices, the most modern practices does not affect directly to biodiversity. It affects to the environment through unsustainable demands on water, overgrazing, as well as excessive use of nutrients and chemical inputs to control weeds, pests and diseases. So, agriculture affects to biodiversity in a roundabout way.

There are problems that are affecting to the biodiversity, such as the homogenization of species and of farming systems. According to the FAO³, 75% of the world's food is generated from only 12 plants and 5 animal species. This is because people are consuming products monocultures increasingly, which results in a reduction in diversity.

² The animal and plant life of a particular region, habitat, or geological period.

³ Food and Agriculture Organization of the United Nations.

2.3. Chemicals

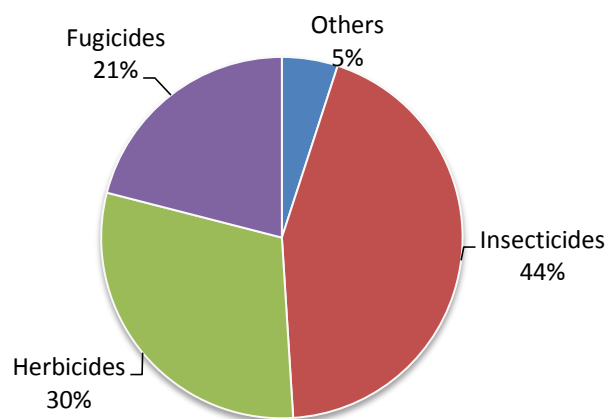
This section illustrates the effects of pesticide use on the environment, specifically in agriculture, since according to the Environmental Protection Agency (EPA, 2008), 80% of pesticide use is caused by agriculture.

Note that when we talk about pesticides, we talk about a wide variety of components, including insecticides, fungicides, herbicides, rodenticides, molluscicides, nematocides, plant growth regulators, among others.

Pesticides are not a modern invention, but they have been used throughout the history of agriculture. In its beginning, farmers were using sulphur as a way to protect their crops from insects. It is in the nineteenth century when they began to use chemicals. And in 1939 the first insecticides appeared, which are forbidden years later for being dangerous to people (Wasim, 2009).

Nowadays large amounts of chemicals are used, above all insecticides. As we can see in Figure 1, almost all half of pesticides used worldwide are insecticides, the most harmful ones. This is because its use helps to obtain higher yields in agriculture, reducing losses by weeds and preventing that insects transmit diseases to plants.

Figure 1: Consumption pattern of pesticides in the world



Source: Aktar (2001)

However, they have a negative impact on the environment and people. Studies that have been done over the years do not show a direct link between pesticide use and

cancer and cardiovascular problems, but there is a correlation between these problems and dioxin, which is a component of pesticides (FAO, 1999). So it could be a connection between health problems and the use of insecticides.

Also, its use affects the environment in different ways, being the more toxic insecticides class (Aktar, 2001).

The greatest impact occurs against the surface water and the ground water. According to the U.S. Geological Survey (USGS, 2006), more than 90% of water and fish samples contain some pesticides.

With regard to its impact on the soil, pesticide use is reducing the number of microorganisms that help the earth with nutrients (USGS, 2006), and therefore its used are making to waste land quality. This is related to the issue of biodiversity. With the use of pesticides, insects that help plants to do photosynthesis are killed, which results in a reduction of plants and other organisms. This also causes the alteration of ecosystems, leading to further loss of wildlife that cannot adapt.

2.4. Water scarcity

Water scarcity affects agriculture directly and indirectly (Pimentel, 2004). As I have already explained in previous environmental problems caused from industrial agriculture, lack of water affects soil quality and biodiversity, and therefore also to agriculture.

Note that although it is considered that water is an unlimited resource, its availability is finite, because the amount of water available on the planet varies by region, but we cannot use 100% of it (WWF, 2001).

Besides, it depends on the rain. The average rainfall for most continents is about 700 millimetres per year, and in general, it is considered that there is a shortage in a region where rainfall is below 1 million litres per capita per year (Pimentel, 2004).

On the other hand, approximately 30% of all water on earth is underground (WWF, 2001). This helps to combat the effects of some harmful farming practices. However, because it represents an important part of the water of the earth, people try to access it for human consumption. Thus rapid depletion occurs, which represents a serious problem for water supply in the agricultural regions of the world, especially for irrigation occurs.

In this way the main problem is water scarcity (FAO, 2000). This is because large amounts of it are used for human activity, such as drinking, cooking or for our personal use, and it is nonrecoverable. What also affects the availability of water for agriculture, since it requires large quantities.

In this connection, the water that is used for plants cannot be recovered. Photosynthesis of plants and controlling the temperature in greenhouses require large amounts of water (Pimentel, 2004).

With regard to UNESCO (2009), world agriculture consumes about 70% of freshwater withdrawn per year. According to a study made by this organization in 2001, only 17% of all farmland worldwide is irrigated, nevertheless it produces 40% of world supply, so it expands each year, according with the growth of the population.

IRRIGATION

As for irrigation, there is the problem of the energy needed for this. Farmers must not only assess the costs of irrigated land, but also consider the annual costs of irrigation pumping. For a data example, in the United States about 150,000 ha of farmland are abandoned due to the high costs of pumping irrigation use, both in terms of energy and water management (FAO, 2000).

Another problem is the salinization of irrigation. Salinization by itself is not a problem because the salt naturally is flushed away. However the problem arises when irrigation water is used on crops and this returns to the atmosphere through plant transpiration. In this manner the dissolved salts are concentrated in the ground, hampering the growth of plants. Worldwide, about half of all irrigated soils are adversely affected by salinization (Pimentel, 2004).

3. The organic agriculture as an alternative to environmental challenges

3.1. What is “organic agriculture”?

The term "organic" has an ambiguous character, so it is difficult to define it precisely. It can be considered as a tag that supports various interpretations.

Similarly, the use of "organic" in terms of agriculture depends on regions, since in each one there are agencies that certify when a product or food is organic or not, and they have different requirements before putting the tag, which in some places may be more strict than in others (Rigby, 2001). Also, consider that agriculture used in a region is organic also depends on the ability of the technology to be sustainable, which will depend upon the context in which it is used; "systems that are sustainable for one farmer or farm at one point in time may not be sustainable for another farmer or farm at another point in time" (Ikerd, 1993).

Thus, in less developed countries, some farmers can practice organic farming as a traditional method of production, as they have known no other method to do so. And therefore they do not realize all the benefits that their actions have on the environment.

With regard to organic agriculture, the international food standards, Codex Alimentarius, state:

"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system. (FAO 1999)."

It should be noted that organic farming would not be possible without the existence of an alternative way of practicing agriculture, as it is conventional, or also called industrial by some authors.

So the term "conventional agriculture" refers to a set of standard practices, used by most farmers worldwide in agriculture, and that they are promoted and studied by most governments and agribusiness groups (Kristiansen, 2006).

Normally, the practices which are carried out in industrial agriculture have no restrictions beyond those contained in the laws of each of the regions. However, as it is included in the above definition that made the FAO in 1999, practices considered organic farming seek to protect and benefit the environment, so that actions that do not meet this will be prohibited if the farmers want to practice organic agriculture. In fact there is also a difference between sustainable farming practices or organic farming practices. Unlike the first one, the organic one includes actions which are considered

as law. This means that its principles are a way of doing business; they are part of its mission. And sustainable practices refer to specific practices that any farm can implant to be more ecological.

In brief, organic agriculture is a whole system approach to land management and agricultural production. This can be seen with the interest on the pest control, since this form of agriculture considers that this monitoring must be done by the design and interaction of the farm as a natural system. So, farmers use some insects to help control pests instead of using pesticides (Rigby, 2001). This leads to note that organic farming no longer considers to the farms as separate parts that are related between them, but as a unique and whole organism (Morgan, 2000).

3.2. Organic agriculture development

The origin of organic agriculture is closely related to the beginning of industrial agriculture (Kristiansen, 2006). Some of the practices that include the first one are carried out by farmers, since those are the only that they knew. This was before the emergence of chemicals such as synthesised fertilisers, biocides, medicines, mechanisation and fossil fuels that allowed industrial agriculture work.

The agricultural revolution began in Europe in the 1840s and with it came the first commercial production of inorganic fertilizers. Its use became widespread worldwide as farmers used it as fertilizer substitute to expedite production and efficiency. However, it should be noted that at this time many mistakes were made in the use of these new fertilizers as it was the first time they used chemicals, and it was not until the beginning of World War II when this revolution in agriculture had success. Some of these errors were related to the misuse that gave farmers and the health problems that they had (Kristiansen, 2006).

In the 1920s, individuals and scientists began studying the direction that agriculture was taking in both productivity and efficiency or environmental impact.

With the first studies appeared other works and publications of different professionals that influenced the next wave of organic pioneers. This organic movement was consolidated over the years, and meanwhile associations appeared to be in charge of implementing the term "organic" in the agriculture (Morgan, 2000).

However there were not all good expectations for organic agriculture. In the 1950s, the environmental movement that was occurring saved the organic agriculture to end quickly since after World War II, part of the industrial equipment that had been used

was directed to the manufacture of chemicals and farm equipment (FAO, 2000). Therefore it can be noted that the current thinking and "organic" movement is different than there was in the beginning, since in those years the primary goal of organic agriculture was the health, whether soil, food or people, while today it has more a sense of environmental sustainability.

In the 1970s, organic agriculture re-emerges as agriculture responsible for the environment, and with it the strengthening of existing organic organizations and the emergence of new ones, many of them are specialized on the certification process of farmers and producers (Kristiansen, 2006). However, organic farming practices were not so popular yet, and politics did not consider it important enough to enact new laws on this subject.

In this sense, many people were struggling to popularize this concept and practices, which led them to several confrontations with governments. This changed when a formal global network, known as the International Federation of Organic Agriculture Movements (IFOAM) in 1972, which still remains today, was created.

In the 1980s, there was a strong growth of organic agriculture (UNESCO, 2009). The intensity of agriculture has become a national political issue, and a public concern, such as the destruction of some features of the rural landscape, the intensification of livestock production or food scares, which led to people to know the reality of the systems of industrial food production and see how the animals were treated in the factories.

Thus, organic food offered an alternative to this, resulting in considerable increases in organic food consumption during these food scares. It also came to become a status symbol, as it became the fashion for high-income families (Kristiansen, 2006). What strikes with one's principles of organic agriculture, as it is based on social sustainability of the whole local communities.

Otherwise, besides the growth that was occurring in Europe and North America Central and South America (the continent where organic agriculture emerged), during the 1980s, there was a strong growth in this type of agriculture in parts of Oceania, Asia and Africa (UNESCO, 2009).

At the end of this decade, the interest aroused and the amount of research and information that emerged during these years about organic methods were huge.

This trend began in the 1970s, and it continued growing during the 1990s and into the new millennium. The demand for organic foods increased over time, and therefore also the production, worldwide (UNESCO, 2009). It came to be a topic discussed by governments, so laws emerged surrounding organic agriculture. Following this were intergovernmental agreements to facilitate international organic trade.

Science quickly became a tool for showing all the problems of industrial agriculture, and all the benefits of the new type of agriculture, the organic one. Thus, since the 1980s, numerous organic research centres and associations have been established internationally, searching for new organic practices, promoting the importance of the environmental sustainability, among others.

At the ends of 1990s new concerns began to raise about organic farming in terms of environmental sustainability. An example of this relates to the increase that was occurring with global demand. To satisfy it, large amounts of organic foods were transported long distances, making it questionable whether it was environmentally friendly, since the transport sector is one of the most polluting (European Environment Agency, 2006).

With reference to the above, due to this large increase in demand, production also increased. However, I have to point out that in 2004, 80% of organically managed land was located in only ten countries, with more than 50% of them located in just two countries, Australia and Argentina (Kristiansen, 2006). However, the most intensive adoption of organic agriculture has not occurred in these countries, but in Western Europe, above all in Germany and Scandinavia.

Nowadays, governments are realizing of all problems that conventional agriculture causes, and the solutions that organic agriculture offers to many of these issues. So this results in many policies and government actions that support the application of this new type of agriculture more respectful with the environment.

A fundamental part of governments is that they are finally defining organic agriculture in law and creating enforcement mechanisms, often by using existing non-governmental certification agencies. This can help to establish the organic agriculture in a better way, and make it more popular around the world. Besides, they provide to the farmers of direct subsidies for the conversion to an organic agriculture. Although, according to some studies made by the Organization for Economic Co-operation and Development (OECD), there is not a direct relation between these direct payments and the improve of environmental practices of farmers.

In summary, fortunately, nowadays, organic agriculture is recognized by the public and government as an alternative to conventional agriculture and this includes some ideas and practices that the industrial one can adopt to be more sustainable. However, they are so interrelated that this process of one adopting practices of the other one has resulted in organic agriculture taking on some of the practices of industrial agriculture, which contradict with the organic principles about sustainability.

In addition, it is important to point out that these positive trends towards an organic agriculture can change in every moment, due to, according to some studies; the main motive for adopting organic farming is profitability, which means that if their premiums decreases, they are ready to switch to conventional production (Morgan, 2000).

EVOLUTION OF THE PRINCIPLES OF ORGANIC AGRICULTURE

The principles explained below are a series of goals and caveats that are important to produce high quality food, fiber and other goods in an environmentally sustainable way. As we have seen in the section on history, organic agriculture has gone through several phases, so that its principles have also changed over the years. Now they have a stronger environmental focus than what they had in the early twentieth century.

However, the principles have not been specified until the last thirty years. This is because they only came to have a political and social acceptance when the organic movement was worldwide and their principles began to spark interest and gain recognition.

The first principles of organic agriculture were written in 1980 by IFOAM. In table 1 some of them are shown in summary. These were published in the beginning of this organization, with the "basic standards" guarantee of an organic system.

TABLE 1: IFOAM principles of organic agriculture (1980)

1. To work as much as possible within a closed system, and draw upon local resources.
 2. To maintain the long-term fertility of soils.
 3. To avoid all forms of pollution that may result from agricultural techniques.
 4. To produce foodstuffs of high nutritional quality and sufficient quantity.
 5. To reduce the use of fossil energy in agricultural practice to a minimum.
 6. To give livestock conditions of life that conforms to their physiological needs and to humanitarian principles.
-

7. To make it possible for agricultural producers to earn a living through their work and develop their potentialities as human beings.

Source: *Woodward and Vogtmann (2004)*

But these have been modified over the years. The following table (Table 2) shows some of the principles that were established early in the new millennium. More than principles, these were considered "principles aims".

Table 2: Objectives that IFOAM considers 'the principle aims of organic agriculture for production and processing' in 2004

- To produce sufficient quantities of high quality food, fibre and other products.
- To work compatibly with natural cycles and living systems through the soil, plants and animals in the entire production system.
- To recognise the wider social and ecological impact of and within the organic production and processing system.
- To maintain and increase long-term fertility and biological activity of soils using locally adapted cultural, biological and mechanical methods as opposed to reliance on inputs.
- To maintain and encourage agricultural and natural biodiversity on the farm and surrounds through the use of sustainable production systems and the protection of plant and wildlife habitats.
- To maintain and conserve genetic diversity through attention to on-farm management of genetic resources.
- To promote the responsible use and conservation of water and all life therein.
- To use, as far as possible, renewable resources in production and processing systems and avoid pollution and waste.
- To provide living conditions that allow animals to express the basic aspects of their innate behaviour.
- To utilise biodegradable, recyclable and recycled packaging materials.
- To support the establishment of an entire production, processing and distribution chain which is both socially just and ecologically responsible.

Source: *IFOAM (2002)*

In more recent years, it was considered that these "principles aims" had become bloated, lack consistency and have been weakened, so they were modified. Thus, in 2005, the new principles (Table 3) were accepted, which were more similar to those written in 1980 than those which exist today. However, we must consider that they were rewritten a few years later, and therefore they were established as a draft.

One of the novelties of this new draft was that the principles were divided into categories, so they were more specific and they referred separately to each of the main objectives of sustainable organic agriculture.

Highlighting the principle on the environment, as it is the one which is being analysed in this paper, it states that organic agriculture should function in the same way as natural ecological systems, which are self-contained, self-maintaining and self-sufficient. For farms, they should work within a closed system for nutrients as well, avoiding the use of fossil fuels, and designing farming systems that are self-regulating, such as the control of pests that they carry out by growing plants that increase biological control agent populations, rather than using interventional techniques such as pesticides derived from natural sources.

Table 3: IFOAM's draft revised principles of organic agriculture

- Principle of Health
 - Organic agriculture should sustain and enhance the health of soil, plant, animal and human as one and indivisible.
- Ecological Principle
 - Organic agriculture should be based on and work with living ecological systems and cycles, emulate them and help sustain them.
- Principle of Fairness
 - Organic agriculture should be built upon relationships that ensure fairness with regard to the common environment and life opportunities.
- Principle of Care
 - Organic agriculture should be managed in a precautionary and responsible manner to protect the health and wellbeing of current and future generations and the environment.

Source: IFOAM (2002)

In parallel with the principles established by IFOAM over the years, there have also been other studies that discussed and redefined them, as the USA government or the Danish Research Centre for Organic Farming (DARCOF) made. In the latter case, the center raised discussions about the principles that established the IFOAM, which was taken into account in subsequent revisions thereof.

3.3. Environmental advantages

Before pointing out the environmental benefits of the incorporation of organic agriculture in the industry, other aspects must be taken into account.

The main factor to consider is that organic farming is not a unique solution with specific practices, but to solve the problems of environmental sustainability of traditional industrial agriculture is necessary that it adapts to the local farming, and social, geographic and climatic factors.

Therefore, as I have already explained in previous sections, it is the responsibility of each region to determine which practices are the most sustainable and green when it comes to carrying out organic agriculture, as there may be regions where sustainable practices cannot be implemented. Some of these causes may be the increasing costs of changing from a conventional farming to an organic one, by the act of requesting organic certification.

As I have already said, the organic agriculture was born in Europe, so the adjustments that have occurred in this region over the years, in terms of considering what practices are more environmentally sustainable (as they have varied over time) may have been resulted in greater sustainability here than in other regions.

However, there are small regions worldwide, which are local ones, whose practices have been considered sustainable as well. One factor that explains this is because there are places where their standard and traditional practices have always been respectful with the environment, so it's a matter of tradition rather than an environmental commitment.

Another second factor is that organic agriculture is only a small part of the whole agricultural business world. Therefore, as we will see, it is a way to improve agriculture in their commitment with the environment.

In addition, noting that most of the fields of organic farming that exist throughout the world is due to a conversion of industrial agriculture to organic agriculture. So what will

be discussed in this section are the environmental benefits associated with this conversion system.

Therefore, once these factors have been exposed, I will start establishing the main environmental differences between the two types of systems.

It is noteworthy that environmental impact between these two types of agriculture is not the same, but there are huge differences in the biological, chemical and physical characteristics of soils between the two systems. Additionally, the conversion also requires many structural changes.

Unlike conventional farming, organic agriculture aims to environmental sustainability so it incorporates on its system two main methods to achieve this result: the regulation of the use of inputs and the requirement of specific measures to be applied. According to FAO (2000) the first method is more important than the second one.

Also, in relation with these methods, two basic characteristics of organic agriculture are defined: the avoidance of fertilisers, and the prohibition of agro-chemical pesticides. This results in a greater respect to floral and faunal diversity by the organic farming against conventional one. Besides, it also translates into a better conservation of soil fertility and system stability than conventional agriculture systems.

Some practices that are popular in organic farming systems are crop rotations and cover crops. These methods help to improve soil fertility and water quality, control weeds and pests, and increase biodiversity in production systems.

Nevertheless, some researchers have shown a trend in organic agriculture towards different practices, replacing some such rotations, especially in some agriculturally intensive areas. Below there are detailed the main management practices in relation with environmental issues.

According to Organic Farming Research Foundation (OFRF), the biggest problem in organic agriculture crop systems is weed management. Unlike industrial agriculture, the organic one includes techniques like mechanical cultivation, hand or hand implement, crop rotations and cover crops, while conventional one includes methods which involves chemicals. Many assessments conclude that organic crop systems tolerate higher weed densities without yield loss than conventional systems, which helps to maintain plant biodiversity.

Another important problem, and maybe the most significant difference between them, is pest management. Since organic farming appeared, alternative pest management practices have also emerged.

Organic farmers defend that the use of synthetic fertilizers and pesticides makes crops more susceptible to pests. So for them there is no reason to use it, apart from that they are more damaging to the environment. In relation with this, some studies have proved that organic crops are more tolerant of insect attack, achieving even a better resistance to them. Pests died quickly, and had lower reproduction rates on plants grown in organic farming than on plants in conventional ones (Morgan, 2000).

Mostly this affects the land of organic agriculture to be of higher quality than industrial, with higher water holding capacity or microbial biomass. However, when there is a transition from industrial agriculture to organic agriculture, farmers have to take into account that this positive change in soil may take several years before they appear.

With regard to environmental costs of both types of agriculture, many reviews that have been made over the years, have shown that organic farming systems perform significantly better than conventional agriculture.

The industrial farming's major environmental costs are pesticide and pollution of water, erosion, and reduction of biodiversity, which are explained in previous sections.

According to a study made by the US National Water Quality Assessment Program (NAWQA) at the beginning of the century, more than 95% of streams and nearly 50% of shallow wells contained some agricultural pesticide, mostly below EPA thresholds for health. On the contrary, none of those pesticides which were found in the study are used in organic agriculture systems.

Nevertheless, organic farming does allow the use of pesticides in their practices, because the complete dependence on natural origins does not have the guarantee of being 100% healthy. But it is noteworthy that the use of pesticides is minimal, and those which are used are less harmful to the environment and the health of living beings.

Regarding nutrients, the NAWQA program establishes that those agricultural nutrients that can become pollutants of aquatic systems are present in both systems. And about

soil nutrient, studies show that in organic agriculture there are lower leachable nitrates⁴ than in conventional farming systems.

Studies conducted in different regions of the world show how the implementation of an organic farming system causes less soil erosion than an industrial agriculture system. And that is because the organic farming soil implements practices that help more to the soil stability and the resistance to water and wind erosion, in comparison with conventional agriculture soils.

In terms of the energy used by both systems, at the beginning of the century, studies showed how organic agriculture used 50% less energy than an industrial system. But we have to consider that the demand for organic products has increased in recent years, and not all regions use an organic agriculture system. This results in a greater need to carry some food from one place to another, and so an increase of energy use, thereby also increasing the energy used for the production of those food.

And the last important advantage is referred to biodiversity. This is generally higher on organic farming systems than in conventional ones, either in non-crop plant species, soil biota, or other species.

In short, as we have seen, a conversion from traditional agriculture to organic can mean many benefits for the environment. Similarly, it can lead to higher profits, since according to numerous surveys conducted by various institutes to farmers who had adapted their farming practices, the benefits which they have obtained had increased about 20% compared to those that they have obtained with traditional practices.

4. Business models and agriculture

We have seen all environmental problems that are related to agriculture, and how organic one can reduce their impact. However, it is important to notice that although organic farming system is less harmful with environment, farmers have to run a business which is profitable. All managers should think in their business like a way of living, even when one of the main purposes is being more “green”. They should think about how organize themselves, so they should have a strategy, a plan.

⁴ Nitrate that appears on the ground in wet areas, and whose appearance is accelerated by the misuse of the land. This substance causes the displacement of soluble substances (salts, iron, humus, etc...), and the loss of nutritive compounds of the soil.

Nevertheless, in this section, I will talk about management of those firms, explaining which type of business may be the best option to run by farmers to achieve those environmental goals and being profitable at the same time.

4.1. Family farms versus agribusiness

Agriculture is not a homogeneous industry. This industry is composed of a complex series of firms.

Nowadays there are two main kind of companies that predominate in the sector: the individual one (which used to be familiar), and corporate agricultural company (or also known as agribusiness), which are bigger than the first one.

FAMILY FARMS

With reference to individual companies (family business), they are characterized by the presence of the farmer in all stages of the production process. They are also known as “family farm”; due to it is a way of production where all members of the family contribute with the majority of the labour, the management and the financing.

All people dedicated to agriculture face some challenges, being the most difficult of this sector the production of food keeping biodiversity and ecosystem in long term. This implies that farmers cannot carry out all practices they want, but those that contribute to the wellbeing of the environment. For small farms it is a bigger problem than for big agricultural industries due to, though farmers from both businesses cannot produce all food they want, remains being in small farms where less food is grown, losing market power.

In this way, special attention requires externalities, such as social and ecological aspects. The first one refers to sustainability of rural communities. Owners of this type of farms have to guarantee that community, where they work, is not affected by their agricultural activity. And about ecological aspects, as I have said before, one of their goal is to keep biodiversity, and not contribute to loss of habitats, so their practices have to follow these main principles. But also keeping their survival in short and long term, focusing on doing business. This is one of the most difficult problems for family farms, above all by the strong increase in competition caused by large companies, which are able to produce more because they are more focused on making of the agriculture a profitable business, and they have more resources to do so.

In relation with farmers in this type of business, the most of them are members from the same family, which helps to communication among them. Although, it is usual that farms are inherited among the family for generations, causing workers do not have much knowledge about how to use best practices for sustainable agriculture. Thus, new generations still use traditional practices since these are the only ones they know, those that their fathers taught them.

With regard to evolution of family farms, in spite of all changes that occurred in the twentieth century (technological revolution), this model has not disappeared. One reason of this is that family businesses have developed different strategies, and they have known how to adapt themselves to the market. Although their resources are limited, they have incorporated new technology to their work, achieving greater efficiency. Indeed, at the beginning of this century, just in United States, almost 90% of all farms were small ones [...family farms accounted for 86% of all farms, partnerships accounted for 9%, corporations 4%, and others less than 1%.] (Cramer, 2000). Even in European countries, this level is also huge. Thus, according to FAO, the 98% of all world agricultural exports are family ones.

In this sense, the main characteristic of small farms is the continuous and uncertain changes that face farmers (Darnhofer, 2010). These are usually by extern factors from outside the company (like changes on agricultural govern policies, or technological, demographic and climate changes), where farmers cannot influence, they can just adapt to those changes in the best way. This is a problem because of little capital that they have. In spite of all those changes, farmers have to maintain stable levels of debts, so they have to study each investment that they are going to make. Whether they will take a long time to recover those investments, farmers will not make it, since their debts grow more than they are capable of winning before the recovery of that investment. So, the inversion occurs if farmers have a guarantee or external help to make it, to reduce the risk. Or even, if they can make it with a group of farmers of small farms, to share the risk.

Furthermore, those external changes result in internal changes, but these are produced on a small scale, for, I have said, avoid large investments, which is a relevant aspect for the implementation of new technology, due to it implies huge investments. So they do it under some conditions, as I have explained in the previous paragraph.

To summarize, I will discuss the main advantages and disadvantages that family farms face:

Advantages:

- Greater control of work. Family farms are characterized for having a small structure. This facilitates the supervision of the work, and they can motivate family labour.
- Faster implementation of small structural changes. Because of the size of their structure, farmers can change their strategy easier.
- Good communication. Almost all farmers are members from the same family, and as they all know each other, it facilitates communication flow.
- Biodiversity. Small farms are more likely to crop rotation. Thus get better performance because its dependence on machinery or fertilizers is reduced, due to it involves a large investment.

Disadvantages:

- Greater impact of external factors on which farmers cannot influence, like weather or new policies, because they do not have too many resources to make changes.
- Difficulty in achieving economies of scale, because their resources are limited and they have more difficulties on invest in innovations
- High unit transaction costs in almost all non-labour transactions due to their small scale. For them it is more difficult to access to capital, technical information,
- Few bargaining power.

AGRIBUSINESS

“Agribusiness” emerged by the necessity to specify the strategies of the agriculture, which was very important in the twentieth century due to all changes which was happening, as a consequence of industrialization. Population was increasing, and with it the demand for food. As a result, agriculture became a crucial issue to be addressed and improved.

So, in 1956, John H. Davis, the director of the program in agriculture and business at the Harvard Business School, introduced a new concept: the agribusiness, which is explained in his publication A Concept of Agribusiness:

“Agribusiness is the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing, and distribution of farm commodities and items made from them. Thus, agribusiness essentially encompasses today the functions which the term agriculture denoted 150 years ago.” (Davis and Goldberg, 1956)

Since then, there have been many publications and agricultural specialists to define this new concept. One of the latest definitions is given by Gail L. Cramer in his book "Agricultural Economics and Agribusiness":

“It involves the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing, and distribution of farm commodities and items made from them.” (Cramer, Jensen and Sourthgate 2000, p. 490)

In general, this concept refers to all type of private agricultural firms (family farms and corporative firms). It includes all industries that participate in the agricultural system: input suppliers, producers, commodity processors, food manufacturers, food distributors and food retailers. However, as it refers to many different areas, agribusiness is usually associated only with corporate firms, due to their size and their great influence on the market. And in this work, I will continue with this principle.

Unlike family farms, industrial companies have large amounts of capital, so it is easier for them to use modern business strategies to make a profit on their products. Some of them may even control the entire process of food production, or produce wide range of food and attend to a larger market segment.

With the growth of the agricultural industry, new and bigger corporate firms are emerging, and they are becoming more flexible and complex, and even more decentralized. This is an opportunity for them, because in this way, they can adapt to changes on the environment easier.

Like family farms, there are some advantages and disadvantages that corporate firms face:

Advantages:

- Economies of scale. Thanks to its large capital owners can invest in innovation and thus achieving economies of scale, and reducing costs.

- They can better meet critical services with suppliers or customers, as they have better contact with intermediaries and greater bargaining power.
- Better access to financial markets. A greater demand means greater technological necessity, so it is necessary more resources. It also implies a greater need for access to market information. And it is easier for corporative farms, due to they have more resources.
- Greater competitive advantage.

Disadvantages:

- Huge investments. Because they produce greater quantities, greater investment in staff and equipment are required.
- Staff control becomes more difficult for large farms, resulting in a greater allocation of resources toward this goal.
- Sustainability in long term. Although they can set long-term goals, the agribusiness sets short-term goals, wanting to meet the demand that occurs today, but without a long-term view on the use of natural recourses. Increased production means more use of resources, but these are not unlimited.

4.2. Family farms, agribusiness and organic agriculture

Organic agriculture plays an important role on food production, sustaining rural economies and stewardship of biodiversity (FAO, 2000). Through organic farming, companies can achieve ecological, social and economic benefits. One of its principles is oriented towards sustainability of rural communities. It provides healthy food, and keeps their traditions, sharing experiences and developing new farming methods.

In this sense, Technology Research Platform for organic food and farming (TP Organics) distinguishes the main objectives of organic agriculture at its core:

- to produce products of high quality that nurture consumer health
- to respect high animal welfare standards
- to establish sustainable management systems for agriculture that sustain and enhance the health of soil, water, plants and animals and the balance between them
- to contribute to high levels of biodiversity, and
- to make responsible use of natural resources.

These objectives contribute to the generation of wide range of innovation and the development of new ideas and practices to achieve them. And it implies the use of new ways to control weed avoiding the use of pesticides.

According to GRACE Communications Foundations⁵, organic food can be produced by large corporations and there is no limitation on the size of the farm. In this way, as organic agriculture is becoming more popular, large corporations are commercializing products with this tag. As this organization points out, although some companies may say their products are organic, this can be questioned sometimes, because some of them may use pesticides and other chemicals. Anyway, this increase in the demand may result in a problem for small farms if many large companies adopt this philosophy, because they will be able to produce more food in less time, being more competitive.

Either way, there are some practices that all companies should implement to produce organic agriculture. With regard to what I have said above, practices in organic agriculture imply more innovation due to practices used in conventional agriculture contradicts the objectives named previously; therefore farmers have to change their strategy. For corporative firms is easier to incorporate new innovative machinery and practices, due to they have a better access to global financial market, being able to achieve huge quantities of capital and implement the best innovations, which also contributes to the achievement of economies of scale.

Another important aspect consists in good planning and prevention of organic practices and management. Unlike conventional agriculture, organic farming does not allow to take action and then correct them if they have not worked or are too harmful. But it involves an in-depth study on the best actions to be performed and its impact on the environment, including the impact that has on the organization if it has to be changed.

For this, it is important to have good management of knowledge resources among all users. This consists in an exhaustive search and development which needs to engage all employees in all phases. In this sense, family farms are more likely to develop a continuous flow of communication throughout the organization, as stated in the previous section. Workers are more involved and therefore more motivated, resulting in a great incentive for them to work and achieve greater results. However, even for the corporative firms to achieve a good flow of information is also possible, they need to invest more resources to supervise all workers, since the organization is larger and

⁵ "It develops innovative strategies to increase public awareness of the critical environmental and public health issues created by our current food, water and energy systems, and to promote a more sustainable future." GRACE Communications Foundation

more difficult to get all of them to be motivated. In addition, to these farmers who work in large industries, their primary motivation is not to make the farm profitable on a long term (as in the case of family farms), but only to get a high salary for their work.

With regard to vision of the company, all its objectives have to be oriented on a long term. As TP Organic has established, its management has to be sustainable. Its actions have to guarantee the sustainability of the environment, so its practices cannot damage biodiversity and soil. For this, it takes into account all the changes that may occur in the medium and long term, and therefore it is important for farms to have the ability to adapt quickly. In this sense, small farms have an important advantage, because, thanks to their small organization, they are more flexible and they can adjust their practices to changes on climatic and soil conditions.

As it is explained in the previous section, organic agriculture implies the use of limitations in using inputs (like the ban on the use of pesticides) and agricultural practices, which results in labour intensive for certain types of production (European Commission, 2013), due to it is necessary to work more lands to achieve greater production. In family farms, this workforce translates into hiring more family members, and in the case of large farms, into hiring external farmers. Similarly, for both results in higher costs, which is more harmful for small farms.

To summarize, there is a huge necessity of capital to implement organic agriculture, because innovation in all process is very important, and this is an advantage for large industries. However, according to FAO, an organic vision consists in the achievement of an ecological balance (“Organic Agriculture should attain ecological balance through the design of farming systems, establishment of habitats and maintenance of genetic and agricultural diversity”). So, if farmers want to follow an organic vision, the best way to implement it is through small farms, because of its organization, which makes it easier to get more control over farmers.

4.3. Cooperatives as a tool for small farms

To solve this problem of lack of capital resources that family farms faces, cooperatives arise.

Being part of a cooperative helps to small farms to be able to produce enough to generate profits and ensure their substance, which is an opportunity to compete with larger companies. In this way, cooperatives help agricultural managers to reduce

uncertainty and risks which emerge when they carry out their activity (Barancheko, 2012):

- Greater accessibility to new technologies.
- Risk diversification due to they have they possibility of commercializing with different products and markets.
- Greater access to information, which results in taking better decisions in production and in commercialization.
- Farmers have fewer responsibilities. Cooperatives collect information from farmers and act as means to expose their thoughts and necessities to public organizations.

In general, cooperatives help them to face the limitations of the small farming and manage the uncertainty and risks that it entails.

Furthermore, cooperatives also help to cultivation of family farms to increase. They can guide farmers about what food cultivate thanks to a market study made by them. This allows them to take fewer financial risks, increasing their sales. It results in outsourcing of their tasks, due to cooperatives offer them some services.

In relation with financial, agricultural sector is the industry where governments are more present, due to its production depends on some factors. Apart from public power, there are many organizations whose main objective is the help to farmers and companies with their job, because agriculture has many risks and depends on external factors, like weather. In this sense, cooperatives can help to farmers as a representation means in politic forums, and influence in the decisions that affect to agricultural companies. This helps them to get insurance if weather and soil conditions affect their production, competing with the big industries that, thanks to its capital resources, they can get to those insurance on their own.

Referring to the management of the farm, now I will develop some economic and environmental benefits that family farms can get if they work in a cooperative:

ECONOMIES OF SCALE

Because of the growth of organic agriculture, it is leading to increased demand and therefore mass production. This results in a greater ease of achieving economies of scale in production.

Thanks to technological innovations, all agricultural enterprises are incorporating new machinery to produce more in less time, achieving greater efficiency and cost reduction. Large corporations, having more resources, are more likely to achieve these economies of scale, since they can implement better equipment and more modern methods. For small farms, this technological implementation becomes more complicated, but through cooperative they can help each other to reduce costs, such as using the same trucks to distribute food, resulting in a save on energy consumption and thus in greenhouse gas emissions. It also permits them to benefit from discounts through the bargaining power and purchase exercised by representatives of cooperatives.

Furthermore, cooperatives allow them to unite their lands to achieve large-scale production, and thus they are better prepared to soil erosion. Another way to achieve economies of scale is through market access. This is one of the most important challenges that small farmers face, and this is where cooperatives play a key role because through them farmers can attract traders and buyers.

COMMUNICATION

Cooperatives have a huge advantage in this aspect. For its successful, there has been a great communication through all levels of the organization, and with all members of the cooperative. The objective is to know what is working and which aspects need to be improved. Thus, through cooperative, weak points on the production are known, and workers can know in which step it is more necessary to set their resources, and getting reduced waste of them, and of time, being more efficient.

Companies are able to establish an organization where communication flows in the best way, but it is easier in cooperatives, due to their main objective is to be informed about all what happens in farmers. In this way, cooperatives have the ability to transfer information from clients to farmers. Thus, they can attend better the demand that if they are not part of a cooperative.

Furthermore, thanks to better information flow, farmers can incorporate technological innovations due to cooperatives can collaborate with organizations with this purpose.

SPECIALIZATION AND KNOWLEDGE SHARING

With relation to the previous point, through a good information flow, farmers can get specialization. In this work I am talking about family farms, but can happen that, despite of most of them are members from the same family, they can hire other employees due

to huge demand that occurs at certain times of the year. Although owner farmers should train to their own family as well.

Thus, cooperative promotes to the farmers to take training activity to get specialization and develop their abilities, with the objective of being more efficient.

Through specialization and knowledge sharing, farmers can focus their ability to a same purpose, avoiding the waste of time and resources.

MANAGEMENT OF RISKS

Agricultural sector is very unstable, because it may be affected by many external factors, like weather or climate change. A way to manage these risks for small farmers is being part of a cooperative. Today there are many organizations for assisting farms to recover their investments in situations where these have been affected by adverse external situations. But for this, the owners of the farms have to buy insurance with these organizations, which is a greater need to invest resources, which often they do not have. Thus, cooperatives can act as intermediaries, ensuring farmers the right quality in production, in cases where the climatological weather is not favourable.

5. Case study: CROPP

To further analyse cooperative, I have used a case study as a research. The objective is to demonstrate how a cooperative succeeds following the practices listed above. Thus, through the analysis of a case study we can observe the practical sense of all previous study.

Thus, the main purpose of this work is to understand in a practical way how a cooperative helps to solve the problems that face family farms, and also following an organic vision. For this I have used a case study, which shows how the company incorporates all these principles that all the cooperatives should follow to become successful. However, it is important to consider that these results are only extracted in this specific case, but they let give an initial idea of how to implement organic practices in a company, and how to be part of a cooperative helps to solve problems that small farms face.

DATA COLLECTION

For the realization of this investigation, I have drawn on external data. First, I rely on periodic reports provided by the company itself to study how its business model is and how they share an organic vision. Second, and most important, I have relied on many studies about this cooperative that explain how CROPP has become a success business within the organic industry. To do this I have relied in finding academic and business articles in specialized databases such as Business Source Premier or Wiley Online Library, with a focus on sustainable development.

Through this research I have been able to study from different perspectives which are the practices that have made Organic Valley one of the largest brands of organic products in the United States. In the same way, and most importantly, how to establish a type of business, such as the cooperative, has helped to make this happen successfully.

So, then this case will be analysed in particular, making a first introduction to the situation of the company, to develop later which corporate actions are used by the cooperative.

5.1. History

Organic Valley, formally known as the Coulee Region Organic Produce Pool, or CROPP, is the largest cooperative of organic farmers in United States. And it is also the single largest source of organic milk in this state. This cooperative is headquartered in a small town in the southwest of Wisconsin, and it is made up of more than 500 farmer members in 17 states of North America. More than two-thirds are principally dairy farmers, and the rest raise meat, eggs, vegetables, or citrus crops. Organic Valley's products are sold in all 50 states and in some overseas markets.

Organic Valley was founded in 1988 by seven farmers. They organized a cooperative under the name Coulee Region Organic Produce Pool (CROPP). Coulee is a geologic term for the small valleys that are common in southwest Wisconsin, where the original farmers were located. It was an area affected by drought in the mid of 1980s, and many small family farms in this region were struggling to survive. George Siemon, currently chief executive of Organic Valley, was one of the founders of the cooperative. He and his family began running an organic farm in Wisconsin in 1977. The Siemon farm used no pesticides or herbicides on its crops. In those years, farms treat their animals with antibiotics, but Siemon (among other organic farmers) only treat them if

they were seriously ill. Besides, he bet on fields that were free of herbicides and pesticides where animals could graze. Based on these actions and principles, Siemon became one of the nation's premier spokesmen for organic methods of farming.

Some years earlier, in the mid-1980s, Siemon and other organic farmers thought that they were not getting a decent price for their milk and crops, so their lifestyles could be adversely affected. In this way, they concentrated their efforts on improving marketing their organically grown vegetables. But dairy products represented a much bigger market, and the group decided to focus on organic milk.

In this situation, the seven founding members were already members of a farming group called the National Farmers Organization (NFO). This organization was founded in 1955 to give family farmers unified bargaining power. It was a nonprofit group, whose main objective was to pool the interests of member farmers and negotiated prices for farm commodities. This organization helped the seven farmers to create CROPP, with the purpose of creating a more specialized group that would be able to raise the prominence of organic products. And, I have said before, in July of 1988, it was created and began shipping milk under the CROPP name.

Thus, in 1989, the small cooperative was located in a small town called LaFarge, in Wisconsin (United States), to serve as its headquarters. In these years, the group did not have its own milk processing facility, but used existing ones. To sell its milk, the group hired an outside marketer. But this did not work, and CROPP decided to develop its own marketing program and its own brand, Organic Valley. So, the Organic Valley brand was created in 1989, and it became more popular than CROPP.

For its first five years, the cooperative just sold about half its milk for the premium prices of organic milk, on the organic market. The rest of this milk was sold on the conventional market. Gradually, consumers started to buy more its products, although they were more expensive than conventional dairy products. But there were people who were willing to pay more for certified organic dairy products, and Organic Valley took advantage.

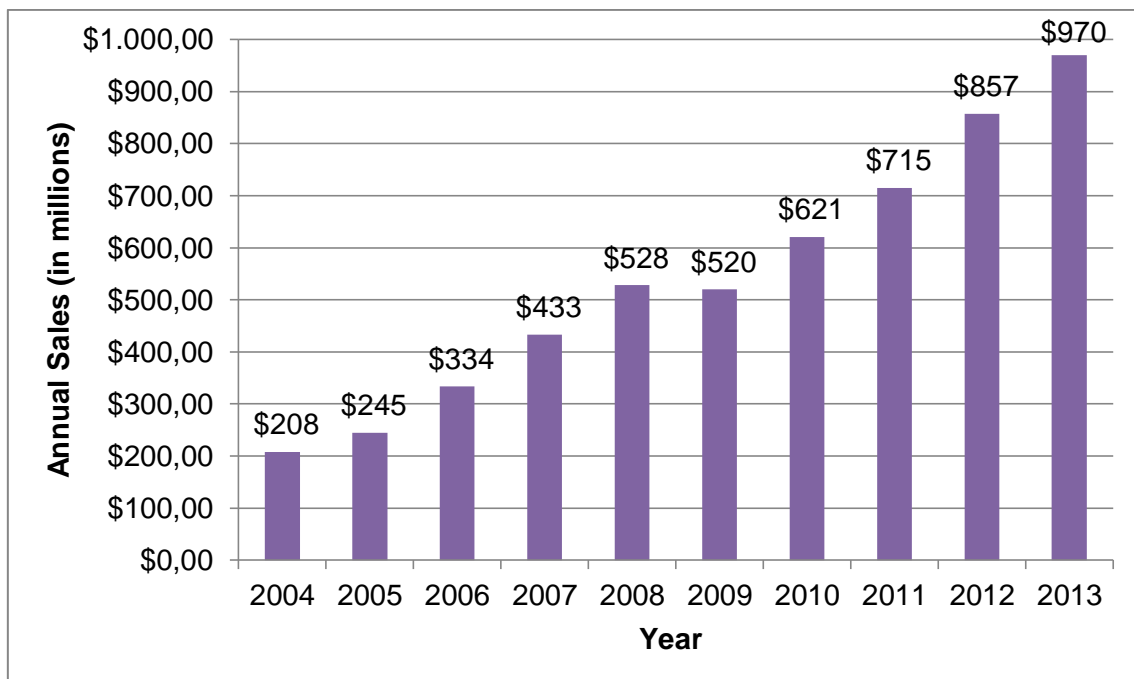
The organization's philosophy was to do the best for its member farmers. So CROPP offered high milk prices to members rather than aim to accumulate capital for expansion. The group also wanted to preserve the family organic farm, due to they believed that this method of agriculture helped farmers, consumers, animals and the land. Thus, over the years, sales grew significantly, achieving in 1992 sales of around 2

million dollars. The next year, the organic dairy market became more popular thanks to a new development in conventional farming.

Organic food was the fastest growing sector of the retail food market in the 1990s, growing by as much as 24 percent a year over the decade. Up to 1999, the USDA had prohibited the marketing of meat as organic. But the USDA rescinded the restriction, and Organic Valley began selling a variety of meat. In 2000 the USDA finally released National Organic Standards, which is a unified federal program for certifying organic foods. Thanks to these standards, consumers can know which products are completely organic because they meet its strict certification rules.

In this way, instead of some companies stopped selling organic products due to they do not comply with the USDA standards, Organic Valley's sales increased considerably. As we can see in Figure 2, since 2003, sales have been growing significantly, getting sales of a billion last year. According to Siemon: "While organic fluid dairy grew by 5 percent, Organic Valley branded dairy grew by 5.4 percent".

Figure 2: Annual sales



Source: *SFTA Annual Sustainability Report 2012*

In 2000, it became to distribute more than 100 different organic food products and the group had more than doubled its membership from two years earlier, to more than 300 farmers. Two years later, Organic Valley was paying its dairy farmers almost twice what conventional farmers were getting for milk.

5.2. Goals and organizational structure

According to Siemon, “Organic Valley is a social experiment disguised as a business” (George Siemon, CROPP CEO, interview in 2007).

Its mission consists on running a cooperative whose principles are the promotion of regional farm diversity following organic methods to sell organic products.

“The purpose of the Cooperative Regions of Organic Producer Pools is to create and operate a marketing cooperative that promotes regional farm diversity and economic stability by the means of organic agricultural methods and the sale of organic products” (Organic Valley’s website).

These principles have to be shared across the enterprise. Both managers and workers have to consider that organic is not just about food: “Organic’ simply means everything fitting together to make a whole” (Siemon, interview in 2007).

Table 4: CROPP goals

- **COOPERATIVELY** market certified organic products produced exclusively by our members.
- **MARKET** nutritious, wholesome food as directly as possible to the consumer.
- **ESTABLISH** farmer determined food prices to reflect fair return and to use these prices to guide the cooperative marketing.
- **ENCOURAGE** a farming future emphasizing ecological and economic sustainability.
- **ENABLE** a healthy human livelihood by providing quality employment, cooperation, organic education, and community growth.
- **PRACTICE** environmental awareness and cooperative principles in all aspects of production, handling, marketing, and operations.
- **PROMOTE** respect for the dignity and interdependence of human, animal, plant, soil, and global life.

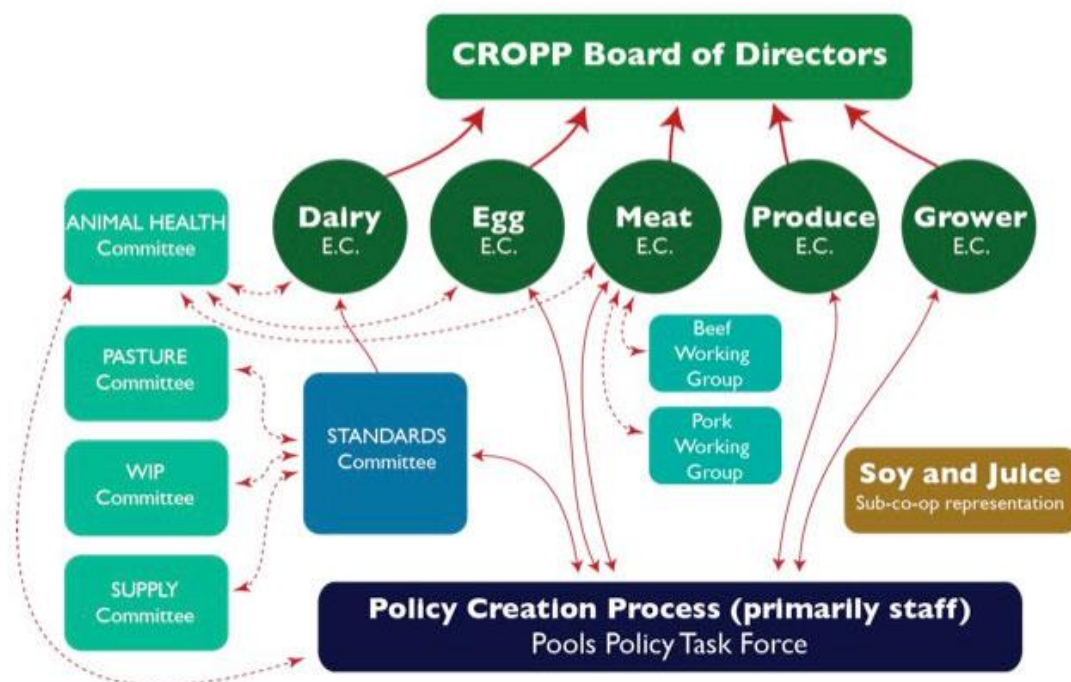
Source: CROPP website

CROPP Cooperative’s executive management team reports directly to the board of directors, which is elected by farmers. This team is responsible for the marketing and operations functions of all products which are bought under the Organic Valley and Organic Prairie brand names.

The next organizational chart shows how the cooperative is structured. It is organized by products: dairy, egg, meat, produce and grower executive committees. In particular, the executive committee of meat is divided into two working groups: beef and pork. Besides, since 2004, they introduced into beverage sector, through the commercialization of a drink called Organic Valley Soy.

Moreover, there are four important committees related to animals, which are: animal health, pasture, work in progress, and supply. The three last are analysed by the standards committee to ensure that they meet the requirements of the company, because as we will see below, they have a very restrictive policy on the treatment of animals and the quality of the products.

Figure 3: Pools Executive Committees



Source: CROPP website

One of the most important aspects of this company is that all workers have to share the same vision of having present values that organic involves. The directors elect farmers who become part of the cooperative for their personal values. They are not driven by their ego or ambition to get much money, but they must be driven by CROPP's mission and by doing the right thing, thinking about their impact on environment.

According to one of the seven founders of CROPP, they try to recruit people who do not want to have a high fixed wage, because they will not get it, but people who want to work and have a passion for the principles of the company, for the environment, organic farming and for family farming.

5.3. Implementation of an organic vision

As we have seen in the section of the company's mission, CROPP seeks sustainability through incorporating organic principles throughout the company. Thus, all targets are set based on the principles of organic agriculture. In this way in this section I will discuss the actions carried out by the cooperative to successfully implement this philosophy and be both efficient. Although the explanation of why it is efficient will be described in greater detail in the following section.

To understand organic practices that incorporate the cooperative, we must know that this philosophy is the foundation of the company, and is conceived as a lifestyle of the cooperative. Thus, CROPP defines organic as "*A philosophy and system of production that mirrors the natural laws of living organisms with an emphasis on the interdependence of all life.*" They follow this organic philosophy because they want to produce food with more quality, respecting all living beings, without damaging the environment. As Simone says: "*...organic as a choice, not a moral issue*".

So, CROPP establishes that "organic" is not just a strategy, but a way of making business, "*of looking at the world*". So its philosophy is known across all farmers, and it is represented on all products that it sells.

In this way, through some courses and training all staff know what are the Organic Valley's principles, and they can internalize the importance of sustainability in their activities, and even in their personal life. This is so important for CROPP that before hiring new employees, they ensure for that person is important to preserve the environment and act accordingly.

To further describe the human resource policies carried by the company, Organic Valley has implemented wellness program, including yoga, Zumba, pilates, stretch,

among others. In addition, it also offers to its employees massage or courses on health and welfare, to motivate workers. It also has a program called "The Cooperative Action Network (CAN)" whose aim is to improve the relationship between farmers and local people, to achieve a more sustainable development. In this sense, Organic Valley has also created the Employee Growth Incentive Program (EGI), to reward those employees who best contribute to good development of communities through community service, wellness activities or sustainability activities.

On the other hand, to combat labour intensive derived from the implementation of organic agriculture on family farms, Organic Valley sets farmers ambassadors for marketing in retail stores and food service institutions, as well as public appearances and speaking engagements. Thus, these farmers act as intermediaries, trying to get more capital for farms.

With regard to the objective to produce products of high quality, CROPP tries to differentiate in its logistical services that include food quality monitoring, traceability and recall capacity, and prompt delivery. Organic Valley milk is regularly tested for pathogens at the farm level. Final products are routinely evaluated by inspectors at processing plants, and CROPP has the laboratory capacity at its headquarter in Wisconsin to spot-check products.

Thanks to its regionalization strategy (as we will see below), CROPP has the capacity to achieve logistical efficiencies, because although products are distributed primarily by trucks. CROPP does not have any delivery trucks. The cooperative has contracts with transportation companies for the distribution of its products across the country. These trucking companies are selected based on their rates, capacity, service, scale and fit with CROPP's support for smaller, family-owned businesses. This reduces distribution costs for farmers.

As I have already explained, one of the most important aspects to implant organic agriculture is to make a good planning and prevent the consequences of activities. In this sense, Organic Valley has a business model that consists on the board setting milk prices and that oversee every aspect of the organic process. Before acting, board defines all sustainable agricultural practices, making sure that they meet the requirements of the U.S. Department of Agriculture (USDA). All staff participates in making decisions, so they are involved and know exactly what the practices that they are going to follow are.

Finally, Organic Valley offers sustainable services by following some methods and principles. The most important are referred to animal welfare and biodiversity. According to its website, Organic Valley farmers utilize a method known as “Humane Treatment of Animals”, which consists on a strict pasture policy: “All Organic Valley animals have access to the outdoors, fresh air, pure water, and sunshine. Farmers do not use any chemicals over animals, except when they are sick.” Also pasturing is important, and animals have to pasture whenever the weather is not a problem. Thus, this ensures their welfare and quality of milk as well.

Moreover, there is a restriction in the use of pesticides. Farmers have to follow the Integrated Pest Management (IPM), which consists on the use of natural methods, as the use of raptors, bats and other beneficial insects, to control pest.

As an offered service to farmers, Organic Valley carries out energy efficiency audits at no cost to them. Through them farmers can identify areas for improvement and know what renewable energy can be implemented, thus reducing pollution generated by their activity. Besides, it also allows them to get more subsidies.

5.4. Business actions

As I have explained above, there are specific issues that farms have to manage if they are part of a cooperative. In CROPP, they are carrying out some practices with an organic orientation. Following the same division made in previous points, in this section there will be described practices that this company follows.

But first, it is important to notice that the others strategies are based on two, which are the major: regionalization and specialization. Regarding to the first strategy, the cooperative has established milk pools that provide both regional identity and fluid milk for processing and delivery in eight regions of the United States. Due to high demand, the company that originally distinguished the manufacture of certain foods in certain regions, now they produce food which is demanded in an area, in the factory which is located in the same region, since transportation is a major cost and greater environmental impact.

In terms of specialization, CROPP created two separate entities: Organic Prairie Family of Farms, which produces, processes and sells organic meat products, and Organic Logistics LLC, which focuses on distribution logistics for Organic Valley, Organic Prairie and smaller organic food companies. The decision of this separation is due to the strategy of isolating the Organic Valley brand, and ensure that it does not run any risk

of liability of these two independent companies. Furthermore, due to this separation, the management of the entire company was also separated, and letting them to specialize in a particular aspect. Thus, as stated in the previous section, this would not have been possible without the creation of the cooperative, as if it had just remained a family business, it would not have enough resources to divide tasks.

ECONOMIES OF SCALE

CROPP help to all farmers to get better prices so they can reduce their costs and motivate them to work through an organic vision. In this way, they try to know what the problems they have to check the best solutions for them.

An example of this are the issues that have sometimes farmers to control their production costs, so they cannot report that information to Organic Valley, which is a problem if they want to achieve economies of scale, and reduce their costs. To solve this problem, the cooperative has hosted cost-of-production workshops and has created workbook for growers, which include production tracking forms and accounting formulas. So, all farmers know what their costs are and how to reduce them.

Besides, to solve financial problems that I have explained in previous sections, Organic Valley has subsidies in all processes (marketing, infrastructure and sales force) due in part to all sustainability projects that they carry out, which help farmers to reduce distribution costs.

With regard to these benefits from transportation, CROPP negotiate with different companies to get competitive rates. Thus, they work with many trucking companies to ensure their customers that they are receiving the best prices for the feed and the freight. Besides, CROPP monitor all process to guarantee the food quality and to resolve any issue that can emerge.

However, this cooperative requires all farmers to purchase a truck, or at least railcar quantities, to not depend on transportation companies. But, in the case farmers cannot afford it, CROPP help them to split or share a load of feed with other farmers that are close. So, they can save money by purchasing in bulk quantities.

COMMUNICATION

With regard to communication, the company promotes that all farmers can give their opinion about the firm. For this reason, there is a suggestion box where all workers can

write questions, concerns or suggestions anonymously. When the proposal is received, it is sent to the right person, and his answer is published on the intranet. Besides, through this, CROPP ensures that there is always communication flows among all farmers.

On the other hand, all workers have to complete a quarterly work progress and reviews with their supervisor, and also Development Plans where farmers identify those areas where they can improve their abilities and knowledge through training activities purposed by them, and also the step they think they should follow.

However, all these actions are carried out within a privacy policy. CROPP Cooperative ensures that personal information of farmers is protected, and they can provide as information as they want. So farmers can use CROPP Cooperative's websites freely without fear that their personal information is shown, since it is required as far that farmers want.

Another type of communication flow is produced by the clients and CROPP. The cooperative encourages good communication with customers as they can know what their preferences are. Thus, the cooperative includes a toll free number on all product packaging for consumers to call for any questions. In addition there is also a website for consumers to send their questions and comments.

SPECIALIZATION AND KNOWLEDGE SHARING

In relation to the above, through these Development Plans, there is an incentive to all workers be involved in their work, and they can specialize and improve their abilities. To ensure that all members can participate in the decisions of the company, Organic Valley farmers belong to pools based on region and product produced. Each of it meets monthly and has an elected executive committee, made up of farmers. They decide the policy of the company and all decisions.

Also in this way, the company implements activities to get professional development and train to all staff. This training takes between 15 and 20 hours annually. And through it, workers can know how to do their job in a better way, but also get knowledge about sustainability. Thereby, they know what the purpose of the cooperative is, and they can oriented their activities and practices to achieve this main goal, which for CROPP is the sustainability.

The main vision of the company, and which has been named several times in this work, is that all farmers have to know what CROPP's philosophy is, to internalize and

perform their work based on this philosophy. Therefore, and as Simone states in the Organic Valley's website, this cooperative is an enterprise-wide system, which is composed of parts that interact with each other and with the environment. But the main point is that all farmers are considered as only one big group, although they work independently. Thus communication flows better and they all work towards the same goal.

MANAGEMENT OF RISKS

CROPP have a well-defined strategy to reduce risk, and improve benefits, CROPP has a push business model, which guarantees it will buy a specified quantity of milk or other products at a set price from member farmers. Then, the cooperative purchases production capacity from manufacturing partners which are close to its farmers, to manage the supply process so milk and other materials arrive at the right plant at the right production time.

To join the Cooperative, dairy farmer are required to contribute the financial equivalent of approximately one month's worth of production to CROPP Cooperative. This was established to reduce the risks that arise in the time from which the raw are picked up from farm members until the retailer pays after product delivery. But, in return for this support, the new members have control over their products from farm gate to the retail store. Besides, they add value to their products because they are under a recognized brand name, which is a saving on promotion. This results in a great focus on farming rather than sales, transportation management or market studies.

Another way to reduce risks is through the technical assistance and the access to scarce inputs that CROPP provides to the members. For example, the vegetable pool coordinator of CROPP works full-time to answer all questions about seeds, planting dates and pests. Likewise, in CROPP's website, buyers and sellers of organic feed can exchange information about supply availability and demand. Thus, all farmers can help each other, and have a personal advice to minimize risks in their production.

On the other hand, to reduce risks in fluctuations in customer demand, CROPP uses product diversity as tool. They can use product which are highly perishable to produce other products or to use them as ingredients for others to add value. For example, skim milk, which is a by-product of butter production, is used to produce many ingredient products. Likewise, if demand for fluid milk wane as a result of seasonal or other factors, CROPP can turn its fluid milk into other products, like cheese, which are not so perishable.

6. Conclusions

As we have seen, there are many environmental problems caused by agriculture sector, however, organic agriculture can help to reduce the impact that this work has on the environment. So, one of its principles is the reduction in the use of pesticides. This contributes to the improvement of biodiversity and soil health, which promotes sustainable agriculture.

With regard to implementation of this type of agriculture in business, for some farmers it can be a problem, because it is necessary that they change the way of working. They have to follow ecological principles to get the organic certification. And to achieve this purpose, they may need to shell out money since one of the features of this agriculture is that investments are needed.

Over the years, organic products have become more popular, and many farms (not matter is size), have started to produce organic food. In this way, there has emerged the problem of which type of farm is better to implement organic practices. Referring exclusively to the management of farms, family farms have some advantages over agribusiness, as may be the best communication flow that occurs between all farmers, which helps everyone to know better what the company goals are and feel more motivated. Also contributes to prudent planning of actions to be carried out, which as I said, is one of the bases for the implementation of organic agriculture. However, their resources are very limited, and new organic practices require investments on new machinery, and new methods of doing agriculture, which may result in a return to conventional agriculture, because they cannot cope with these costs. Thereby, agribusinesses have clear advantages over the family farms. For them is easier to implement organic agriculture, and those large quantities of investments are not such huge problem. They can buy better machinery to produce more in less time, being more competitive, which is also a problem for family farms.

Nevertheless, there is a solution for these small farms, and it is to be a part of a cooperative. They work as independent farms, but following some principles that cooperatives establish. Setting up a cooperative can help to these farmers to get the necessary resources that they need to be more competitive, and to get produce more to a reduced cost. To delve further into this issue, following the characteristics named in this paper, note that the implementation of a cooperative helps small farms in four key areas: economies of scale, communication, specialization and knowledge sharing, and the management of risks.

With reference to the first one, cooperatives act as intermediaries, helping in the bargaining power of farmers, and dividing among the members of the cooperative some expenses, such as transportation. Cooperatives also help to improve communication, helping farmers to know what their weaknesses are and providing them resources to improve them. The third area relates to specialization and knowledge sharing. In this sense, cooperatives help to farmers by providing them training service to have a good flow of information, so farmers can specialize and perform their jobs more efficiently. And finally, the last area relates to management of risks. Agricultural sector is very unstable, and cooperatives give them security by providing insurance cover for harmful external factors, like weather.

A successful case about this has been the CROPP cooperative in the United States (or also known as Organic Valley for being the main brand). This firm was born 30 years ago, and it became one of the largest organic farms very soon. Since it was founded, its goal has been to work with a vision of sustainability and respect for the environment. Thus, one of its principles is that all workers should worry for the environment, and not carry out actions that are contrary to the principles of organic agriculture.

With regard to its management, this company is an example of how cooperatives help to family farms. Following the different areas, it helps to achieve economies of scale by negotiating with different transport companies to get better prices, and they have created plans for farmers to know what their costs are in every moment and to know how to reduce them. Regarding to communication, CROPP promotes good communication between all workers. To do this, Organic Valley gives workers a place on the web where farmers can give their opinion, or write comments about the company, since its main objective is to always know that they are working in the same direction that CROPP requires, the environmental sustainability.

In this way, the cooperative implants Development Plans where workers have to complete reviews to know which aspects need improvement. So, annually they carry out training programs for all employees, aiming to make them more efficient and better internalize the mission of the cooperative. And finally, CROPP has a push business model with the objective to reduce risks. Thus, the cooperative guarantees they will buy a specified quantity of milk or other products at a set price from member farmers, so they are not affected by price fluctuations. Besides, CROPP provides technical assistance and the access to scarce inputs to help farmers at any time.

Thereby, the result of this study indicates that organic farming can be implanted in both types of farms: family farms and agribusiness. However, to better implement the

principles of organic farming that refers to environmental sustainability is more suitable to implement it in small farms where control is greater. For them there is the main problem of the limited available resources. One way to solve this is through the creation of cooperatives, where all members can help each other, getting better prices and reducing costs in some respects. This is demonstrated with the case discussed in this paper. CROPP, a cooperative that has become one of the largest in the United States, and continues to follow the principles of organic agriculture to incorporate new business actions.

7. References

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