RELIABILITY OF THE ORGANIC CERTIFICATION STANDARD: AN EMPIRICAL STUDY AT THE PRODUCER LEVEL IN COSTA RICA

Ana Gabriela Centeno Cerdas
Matrikelnummer: 20678195

M.Sc. Thesis
Tropical and International Agriculture – International Agribusiness
Faculty of Agricultural Sciences
Georg-August Universität Göttingen, Germany

Supervisors:
Prof. Dr. A. Spiller
Prof. Dr. B. Kilian

Accomplished at the Department of Food Marketing
Institute of Agricultural Economics

Date of submission: April 9th, 2008

ACKNOWLEDGMENTS

I would like to show my gratitude to all the producers and institutions that participated in this research, as well as to my supervisors, colleagues and members of my family who supported me for the execution of this project.

Besides, I would like to take advantage of this opportunity to thank the Deutscher Akademischer Austauschdienst (DAAD) for financing my Master studies, and to those who wrote a letter of recommendation for my application to the program.

This achievement is dedicated to all those persons who believed in me and accompanied me along the process.

ABSTRACT

The extraordinary growth experienced by the organic market around the globe has created new opportunities and challenges for the organic sector. Among them, one of the most important challenges is to guarantee the reliability of the organic products. The mechanisms of control implemented for that proposed so far have shown not to be a 'panacea' and actually 'feeble' in the achievement of its ambitions. Therefore, new and more suitable mechanisms should be developed, along with a deeper knowledge of the factors that influence the reliability of the organic certification standard. This work seeks to shed some light on the matter of reliability, with the main objective of identifying the factors that influence the reliability of the organic standard at the farmer level. To that end, a theoretical model was purposed and proved through a survey carried out at the producer level in Costa Rica (n=63). The original theoretical model pursued to measure the influence of seven independent variables ('perceived usefulness', 'perceived costs', 'motivations', 'sources of control' attitudes towards risk, the certification body and the auditor) influencing the determination of the reliability, and three target variables (satisfaction, credibility and good reputation) linked with the reliability. From them, the variables 'managerial and economic motivation', perceived usefulness', 'perceived costs' and 'auditor's expertise' were found to be significant, explaining 61.3 percent of the variance in the 'perceived reliability' of the organic certification standard among organic farmers. Besides, the results indicate the existence of a significant correlation between the reliability and farmers' satisfaction with the organic standard. Instead of the introduction of stricter controls or higher sanctions, as suggested often in the literature, the findings of this work propose working on the cost/benefit ratio of the producer, his/her motivations and the performance of the auditor during the inspections in order to improve the reliability of the organic certification standard. Besides, that will be way to contribute to farmers' satisfaction with the use of organic certification standard.

TABLE OF CONTENTS

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

LIST OF ANNEXES

Annex Page

ACRONYMS AND ABBREVIATIONS

APPTA	Talamanca Small Farmers' Association
ACAPRO	Organic Peasant Producers Association
APROCAM	Organic Certified Blackberry Producers Association
B-to-B	Business to business
CB	Certification body
CNP	National Production Council
DARAO	Department of Accreditation and Register of Organic Agriculture
EAP	Economically Active Population
EC	European Community
EU	European Union
GFSI	Global Food Safety Initiative
GMO	Genetically Modified Organism
ha	Hectare
IFS	International Food Standard
MAG	Ministry of Agriculture and Livestock of Costa Rica
IFOAM	International Federation of Organic Agriculture Movements
MAOCO	Costa Rican Movement of Organic Agriculture
NGO	Non-governmental organization
NOS	National Organic Standards (of the US)
NSM	New Social Movements
OPFA	Organic Foods Production Act
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PNAO	National Program of Organic Agriculture
QS	Quality Assurance
S.A.	Stock company
TAM	Technology Acceptance Model
TNC	Transnational corporations
TPC	Third party certification
US	United States
WTO	World Trade Organization

1 GROWTH: OPPORTUNITY AND THREAD FOR THE ORGANIC MARKET

The interaction of many situations, such as protest movements against conventional agriculture, consumers' awareness about the effects of agrochemicals on health and environment, and some food scares in the conventional sector, has led the extraordinary growth of the organic market around the world. According to Willer and Yussefi (2007: 9) organic agriculture is now practiced in more than 120 countries of the world, where almost 31 million hectares and 633 thousand farms are managed organically. Besides, global sales of organic foods increased by 43 percent between 2002 and 2005, reaching USD 33 billion or 25.5 billion Euros (ibid: 11).

This growth has created new opportunities and imposed new threads and challenges for the organic sector. Among them, one of the most important challenges is the maintenance of the reliability of the supplied organic goods. The mechanisms implemented so far to deal with this phenomenon contemplate the standards, regulations and certifications. However, this framework has showed not to be a 'panacea', as several weaknesses have given room to scandals and published cases of fraud, causing losses of credibility for the organic sector. This situation has to be properly addressed on time, because not fully credible standards jeopardize public confidence, leading to consumer's deception and, sometimes, to market collapse. In order to guarantee the log-term success of the organic standard, market forces have to be complemented with suitable legal and institutional frameworks, as well as with a deeper knowledge of the factors influencing the reliability of the participating actors because the best way to describe behavior is through the understanding of the individual's frame of reference (Flaten et al. 2004: 5).

Costa Rica is not the exception to the 'organic growth trend'. As a country whose economy still depends on agriculture, and possesses an international 'green image', Costa Rica has put emphasis on the development of the organic sector. Measures like the approval of a 'National Regulation for Organic Products' already in 1994, as well as the inclusion in the 'List of Third Countries' of the EU, locate Costa Rica as pioneer in the organic field among the Latin American countries. Nevertheless, the reliability of the Costa

Rican organic products has also experienced some questioning in the market destinations. All these reasons motivated the election of Costa Rica for the implementation of the study.

Interestingly, despite the increasing share of the organic sector in the food markets, and the incidence of irregularities, the reliability of the organic sector has not been analyzed in depth by the literature yet. On this regard, Giannakas (2001: 2) sustains that in many studies the possibility of 'cheating' is not assumed, granting (implicitly) that the certification and labeling suffice to avoid such market failures.

For all these reasons the present work seeks to shed some light on the matter of reliability in the organic sector. The main objective is to identify the factors that influence the reliability of the organic standard at the producer level. This is done through the extraction of Costa Rican producers' attitudes towards the functioning of the organic standard.

To fulfill the above-mentioned objective the study has been divided in seven chapters. The next two chapters present the principles and basic functioning of standards (in general), and the organic standard, respectively. Both chapters explain the current situation in the world, and particularly in the case of Costa Rica. The fourth chapter deals with the causes that have led to the questioning of the reliability of the organic standard, as well as some examples of opportunistic behavior. Chapter 5 describes the theoretical fundaments and main steps in the development of this research. Chapter 6 presents and discusses the results obtained in the field survey in Costa Rica. Finally, the last chapter draws the most important conclusions, recommendations and limitations of the study.

2 STANDARDS AS PART OF THE AGRI-FOOD SECTOR

Neo-classic economic theory assumes that all participants in a perfect market posses perfect information. In reality, depending on the degree of information existent between suppliers and customers, different types of goods can be identified according to the dominant attributes, namely: (1) search goods, (2) experience goods, and (3) credence goods (Nelson 1970; Darby/Karni 1973). Credence goods are those that *"cannot be evaluated in normal use… since the assessment of their value requires additional costly information"* (Darby/Karni 1973: 68). In other words, while producers know if the good has a certain attribute or not, consumers are not able to detect it, even after purchase and use of the product (McCluskey 2000: 1; Giannakas 2001: 2). The only way to found it out is through specialized laboratory analysis, as it is the case of products free of agrochemicals or free of GMOs.

Besides, some goods posses 'Potemkin attributes' due to the impossibility to assess these attributes on the final good, because they correspond to idealistic or psychological values, as it is the case of items with social, environmental, and animal welfare characteristics, like 'dolphin friendly tuna fish' and 'free of child labor' products (Chemnitz et al. 2006: 2; Jahn et al. 2005: 55).

In this way, standards have become commonplace in the trade sector as they are said to be helpful for the correction of such market failures. According to Nadvi/Wältring (2002: 6) *"standards are agreed criteria… by which a product or a service's performance, its technical and physical characteristics, and/or the process, and conditions, under which it has been produced or delivered, can be assessed".*

However, since consumers cannot determine whether a product fulfils the standard or not, it can be stated that there exists information asymmetry in the market, and the only way to address this issue is through the acquisition of a certification. Thus, the fundamental task of certification is the reduction of information asymmetry within the market (Giannakas 2001).

2.1 IMPORTANCE OF STANDARDS IN THE AGRI-FOOD SECTOR

The importance of standards increases constantly as they are turning into a global governance structure with implications for the future world economy (Nadvi/Wältring 2002: 2). With the global expansion of food retailers and food sourcing, the use of standards determines how food is produced, processed, and delivered to consumers (Fulponi 2006: 2). Besides, such links across the world reduce national biases, at the time that promote economies of scale and efficiency gains (Nadvi/Wältring 2002: 3).

Although the incorporation of standards was rare a decade ago, it is not new, and actually its use in the agribusinesses presents some time lag in comparison to other industries (Enneking et al. 2007: 2). However, the current increase in the use of standards in the food sector obeys mainly to the occurrence of continues food crises and scandals (i.e. Bovine Spongiform Encephalopathy-BSE; Foot and Mouth Disease-FMD; dioxins in 2004; carcinogenic food dyes in Ireland in 2005; such as awareness about the use of GMOs) that have scared the world and collapsed some markets at the beginning of this century (Le Guillou/Scharpé 2000: 4; Jahn et al. 2005; Fulponi 2006; Franz et al. 2007). An important issue for the food sector is that the causes of these incidents were only detected after they occurred, leading to a decline in consumer's confidence in the safety and quality of many products, as well as on the national regulations and governmental control established for these proposes (Jahn et al. 2005: 53).

Moreover, the food crises, joined to increasing incomes, mobility, and communications have occasioned a new arrangement in the way society functions, where concerns about quality assurance, health, ethical, social and environmental matters become central for the global agenda on trade, at the time that there is a shift in the roles of retailers and the state (Nadvi/Wältring 2002: 38; USAID 2005; Giovanucci/Ponte 2005; Fulponi 2006; Franz et al. 2007).

In the first place, the voice of the civil society has allowed the birth and rapid growth of a new type of organization, known as 'New Social Movements' (NSMs)[1], often concerned with consumer welfare, environmental protection, workers' rights, human rights, and animal welfare, among others (USAID 2005: 19). Among the main achievements of NSMs in industrial nations (and to some extent in developing nations) is the transmission of those concerns backwards in the supply chain.

At the retail level, exists higher pressure to fulfill their consumers' and shareholders' expectations; especially in the case of multinationals present in international financial markets, which are more susceptible in terms of reputation and the delivery of quarterly returns (Fulponi 2006: 4). The instrument elected to keep costs under control and accomplishing a good reputation has been the imposition of new private standards, many of which, going beyond technical attributes into issues such as labor, environment and ethics (ibid: 2).

At the governmental level some administrative structures were modified and more consumer protection topics were introduced on the political agenda (Franz et al. 2007). Examples of these changes were the foundation of the European Food Safety Authority – EFSA, and the introduction of new standards based on neutral control (i.e. QS for quality assurance in Germany) (Jahn et al. 2005). Regarding the introduction of standards it is important to state that governments have shifted from command and control positions to auditing systems, meaning that the state only sets the rules, rather than being directly involved in the standard definition (Giovanucci/Ponte 2005: 284; USAID 2005: 5), usually due to '*budgetary constraints'* (Fulponi 2006: 2).

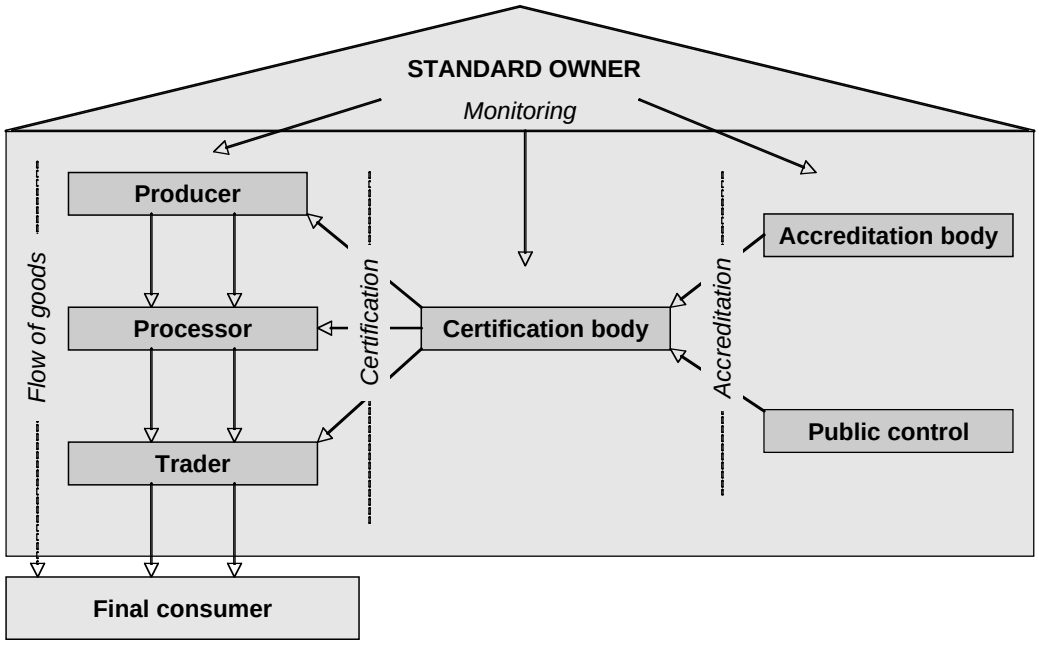
[1] Older social movements usually involved volunteer activists, as well as some labor commitment of their members, while NSMs usually require little commitment of their members; have paid staff that engage in full time lobbying activities; sometimes receive payments for certain services from government agencies; and are more concerned with consumption issues.

2.2 SETTING AND FUNCTIONING OF STANDARDS

The new configuration in the society has stimulated that, while national institutions remain important, the private sector, civil society and international organizations, increasingly take the lead in shaping global standards. These networks, denominated *"amorphous alliances"* by Giovanucci/Ponte (2005: 298), need to gather the resources and credibility distributed among all the participating actors in order to make a standard reliable, transparent, efficient and legitimate (Nadvi/Wältring 2002: 9). Baummann (2001: 98) proposes that the participation of official authorities increases the reliability of the standard, as sharing the responsibility also implies the commitment of their reputation.

Most of the existent standards present the same basic functioning structure (Figure 1), where the starting point is the relationship between the suppliers and the customer (left side). All participants must provide a certificate, issued by a neutral certifier, implying compliance with the rules established by the standard owner. To be able to extend the certification, the neutral certifier should be accredited, and in some cases monitored by public authorities.

Figure 1. General functioning of a certification standard



Source: Modified from Jahn et al. (2005: 58).

Different certification systems can be described according to the standard owner, which is the institution responsible for standard's definition and creation of a specific enforcement system (Dimitri/Oberholtzer 2005: 11). The spectrum of possible standards starts with completely state-run schemes (like 'organic' in Denmark), going through governmental schemes with private control (such as 'organic' in most European States), schemes created by international standard organizations (i.e. ISO), standards run only by private inspection bodies (like TÜV in Germany), until schemes founded by producers' associations (e.g. British Assured Farm Standards) or stakeholder approaches (e.g. World Wildlife Found-WWF) (Theuvsen/Spiller 2007).

Certification is a means to assure compliance with a certain standard (Hearne/Volcan 2002: 2). In that way, the certification aims at a firm reaching a defined performance, and communicating it effectively to the stakeholders (which may be customers, governments, or the society as a whole) (Meuwissen et al. 2003: 6; Ferguson et al. 2005: 1).

For that purpose, an independent third party certifier (TPC) or certification body (CB), is responsible for verifying that a product labeled as fulfilling certain standard is produced, processed, prepared handled, and imported in accordance to the corresponding guidelines (Codex Alimentarius 1999: 6), and then, extending the certification.

Accreditation is the process by which an authoritative organization gives formal recognition that a particular certification body is competent to carry out a specific task (USAID 2005: 11). Currently, certifiers are accredited according to the ISO 65/EN 45011, IOAS or requirements of the national legislation (Schulze et al 2007a).

According to the different types of functioning explained above, an extensive number and variety of standards can be defined. Different authors propose several typologies. For instance, Nadvi/Wältring (2002: 11) grouped them according to their field of application, form, coverage, key drivers, certification process or regulatory implication. Theuvsen/Spiller (2007: 14f) proposed the categorization according to: target, focus, goal, content, number of stages in the supply chain, standard owner, degree of harmonization, geographic focus, and number of participating firms, among others. Some of the above-mentioned classifications are commented below.

- Field of application: could be quality assurance, environmental, health, labor, social, or ethical (Nadvi/Wältring 2002: 11).
- Target: standards differ depending on whether they target the final consumer or institutional buyers (business-to-business or B-to-B). For instance, the organic label is mainly used for consumer marketing; while EurepGap is B-to-B.
- Key drivers: the forces behind the standard can be the private sector, NGOs, trade unions, or the consumers (Nadvi/Wältring 2002: 11).
- Focus or scope: standards can be either process, product or information standards. Process standards specify the way a product should be produced (like QS in Germany), while product standards define specific characteristics of the final product (like PDO, PGI), and information standards deal with the information that must accompany a product (like nutritional value) (Caswell 2003).
- Coverage: some standards involve only one stage of the supply chain (such as food manufacturers or retailers in the case of IFS), while others are chain wide concepts and include all actors along the supply chain (such as QS) (Theuvsen/Spiller 2007).
- Regulatory implication: the adoption of the standard can be legally mandatory, market competition requirement, or voluntary (Nadvi/Wältring 2002: 11).

At this point it is important to mention a trend called 'standard proliferation', which makes reference to the constant appearance of new standards labels in the market (Nadvi/Wältring 2002). However, instead of helping the sector, this trend constitutes an obstacle as it only causes confusion and distrust, especially at the consumer level. Moreover, lacking acceptance and recognition between the different certification and accreditation systems contradicts the objective of enhancing trade and market development.

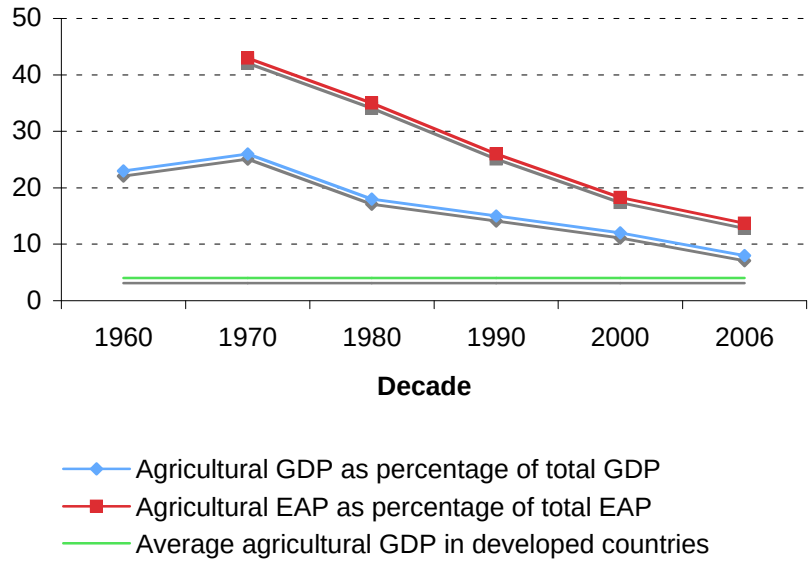
On the contrary, the operation in global markets has increased the need for global standards. According to Meuwissen et al. (2003: 175) the *'standarization of standards'* aims to manage the increasing number of similar schemes, through their homogenization. Harmonization causes the development of average standards, where everybody can agree, but nobody is content (Vogl et al. 2005: 19). However, it decreases total certification costs for suppliers by relieving them to have separate certifications, and allows retailers to switch suppliers more quickly and source across the globe (Fulponi 2006: 12).

2.3 IMPORTANCE OF AGRI-FOOD STANDARDS FOR COSTA RICA

With an extension of 51.100 km^2 (approximately the same as the state of Lower Saxony), and a population close to four million inhabitants, Costa Rica is predominantly a rural country, with a strong agriculture component[2]. As the rest of Central American economies, the primary sector is still very important for the country.

Besides, agriculture still has a strong share on the Costa Rican Gross Domestic Product (GDP), Economically Active Population (EAP) and exports. In 2006 agricultural, silviculture and fishing activities represented eight percent of the total GDP (SEPSA 2007: 6). Rural areas provide food, employment, and exports to the country; as well as home for around 41 percent of the population (SEPSA 2007: 11). Agricultural production employs near to 266 thousand persons, equivalent to 14 percent of the EAP (ibid: 11) (Figure 2).

Figure 2. Agricultural share in Costa Rican GDP and EAP during the last decades



Source: Own elaboration with information from CLADS (n.d.) and SEPSA (2007)

[2] A political map of Costa Rica can be found in Annex I.

According to Volio (2006: 3), in 2006 Costa Rican agricultural exports included 748 products by a value of US$ 2,6 millions, contributing with 32 percent of the country's total export income. The main products exported were: banana, pineapple, and coffee, which altogether represented 48 percent of the total agricultural exports in 2006 (ibid: 3). The US continues to be the main trade partner for Costa Rica with a share of 42 percent of total agricultural exports. Other important destinations were Holland (9.6 percent), Germany (5.4 percent), and Belgium (4.3 percent) (ibid; 5)[3].

Although, the agricultural shares on the GDP and EAP have both decreased during the last years, they are still of great importance for the country. Nowadays, there exist a movement towards the reconversion of the agricultural sector that makes emphasis in the creation or adoption of agri-food standards. The adoption of such standards is key as they constitute decisive elements within a development strategy that stimulates the fulfillment of agreements with the World Trade Organization (WTO), as well as exigencies of importer countries, and an every day more demanding domestic market (Madriz 2002).

[3] This fact is attributed to the presence of the main ports in Europe, and does not necessarily mean that the products are consumed in these countries.

3 PRINCIPLES AND EVOLUTION OF THE ORGANIC STANDARD

One of the first standards in being born, and whose principles are most extended in the world nowadays is the organic standard. It shares most of the features elaborated in the previous chapter, but it possesses some particularities that distinguish it from the others as well. The aspects concerning exclusively to the organic standard will be presented in this chapter.

Since a scientific definition of the organic agriculture does not exist to date, it is defined through standards based on a compromise between aims and technical principles (Heinonen 2001). For instance, according to the Codex Alimentarius (1999: 5) an organic good is the one produced in a *"… system employing management practices which seek to nurture ecosystems and achieve sustainable productivity…"*. Besides, the standard contemplates specific practices for pest and disease control, crop selection and rotation, water management, cultivation, and soil fertility, among others (ibid: 5). In this way, organic foods are distinguished from their conventional counterparts by production and processing principles, rather than by attributes noticeable in the product itself (McCluskey 2000: 2).

According to a survey carried out in 2007, organic agriculture is practiced in more than 120 countries around the world, where almost 31 million hectares are managed organically by close to 633 thousand farms, representing 0.7 percent of the agricultural land in the countries covered by the survey (Willer/Yussefi 2007: 9). Besides, some governments in developed countries have announced ambitious targets for the organic agricultural production (ibid: 9). In spite of the absence of official subsidies, organic agriculture also grows rapidly in developing countries, due to the belief that it influences positively farmers' income and quality of life, hence becoming an effective tool to overcome poverty and promote rural development (Damiani 2001: 8; Soto 2003: 1).

The sustained growth in the demand of organic products caused an increase in the quantity, quality and range of organic goods currently produced and offered to consumers. Consumers' interest in the purchase of organic food is seen as a way to address their health and environmental concerns (Darnhofer/Vogl 2003: 16; Le Guillou/Scharpé 2000: 4).

In this sense, the role of consumers in the development and establishment of organic agriculture must be acknowledged, as for the first time they recognize the influence they can have through the selection of their food (Soto 2003: 5). Thus, organic farming has become an issue of public concern, and a great business at the time (Vogl et al. 2005: 7).

Global sales of organic food and beverages increased 43 percent between 2002 and 2005; and were expected to approach the US$ 40 billion (30.9 billion Euros) in 2006 (Willer/Yussefi 2007: 11). Although organic agriculture is now present in all the continents, demand remains concentrated in Europe and North America. Due to conditions of undersupply in the main market destinations, large volumes of goods must be imported from abroad (ibid: 11).

3.1 MAIN STAGES IN THE DEVELOPMENT OF THE ORGANIC STANDARD

Agriculture without the use of synthetic inputs has always been practiced. For instance, the Maya culture developed the capacity to produce food for more than 30 million inhabitants in small areas, and using only local natural inputs (Soto 2003: 5). Besides, this has been an alternative for poor farmers who lack of the resources to access agrochemical inputs, and are therefore considered as organic 'by default'.

The origins of the current organic movement can be found in northern Europe at the beginning of the 20th century, where small initiatives against the new trend of applying synthetic agrochemicals in agriculture were born. Three important currents stand out: (a) Biodynamic agriculture in Germany leadered by Rudolf Steiner; (b) Organic farming in England based on Albert Howard's theories; and (c) Biological agriculture, developed by Hans-Peter Rusch and Hans Müller in Switzerland (van Bemmelen 1995; Le Guillou/Scharpé 2000: 4). At a similar time, J.I. Rodale popularized organic agriculture in the US through the magazine 'Organic Farming and Gardening' (Klonsky et al. 1998: 1); and Mokichi Okada promoted the natural agriculture system in Japan (Soto 2003: 5).

The common feature of all these movements was to stress the understanding of the linkages between agriculture and nature, as well as the promotion of respect for the natural equilibrium, expressing criticism against the increasing mainstream agriculture or Green Revolution (Michelsen 2001; Soto 2003: 5; Vogl et al. 2005: 9).

The first attempts to establish the organic sector took place between 1960s and 1970s, when organic producers started gathering themselves in associations and developed private standards that were binding for their members (Le Guillou/Scharpé 2000: 4). Besides, IFOAM (International Federation of Organic Agriculture Movements) was set up in 1972 with the aim of coordinating activities in the international field (van Bemmelen 1995). The private standards determined the content of the IFOAM Basic Standards, which in turn had a major influence on the European Regulation and the Codex Alimentarius. From that point on, organic agriculture has evolved based on the knowledge of traditional sustainable agriculture, farmer's innovations and the scientific research (Vogl et al. 2005: 8).

Although the organic market gains significance already in the 1970s, the real boom takes place in the 1990s, largely due to consumers' strong concern about health and environmental-friendly products (Le Guillou/Scharpé 2000: 4). At the same time, public authorities start to include organic farming in their agenda in the form of research topics and developing specific legislation. It was during this decade that the European Community enforced the EC Regulation No 2092/91 (in 1993), IFOAM adopted 'Basic standards for organic farming and processing' (in 1998), and the Codex Alimentarius Commission published the 'Guidelines for the Production, Processing, Labeling and Marketing of Organically Produced Foods' (in 1999).

In the XXI century the scientific recognition that expansion of the agricultural frontier constitutes the greatest threat to the global biodiversity popularized agricultural sustainability initiatives (Le Guillou/Scharpé 2000: 4). Moreover, continues food crises also motivated the consumption of organic food, as consumers expect that such incidents do not occur in the organic sector (Le Guillou/Scharpé 2000: 4; Darnhofer/Vogl 2003: 16).

Today organic farming is known as an alternative to overcome some of the limitations encountered in the conventional model, having as a central element the efficient use of local resources (Vogl et al. 2005: 6). It is the conjunction of ancestral practices (i.e. use of terraces created by the Incas) with the traditional knowledge of the modern peasants, linked to the proper new technologies (Soto 2003: 5). Besides, the perspectives of conventional farmers towards organic production change gradually, sometimes as a result of market and political influences (McEachern/Willock 2004: 534).

3.2 INTRODUCTION OF CONTROL IN THE ORGANIC SECTOR

The great growth experienced in the organic market demanded the implementation of control instruments, especially when the private standards became insufficient for that propose. In this attempt the institutionalization and the introduction of certification systems were key.

The term 'institutionalization' makes reference to the integration of the organic agriculture into the official national agricultural policy of a country (Seppänen/Helenius 2004: 2), meaning that organic standards have become 'public policy'. The definition of a legal and institutional framework aims usually at (1) protecting consumers' interests, (2) protecting producers form fraudulent trade practices, and (3) to regulate international trade and certification (Vogl et al. 2005: 6).

The first region in giving this step was the EU with the creation and approval of the Council Regulation 2092/91. Other important achievements were the US Organic Food Production Act 1990 (set into force in 2000), and the Japan Agricultural Standards for Organic Agricultural Products and their Processed Foods (set into force in 2001). Currently, more than 60 countries count with national regulations for organic farming (Willer/Yussefi 2007: 11). Otherwise, the Codex Alimentarius' norm is highly regarded when no national standard is specified (Fulponi 2006: 9).

As these standards influence organic farming on a national level and across the borders, they are relevant for international trade (Vogl et al. 2005: 6). International trading rules permit countries to determine their own standards, so long they apply them equally to domestically produced and imported goods (UNCTAD 2004: 46). Besides, appropriate laws and institutions dealing with organic agriculture provide protection to exporters of organic products in case they encounter problems in foreign markets, and are essential in international negotiations (Damiani 2001: 26). For instance, according to García/Bañados (2004: 12) an unregulated domestic organic market in Chile discourages European importers, as they might be unprotected in case of a fraud related to organic products.

The presence of a national regulation is especially critic for producers in developing countries because they are expected to comply with the standards, but they do not have a representative participation in its elaboration, thus standards are only imported, and no yet harmonized with the national legislation (Nadvi/Wältring 2002: 3). Continuing with the example of Chile, the absence of a national legislation acts as a major non-trade tariff, forcing organic products to enter the European Union through the 'back door'[4], and hence increasing transaction costs (García/Bañados 2004: 1).

Nowadays, the US and the EU constitute the two largest markets for organic products in the world, at the time that they are also important producers. Interestingly, these both regions have adopted very different policy approaches to encourage the growth of the organic sector. The main reason behind such differences is that while both recognize that organic practices deliver environmental, social and other benefits, the Europeans consider that it is a young industry needing support until it is able to compete by its self in established markets; and the US sees organic production as an expanding market opportunity for producers, and organic products as differentiated products available to consumers (Dimitri/Oberholtzer 2005: 2).

The second instrument introduced for the control in the organic sector was the certification. From the beginning, certification has been accomplished in two ways: (1) the producer's personal guarantee (that does not involve external certification), and (2) third-party certification (Conner/Christy 2002: 48). However, in the international context, only the second option is valid, demanding adhesion to the respective organic legislation. Compliance with the organic standard is verified by private certification bodies, mainly through inspection visits, document checking and laboratory tests (Neuendorff/Fischer 2007). Besides, the organic certification process involves annual re-inspections in order to keep the certificate, not to mention that some regulations differ in every country (Canavari/Cantore 2007: 442). Moreover, even the individual certification bodies (like Soil Association or Ecocert International) can impose their own additional requirements (Barrett et al. 2002: 306).

[4] Article 11 of the EC Regulation No. 2092/91 specifies that organic products from third countries not included in the 'List of Third Countries', need a special import permission for the EU, system known as 'back door'.

Today, 395 organizations worldwide offer organic certification services: 160 in Europe, 93 in Asia, and 80 in North America (Willer/Yussefi 2007: 11). Many of them also operate outside of their home country. However, of the existing CBs only 40 percent have been approved by the EU, 28 percent are accredited under the US National Organic Program, and 32 percent have the ISO 65 accreditation (ibid: 11).

3.3 GLOBALIZATION AND THE HARMONIZATION

Nowadays, due to the continues growing and internationalization of the market, the organic sector deals with the issues of globalization and harmonization of the standards. Efforts in these directions aim at matching supply with demand of organic products, as well as the simplification of tedious procedures.

Those in *pro* of globalization argue that a worldwide system of standards and certification is needed to facilitate international trade and the further growth of the organic market (UNCTAD 2004: 45; Willer/Yussefi 2006: 82). A good example of this trend is the case of the 'Biosiegel', a label launched in 2001 by the German Federal Government with the aim of gaining the trust of German consumers of organic products from worldwide origin. Federal Minister of Agriculture at that time Renate Künast, lobbied for the equal use of the Biosiegel in 'all products' traded, setting the basis for a global organic food market. Four large German distribution groups supported the argument of globalization, without whose support the Biosiegel's would not have succeeded (Vogl et al. 2005: 14). To date around 40.000 products sold in the German market carry the Biosiegel (Spiegel Magazine 2007).

Those *against* globalization sustain that organic agriculture should rather remain as a positive alternative, in order to be recognized as an attractive and sustainable way of life and of earning a living for people all over the world (Vogl et al. 2005: 23). Klonsky et al (1998: 2) argue that organic farming practices cannot be straightforward regulated because they are conceptual and open to interpretation. Nevertheless, the high interest of the society on organic farming has caused that the ownership of its definition does not longer lay on the original principles, nor be in the hands of the producers, but be threatened by a bureaucratic view of "recipe" (Vogl et al. 2005: 6).

In order to reach globalization significant harmonization is needed. Harmonization in the organic sector is convenient as long as overlapping work, unnecessary bureaucracy and costs can be avoided (Vogl et al. 2005: 20). For instance, Darnhofer/Vogl (2003: 17) state that several farmers' associations have criticized the lack of harmonization in the documentation requirements and the farm inspection methods. However, the harmonization of the practices should still be able to ensure local adaptations according to the needs of the people and the environment (Vogl et al. 2005: 20), and do not undermine diversity among regions (Willer/Yussefi 2006: 82).

With this propose in mind, the International Task Force on Harmonization and Equivalence in Organic Agriculture (ITF) was developed, pursuing a general consensus on the harmonization of private with government, and government with government standards (Willer/Yussefi 2007: 11). Besides, the signature of a cooperation agreement among the IFOAM accredited certification bodies, so called Multilateral Agreement-MLA, is also aimed at facilitating harmonized international trade of organic products (Baummann 2001).

Finally, it is worth to mention that two of the current politics of the World Trade Organization (WTO) have affect the organic food market: (1) subsidies, and (2) the Agreement of Technical Barriers to Trade (TBT)[5] (Vogl et al. 2005: 16). In the first place, the WTO demands the discontinuation of agricultural subsidies based on production quantities, but promotes the use of subsidies for the enhancement of environmental quality or animal welfare. In the second place, the TBT entitles a state to adopt the standards considered appropriate for the achievement of its legitimate objectives, which are the protection of the environment, or the prevention of deceptive (unfair) practices (UNCTAD 2004). This means that, although the final position of the WTO regarding the organic sector has not been officially given, their politics have an effect on the development of the organic food market.

[5] This agreement discussed the conditions under which trade in goods and services (including non-food items) might be restricted. It limited the degree to which packaging, labeling, customs forms, and other technical aspects of traded products and services as well as their movement in commerce could be used to block trade (USAID 2005: 4).

3.4 DEVELOPMENT OF THE ORGANIC SECTOR IN COSTA RICA

Costa Rica is not the exception to the trend of organic market growth. Furthermore, Costa Rica is one of the countries in Latin America that has advanced most in the field of organic agriculture (Damiani 2001; Echeverría 2002; Soto 2003; UNCTAD 2004). This leadership obeys to factors such as the establishment of a consistent legal and institutional framework, the promotion of the local market for organic products, and the awareness and concern of the population about the large amounts of agrochemicals used in the country.

In Costa Rica, the conventional agriculture model has shown serious sustainability deficits, contributing to the destruction of natural resources and landscape, and to the disappearance of small producers in some regions (Soto 2003: 3). Many small producers have seen in the organic agriculture an alternative to overcome issues of the conventional sector, such as: (a) economic difficulties due to the high costs of synthetic agrochemicals, in contrast with low gains and recent crisis in the prices of the traditional commodities; (b) decline in effectiveness of synthetic agro-chemicals, contamination, and exhaustion of the soils; (c) a search for alternative markets in response to globalization; (d) adverse impacts of pesticides and fertilizers on human health (e.g. intoxication, sterility and cancer), as well as on the environment and biodiversity (Damiani 2001: 5; Echeverría 2002; 2; Hearne/Volcan 2002: 2; UNCTAD 2004).

The practice of organic agriculture in Costa Rica has developed during the last 18 years. As in all other countries in Latin America, the organic movement in Costa Rica originated and grew without the existence of a specific governmental program, neither subsidies nor economic aid. Organic farmers in Costa Rica have been converting mainly on their own initiative and efforts and responding to different reasons (i.e. problems with the market, or difficulties with the conventional management of the plantation) (Damiani 2001: UNCTAD 2004). The only common denominator was always the presence of technical advise from NGOs (i.e. Fundación Guilombé and CEDECO) or foreigner volunteers (van Bemmelen 1995).

Besides, a dynamic "organic movement" also emerged in the late 1980s, including urban professionals working at NGOs and universities who were concerned with the negative impacts of conventional agriculture on the natural environment and on the health of consumers, and certainly played a key role in the development of the organic sector since the mid-1990s (Damiani 2001: 5).

The government has also shown an active role in the support of the organic sector, mainly through the development of an institutional and legal framework. The existence of these laws and institutions presents several advantages, such as the decrease in the costs of certification (as having local offices reduces significantly travel expenses and fees to inspectors), and a solid support to organic exporters in case of any problem in foreign markets (Damiani 2001).

Governmental support started with the creation of the National Program of Organic Agriculture (PNAO) within the Ministry of Agriculture and Livestock (MAG) in 1994. PNAO initiated with the objectives of promoting organic agriculture among producers and consumers and supporting the sector in the areas of incentives, credit, research and training (Damiani 2001: 13; Echeverría 2002: 8).

Then, the government continued with the coordination for the elaboration of the National Strategy for the Organic Production in 1999, which pursued a consumer information campaign a change; more governmental support such as a change in the mentality of some actors involved (i.e. Ministry technicians); and the creation of the National Research and Technology Transfer Program in Organic Agriculture (PITTA-PO); a process of revision of the organic normative; and the inclusion of Costa Rica in the 'Third Country List' of the EU[6] (Echeverría 2002: 9; UNCTAD 2004: 129). The contents of the National Strategy have been the base of the further development of the organic sector, and are still followed today.

---

[6] This implies that the country's legislation is recognized as equivalent to the European law, implying a 'preferential treatment' that reduces significantly the paperwork and bureaucracy during the export process (García/Bañados 2004: 8; Barrett et al. 2002: 305). The inclusion in the list is for a fixed term, and after its expiration term the EU sends missions every 4 to 5 years to check compliance and allow continuance in the list (Barrett et al. 2002: 305). Costa Rica's presence in the list is stipulated until year 2011. It is still uncertain what will happen if the EU legislation changes in 2009 (Ramírez pers. comm. 2007).

The basic laws addressing aspects related to organic agriculture and supporting the existing certification system in Costa Rica are the 'Organic Environment Law No. 7554' (enforced in 1995) and the 'Phytosanitary Protection Law Nº 7664' and its regulation (enforced in 1997). The main event in the future of Costa Rican's organic agriculture seems to be the approval of the new 'Law No. 16028' pursuing to promote, develop and encourage the organic agriculture in the country, at the time that strengths the control for this activity, procuring its competitiveness and profitability.

The Organic Environment Law No. 7554: This "umbrella" law establishes the definition of "organic agriculture"; the obligation of organic products to be certified by a national or international certification firm registered before the Costa Rican State, and it made definitions on the minimum time-period (three years) for the transition from conventional to organic agriculture. Besides it designated MAG as the government agency responsible for the designing and implementing policies concerning organic agriculture (Damiani 2001: 12).

Phytosanitary Protection Law No. 7664: This law established a complete set of general regulations about phytosanitary controls, including some specific provisions related to organic agriculture. It established that the Department of Accreditation and Register of Organic Agriculture (DARAO) within MAG would handle the registration of organic producers and processors, supervising the compliance with the established procedures and issuing the certificates of organic production, or authorizing specialized certification persons or firms. In addition, it established that the government would promote organic agriculture by covering the costs of certification for up to two years to small farmers who demonstrate not having the capacity to pay for it (Damiani 2001: 12; Echeverría 2002: 10).

Law for the promotion, development and encouragement of organic agriculture No. 16.028: contemplates the following incentives for organic producers: payment for environmental services provided by organic farming activities; special credit lines to sponsor peasant and indigenous research; harvests' insurances under favorable conditions for organic producers; exemption of the payment of import taxes for equipment, machinery and inputs for organic production, income and sales taxes; and finally the

recognition of the 'participative certification' only for sales in the local market [7]. This law also establishes sanctions for those producers selling conventional products as organic, and for the use of Genetically Modified Organisms (GMOs) in organic agriculture and protected zones (Asamblea Legislativa de la República de Costa Rica 2007: 9ff)[8].

Apart from PNAO and DARAO, there are around 15 to 20 NGOs, church-based organizations, training centers, universities, and extension agencies of MAG that provide institutional support to the organic sector in Costa Rica (Centeno 2001; Damiani 2001: 16; UNCTAD 2004). In addition, Costa Rica has also been successful in implementing policies to preserve its diverse ecosystems, as well as to promote environmental-friendly economic activities among small farmers, such as ecotourism and environmental services. These measures have contributed to create a positive international image that favors the access of Costa Rican organic products to foreign markets (Damiani 2001: 2).

The establishment of a local market is important in the development of the organic sector, as it could become a comparative advantage in external markets, at the time that offers an interesting alternative, especially for small producers. Besides, some representatives of the organic sector consider that having only an export-oriented focus is counter-productive for the principles of organic agriculture (Hearne/Volcan 2002: 2). Although still incipient, Costa Rica has achieved some development in this field, mainly due to particular characteristics of the country such as a solid middle class population, that along with expatriates, and tourists provide an upscale market; as well as a strong concern of the population about the health risks of conventionally produced vegetables (Centeno 2001: 68; Hearne/Volcan 2002: 2), and their confidence in local government institutions (i.e. Ministries) as certifying agents.

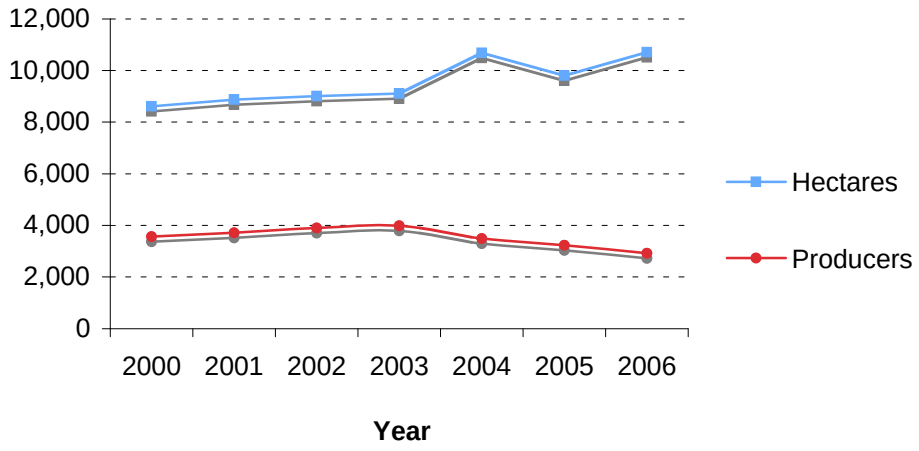
[7] Instead of certification bodies, this system involves local authorities (i.e. town council) and consumers, to carry out the inspection of the farms and assume the costs, reason why it is much more accessible for the producers (Echeverría pers. comm. 2007). Nowadays, this scheme of work is very extended in Brazil.

[8] Although the law was approved in August 2007, it will only entry into force when the Regulation be elaborated, which is expected to happen during the first semester of 2008 (Echeverría and Carazo pers. comm. 2007).

The population awareness about pesticides' use and permanence in food is a very serious issue in the country[9]. Some studies show that Costa Rica presents one of the highest levels of pesticide consumption in the world (about 4 kg per person annually), as well as more than 1,000 cases of intoxication caused by pesticides annually (one third corresponding to children), and several cases of cancer whose origin is related to the use of pesticides (Damiani 2001: 9). Moreover, continues increases in imported agrochemical are a serious source of concern. For instance, only during the period 1991-2001, imports of pesticides, fertilizers, and other agrochemical substances increased 250%, 145% and 5,500% respectively (MIDEPLAN 2002).

Unfortunately, organic products do not figure in the macro statistics of the country yet. To date the most updated data about organic production in Costa Rica corresponds to 2006, and is published by DARAO (2008) in its website.

Figure 3. Number of organic hectares and producers in Costa Rica, 2001-2006



Source: own elaboration with data from DARAO (2008)

[9] Some of this controversy centers on the banana production, where more than 1,000 workers have been sterilized due to pesticide applications (Hearne/Volcan 2002: 2).

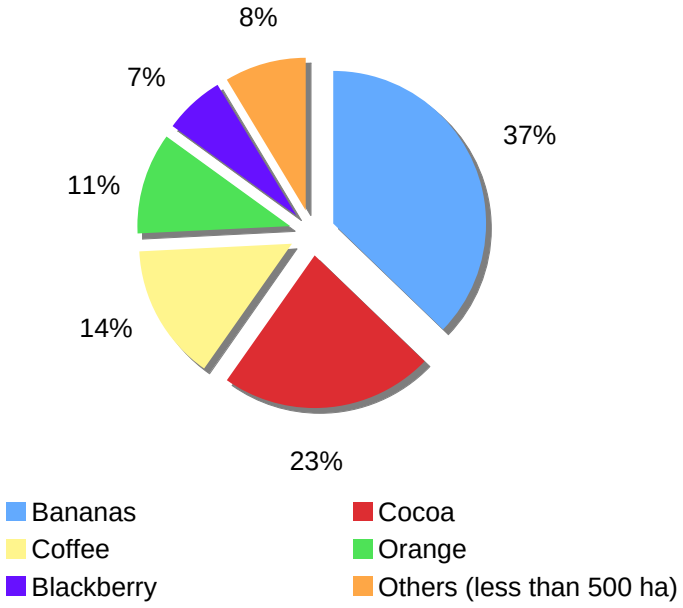
Informal estimates calculate the existence of around 5,000 organic producers in the country, however only around 60 percent of them are certified. According to DARAO (2008) the number of organic certified producers Costa Rica decreased 18 percent between the years 2000-2006, at the time that the number of hectares increased 24 percent (Figure 3). Payne (pers. comm. 2007) sustains that this trend obeys to the fact that only large companies are able to survive the transition period, and current trends in the market. Most small producers cannot afford the low yields and cost of certification services; therefore, they return to conventional practices, or continue organic without certification.

Most of the organic farmers in Costa Rica are isolated, largely disperse and produce very small quantities (Echeverría 2002; 10). So far, their strategy to survive has been the integration into producer associations, what offers several advantages, such as facilitating the procurement of a certification, and gathering the quantities needed to supply international markets (Damiani 2001).

The range of organic products cultivated in Costa Rica is not very voluminous, but very diverse. It includes more than thirty crops going from traditional commodities (e.g. coffee), to non-traditional (like vanilla) (Centeno 2001). Nowadays, the main organic product is banana, with a share of 37 percent, corresponding to 3,938 hectares. Cocoa can be found in the second place with 23 percent (2,382 ha), and coffee in the third place with 14 percent (1,524 ha). Other minor crops are orange, blackberry, pineapple, sugar cane, aloe, noni, rice, macadamia and mango (Figure 4).

Fresh products such as vegetables correspond to the group of foods with higher sales in the local market, while processed products are mostly oriented towards foreign markets. Although the local market has reached some scale, there are still no official statistics about sales. To date, the most successful commercialization channels for organic products have been the weekend markets and conventional supermarkets (Centeno 2001: 68).

Figure 4. Share of the main organic crops produced in Costa Rica in 2006

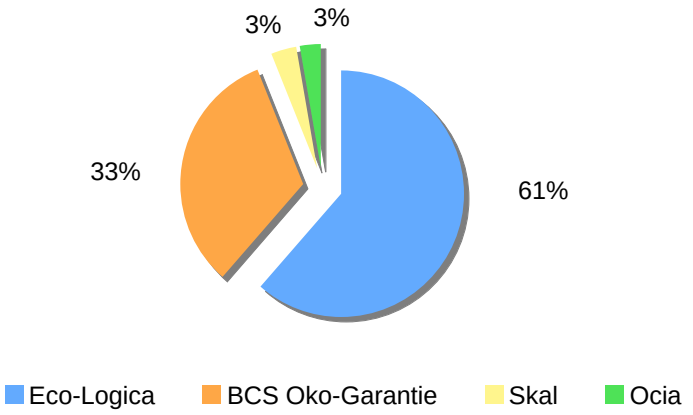


Source: own elaboration with data from DARAO (2008)

In spite of the existence of an incipient local market, exports are still the main destination for the Costa Rican organic products. Oranges (4 tons) lead the list of exported products, followed by bananas (2 tons). Both of them are exported as processed products, namely orange juice, and banana puree. The most important export destination in 2006 was Holland with more than 6 tons. Again this fact is attributed to the presence of the Port of Rotterdam, and does not necessarily mean that the products are consumed in the country. Other countries like Germany, France, Hungary and Austria imported less than 1 ton in 2006.

Until January 2008 there were six CBs accredited in Costa Rica: Eco-lógica, BCS Öko-garantie, Skal, Ocia, Eco-cert, and AIMCOPOP. Figure 5 shows the market share of every of them in 2006. In order to be accredited certifiers have to undertake an audition every year, and renewal every three years (Ramírez pers. comm. 2007).

Figure 5. Market share* of main accredited certification bodies in Costa Rica (2006)



Source: Own elaboration with data from DARAO (2008).
* Based on the number of certified hectares.

Eco-lógica is the dominating certification body with a market share of 61 percent, equivalent to 6,577 hectares and 1,918 producers (DARAO 2008). They were the first national certifier, founded in 1997 with the support of the international cooperation, and with the aim that small producers could acquire the certification to an accessible price, goal that they have achieved, and even extended to other countries in Latin America.

BCS Öko-garantie, of German origin, is in second place, with a market share of 33 percent, corresponding to 3,479 hectares, and 34 producers (ibid). According to Humberto González (pers. comm. 2007), Director of the offices in Costa Rica, after some difficulties faced years ago, BCS pursues to differentiate from the other certifiers by offering high quality services to their clients (treating them like partners), and providing an easier access to the market.

Skal and Ocia possess a share of three percent of the market, meaning around 300 hectares, as well as four and three producers respectively. The certification bodies not included in the graphic (Eco-cert and AIMCOPOP) have market shares smaller than one percent (DARAO 2008).

Regarding the level of competition among the main certification bodies, representatives of the industry find that it is very high, since the market is small, and there seem not to be enough clients for all certifiers (Echeverría pers. comm. 2007; Ramírez pers. comm. 2007). However, González (pers. comm. 2007) thinks that the market is well segmented. Eco-logica is specialized in working with small producers, while BCS certifies the largest companies. In order to be more competitive several certifiers have extended their range of services to include newer standards (such as EurepGap), what also lowers the cost of double certification for their customers.

4 RELIABILITY OF THE ORGANIC STANDARD

The organic standard, as it is known nowadays, is the result of a long process of evolution that started with the practice of a more natural agriculture, went through the establishment of an stricter framework, and now bears the implications of harmonization and globalization. Besides, this standard has been to some extend successful at emitting a positive image to consumers (Giovanucci/Ponte 2005: 289), what have help to its worldwide extension (Willer/Yussefi 2007: 9).

However, the great expansion experienced so far has also imposed new threads and challenges. Such an extended standard turns every time more difficult to handle. Besides, constant changes in the regulations generate confusion in the sector. Moreover, the appearance of opportunistic behavior generates doubts about the reliability and trust on the sector. For instance, according to Jahn et al. (2005: 70), more than 10 years after enforcement of the EC Regulation No. 2092/91, the lack of trust is still one of the most important diffusion barriers of the organic standard in Europe.

4.1 CERTIFICATION FAILS TO OVERCOME INFORMATION ASYMMETRY

Questioning about the reliability of the organic products originates from its credence and Potemkin attributes. The introduction of regulations, containing specifications for the certification and accreditation systems were the mechanisms of control developed to address these issues (Heinonen 2001; Anania/Nisticò 2003: 2; Giovanucci/Ponte 2005: 291). Furthermore, for some authors certification is the only feasible ways to overcome the information asymmetry and gain consumer confidence (Giannakas 2001: 2; Hearne/Volcan 2002: 2).

The paradox is that, at the time that certification tries to satisfy the market demand for information; it also creates incentives for fraud (Giannakas 2001: 1). Moreover, the existence of some degree of disconnection between the expectations created by the certification and the reality in the field motivates the wrong interests (McCluskey 2000; Getz/Schreck 2006: 491ff), not to talk about the existence of increasing demand, price-premiums and subsidies in the organic sector. In short, as stated by Farrell (1993), *“communication cannot work well when there are incentives to lie”.*

In this sense, it must be kept in mind that they supervisors and supervised are economic entities, and as such, they both will seek to maximize their own profits (Jahn et al. 2005: 59). For that reason, conflicts of interests may arise in a market where the company to be supervised is able to choose its own auditor. On the one hand, as the adoption of a standard is often externally imposed, it could be assumed that the supervised company is not interested in complying with the highest possible standard of inspection, but in acquiring the certificate as easily as possible (Jahn et al. 2005: 60).

On the other hand, the certifier, desiring to help its client and minimize its audit costs, relaxes the certification process (Nadvi/Wältring 2002: 16; Anders et al. 2007: 653). Getz & Schreck (2006: 495) mention the case of an auditor who developed a reputation for only certifying extra land to those farmers that he liked; situation that helped the growth of the cooperative, but distorted income flows for some of its members. Besides, lower certification costs are seen as a competitive advantage, but they can affect the quality of inspections (Jahn et al 2005: 54).

Finally, it is important to state that if the certification procedures betray the core of what organic farming stands for, they might also betray consumers' expectations (Darnhofer/Vogl 2003: 18). In this sense, it is crucial to preserve consumers' trust on the certification and the institution that extends it. Consumer disbelief reduces their willingness to pay, which makes it difficult to cover the higher cost of the organic methods, and reduces the likelihood that they be actually used (Ward et al. 2004: 62). When consumers' trust on the certification falls below a threshold, the certification lost its effectiveness and the market can collapse (Giannakas 2001: 1). In this way, if consumers do not trust the certification, both consumers' welfare and the demand for organic products decrease. Furthermore, as proposed by Becker (1968), the determination and punishment of the opportunistic behavior represent costs for the society as a whole.

All these situations corroborate that the certification has proven not to be a 'panacea', and on the contrary, it appears to be 'feeble' in the achievement of its ambitions. Many cases of fraud in the use of standards reported by McCluskey (2000), Giannakas (2002), Anania/Nisticò (2003), GfRS (2003), Getz/Schreck (2006), BioFach

(2007), Spiegel Magazine (2007), Neuendorff/Fischer (2007), and Anders et al. (2007), as well as some scandals in the organic market (i.e. Nitrofen [10]) confirm this suggestion.

4.2 FRAUD IN THE ORGANIC SECTOR

According to van Elzakker et al. (2005, translated from Spanish) fraud in the organic sector occurs *"when a product is sold as organic, although it is not qualified for this label, whether due to a mistake or intentionally"*. Nowadays, fraud can adopt several forms, and can take place at any level of the supply chain (Spiegel Magazine 2007; Neuendorff/Fischer 2007). In order to cheat, offenders take advantage of existing gaps that allow them to proceed. For instance, the fact that trading companies were exempt of the requirement of certification until 2005 caused that most of the detected cases of fraud in the European market between 1999 and 2002 involved processing and importing companies (Neuendorff/Fischer 2007).

At the certification level, further factors determining the commitment of fraud are the level of competition between certifiers, the number of certifiers in the market, and the certifier's objectiveness (Anders et al. 2007: 654). In a study carried out in Germany, GfRS (2003) found the following factors at the client level: results of the last inspection, type of product (i.e. fresh, or shelf life); potential benefits, potential fines, organizational structure (i.e. company size), and the internal quality management system implemented by the farm. Jahn et al. (2005: 55) add two more factors: the amount of monitoring in the respective product category, and whether the company is famous enough to be in the newspapers.

According to USAID (2005: 33) certifiers may incur into fraud in ways such as: (1) provide only a stamp to already existing practices, (2) use the certification unscrupulously to extort producers, (3) certify based on requirements that are irrelevant for final consumers, (4) serve only as another form of non-tariff trade barrier, or a combination of them.

[10] In 2002, organic wheat, used as food for poultry by German farmers, was contaminated with the weed killer called Nitrofen, which is banned in Germany. The contaminated grain had been stored in a warehouse used previously to keep herbicides (Dimitri/Oberholtzer 2005: 4).

GfRs (2003: 24ff) identified three types of possible offences to the organic standard at the producer, processor and trader levels: the use of not allowed substances, the use of conventional ingredients (from parallel conventional production) for the organic production, and the infiltration of conventional goods in the organic supply chain. This last one, widely known in the organic sector as 'mislabeling', corresponds to one of the most common cases of fraud investigated until now (GfRs 2003: 24; Neuendorff/Fischer 2007).

Giannakas (2001: 6) explains the logic of mislabeling. According to him, the use of the organic label by conventional companies should be prohibitively high, otherwise, the label lacks of credibility. Conventional suppliers could, however, misrepresent the origin of their products (i.e. labeling them as organic), and take advantage of the higher price paid for them, at the time that they save costs producing conventionally. But, is probable that they will not succeed since they are not able to obtain the certification. For these reasons, mislabeling is more likely to be executed by certified suppliers, who can procure conventional product, and later resell it as organic. Getz/Schreck (2006: 494) cite the case of how the extremely rapid growth of an organic cooperative in Mexico made it difficult to function effectively, and motivated its members to limit membership. However, in some communities, cooperative members overcame the barrier of entry by illicitly buying cheap produce from non-members and selling it expensive to the cooperative.

4.3 THE ISSUE OF RELIABILITY IN COSTA RICA

Costa Rica is not the exception to the trend of growth of the organic market, and unfortunately, is also not the exception to the reliability doubts. In year 2001 the German Magazine MAX (2001) published an article questioning the organic production and control systems in the country, suggesting that Costa Ricans have a 'tendency towards fraudulence', and arguing that ' it is not possible to produce organic bananas' (Robert 2001).

To that end, they involved a banana producers' association, the processing company, the German certifier, and the retailer company also in Germany, in a big scandal. Undoubtedly, the article caused polemic in Costa Rica, as well as credibility lost for the companies involved. For Costa Rican authorities, that was a critical moment since the country was applying for the inclusion in the 'List of Third Countries' when it happened.

In view of the situation the Costa Rican Government published their official position arguing that: *"the producers involved in organic production deserve all the respect, admiration and support of the Costa Rican Government, which is conscious that in every human system there will always be someone who does not fit, and therefore refuting the suggestion of the magazine MAX that 'Costa Ricans have a tendency towards fraudulence'; that the agricultural production systems under tropical conditions, as well as the reestablished natural production systems (such as bananas associated with trees and other crops)… make possible the production of organic bananas, reason why it is not ethic to generalize declarations such as 'it is not possible to produce organic bananas without any toxic ingredient; that the background of the country in the field of organic agriculture allows it to have a regulated quality system, and procedures designed under ISO 65 standards, and where the paths to follow before a fraud situation are contemplated. Finally, the Costa Rican Government offers its disposition to cooperate in any further investigation that German authorities or consumers would like to entail"* (Robert 2001, translated from Spanish).

With the exception of this isolated case, no other questioning regarding the reliability of the organic sector in Costa Rica was found nor in the literature, neither in the interviews held with representatives of the sector. Moreover, these representatives were very confident that farmers in the country are reliable.

According to Echeverría (pers. comm. 2007) the main incompliance found to the producers are failures in registers. The producers fulfill the requirements of organic agriculture because they know the technique; however, they fail to show it whit records, principally due to ignorance of the norm and in some cases due to illiteracy. González (pers. comm. 2007) adds that the faults oftener found by him are incomplete or inexistent records, inappropriate inputs, and contamination risks.

5 CONCEPTUAL FRAMEWORK

The present empirical study pursues to close the existing knowledge gaps, dealing with the factors influencing reliability from the producer's point of view. For that propose, previous empirical approaches are presented and taken as a base for the elaboration of a research model, which will be proved in a survey among Costa Rican organic producers. The following sections briefly describe the theoretical foundations and main steps applied in the development of this research.

5.1 EMPIRICAL APPROACHES

Interestingly, despite the increasing market growth and demand for organic products, as well as the incidence of irregularities in the organic sector, the reliability of the new sources of supply has not been analyzed in depth yet. In his study about 'Information asymmetries and consumption decisions in the organic market' Giannakas (2001: 2) sustains that in many studies the possibility of 'cheating' is not assumed, granting (implicitly) that the certification and labeling suffice to avoid these market failures.

Some models developed for the conventional sector help to explain the occurrence of fraud in the organic sector. Besides, some studies have proposed empirical models to deal with the appearance of opportunistic behavior in the organic sector.

According to Akerlof's theory (1970), in the absence of credible certification, buyers are not able to verify the origin and organic condition of the product. For this reason, producers are tempted to label all produce organic, whether or not it was organically produced, which constitutes a problem of 'averse selection' (hidden characteristics). While consumers cannot verify the claims made with reference to the product, producers will be tempted to claim that it was organically produced, although it is not, what reduces their costs and increases their profits, constituting a problem of 'moral hazard' (hidden action).

The Expectancy Theory developed by Vroom (1964) attempts to explain individuals' election for certain courses of action, assuming that human behavior is the result of conscious choices seeking to maximize pleasure and minimize pain. The key elements are three factors, organized as an equation: Motivation (M) = Expectation (E) x Valence (V). In this way, the higher the single values for expectation and valence, the higher the willingness to a certain behavior. In other words, the higher the expectation to achieve certain goal, and the higher the positive character of the target, the greater will be incentive to pursue that goal.

GfRs (2003: 25) applied the Expectancy Theory developed by Vroom (1964) to the false declaration of conventional goods as organic ones, and found the following scenarios:

(1) High expectation to be able to sell the conventional product as organic x high financial gains = willingness to conduct fraud

(2) Low expectation to be able to sell the conventional product as organic (e.g. high risk of discovery) x high financial gains = medium willingness to conduct fraud.

(3) None (zero or negative) expectation to be able to sell the conventional goods as organic x high financial gains = no willingness to conduct fraud

McCluskey (2000) utilizes a game theory analysis approach to study the asymmetry information in the organic sector, and shows that repeat-purchase relationships and third party monitoring are required for high-quality credence goods to be available. If a producer is able to get away with making false quality claims, s/he will enjoy a higher price with lower production costs. The minimum necessary level of monitoring depends on the price of the organic foods, the difference in costs of using organic versus conventional methods, and the discount rate. If consumers are willing to pay a premium for organic food products, a profit-maximizing producer has a strong incentive to falsely claim that his/her products are organic as long as the probability of not being discovered is high enough.

Jahn et al (2005) developed a model that includes several starting points to enhance the efficiency of certification systems and the corresponding labels. According to them, tendencies towards price wars on the certification market and considerable differences in performance reveal the necessity of institutional changes. Besides, they suggest strategies for reducing auditors' dependence, intensifying liability, increasing reputation effects, and minimizing audit costs.

Finally, Schulze et al. (2007a) developed a model consisting on a modified TAM to measure farmers' attitudes towards organic agriculture in Germany. They identified the effects of five determinants, namely: perceived usefulness, perceived (bureaucratic) costs, risk perception, perceived effectiveness and organic motivation on the acceptance and satisfaction with the certification. Their results indicate that most of the farmers accept the organic certification system, although they are not convinced of its costs and benefits.

5.2 RESEARCH MODEL

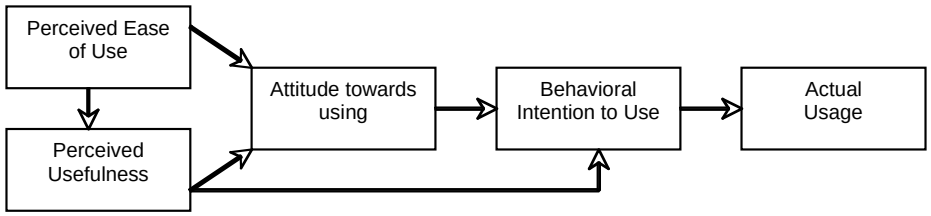
The implementation of this research involved the creation of a theoretical model able to represents the factors influencing the reliability. For that propose, a modified TAM was selected, as Schulze et al. (2007a) results' demonstrated that this tool could be used to analyze the producers' attitudes towards organic certification.

5.2.1 Technology Acceptance Model

The 'Technology Acceptance Model' developed by Davis (1989) pursues to explain and predict user's acceptance of information technologies, and is often used in psychometrics and marketing research. The model validates scales for two specific variables (perceived usefulness and perceived ease to use), which determine the attitudes, intentional behavior, and actual use of the technology (Figure 6).

Although the TAM constituted a departure point for the development of the research model, it had to be modified due to some inconsistencies. In the first place our model does not pretend to predict usage, as all the respondents are already certified. Finally, the implications of TAM do not apply when farmers were asked to express opinions about the behavior of other colleges, the auditor, or the CB, and not always about themselves.

Figure 6. Technology Acceptance Model



Source: Davis (1989)

5.2.2 Modifications

Other models, theories and premises of the literature were integrated into the model in order to adapt it to the measurement of new attitudes, as explained below:

- Motivations: contemplated by Vroom's (1964) Expectancy Theory and introduced to the TAM by Moon/Kim (2001)[11]

- Perceived costs: departing from cost/benefit analysis, McCluskey's postulates on profitability, and Weber's (1968) Theory of Bureaucracy

- Sources of control and attitudes towards risk, based on the Expectancy Theory (Vroom 1964)

- Attitudes towards the certification body and auditor based on Jahn et al (2005) suggestions for the improvement of the reliability in the organic sector

- Satisfaction: assessed with a modified TAM by Schulze et al (2007b)

- Credibility: as it is closely linked to the concept of reliability. None previous work was found where the variable of credibility is linked to the TAM, therefore it constitutes a new insight of this research

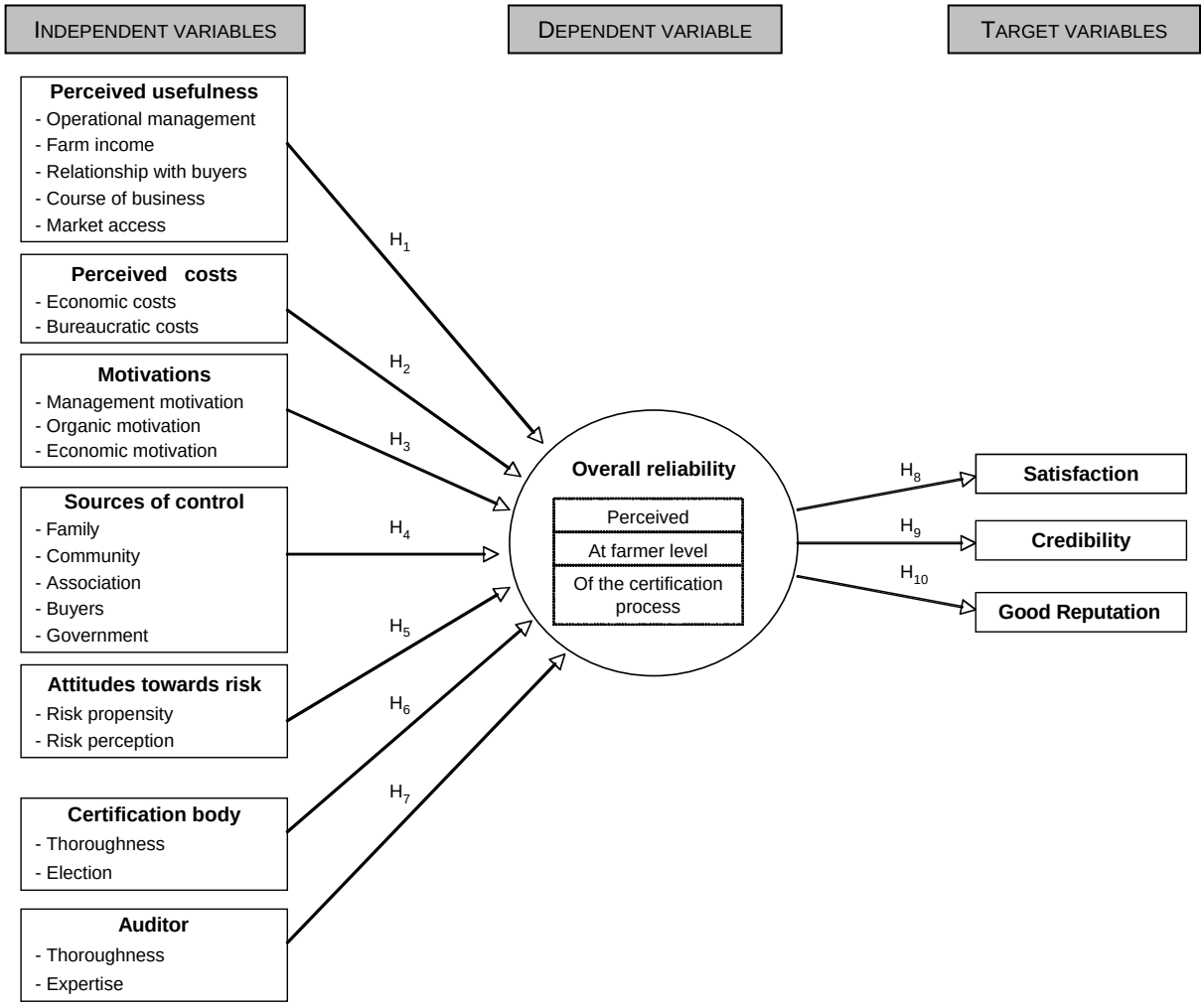
- ^ Good reputation: also evaluated in a modified TAM by Schulze et al (2007b).

[11] Moon/Kim (2000) extended TAM by adding the playfulness concept based on the (intrinsic and extrinsic) motivations.

5.2.3 Proposed model

In the proposed theoretical 'reliability' appears as the dependent variable that wants to be studied. Seven independent constructs were proposed as having an influence on reliability: perceived usefulness, perceived costs, motivations, sources of control, attitudes towards risk, the certification body and the auditor. Additionally, three target variables were suggested as having a relation with reliability: satisfaction, credibility and good reputation (Figure 7).

Figure 7. Research model to study the reliability of the organic standard



Source: own elaboration

5.2.4 Definition of concepts

This section briefly describes the meaning of the key concepts within the context of this research, corresponding to the dependent, independent and target variables utilized in the model and hypothesis.

Reliability

As it has been seen in Chapter 4, the organic sector nowadays faces serious threads to its reliability mainly due to the appearance of opportunistic behavior. Therefore 'Reliability' corresponds to the dependent and main variable of study in the proposed model.

The definition of reliability makes reference to the 'capability of inspiring confidence based on previous experiences'. Based on this premise, in the context of this research, the concept of reliability refers to the capacity of the organic products to properly reflect what the organic certification standard stands for, and as a consequence, the capacity to inspire trust to its consumers in every experience. On the contrary, opportunistic behavior is considered as the betrayal of the contents of the organic standard through the commitment of fraud, and it is considered counter-productive for the achievement of reliability.

Farmers' perceptions about the reliability of the sector are evaluated from three different perspectives, which are: in general, at the farmer level (among colleges), and of the certification process (linked to the performance of the certifier and the auditor).

Perceived usefulness

Davis (1989: 320) defined 'perceived usefulness' as *"the degree of which a person believes that using a particular system would enhance his or her job performance".* In the case of this survey, it has to do with improvements in the farm's or company's performance.

Improvements perceived through the adoption of standards include market penetration, system coordination, niche definition, good reputation, and the development of physical and human capital (Chemnitz et al. 2006: 10; Nadvi/Wältring 2002: 3; Giovanucci/Ponte 2005: 286; Schulze et al. 2006: 2; Fulponi 2006: 6; Getz/Schreck 2006:

491; Enneking et al. 2007: 11). Besides, standards could increase income, have positive health effects, and allow adding value to the products (McCluskey 2000: 1; Giovanucci/Ponte 2005: 298). For instance, the adoption of standards helped Latin American producers to face the coffee crisis at the beginning of this century, by allowing them to differentiate in competitive markets, and receive better prices (Kilian et al. 2004: 43). Moreover, some standards (i.e. organic) have raised expectations for an improved rural life and development (Damiani 2001: Getz/Schreck 2006: 493).

Perceived costs

On the contrary of 'perceived usefulness' the 'perceived costs' correspond to the reduction in welfare due to the adoption of the standard. According to Vogl et al. (2005) organic farming becomes less interesting because of the high costs of compliance involved. Costs of compliance are defined as *"… all additional costs necessarily incurred… in meeting the requirements to comply with a given standard"* (Chemnitz et al. 2006: 7), and in this study they have been divided into three types: bureaucratic, economic or intangibles.

In the organic sector bureaucracy has been one of the main results of institutionalization (Seppänen/Helenius 2004: 9), implying the increase in the amount of records are procedures necessary to comply with the standard. The costs of the inspection represent an important part of the producer's costs of compliance (Van Elzakker et al. 2005), and according to UNCTAD (2004) the high cost of certification constitutes a major impediment to increase certified agricultural production in developing countries.

Other not measurable costs of compliance that can be experienced include: dependency, vulnerability, credibility threads from the buyer, disruption of the local governance within the community, and increase of existing inequalities between producers (Giovanucci/Ponte 2005: 297; Getz/Schreck 2006: 491). Moreover, there are those who question that private standards undermine democracy, since a single company or NGO can make a *de facto* change in governance without consulting with others affected (USAID 2005: 38).

Motivations

The motivation is strongly influenced by the cost/benefit ratio perceived by the farmer (Chemnitz et al. 2006: 10). In this study three types of motivations are considered: organic, good management and economic motivation. Organic motivation is understood in this context as the motivation for the practice of a healthier and more environmental-friendly agriculture. According to Hanson et al (2004: 2) risks regarding exposure to pesticides and environmental contamination act as an important motivation for practicing organic farming.

The good management of the farm entails to take the courses of action that be necessary in order to improve the performance of the farm. A better economic situation can also act as motivation, and its main source is when market access demands certification. Otherwise exists the risk of being forced out of the market and even of the sector (Fulponi 2006: 8)[12]. Getz & Schreck (2006: 495) report the existence of concern about the waning of organic farming's integrity as farmers focus more in the economic and less on the organic principles.

Sources of control

Control refers to the possibility that other entities alert the respective authorities about improper actions carried out by the farmer (Van Elzakker et al. 2005). The awareness about the existence of such sources of control acts as an external motivation for the farmer to stay reliable.

According to Getz/Schreck (2006: 495) the societal sources of external control include the family, the neighbors, colleges or members of the association, buyers and the government. The control is executed during the constant monitoring of the activities in the farm, and can also occur during visits and inspections to the farm.

[12] For instance, Boselie (2002 cited by USAID 2005: 12) presents the example of Royal Ahold, which required that the suppliers of its Thai stores (operated under the name Tops) obtain a certification developed by the Thai Ministry of Agriculture to improve food safety within the country. This measure had the effect of reducing the number of suppliers from 250 to 60, as the rest were apparently unable to meet the certification requirements.

Attitudes towards risk

Farmers' perceptions and responses to risk are important in order to understand their behavior (Flaten et al 2004). Risk, in general, is defined as the degree to which a person expresses doubts about the uncertainty of something (Bruner et al 2005: 490). Risk aversion, on the contrary, is the degree to which a person expresses a desire to avoid taking risks (Bruner et al 2005: 491).

Farming is an activity that involves many risks. Furthermore, organic farming relies on the natural processes of the ecosystem, excluding therefore, important management tools such as restrictions on chemical inputs use, synthetic medicines and purchase of feed, among others (Flaten et al 2004; Hanson et al 2004: 2). Hence, it could be expected that organic farmers do not be risk averse (Flaten et al 2004: 23)

The individual awareness of sanctions will determine the attitudes towards risk. Unfortunately, in the case of private standards, there is not legal basis at all for public or private control of the production process (Jahn et al. 2005: 56). In many nations the certifier's potential fine is not determined by third party damages (i.e. losses suffered by those relying on the certification, like customers and consumers), as only the contracting party can enforce damage payments, reason why a shared liability of certifiers for the damages resulting from a loss of reputation of a well-known brand could contribute to increasing the level of reliability in their practices (ibid: 64).

Attitudes towards the certification body

The measurement of attitudes towards the certification body pursues to assess how farmers perceive the performance of these institutions, especially regarding the achievement of the goals that command their existence.

Nowadays, certifiers face multiple sources of pressure, which can be counter-productive for an effective performance. For instance, according to Anders et al (2007: 652) as the demand for private third-party certification increases, the level of competition among accredited certifiers increases as well, what may affect the standard's owner goal of maintaining the highest possible level of compliance.

The credibility of the third-party certification critically depends on the objectiveness and independence of the certifier. Therefore, the trade-offs between the reliability of the third-party certifier and a market structure, invite to question the role of third-party certifiers as “efficient and independent signaling institutions” (ibid: 652).

Attitudes towards the auditor

The thoroughness of the certification body relies to a great extend in the thoroughness and expertise of the individual auditor. In words of González (pers. comm. 2007) *“the quality of the service provided by the certification agency depends mainly on the inspection”.* For this reason, auditors have to be very professional and show an ethic and confidential behavior at all times (Echeverría pers. comm. 2007).

The construct dealing with attitudes towards the auditor seeks to extract producers’ perceptions regarding auditors’ performance during the inspection, as the auditor represents for many the face of the certification body. Besides, the inspection carried out by the auditor has impacts for the farm, which are also for the interest of this study.

Finally, the study pursues to asses if individual differences between the different auditors also influence on reliability, due to the fact that individuals sub-contracted to become auditors of the certification companies may lead to different levels of stringency (Anders et al 2007: 655).

Satisfaction

According to Oliver (1997) satisfaction is *‘an affective and evaluative response to the overall product or service experience’.* Besides, the concept is linked to states of contentment and gratification. Therefore, the model pursues to assess the degree to which a farmer is content and gratified with the practice of certified organic agriculture, and to what extend these practices suffice to fulfill his/her needs. The measurement of the satisfaction is relevant for this research as Schulze et al (2007a) found that it is a good indicator of the cost/benefit ratio.

Credibility

The concept of credibility implies the quality of inspiring belief, hence being close related to the definition of reliability. Another related concepts are ‘trust’ and ‘trustworthiness’, which according to Bruner et al (2005) corresponds to a sub-dimension of credibility. In the context of this research, they all seek to assess the organic standard’s degree of success in transmitting a positive image to the consumers.

Good reputation

Finally, reputation means the recognition of some characteristic or ability by other people. In the context of this research, good reputation refers to the recognition that the organic certification standard is able to achieve its postulates and, transmit that image to the public.

5.3 HYPOTHESIS

The elaboration of the theoretical model allowed the development of hypothesis for both independent and target variables and their effect on the reliability:

H_0 : There is no relationship between both variables (applies for all)

H_1 : There is a positive relationship between the perceived usefulness and the reliability of the organic certification standard

H_2 : There is a negative relationship between the perceived costs and the reliability of the organic certification standard

H_3 : There is a positive relationship between the motivations and the reliability of the organic certification standard

H_4 : There is a positive relationship between the sources of control and the reliability of the organic certification standard

H_5 : There is a negative relationship between the attitudes towards risk and the reliability of the organic certification standard

H_6 : There is a positive relationship between the attitudes towards the certification body and the reliability of the organic certification standard

H_7 : There is a positive relationship between the attitudes towards the auditor and the reliability of the organic system

H_8: There is a positive relationship between the reliability of the organic certification standard and farmer's satisfaction

H_9: There is a positive relationship between the reliability of the organic certification standard and its credibility

H_{10}: There is a positive relationship between the reliability of the organic certification standard and its good reputation

5.4 QUESTIONNAIRE DESIGN

After defining the constructs and hypothesis contained in the research model, statements and questions were formulated according to specifications and examples presented the literature. The list of statements used to operationalize every construct is presented in Annex II.

The survey instrument had six sections: introduction, open questions, polarity profile, attitudinal questions, questions about the farm and product, and finally personal questions, as explained below:

1) Introductory section: A brief explanation of the extension and objectives of the study, as well as names of persons and institutions involved, with the respective contact information.

2) Open-ended response questions: These type of questions are considered to be more valuable to commence the interview as they give room for free expression and allow respondents to 'warm up' with the questioning process (Zikmund 1991: 409). In the questionnaire they were used to obtain respondents' opinions about the main strengths and weaknesses of organic agriculture.

3) Polarity profile: With this technique respondents are invited to place a concept on a seven point scale 'anchored' by a pair of polar adjectives (Baker 1991: 151), with the objective of elaborating an image profile of a concept. This tool was used to elaborate a polarity profile of organic agriculture, and measure the target variables.

4) Attitudinal questions: The main body of the questionnaire consisted of closed or fixed-alternative questions. These questions present given answer possibilities, which demand less interviewer skills, take less time, and are easier for the respondent (Zikmund 1991: 410). The statements were measured with a seven-pointed Likert scale, in which the respondents are asked to indicate their degree of agreement or disagreement with the statement by selecting a point on the scale (Baker 1991: 147). Measured attitudes were those defined as independent variables in the empirical model (Figure 7).

5) Questions about the farm/company: These questions were a mix of open and closed questions, dealing with aspects such as location (province), extension, organizational structure, annual sales, number of employees, main and secondary products, as well as market destination.

6) Personal and demographic questions: The last questions had fixed-alternative answers and dealt with topics like position in the farm/company, age, level of education, and gender of the farmer.

Finally, the questionnaire was elaborated and both pre-tested internally (with students of the Faculty of Agricultural Economics), and with some organic farmers. As a result of the comments and suggestions received some of the statements and scales had to be re-formulated. Besides, to give scientific validity to the questionnaire it was translated twice[13]. To observe the complete questionnaire please refer to Annex III.

5.5 SAMPLING

The survey was applied between November 1st 2007 and January 19th 2008, throughout the Costa Rican territory, involved 63 farms and companies (n=63), and took in average 26 minutes to be completed. Since the total population was constituted by 2.921 certified organic farmers registered in Costa Rica (DARAO 2008), the survey achieved a two percent of response rate. This sample size was mainly limited by the high costs of having access to the farmers. There was only one interviewer involved in the survey process.

The survey contains answers of farmers working with the main organic commodities produced in the country, and affiliated to the main certification bodies. Besides, it includes all farm sizes, and farms located in every province of the country.

[13] The questionnaire was first developed in English and translated into Spanish. The translated version was again translated into English and compared to the first version.

However, the sample is not representative because the producers were not randomly selected (Zikmund 1991: 462). The selection of the respondents obeyed mainly to two aspects: (1) accessibility[14], and (2) willingness of the producer/association to participate in the study. The process of convincing the producers to take part in the survey was not easy because according to some representatives *"a lot of research is currently done, reason why the producers are 'tired' of so many interviews"*; besides, producers are fairly suspicious of giving information about their activities to strangers due to political events in the country (i.e. referendum about the signature of a free trade agreement with the United States), as well as cases of swindle.

Of the 63 interviewed producers, 44 interviews took place in person, 15 interviews were done by telephone, and only four answers were received via e-mail. Although every attempt was made to avoid bias, some of it can be present.

The application of the interviews "face to face" (Zikmund 1991: 226) was strongly recommended by representatives of the sector because it provides more confidence to the producers. Besides, there is opportunity to repeat and reformulate the questions when the respondent has difficulties to understand. It has the disadvantage that the respondent is not completely anonymous and could be reluctant to give confidential information (i.e. annual sales), at the time that there is higher interviewer influence and costs (ibid: 228).

In the case of the questionnaires applied via telephone or e-mail, the respondents just limited themselves to answer the questions where they felt save, hence some did not respond the questions related with income or the governmental role. Another setback in the surveys applied by telephone is that the respondents were not able to see the scales, thus just expressed 'agreement' or disagreement' with the statement. In the case of surveys by e-mail the number of answers received was very low.

In order to collect specific data about the branch, as well as a better comprehension of the results of the survey, meetings with representatives of the organic field and the government were held parallel to the survey.

[14] Only farmers who were accessible by main roads, telephone or e-mail could be included in the study.

5.6 DATA ANALYSIS

The analysis of the data was divided into three stages. The first one corresponds to the preparation of the database to proceed with the analysis, then the descriptive statistics, and third the inferential statistics. All computations were performed using SPSS statistical software.

Once the data was introduced into the database, the first step was to clean it, structure it and organize it. Cleaning was accomplished through consistency checks (looking for inconsistencies within the responses), and extreme case checks (identification of outliers and extreme values through graphics). Afterwards, the descriptive statistics, such as mean (μ), standard deviation (σ), frequencies and percentages were extracted.

The processing of the open-ended response questions as done through a classification according to a given scheme (Zikmund 1991: 409). In this way, the answers regarding the strengths and weaknesses of organic agriculture were grouped depending on their main subject. Strengths were classified into: human health, positive effects on the environment, higher prices, altruistic intentions, better product characteristics, market advantages, among others. Weaknesses were divided into: higher costs, problems to control plagues and diseases, lack of support, difficulties with inputs, bureaucracy and problems with the market and the prices. These results can be found in Annex III.

Pearson's correlations were executed in order to establish the relationship between the target variables. Standard parametric statistical procedures were assumed appropriate for ordinal variables in the form of Likert scales. Besides, other statistical measurements, such as Pearson correlations and mean comparisons (F-test) were performed to determine the relationship between some of the statements.

In order to extract the underlying dimensions of a large number of variables, into fewer factors that explain most of the observed variance, two factor analyses employing the principal components method were carried out. The first one was an unrotated analysis at the level of the dependent variables. The second one was rotated and executed at the level of the independent variables. Varimax rotation was used to assure that factors were as independent as possible for subsequent use in regressions.

Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) as a Measure of Sampling Adequacy (MSA) were used to determine the matrix suitability for factor analysis.

Some solutions with a different number of factors were examined before structures were defined. The chosen standardized factors were saved for subsequent analysis according to the Bartlett's method. The approach used to deal with missing data in the factor analysis was the replacement of the missing data with the mean value of the respective variable, based on the valid responses of the group. The internal consistency or reliability of the statements composing a construct, was achieved with the Cronbach's Alpha test (Cronbach 1951). This step is important to determine if similar results would be obtained over time and across situations (Zikmund 1991: 360).

Finally, a linear regression analysis with the method stepwise was carried out to measure the impact of the identified factors and individual statements on the attitudes of the producers towards the reliability of the organic standard. The goodness of fit was checked with the R^2 and through the analyses of the residuals and hypothesis testing. Statistical significance was checked by an F-test of the overall fit, followed by t-tests of the individual parameters. Additionally, an item-to-item correlation analysis was calculated for excluding any problem of multicollinearity, and the Durbin Watson test was calculated to check the absence of autocorrelation in the residuals. Finally, the proposed original model was modified to reflex the obtained results.

6 RESULTS OF EMPIRICAL SURVEY

This chapter presents the main results of the conducted survey, and discusses them with the support information from the interviews and the literature. The results are divided into three sections: descriptive statistics, factor analysis and regression analysis.

6.1 SAMPLE DESCRIPTION

Table 1 presents the descriptive statistics about the respondents and farms/companies participating in the survey. In fist place, it is important to mention that the questionnaire was responded for 79.4 percent of the owners, and 9.5 percent of the farm/company managers, allowing to capture the opinions of the 'decision maker' in the 88.9 percent of the cases. According to the gender, male participation was higher with 74.6 percent, and 25.4 percent of the respondents were female. Regarding age, the minimum was 22 and the maximum 77, for an average of 43 years old.

As it can be seen most of them correspond to small farms with an extension between one to 10 hectares (81.0 percent), one to three workers (69.8 percent), and annual sales under USD 5.000 (60.3 percent). Participating farms/companies are located throughout the seven provinces of Costa Rica. For more information about the location of every farm please refer to Annex IV.

With respect to the main crop of the farm the survey is very heterogeneous. The interviewed farmers work with blackberry (28.6 percent), coffee (19.0 percent), banana (11.1 percent), fresh vegetables (11.1 percent), pineapple (9.5 percent), and the rest cultivates other crops such as citric, cacao, ornamental seeds, medicinal plants and noni.

Half of the farms (50.8 percent) destined their products direct to exports, where the US appears to be the preferred market. Twenty two percent of the farmers sale their products to others such as to processing plants (specially in the case of banana which is processed into puree, and coffee which is roasted) that later export them. Local farmers markets and supermarkets are in the second place with a share of 28.0 percent.

Table 1. Sample's descriptive statistics

Aspect	Answers	Frequency	Percentage
Gender	Female	16	25.4
	Male	47	74.6
Age	Between 20 and 30 years old	10	15.9
	Between 31 and 40 years old	10	15.9
	Between 41 and 50 years old	29	46.0
	More than 51 years old	14	22.2
Level of education	Primary school	34	54.0
	Secondary school	13	20.6
	Technician	4	6.3
	University Bachelor	12	19.0
Position in the farm	Owner	50	79.4
	Manager	6	9.5
	Employee	2	3.2
	Other position	5	7.9
Extension of the farm	1 to 10 hectares	51	81.0
	11 to 100 hectares	10	15.9
	More than 101 hectares	2	3.2
Number of workers	1 to 3 persons	44	69.8
	4 to 10 persons	13	20.6
	More than 10 persons	4	6.3
Annual sales (USD)	Less than 2.499	25	39.7
	2.500-4.999	13	20.6
	5.000-9.999	8	12.7
	10.000-49.999	8	12.7
	More than 50.000	7	11.1
Years of experience	From 0 to 5 years	14	22.2
	From 6 to 10 years	22	34.9
	From 11 to 15 years	16	25.4
	From 16 to 20 years	8	12.7
	More than 20 years	3	4.8
Type of organization	Cooperative	1	1.6
	Farmer's association	47	74.6
	S.A.*	6	9.5
	Other type	9	14.3
Certification body	Eco-logica	47	74.6
	BCS Öko-garantie	14	22.2
	OCIA	1	1.6
	Ecocert	1	1.6

* Equivalent to 'stock company' in English and 'Aktiengesellschaft' in German
Source: own elaboration

With respect to the work in the organic sector most of the farms have between zero and fifteen years of experience (82.5 percent), and the rest (17.5 percent) has more than 16 years of experience. The majority of the respondents belong to a farmer's association (74.6 percent), and 14.3 percent are organized in other ways (cooperatives or private companies). It is important to mention that the survey had the participation of members of the major association groups in the country: APTTA, ACAPRO and APROCAM.

Regarding the affiliation to a certification body only 14.3 percent of the farms have changed their certifier, mostly due to market requirements. Currently 74.6 percent work of the farms with Eco-lógica, and 22.2 percent with BCS Öko-guarantee, while only one farm work with Ecocert and one with OCIA.

6.2 CONSTRUCTS' MEASUREMENT

In total seven constructs were proposed in the theoretical model and presented to the respondents. The following section presents the results of the assessment of these constructs. To that end, mean (μ) and standard deviation (σ) are mixed with answers to open-ended questions (Annex III), as well as further comments of the farmers, and information from the additional interviews, all in order to provide a valid explanation for most of the obtained results.

6.2.1 Reliability of the organic standard

The concept of 'reliability' was evaluated from three perspectives: general reliability, reliability at the farmer level, and reliability of the certification process.

The measurement of general reliability included the concepts of reliability, effectiveness and utility. The results show mean values around 2.000 with low levels of standard deviation, indicating agreement about the positive image of this activity (Table 2). Eighty five point seven percent of the farmers think organic agriculture is 'reliable', 86.4 thinks it is effective, and 85.7 considers that it works. Mean comparisons between the three concepts indicate no significance difference between reliable and effective (F=0.348), but significance differences between work with reliable and effective (F= 7,924; 6,350 respectively).

Table 2. Results of the statements assessing reliability of organic farming

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
I think organic agriculture is reliable	1.921	0.885						•	
I think organic agriculture is effective	2.048	0.551						•	
I think organic agriculture does work	2.016	0.813						•	

Source: own elaboration

In the case of the reliability at the farmer level, contrary positions were found. On the one side, 66.7 percent of the respondents were in agreement with the statement 'Not every farmer has the same level of reliability'; and 65.1 percent with 'I do not believe that all organic producers are trustworthy. On the other hand, 80.9 percent of the farmers agreed on 'I think there are organic farmers who would never cheat' (Table 3). This indicates that, although farmers are aware of the existence of opportunistic behavior in the sector, they trust their colleges within the association and do not think that they cheat.

Table 3. Results of the statements assessing reliability at the farmer level

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
Not every organic farmer has the same level of reliability	0.857	1.777					•		
I think there are organic farmers who would never cheat	1.597	1.152						•	
I do not believe that all organic producers are trustworthy	1.000	1.626					•		

Source: own elaboration

Responses to the construct of reliability of the certification process show that farmers judge the certification process as capable to manage opportunistic behavior (Table 4). For instance, 82.3 percent of the farmers agreed that the certification process is reliable. Besides, 57.2 percent thinks that 'cheaters are discovered during the inspection', 63.4 percent considers that violations against the guidelines are discovered, and 77.8 percent that inspectors notice such violations.

Table 4. Results of the statements assessing reliability of the certification process

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
Cheaters are discovered during the control.	0.639	1.880							
Violations against the guidelines are rarely discovered.	-1.016	1.655							
The certification process is reliable.	1.726	0.961							
Inspectors are able to notice if other farmers sometimes do not follow the guidelines.	1.645	0.960							

Source: own elaboration

6.2.2 Attitudes towards the organic standard

This section shows the results about the attitudes, which are expected to influence farmer's reliability in the use of the organic standard. The assessed constructs correspond to perceived usefulness, perceived costs, motivations, as well as attitudes towards risks, the certification body and the auditor.

Perceived usefulness

The construct of perceived usefulness embraces the areas of operational management, farm income, and relationship with the buyers, course of business, and market access (Table 5). Inside the construct important levels of standard deviations are observed.

In general, farmers recognize the usefulness of the organic certification standard with 80.9 percent showing 'agreement' with the statement 'the organic certification standard is very useful. Besides, 65.1 percent is convinced that the organic standard improves the productivity of the farm, and 77.8 percent that improves the effectiveness of their organic practices. There also seems to be agreement regarding the usefulness of the standard to improve the quality management (74.6 percent), the relationship with the buyers (77.7 percent), the business relations (76.2 percent), and the course of business (82.5 percent) (Table 5).

Table 5. Results of the statements assessing perceived usefulness

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
The organic certification standard is very useful.	1.857	0.644							
The organic certification standard improves my productivity.	1.175	1.454							
Organic certification standards enhance the effectiveness of my organic practices.	1.381	1.486							
I do a better quality management since I got the organic certification	1.238	1.614							
I have a better relationship with my buyers since I got the organic certification.	1.635	1.005							
Since I farm organic, my business relations have increased.	1.698	1.173							
Our course of business becomes clearer through the certification process.	1.556	1.329							

Source: own elaboration

The consensus seems to disappear when farmers are asked about the usefulness of the certification for the farm income. Although Damiani (2001) reported that organic production has had substantial positive effects on income in some parts of Costa Rica [15], this situation may have changed in the last years. In the survey only 47.6 percent of the respondents agreed with the fact that the certification increased their income. Moreover, when asked about the weaknesses of organic farming 27.0 percent of the farmers complained about the low prices they are paid. On this regard a correlation between the increase in the farm income and the main product of the farm was found ($r=-0.299$; $\rho=0.05$). It that way, farmers selling products for fresh consumption (i.e. vegetables and blackberries) are able to become better prices than those selling products for processing (i.e. bananas).

Regarding the usefulness of the certification for having access to the market, it was found that while most of the farmers need the certification to be able to sell their products (82.5 percent), only 44.4 percent admits that they acquired it to have market access.

[15] According Damiani (2001: 8) the revenues from organic cacao and banana represented 31.7% of the total farmers' income in 2000, with an additional 37.2% coming from products from the forests that are part of the organic cacao and banana production systems. If only cash incomes were considered, organic cacao and banana represented 61.8% of the income.

However, a high standard deviation gives an idea of the wide variance within the answers. Additionally, when asked about the strengths of organic agriculture, 20.6 percent of the farmers mentioned the market conditions.

Table 6. Results of the statements assessing farm income and market access

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
My income has increased since I got the organic certification	0.730	1.598							
I had more gains with conventional agriculture than with organic agriculture	-0.746	1.596							
I need the organic certification to be able to sell my products	1.556	1.341							
I acquired the certification only to have market access	0.175	1.871							

Source: own elaboration

Finally, two statements evaluated the impact of the inspection for the farm through the inspection report and the visit of the auditor. In spite of high standard deviations, farmers consider that the inspection is helpful for the management of the farm.

Table 7. Results of the statements assessing usefulness of the inspection

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
The inspection report gives me a clearer idea about the current situation in my farm	0.698	1.940							
The auditor gives me good ideas to improve the management of my farm	1.581	1.209							

Source: own elaboration

Perceived costs

The perceived economic and bureaucratic costs of the certification were measured in this construct. The results demonstrate that most of the farmers do not perceive certification as too costly, neither in the economic nor in the bureaucratic aspects. However, mean values close to zero (nor agreement, nor disagreement), along with high levels of standard deviation indicate wide differences in the responses (Table 8).

On the one hand, when asked about the main weaknesses of organic agriculture 15.9 of the farmers mentioned the higher costs. Besides, 38.1 percent agree, and 25.4 partially agree with the statement that 'the cost for the certification is too high'. On the other hand, more than the half of the respondents disagrees with the fact that the costs for the certification are higher than the benefits (57.2 percent). Finally, some level of contradiction was found in the third statement, and confirmed through a mean comparison between statements #1 and #3, that revealed significant differences (F=11.985***). The reason for this contradiction is that the understanding of the second statement represented some level of difficulty for some farmers.

Table 8. Results of the statements assessing perceived costs of the certification

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
The cost for the organic certification is too high.	0.921	1.506							
The costs for the certification are higher than the benefits.	-0.429	1.829							
The fee for the certification process is not so high.	-0.175	1.498							
The time expenditure for the certification process is exaggerated.	-0.730	1.734							
The organic certification control system is very bureaucratic.	0.698	1.802							
The required documentation by the organic certification is exaggerated.	-0.175	1.871							
The bureaucracy to obtain the certification has increased in the last years.	1.175	1.671							

Source: own elaboration

Although most of the farmers (54.0 percent) agreed that the certification system is very bureaucratic, and the bureaucracy has increased in the last years (71.4 percent); they do not find that neither the time expenditure (61.9 percent) nor the documentation (47.6 percent) required by this system are exaggerated.

Motivations

The construct evaluating the motivations to remain reliable contemplates the aspects of organic, managerial and economic motivations (Table 9). Again in the cases of organic and economic motivations, mean values close to zero (not agree, nor disagree) and high standard deviations are indicators of great variability within the answers.

Organic motivation is understood in this context as the motivation for the practice of a healthier and more environmental-friendly agriculture. Asked about the main three strengths[16] of organic agriculture, 65.1 percent of the farmers agreed that the most important advantages are the positive effects on human health (producer, producer's family, farm's workers and the consumer), and 63.5 percent agreed on the positive effects for the environment (i.e. biodiversity conservation). In the closed questions the respondents also showed a high degree of commitment with these principles. Most of them said that 'they would change today again to organic agriculture, if they would have to'; 'they do not want to farm conventionally again'; and 'they will remain organic even if the prices do not improve'.

Table 9. Results of the statements assessing motivations

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
Nowadays I would never change to organic farming	-1.460	1.330							
I would never farm conventionally	0.968	1.736							
If the prices do not improve, I will return to conventional farming	-1.254	1.502							
I work with organic products because of the economic benefit	0.635	1.639							
I care of maintaining a good management in my farm	1.984	0.660							
I am highly motivated to administrate in my farm right	2.095	0.429							

Source: own elaboration

[16] Percentages do not sum 100% because every farmer expressed three strengths and three weaknesses.

Many farmers also accepted that they work with organic because of the economic benefits. As showed in the 'perceived usefulness for the farm income' motivation towards organic agriculture is to a large extend conditioned for the prices that producers receive. For instance, a significant correlation was found between the statements 'my income increased with the organic certification' and 'I work with organic products because of the economic benefit' ($r=0.485$, $\rho=0.01$). Furthermore, when asked about the strengths of organic farming 27.0 percent of the respondents mentioned the higher prices and 15.9 percent mentioned the independence of expensive agrochemicals.

The two statements dealing with the managerial motivation are among the answers with the highest mean and lower standard deviation values of the entire questionnaire, showing that the motivation towards a good administration of the farm is very solid. Only three persons disagreed with these statements, with the justification that they have had bad experiences with the commercialization of the products, and are therefore willing to leave the organic production and look for alternative activities in the farm.

Other sources of motivation were also mentioned when the producers were asked about the strengths of organic farming. Among them are, altruistic motivations or religious believes (17.5 percent) and a higher quality of life (15.9 percent).

Sources of control

The construct of sources of control is integrated by different sources of control such as the family, community, association's colleges, buyers, and finally the government (Table 10).

The closest source of control, which can also act as support, corresponds to the family. The results of these statements (although inverse) reflect agreement with the familiar commitment to the organic activities (76.2 agreement with the first statement, and 73.0 disagreement with the second statement). Especially in the case of small farmers the practice of organic agriculture serves familiar proposes such as integration, food security and sustainability of the farm. The respondents who did not counted with familiar support argued that they work for big companies or live by his/her own.

Table 10. Results of the statements assessing familiar participation

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
My family cares that I fulfill the requirements of organic farming.	1.333	1.437							
My family has no interest in my organic business.	-1.306	1.444							

Source: own elaboration

The results regarding the association's control show an strong commitment of the farmers with the association (88.9 percent of agreement). Besides, there exists agreement regarding the control executed by the association and the community. In reality, communities and associations are often closely related, as many neighbors plant the same crop and sell it through the association (i.e. banana, cacao and blackberries). Moreover, the associations play an important role in creating awareness among its members about the importance to comply with the organic technologies, or everybody could suffer from negative effects and even loss of the market. For instance, Damiani (2001: 23) presents the case of APTTA, association that includes this topic as part of the training of their members

Table 11. Results of the statements assessing control of the community, association and buyers

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
Producers are aware that if any of them cheat, that could be detrimental to the name of the association.	2.000	0.724							
If my neighbors discover that I do something wrong, they would denounce me.	1.597	1.166							
My organic certified neighbors monitor that I comply with the requirements of the certification.	0.937	1.595							
My buyer controls that I keep close to the guidelines.	1.032	1.727							
My buyer warns me frequently about the consequences of cheating.	0.825	1.756							

Source: own elaboration

As most of these products are exported, direct control from the buyer is very difficult. Therefore, the control is carried out by specialized members of the association, some of them with the status of 'internal auditor', or even accredited as organic auditors. Direct control of the buyer does take place in the case of products sold to the national supermarkets (i.e. fresh produce).

Regarding the control and sanctions imposed by the government there exists plenty of ignorance and confusion at the producer level, reason why the producers gave very different opinions about these statements, taking to mean values close to zero and high standard deviations (Table 12). In the case of the first statement regarding governmental control there was 44.4 percent of disagreement and 41.3 percent of agreement. In the second statement dealing with governmental punishment there was 38.1 percent of agreement, 31.7 percent of disagreement, and 27.0 percent answered with nor agreement nor disagreement.

Table 12. Results of the statements assessing governmental control

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
The government does not monitor if farmers comply with the organic certification.	0.000	2.008				●			
The government punishes farmers who show opportunistic behavior.	0.111	1.761				●			

Source: own elaboration

To clarify this situation it is important to state that it is true that the Costa Rican government does control farmers through a special entity created for this proposed, called DARAO. However, according to Ramírez (pers. comm. 2008, representative of DARAO) the national regulation does not allow DARAO to punish the producers directly in case of finding any incompliance. Instead, DARAO notifies the incompliance to the respective certification body, which is in charge of applying a sanction.

Finally, it is worth to mention that producers confusion is justified due to the large number of visits that they receive in the farm, and include researchers, teaching institutions, and other governmental entities (i.e. National Production Council-CNP). The results obtained in this construct confirm that, although multiple inspections help as a way of control, they can also become a burden for the producer (Darnhofer/Vogl 2003: 17).

Attitudes towards risk

Attitudes towards risk are measured from two different perspectives: one is the personal propensity to take risks, and the other one the perception of risks present in the organic sector, as well as the awareness of sanctions.

Table 13. Results of the statements assessing attitudes towards risk propensity

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
I avoid risky situations	1.774	1.047						•	
Compared to most people I know, I like to take risk.	0.823	1.806					•		

Source: own elaboration

The practice of organic agriculture involves more risks that the conventional one. Therefore, it can be expected that organic farmers be significantly less risk averse than their conventional colleagues (Flaten et al 2004: 13). The measurements of this construct indicate positive mean values and high levels of standard deviation (Table 13). Hence, confirming farmer's positive attitude towards taking risks.

In general farmers are aware of the existence of opportunistic behavior in the organic sector. However, as most of the farmers taking part of the survey are small and live far away from the city, they miss the contact with the market and sometimes also with the reality in the country. This is revealed by the mean values close to zero.

Table 14. Results of the statements assessing attitudes towards risk perception

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
Worries about an increasing number of cheaters in the sector are exaggerated for me.	-1.048	1.518							
Nowadays there are more farmers who do not follow the organic guidelines.	-0.286	1.689							
I am worried that the number of "black sheep" in the organic sector is increasing.	0.629	1.840							
Cheating is not worth it because sanctions are too strong.	1.619	1.237							
The sanctions applied to cheaters are exaggerated.	-0.694	1.655							

Source: own elaboration

At the same time, producers are aware of the existence of sections in the case of incompliance, but often they did not know what these sanctions imply, and hence neither if they are too strong or not. Most farmers' associations have set punishments for those members who do not comply with the requirements, among them, the exclusion of the association for one or two years. Such exclusion would deprive the farmer of the possibility to sell his/her products through the association, thus losing the organic recognition for the product. Apart from that, very few cases were mentioned where the farmer received a punishment from the certification agency.

Certification body

Two aspects were evaluated in relation with the certification body: the thoroughness and the criteria used for its election (Table 15). In this case, most of the producers taking part of large associations were not able to express their opinion with respect to the CB election, because the associations' directives usually take such decisions. Moreover, some of the farmers did not even know the name of their own certification agency. Besides, producers who have never worked with another certification body were not able to answer to some of the statements. This justifies that many of the evaluated aspects present mean values close to zero (nor agreement, nor disagreement).

According to the few answers received, the reputation, and not the low prices or the possibilities to obtain the certification are the heaviest criteria in the CB election. Besides, most of the producers perceive their CB as being thorough (31.7 percent) and strict (73.0 percent).

Table 15. Results of the statements assessing attitudes towards the certifier

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
I chose this CB because it has a good reputation.	0.905	1.103							
I chose the CB that offered the lowest price for the certification.	-0.254	1.307							
I chose this CB because the possibilities to get the organic certificate were higher.	-0.079	1.462							
My CB usually approves all the farms that request its services.	-0.159	1.547							
In comparison to other CBs ours is more thorough.	0.508	1.203							
I like my current CB because it is not so strict	-1.306	1.444							
It does not make any difference what CB controls our farm.	-0.254	0.967							

Source: own elaboration

Auditor

With respect to the auditor two aspects were evaluated: thoroughness and expertise. The results suggest that auditor possess a positive image among the respondents, being perceived as not tolerant (87.3 percent), but rather accurate (82.6 percent) and professional (88.9 percent) (Table 16).

As in the previous construct, many producers who have never worked with other CBs, or have always been inspected for the same auditor were not able to respond to some of the statements leading to mean values close to zero (nor agreement, nor disagreement), but middling standard deviations.

Table 16. Results of the statements assessing attitudes towards the auditor

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
In comparison to auditors of other CBs, our auditor is more strict	0.159	0.846							
Our auditor tries to find the weak points in my farm.	1.810	0.715							
The auditor is very tolerant if I sometimes do not follow the organic guidelines	-1.651	1.138							
It does not make any difference which auditor controls our farm.	0.311	1.566							
The work done by the auditors of my CB is very professional.	1.730	0.954							
The auditor is an expert in organic production.	1.286	1.237							
The performance of the auditor during the inspection is very accurate.	1.651	0.953							

Source: own elaboration

6.2.3 Target variables

Satisfaction

Evaluation of the satisfaction was seen from two angles: with the practice of organic agriculture and with the certification process. In the survey 88.9 percent of the farmers declared to be satisfied with organic farming, and 79.3 percent with the organic certification. Mean and standard deviation values are very similar, and a mean comparison of confirmed no significant differences between them (F=0.630), meaning that both concepts are very close related.

Table 17. Results of the statements assessing producers' satisfaction

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
So far, how satisfied are you with the practice of organic farming?	1.619	0.958							
I am satisfied with the organic certification	1.698	0.994							

Source: own elaboration

Credibility

The dimension of credibility was assessed through the measurement of farmers' perceptions towards the 'credibility' and 'trustworthiness' of organic farming. These results demonstrate that organic farming posses a positive image before the producers. Both mean values seem to be very similar and close to 2.000 (agreement). Furthermore, low standard deviations confirm high consistency of the results. However, a mean comparison between both statements revealed significant differences at the 0.05 level (F=3.973**). On the other hand, when asked about the weakness of organic farming 11.1 percent of the farmers mentioned problems related with credibility, implying the existence of some awareness and concern on this regard among some of the producers.

Table 18. Results of the statements assessing producers' credibility

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
The organic standard is credible	2.111	0.764						•	
The organic standard is trustworthy	2.095	0.560						•	

Source: own elaboration

Good reputation

The statements related to the good reputation of organic agriculture present the highest mean values, and lowest standard deviation values of the entire questionnaire, demonstrating high consistency, as well as uniformity in the answers, and confirming the positive image of organic farming among the respondents. Mean comparison tests revealed no significant differences between good reputation and the other three adjectives (F values = 0.957 for important; 0.951 for necessary; 1.151 for motivating).

Table 19. Results of the statements assessing producers' good reputation

STATEMENT	μ	σ	Disagreement ⟷ Agreement						
			-3	-2	-1	0	1	2	3
I think organic agriculture is important	2.397	0.525						•	
I think organic agriculture is necessary	2.286	0.521						•	
I think organic agriculture is motivating	2.016	0.707						•	
I think organic agriculture has good reputation	2.016	0.852						•	

Source: own elaboration

Significant (Pearson's) correlations were found between some of these attributes, reflecting some degree of positive linear relationship between the measured variables. Among them protrude the strong correlations between 'trustworthy' with 'important', 'necessary', 'motivating' and 'effective' (Annex VI).

6.2.4 Additional remarks

The general denominator of the farmers taking part of the survey was their small size. These farmers have few economic resources, low levels of schooling and are very disperse. For instance, many of them are very limited to acquire inputs for the farm, as they are very distant from community centers, do not have a transportation facility, and do not have the economic resources to invest in this sense. Such limitations are overcome through the production of some inputs inside the same farm. However, farmers who are not able to do it face serious threats to the sustainability of the system.

For this reason is that the associations play a special role. They create the economies of scale that allow the development of a viable business. For example, in the case of the bananas association (composed by more than 1,500 members) a truck drives around the community to pick up the harvest once a month. In that way, farmers must carry the product only until the closest road shore. In the case of the blackberry association, a directive committee with offices in the capital is in charge of dealing with the buyer in the US and later transmitting the information to the producers. Besides, farmers

are not responsible for the payment of the certification fee, as they are diminished a small percentage of their sales in order to pay for these services.

In short, although many producers complained about the prices paid, for some of them the organic market, that they can access through the association is the only opportunity that they have to sale their products, and hence to receive cash payments. Besides, the affiliation to an association grants some additional benefits, that most of them would not be able to handle by them selves such as the contact with the buyer and certification formalities.

For all these reasons, farmers are highly aware of the importance of the organic market for them. Besides, they feel closely observed by the many sources of control that they experience. They are actually very kind to cooperate with governmental, research and teaching institutions. However, they would also like to get more support from them in terms of technical advice, credit and information campaigns to consumers.

6.3 FACTOR EXTRACTION

Two exploratory factor analyses were carried out (one for the dependent and one for the independent variables) in order to determine the consistency of the statements used in every construct. The selected statements present a factor loading which expresses the importance of the variable in measuring each factor, thus providing a mean for the interpretation and naming of the factors (Zikmund 1991: 733). Only one factor loading not exceeding 0.500 and the absence of cross-construct loadings above 0.500 indicate good discriminant validity. Besides, these results confirm that each of the constructs are uni-dimensional and factorially distinct (Moon/Kim 2001: 223).

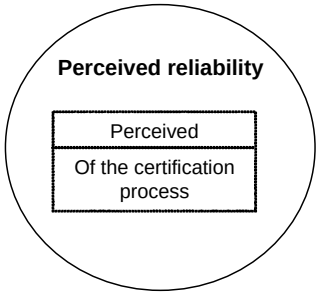
6.3.1 Dependent variable

The results of the factor analysis carried out for the dependent variable suggest that the ‘overall reliability’ is actually composed by two different constructs: one composed by the statements related to the ‘perceived reliability’ and ‘reliability of the certification process’, and the other one composed by the statements related to the ‘reliability at the farmer level’.

As the factor analysis is a measure of correlation among the statements, it can be stated that there exists a higher correlation between the general reliability of the organic standard and its certification process, and that the correlation of both aspects with the farmer reliability is not so high.

The first one of these two factors was chosen to remain as the dependent variable. This factor accounted for 57.0 percent of the total variance and includes four statements referring to the perceived reliability, and reliability of the certification process (Figure 8). As the attitudes at the farmer level were not included, the name of the factor was modified to 'perceived reliability'. The statements included in the factor and their factor loadings are presented in Annex V.

Figure 8. Results of the factor analysis for the dependent variable



Source: own elaboration.

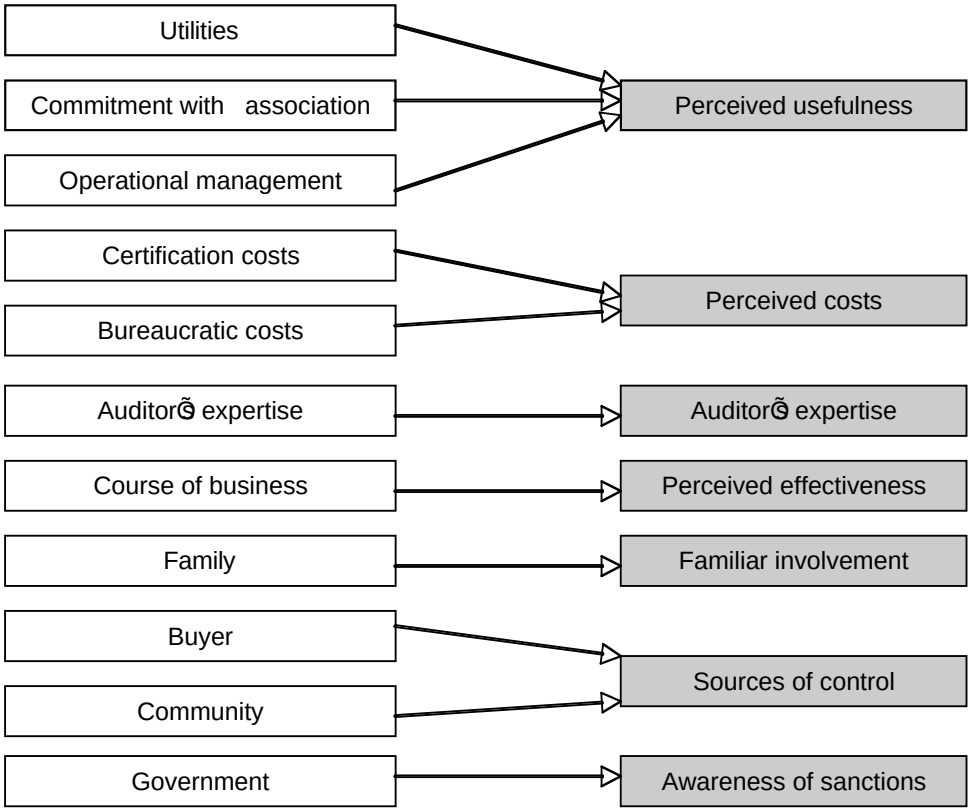
In the factor analysis for the dependent variable factor loadings for all statements were greater than 0.500. Bartlett's test of sphericity (ρ=0.000) indicates the statistical probability that the correlation matrix has significant correlations among at least some of the variables, and the KMO = 0.720 showed middling sampling adequacy.

6.3.2 Independent variables

Seven factors were extracted after 8 iterations with no cross-construct loadings above 0.500, indicating good discriminant validity. To validate suitability of the matrix for factor analysis, some measures were used to examine the entire correlation matrix. Bartlett's test of sphericity (p=0.00) confirms the statistical probability of significant correlations among some of the variables. The KMO = 0.726 showed middling sampling adequacy and suitability for factor analysis.

The 75.6 percent of the variance in attitudes towards organic farming was explained by the following seven factors: perceived usefulness, perceived costs, auditor's expertise, perceived effectiveness, familiar involvement, sources of control and awareness of sanctions. Figure 9 shows the sub-constructs contained within every factor. The statements and factor loadings of every factor are presented in Annex VII.

Figure 9. Results of the factor analysis of independent variables



Source: own elaboration

The factors were named as a result of the sub-constructs and statements contained within each of the factors. Additionally short description of every factor is presented below:

F2. Perceived usefulness: the meaning of this factor remains the same, embracing aspects related to the benefits of the certification standard for the farm. However, two types of benefits stand out, corresponding to the general benefits (such as the improvement of the productivity and effectiveness of the farm), and benefits at the level of operational management (quality management, situation in the farm). Unexpectedly, this factor also included farmers' commitment of belonging to an association.

F3. Perceived costs: the meaning of the construct related to the perceived costs also remains with the same meaning, and continues to be integrated by both the economic and bureaucratic costs of the certification.

F4. Auditor's expertise: among the different attitudes assessed regarding the auditor's performance during the inspections, those related to the 'auditor's expertise' have loaded better into a unique factor, therefore receiving that name.

F5. Perceived effectiveness: a new factor emerged in the factor analysis containing those statements related to the 'usefulness for the course of business', and was named 'perceived effectiveness'. In this way, while both 'usefulness' and 'effectiveness' refer to the positive effects of the certification for the farm, 'perceived usefulness' deals with the general benefits experienced with the certification, and 'perceived effectiveness' has to do with the extend to which the certification helps the farmer to accomplish his/her goals (such as proving market access). Chau (1996) had already suggested the extension of the TAM with the construct of 'perceived effectiveness'.

F6. Familiar involvement: the items related to the participation of the family in the organic activities were extracted from 'extrinsic motivation' construct, and loaded into a different individual factor. This new factor was named 'familiar involvement' because it reflexes the degree to which the family cares about the organic practices in the farm.

F7. Sources of control: of the many sources of control faced by the farmer, two of them (corresponding to the neighbors and the buyer) were selected to remain in this construct. The words ‘control’, ‘monitor’ and ‘discover’ are present in the three statements contained in this constructs, motivating its name.

F8. Awareness of sanctions: the last factor includes only one statement dealing with the punishment of opportunistic behavior by the government. In reality, as found out in the interviews, the government does not execute this function. However, the inspections carried out by the government have provoked in the producers the belief that the government is in charge of applying sanctions.

Finally, it is important to mention that the extracted constructs showed suitability of its operationalization, clear concept definition as well as correlation among the statements. However, problems remained in the operationalization of the two constructs that could not be extracted by the factor analysis (attitudes towards risk and the certification body). Hence, for future confirmatory research the improvement of the reliability and validity of these two constructs is recommended. This could be achieved through the use of a larger number of statements (Davis 1989).

6.3.3 Internal consistency of extracted factors

Alpha values (Cronbach 1951) were also calculated for the eight factors (Table 20). Five factors present values greater than 0.700, indicating a high degree of cohesion among each category. Alpha values for F5 and F7 are acceptable given the reduced number of items (McEachern/Willock 2004: 541). Alpha value for F8 could not be calculated because it is composed by only one statement.

Table 20. Cronbach's alpha values for the extracted factors

Factor	Items	Cronbach's Alpha
F1. Perceived reliability	4	0.747
F2. Perceived usefulness	5	0.837
F3. Perceived costs	4	0.971
F4. Auditor's expertise	3	0.799
F5. Perceived effectiveness	2	0.565
F6. Familiar involvement	2	0.788
F7. Sources of control	3	0.526
F8. Governmental control	1	-

Source: own calculations

6.3.4 Factorization of target variables

Low values of KMO (around 0.5) and Cronbach's alpha (under 0.7) indicated not suitability of the target variables for factor analysis. Hence they will be handled as independent statements in the correlations with the dependent variable. These correlations are presented in Annex VI.

6.4 MODEL TO MEASURE THE PERCEIVED RELIABILITY

The existence of a relation between the dependent, independent variables, and target variables is proved in this section, in order to test the empirical model proposed for the research. At the end, the model to measure 'reliability' will be modified to reflect the obtained results.

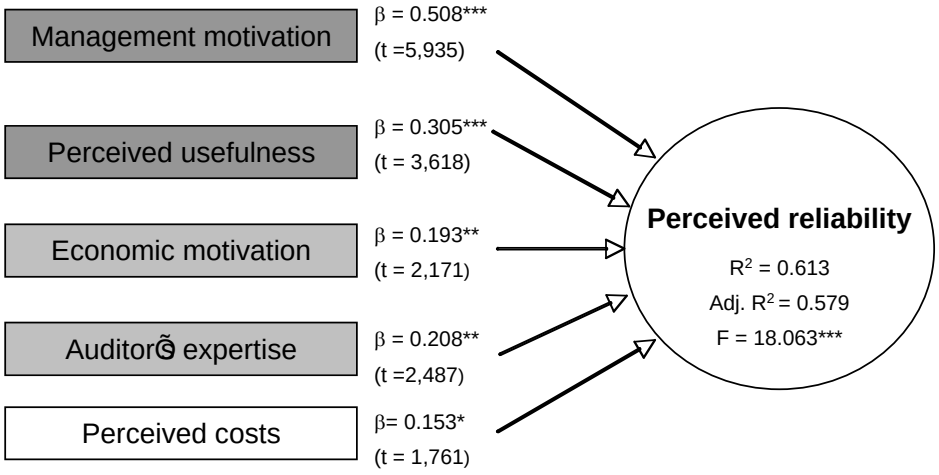
6.4.1 Influence of extracted factors on the perceived reliability

The relationship between the dependent variable (perceived reliability) and independent variables (extracted factors and individual statements) was established through a linear regression analysis, carried out with the Stepwise method. The complete statistical results of the regression and assumptions[17] are presented in Annex VIII.

[17] The presence of multicollinearity took to the exclusion of the demographic variables from the regression. The remaining items are free of multicolinearity. The residuals are normally distributed and free of autocorrelation (Durbin Watson test =2.182) (see Annex VIII).

The R^2 value signals the 'goodness of fit' or percentage of the variance of the dependent variable explained by the independent variables. In that way, the significant independent variables explained 61.3 percent of the 'perceived reliability'. The *t* values show the significance of five independent variables (three factors and two individual statements) for the regression. Besides, the Beta values indicate the strength of this influence on the perceived reliability. Moreover, a high F-test value shows the significance of the results (Figure 10).

Figure 10. Independent variables with an influence on the perceived reliability



*** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.1 level

Source: own elaboration

The motivation construct was divided into two parts: management and economic. The motivation towards a good administration of the farm/company appears to be the variable with the highest influence on the perceived reliability, while the economic motivation appears the third place. The absence of the organic motivation calls the attention and opens room to the possibility that farmers can be converting for the wrong reasons, as suggested by McEachern/Willock (2004).

As proposed by the original TAM, the construct of 'perceived usefulness', dealing with the obtained benefits, was significant for the regression. The construct dealing with the 'perceived economic and bureaucratic costs' of the certification was also significant for the model, being consistent with the results of Schulze et al (2007a,b).

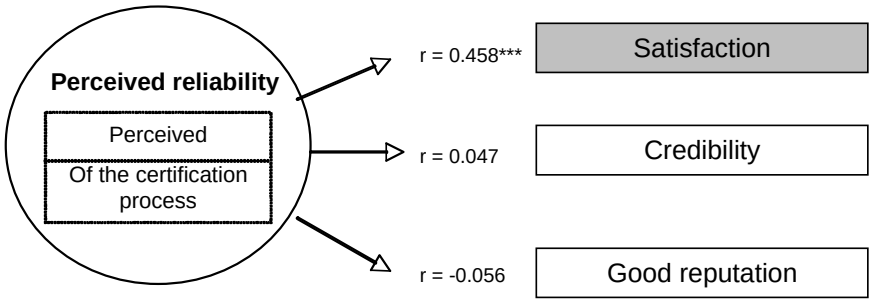
Finally, the attitudes towards the auditor appear to be more significant for the producers than the attitudes towards the certification body. This confirms González (pers. comm. 2007) statement that *"the quality of the service provided by the certification agency depends mainly on the inspection",* and underlies the importance of a good performance of the auditor during the inspection. Besides, it supports the suggestions of a needed improvement of the certifiers' performance (USAID 2005: 42).

The factors and statements regarding the sources control of producers' activities failed to be included in the final regression, implying that intrinsic motivations have a heavier influence on producers' attitudes towards reliability than external pressure. This same principle applies for the attitudes regarding risk (propensity and perception), as well as awareness of sanctions, which showed not to be significant in the regression.

6.4.2 Relations between perceived reliability and target variables

The relations between the target variables and the construct of 'perceived reliability' were established through a correlation with individual statements. The results of this correlation analysis are presented in Annex VI.

Figure 11. Relations between the dependent and target variables



*** Correlation is significant at the 0.01 level (2-tailed).
Source: own elaboration

In the single correlations between dependent and target variables only the statement regarding the 'producers' satisfaction with the certification system' showed a significant correlation with perceived reliability (r=458, ρ=0.01). This finding corroborates the postulate that 'satisfaction' act as an indicator of a positive cost/benefit ratio for the producer. On the other hand, the 'satisfaction with the organic practices' showed not to be significant, strengthening the link between the reliability and the satisfaction both with the certification process.

The correlations of the other two target variables with the construct of reliability showed very low and not significant values, motivating their elimination from the final modified model. Furthermore, of all the adjectives evaluated in the polarity profile of organic agriculture, none of them presented a significant correlation with reliability (Annex VI).

These results indicate that the perceptions of these concepts (credibility, trustworthiness, etc.) are not related to the dependent variable of reliability as hypothesized in the definition of concepts. Moreover, the correlation calculated a negative value for the case of 'good reputation' demonstrating the opposite direction of both vectors. Interestingly, 'credibility' and 'good reputation' happened to be positively correlated between them selves, what could be good reason to include them in a new model in further research.

6.4.3 Hypothesis testing

Hypothesis 1 and 2 examined the links between the 'perceived usefulness' and 'perceived costs' with the reliability. According to the results of the regression perceived reliability is significantly related with perceived usefulness (β=0.305; t value =3.618; $\rho<0.001$) and perceived costs (β=0.153; t value =1.761; $\rho<0.1$). Therefore, hypothesis 1 and 2 are not rejected.

Hypothesis 3 explored the effects of the individuals' motivations on the reliability of the organic certification standard. Two types of motivations showed to have a significant impact on reliability: managerial motivation ((β=0.508; t value =5.935; $\rho<0.001$) and

economic motivation (β=0.193; t value =2.171; $\rho<0.05$). In this way, hypothesis 3 is not rejected.

Hypothesis 4, 5 and 6 evaluated the links between the sources of control, attitudes towards risk, attitudes towards the certification body and the reliability. However, none of these variables appeared to be significant in the regression. Thus, hypothesis 4, 5 and 6 are rejected.

Hypothesis 7 examined the effect of the attitudes towards the auditor and the reliability. Part of this construct regarding the auditor's expertise is significantly related with the perceived reliability (β=0.208; t value =2.487; $\rho<0.05$). Therefore, hypothesis 7 is not rejected.

Finally, hypothesis 8, 9 and 10 assessed the relationships between the reliability and producer's satisfaction, the credibility and the good reputation of the system. From these three variables, only satisfaction showed to have a highly significant correlation (r=0.458, $\rho<0.001$) with perceived reliability. Hence, hypothesis 8 is not rejected; and hypothesis 9 and 10 are rejected.

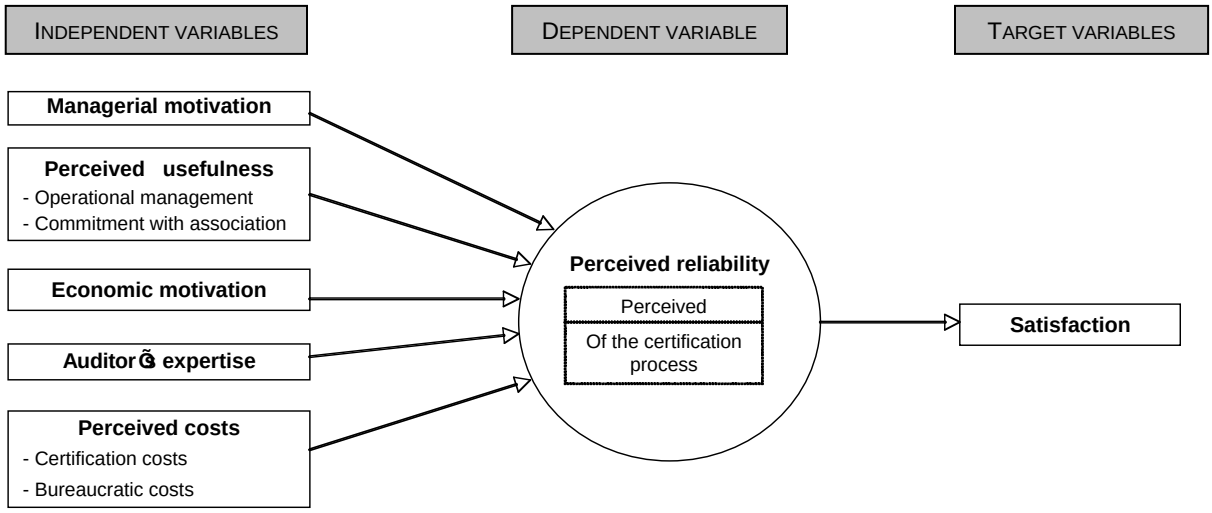
6.4.4 Modified model for the measurement of perceived reliability

The union of the results obtained in the regression and correlation analysis took to the modification of the originally proposed research model (Figure 12). In the new modified model 'reliability' stays as the dependent variable; however its name was changed from 'overall reliability' to 'perceived reliability' due to the exclusion of the items regarding reliability at the farmer level.

From the seven constructs originally proposed as independent variables, four were significant in the regression and are included in the final model. One of the remaining constructs under the name of 'motivations' was divided into two parts: 'management motivation' and 'economic motivation'. Three constructs (sources of control, attitudes towards risk and towards the certification body) are not present at all in the final regression, signaling its low significance for the reliability.

From the three proposed target variables, only satisfaction showed a significant correlation with reliability, and therefore remains in the final model. The other two target variables (credibility and good reputation) were removed due to the absence of a significant correlation with reliability.

Figure 12. Modified model for the measurement of the perceived reliability



Source: own elaboration

The obtained results allowed identifying of the variables with the highest influence on the perceived reliability of the organic certification standard. The presence of the 'perceived usefulness' and 'perceived costs' implies that the improvement of the perceived reliability in the organic sector implies that more attention must be paid to the cost/benefit ratio of the producer. The presence of the satisfaction as a target variable confirms this premise.

The exclusion of the constructs and variables regarding external control could be interpreted as an indication that the producer's intrinsic motivations are more important than the inspections and sections. Particularly in the case of Costa Rica, that means that in spite of the development of an institutional and legal framework, producers continue practicing organic agriculture due to their own motivation.

Finally, it has been corroborated that the auditor's visits have an impact on the farm. However, producers do not perceive these visits as a thread and, moreover feel respect for the knowledge and professionalism of the auditor. This premise should be an indication for the certification bodies to pay more attention to the performance of their auditors in the field. The performance of the auditor is key as s/he acts as a bridge, transmitting the message that the CB wants to send to their affiliated producers, and at the same time, collecting data about the producer's reality. Therefore, a great deal of the responsibility for the proper functioning of the certification and reliability of the standard falls on the auditor, and that has been reflected in the regression.

In Costa Rica many producers have only had contact with one auditor in all their years of experience. However, these results are an indication that the requirements that the auditors must fulfill have sufficed so far to guarantee their good performance and image before the producers.

7 CONCLUSIONS

The subject of this research was the analysis of the reliability of the organic certification standard, and the main objective was to identify the main variables influencing its reliability. This last section pursues to draw the most important conclusions, recommendations and limitations found along the study.

In our days, the reliability of the organic products, and by default of the organic standard has been threatened by the extraordinary growth experienced by the organic market around the globe. The certification, implemented as a mechanism to address this issue has proven not to be a 'panacea', and on the contrary, it appears now to be 'feeble' in the achievement of these ambitions. Therefore, new and more suitable mechanisms should be developed, what cannot be done without the previous identification of the factors that influence the reliability of the organic certification standard.

In this research, a theoretical model for the identification of such factors was proposed and modified according to the results of a survey carried out at the producer level in Costa Rica. The dependent variable aimed to study with the model was the 'reliability' of the organic standard. That variable was represented by a factor incorporating aspects related to the 'general reliability' and 'reliability of the certification process'.

The original model assessed the impact of seven independent variables on the determination of the reliability: 'perceived usefulness', 'perceived costs', 'motivations', 'sources of control', attitudes towards risk, the certification body and the auditor. An exploratory factor analysis demonstrated problems in the operationalization of some constructs, what took to their modification. The constructs dealing with the 'perceived usefulness', 'perceived costs', 'sources of control', and 'attitudes towards the auditor' showed suitability for factor analysis. During this procedure a new construct emerged and was named 'perceived effectiveness'. For future research it is recommended to improve the reliability and validity of the remaining constructs, through the use of a larger number of statements (Davis 1989). The variables 'managerial and economic motivation', perceived usefulness', 'perceived costs' and 'auditor's expertise' were found to have a significance influence on reliability. Together they explain the 61.3 percent of the variance in the perceived reliability of the organic certification standard among organic farmers.

Besides, the model explored the links between ‘reliability’, ‘satisfaction’, ‘credibility’ and ‘good reputation’. The results indicate the existence of a significant correlation between the reliability and farmers’ satisfaction with the organic standard, and no correlation with the variables of ‘credibility’ and ‘good reputation’, what motivated their elimination of the final model. However, due to the exploratory nature of this research, the results obtained are considered satisfactory.

Instead of the introduction of stricter controls or higher sanctions, as suggested often in the literature, the findings of this work propose working on the cost/benefit ratio of the producer, in order to improve the reliability of the organic certification standard. Besides, that will be way to contribute to farmers’ satisfaction with the organic certification standard. In short, as stated once by Emerson: *“Trust men and they will be true to you; treat them greatly and they will show themselves great”.*

This is also confirmed by the fact that the producer’s intrinsic motivations towards the system showed to be more significant that the sources of pressure and awareness of sanctions. However, the absence of the ‘organic motivation’ in the final regression calls the attention, and invites to question if producers might be converting only due to the economic motivation. Particularly in the case of Costa Rica, that means that in spite of the development of an institutional and legal framework, as well as the many sources of control, producers continue practicing organic agriculture due to their own motivation.

All these findings represent clear implications for associations, buyers, support organizations, as well as governmental representatives dealing with policies for organic agriculture. The results invite them to assure that the usefulness and effectiveness of the organic certification continue to be higher than its economic and bureaucratic costs. This situation will act as a motivation for the farmers to act reliably, and at the time contributing to their satisfaction.

Finally, the results indicate that the auditors’ performance during the inspection plays a very important role in the reliability of the system. The auditor constitutes the ‘face’ of the organic certification bodies, and therefore investing to increase their capacities is worth it.

However, the study also presents some limitations. Since the sample was mainly composed of Costa Rican producers, the generalization of the findings should be approached with some caution. Additionally, as the above research findings only facilitate examination of a single relationship at a time they may be considered slightly limited. Hence, future research within this area may benefit from the adoption of structural equations modeling (SEM), to examine a series of dependence relationships simultaneously.

Regarding the vocabulary used in the survey, although attention was paid to use a very basic vocabulary in the formulation of the statements, some words still caused confusion among the producers, obtaining highly disperse and false answers. Therefore, higher attention should be paid to this aspect in further studies.

REFERENCES

Akerlof, G. (1970): The Market for "Lemons": Quality Uncertainty and the Market Mechanism, in: The Quarterly Journal of Economics, Vol. 84, No. 3, pp. 488-500.

Anania, G.; Nisticò, R. (2003): Public regulation as a substitute for trust in quality food markets. What if trust substitute cannot be fully trusted, in: Conference Proceedings, 25th International Conference of Agricultural Economists (IAAE), Durban, South Africa, August 16-22.

Anders, D.; Souza, D.; Rouviere, E. (2007): Objectiveness in the Market for Third-Party Certification: Does market structure matter?, in: 105th EAAE Seminar 'International Marketing and International Trade of Quality Food Products', Bologna, Italy, March 8-10, 2007.

Asamblea Legislativa de la República de Costa Rica. (2007): Ley para el Desarrollo, Promoción y Fomento de la Actividad Agropecuaria Orgánica. Expediente Nº 16.028. San José, Costa Rica.

Baker, M. (1991): Research for marketing. MacMillan Education Ltd. London.

Barrett, A.; Browne, A.; Harris, P.; Cadoret, K. (2002): Organic certification and the UK market: organic imports from developing countries, in Food Policy, Vol. 27, pp. 301-318.

Baummann, P. (2001): Securing against fraud, in: Proceedings of the European Conference Organic Food and Farming. Copenhagen, Denmark. 10-11 May, 2001. The Danish Ministry of Food, Agriculture and Fisheries. pp. 98-100.

Becker, G. (1968): Crime and Punishment: An Economic Approach, in: The Journal of Political Economy, Vol. 76, No. 2, pp. 169-217.

BioFach (2007): 'Organic Fraud' at Wal-Mart?, in BioFach Newsletter, No. 138, pp. 3.

Bruner, P.; Hensel, P.; James, K. (2005): Marketing Scales Handbook Volume IV: A compilation of Multi-item measures for consumer behavior & advertising. Thomson Corporation, Ohio.

Canavari, N.; Cantore, N. (2007): The challenge of the international organic certification: a new opportunity for agricultural trading?, in: 105th EAAE Seminar 'International Marketing and International Trade of Quality Food Products', Bologna, Italy, March 8-10, 2007.

Caswell, J. (2003): Food Safety in Food Security and Food Trade – Trends in Food Safety Standards and Regulation: Implications for Developing Countries, in: Food Safety in Food Security and Food Trade, Brief 4 of 17. Ed.: Unnevehr, L.J., International Food Policy Research Institute, Washington D.C., US.

Centeno, G. (2001). Análisis del Mercado de alimentos orgánicos en Costa Rica. Graduation project. EARTH University. Guácimo, Costa Rica.

Chau, P. (1996): An empirical assessment of a modified technology acceptance model, in: Journal of Management Information Systems Vol. 13 (2), pp. 185-204.

Chemnitz, C.; Grethe, H.; Kleinwechter, U. (2006): Quality standards for food products – A particular burden for small producers in developing countries?. Humbolt University of Berlin. Berlin, Germany.

CLACDS (Centro Latinoamericano para la Competitividad y el Desarrollo Sostenible). (n.d.): El agro del 2020 en Centroamérica va a emplear a muchas menos personas que en la actualidad. URL: www.incae.ac.cr/.../el-papel-de-la-agricultura-sostenible/pdfs/presentacion-agro-primer-taller.pdf. Consulted on: 22.03.2008.

Codex Alimentarius. (1999): Guidelines for the Production, Processing, Marketing and Labelling of Organically Produced Foods. URL: www.codexalimentarius.net/download/standards/360/CXG_032e.pdf. Consulted on: 30.01.08.

Conner, R.; Christy, R. (2002): Consumer Preferences for Organic Standards: Guiding Demand-Expansion Strategies for Organic Food, in: Journal of Food Distribution Research, Vol. 33, pp. 46-51.

Cronbach, L. (1951): Coefficient alpha and the internal structure of tests, in: Psychometrika, Vol. 16, pp. 297-335.

Damiani, O. (2001): Organic agriculture in Costa Rica: The case of cacao and banana production in Talamanca. Draft report prepared for the Office of Evaluation and Studies of the International Fund for Agricultural Development. Rome, Italy.

DARAO (Departamento de Acreditación y Registro en Agricultura Orgánica). (2008): Estadísticas 2006, URL: http://www.protecnet.go.cr/organica1/Estad%EDsticas 2006.pdf. Consulted on: 30.01.08.

Darby, E.; Karni, E. (1973): Free competition and the optimal amount of fraud, in: Journal of Law and Economics, Vol. 16, No. 1, pp. 67-88.

Darnhofer, I.; Vogl, C. (2003): Certification and Accreditation of Organics in Austria: Implementation, Strengths and Weaknesses. URL: http://www.nas.boku.ac.at /fileadmin/_/H93/H933/Personen/Vogl/PDF_Darnhofer_Vogl_Boston_2003.pdf. Consulted on 01.03.2008.

Davis, F. (1989): Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, in: MIS Quarterly Vol. 13, No. 3, pp. 319-340.

Dimitri, L.; Oberholtzer, L. (2005): Market-Led Versus Government-Facilitated Growth, in: Electronic Outlook Report from the Economic Research Service – USDA. Vol. August 2005, pp. 1-21.

Echeverría, F. (2002): Apoyo de los organismos públicos a la producción y comercialización de productos orgánicos: La experiencia de Costa Rica, in: Seminario Taller Certificación y Comercialización de los Productos Orgánicos. Lima, Peru. April 9-10, 2002.

Enneking, U.; Obersojer, T.; Balling, R.; Kratzmair, M.; Kreitmeir, A. Enhancing the acceptance of quality systems by German farmers: The case of quality management and quality assurance. In: Theuvsen, L.; Spiller, A.; Peupert, M.; Jahn, G. (Ed.) (2007): Quality management in food chains. Wageningen Academic Publishers.

Farrell, J. (1993): Meaning and credibility in cheap talk games, in: Journal of Economic Literature, Vol. 5, pp. 514-531.

Ferguson, S.; Weseen, S. Storey, G. (2005): The performance and role of certification bodies, in: Project on Organic Agriculture Nr. 11, Department of Agricultural Economics, Saskatchewan, Canada.

Flaten, O.; Lien, G.; Koesling, M.; Valle, P.; Ebbesvik, M. (2004): Comparing Risk Perceptions and Risk Management in Organic and Conventional Dairy Farming: Empirical Results From Norway, in 86th EAAE Seminar "Farm income stabilisation – what role should public policies play?", Anacapri, Italy, November 21-22, 2004.

Franz, R.; Enneking, U.; Balling, R. Perceived safety of organic and regional food from a perspective of uncertain consumers. In: Theuvsen, L.; Spiller, A.; Peupert, M.; Jahn, G. (Ed.) (2007): Quality management in food chains. Wageningen Academic Publishers.

Fulponi L. (2006): Private voluntary standards in the food system: the perspective of major food retailers in OECD countries, in: Food Policy Vol. 31, pp. 1-13.

García, M.; Bañados, F. (2004): Impact of EU organic product certification legislation on Chile organic products, in: Food Policy, Vol. 29, pp. 1-14.

Getz, G.; Shreck, A. (2006): What organic and Fair Trade labels do not tell us: towards a place-based understanding of certification, in: International Journal of Consumer Studies, Vol. 30, pp. 490-501.

GfRS (Gesellschaft für Ressourcensschutz mbH). (2003): Analyse der Schwachstellen in der Kontrolle nach EU Verordnung 2092/91 und Erarbeitung von Vorschlägen zur Weiterentwicklung der Zertifizierung und Kontrollsystem in Bereich des Ökologischen Landbaus. Göttingen, Germany.

Giannakas, K. (2001): Information Asymmetries and Consumption Decisions in Organic Food Product Markets, in: Canadian Journal of Agricultural Economics, Vol. 50, pp. 35-50.

Giovanucci, D.; Ponte, S. (2005): Standards as a new form of social contract? Sustainability initiatives in the coffee industry, in Food Policy Journal, Vol. 30, pp. 284-301.

Hanson, J.; Dismukes, R.; Chambers, W.; Greene, C.; Kremen, A. (2004): Risk and risk management in organic agriculture: views of organic farmers, in: Renewable Agriculture and Food Systems, Vol.19, pp. 218-227.

Hearne, R.; Volcan, M. (2002): The Use of Choice Experiments to Analyze Consumer Preferences for Organic Produce in Costa Rica, in: American Agriculture Economics Association (AAEA) Annual Meeting Long Beach, California. July 30, 2002.

Heinonen, S. (2001): Securing against fraud, in: Proceedings of the European Conference Organic Food and Farming. Copenhagen, Denmark. 10-11 May, 2001. The Danish Ministry of Food, Agriculture and Fisheries. pp. 91-94.

Jahn, G.; Schramm, M.; Spiller, A. (2005): The Reliability of Certification: Quality Labels as a Consumer Policy Tool, in: Journal of Consumer Policy, Vol. 28, pp. 53-73.

Kilian, B.; Pratt, L.; Jones, C.; Villalobos, A. (2004): Can the private sector be competitive and contribute to development through Sustainable Agricultural Business? A case study of coffee in Latin America, in: International Food and Agribusiness Management Review (IAMA), Vol. 7, Issue 3, pp. 21-45.

Klonsky, K.; Tourte, L.; Thompson, G.; Lohr, L.; Krissoff, B. (1998): Emergence of US Organic Agriculture: Can we compete?. Department of Agricultural and Applied Economics, University of Georgia. Georgia, USA.

Le Guillou, G.; Scharpé, A. (2000): Organic farming: Guide to Community Rules. European Commission, Directorate-General for Agriculture. Brussels, Belgium.

Madriz, J. (2002): Estado actual y perspectivas del sector agropecuario costarrricense. URL: http://www.fao.org/Regional/LAmerica/prior/desrural/centro/madriz.pdf. Consulted on: 22.03.2008.

MAX Magazine. (2001): Hipp Skandal: Der Bio-Schwindel. URL: http://www.max.de/reportagen/bio/index.html. Consulted on: 01.11.2001.

McCluskey, J. (2000): A game theoretic approach to organic foods: An analysis of asymmetric information and policy, in: Agricultural and Resource Economics Review, Vol. 29, pp. 1-9.

McEachern, M.; Willock, J. (2004): Producers and consumers of organic meat: A focus on attitudes and motivations, in: British Food Journal, Vol. 106, No. 7, pp. 534-552.

Meuwissen, M.; Velthuis, A.; Hogeveen, H.; Huirne, R. (2003): Traceability and Certification, in: Meat Supply Chains, in: Journal of Agribusiness, Vol. 21, Fall 2003, pp. 167-181.

Michelsen, J. (2001): Recent development and political acceptance of organic farming in Europe, in Sociologia ruralis, Vol 41, No. 1, pp. 3-20.

MIDEPLAN (Ministerio de Planificación Nacional y Política Económica). (2002): Importación total de agroquímicos en Costa Rica (en miles de kilogramos y litros): 1991-2001, URL: http://www.mideplan.go.cr/sides/ambiental/22-1.htm. Consulted on: 08.08.07.

Moon, J.; Kim, Y. (2001): Extending the TAM for a World-Wide-Web context, in: Information & Management Vol. 38, pp. 217-230.

Nadvi, K.; Wältring, F. (2002): Making sense of global standards. INEF Report 58/2002. Institut für Entwicklung und Frieden der Gerhard-Mercator-Universität Duisburg, Duisburg.

Nelson, P. (1970): Information and consumer behaviour, in: Journal of Political Economy, Vol. 78, pp. 311–329.

Neuendorff, J.; Fischer, U. Maintaining organic integrity: tackling fraud in organics. In: Theuvsen, L.; Spiller, A.; Peupert, M.; Jahn, G. (Ed.) (2007): Quality management in food chains. Wageningen Academic Publishers.

Oliver, R. (1997): Satisfaction: A Behavioral Perspective on the Consumer. McGraw-Hill. New York.

Robert, A. (2001): Posición del Gobierno del Costa Rica ante el artículo “Hipp-Skandal der Bio-Schwindel” (Revista MAX, Alemania). URL: www.anao.org/docs/posicion.doc. Consulted on: 25.02.2008.

Schulze, H.; Jahn, G.; Spiller, A. (2007a): Institutional Change and Acceptance of Quality Assurance: The Case of Organic Farming in Germany, in Conference Proceedings in the 1st EAAE International European Forum on Innovation and System Dynamics in Food Networks Igls 2007 – February 15-17, 2007.

Schulze, H.; Jahn, G.; Spiller, A. (2007b): Farmers' Acceptance of the Organic Certification System in Germany: A Partial Least Square Model, in: 17th Annual IAMA World Forum and Symposium Conference, Parma, Italy, June 23-26, 2007.

Seppänen, L.; Helenius, J. (2004): Do inspection practices in organic agriculture serve organic values? A case study from Finland, in: Agriculture and Human Values, 21 (1), pp. 1-13.

SEPSA (Secretaría Ejecutiva de Planificación Sectorial Agropecuaria). (2007): Boletín Estadístico Agropecuario 2006 - SEPSA Nº17. URL: http://www.mag.go.cr /bibliotecavirtual/sepsa-boletin-estad-17.pdf. Consulted on: 17.01.08.

Soto, G. (2003): Memoria del Taller. Agricultura Orgánica: una herramienta para el desarrollo rural sostenible y la reducción de la pobreza. FIDA, RUTA, CATIE, FAO. Turrialba, Costa Rica. May 19-21, 2003.

Spiegel Magazine. (2007): Alles bio oder was?. Vol, 36/2007, pp. 24-32.

Theuvsen, L.; Spiller, A. Perspectives of quality management in modern agribusiness. In: Theuvsen, L.; Spiller, A.; Peupert, M.; Jahn, G. (Ed.) (2007): Quality management in food chains. Wageningen Academic Publishers.

UNCTAD (United Nations Conference on Trade and Development) (2004): Trading opportunities for organic food products from developing countries. United Nations New York and Geneva.

USAID (United States Agency for International Development) (2005): The relationship of third-party certification to sanitary/phytosanitary measures and the international agri-food trade: Final report. Report #9. URL: http://ifas.msu.edu/downloads/The%20Relationship%20of%20TPC%20to%20SPS%20Measures--Final%20Report%20+%20Annexes.pdf. Consulted on: 27.02.2008.

van Bemmelen, C. (1995): Comercialización de productos orgánicos en Costa Rica, URL: http://www.ciedperu.org/bae/b54d.htm. Consulted on: 10.09.07.

van Elzakker, B.; Neuendorff, J.; Torjusen, H.; O'Doherty, K.; Brandt, K. (2005): Autenticidad y fraude: Información destinada a los vendedores sobre el Control de la Calidad y Seguridad Alimenticia en las Cadenas de Producción Orgánica. Informative booklet. Research Institute of Organic Agriculture FiBL, Frick, Switzerland.

Vogl, R., Kilcher, L., Schmidt, H. (2005): Are standards and regulations of organic farming moving away from amall farmers' knowledge? in: Journal of Sustainable Agriculture, Vol. 26 (1), 2005.

Volio, A. (2006): Memoria 2006 del Ministerio de Agricultura y Ganadería. URL: http://www.mag.go.cr/bibliotecavirtual/memoria-2006.pdf. Consulted on: 28.01.08.

Vroom, V. (1964): Work and motivation. Wiley, New York.

Ward, R.; Hunnicutt, L.; Keith, J. (2004): If you can't trust the farmer, who can you trust? The effect of certification types on purchases of organic produce, in: International Food and Agribusiness Management Review (IAMA), Vol. 7, Issue 1, pp. 60-77.

Weber, M. (1968): Economy and society. Bedminster Press, New York.

Willer, H.; Yussefi, M. (2006): The World of Organic Agriculture: Statistics and Emerging Trends 2006. International Federation of Organic Agriculture Movements (IFOAM), Bonn, Germany; Research Institute of Organic Agriculture (FiBL), Frick, Switzerland.

Willer, H.; Yussefi, M. (2007): The World of Organic Agriculture: Statistics and Emerging Trends 2007. International Federation of Organic Agriculture Movements (IFOAM), Bonn, Germany; Research Institute of Organic Agriculture (FiBL), Frick, Switzerland.

Zikmund, W. (1991): Exploring Marketing Research. Fourth edition. The Dryden Press, Florida.

INTERVIEWS

Carazo, Eva — Leader of the Organic Agriculture Costa Rican Movement -MAOCO. Date: November 23rd, 2007.

Echeverría, Felicia — Executive Director of certification body Eco-lógica in Costa Rica. Date: November 21st, 2007.

González, Humberto — Director of the offices of BCS Öko-garantie in Costa Rica, and organic accredited inspector. Date: November 27th, 2007.

Payne, Noel — Former owner of organic's trader company 'Comercio Alternativo'. Date: November 9th, 2007.

Ramírez, Elizabeth — Representative of the Department of Accreditation and Register of Organic Agriculture (DARAO), Ministry of Agriculture. Date: January 14th, 2008.

Thommen, Christian — Accredited independent inspector for organic farming and organic producer. Date: November 29th, 2007.

ANNEXES

Annex I. Political map of Costa Rica

Annex II. Statements used to operationalize every construct

Construct	Statements
	Target variables
Satisfaction	I am satisfied with the organic certification So far, how satisfied are you with the practice of organic farming?
Credibility	The organic standard is credible / incredible The organic standard is trustworthy / not trustworthy
Reputation	The organic standard is important / unimportant The organic standard is necessary / unnecessary The organic certification is motivating – not motivating The organic standard has good reputation / bad reputation
	Overall reliability
Perceived reliability	The organic standard is reliable / unreliable The organic standard is effective / not effective The organic standard does works / does not work
At the farmer level	Not every organic farmer have the same level of reliability I think there are organic farmers who would never cheat I do not believe that all organic producers are reliable
On the certification process	Cheaters will be discovered during the control Violations against the guidelines are rarely noticed The certification process is reliable If other farmers sometimes don't follow the guidelines, the inspectors will notice it.
	Perceived usefulness
Utilities	The organic certification standard is very useful Organic certification standard improves my productivity Organic certification standard enhances the effectiveness of my organic practices
Operational management	The auditor gives me good ideas to improve the management of my farm. The performance of my quality management improved since I got the organic certification
Farm income	My income increased since I got the organic certification I had more gains with conventional agriculture that with organic agriculture
Relationship with buyers	I got a better relationship with my buyers since I got the organic certification Since I farm organic, my business contacts/ relations have increased.
Course of business	Our course of business becomes clearer through the certification process. The audit report gives me a clear idea about the current situation in my farm
Market access	I need the organic certification to be able to sell my products I acquired the certification only to have market access
	Perceived costs
Certification costs	The cost for the organic certification is too high. The costs for the certification process are higher than the benefits The fee for the certification process is not very high
Bureaucratic costs	The time expenditure, I have for the certification process, is exaggerated. The organic certification control system is very bureaucratic The required documentation by the organic certification is exaggerated The bureaucratic expenditure for certification has increased in the last years.

Motivations	
Organic motivation	Nowadays I would never change to organic farming. I would never farm conventionally
Economic motivations	I produce organics because of economic benefits If the prices do not improve, I will return to conventional farming
Managerial motivation	I care about the good administration of my farm. I am highly motivated to keep a good management in my farm
Sources of control	
Association	Producers are aware that if any of them cheat, that could be detrimental to the name of the association
Community	If my neighbors discover that I do something wrong, they would denounce me My organic certified neighbors monitor that I comply with the requirements of the organic certification
Government	Government does not monitor that I comply with the requirements of the organic certification The government punishes farmers that show opportunistic behavior
Buyer	My buyer controls that I keep close to the guidelines My buyer warns me frequently about the consequences of cheating
Family	My family cares that I fulfill the requirements of organic farming My family has no interest in my organic business
Risk perception and propensity	
Risk propensity	I avoid risky situations Compared to most people I know, I like to take risks
Risk perception	Worries about an increasing number of cheaters in the sector are exaggerated for me There are more and more farmers that do not follow the organic guidelines I'm worried about, that the number of "black sheep" will rise in the organic farming sector Cheating does not worth it because sanctions are too hard The sanctions applied to cheaters are exaggerated
Attitudes towards the certification body	
CB Election	I chose this certification body because it has good reputation I chose the CB that offered me the lower price for the certification I chose this CB because the possibilities to get the organic certificate were higher My certification body usually approves all the farms that request its services
Thoroughness of CB	In comparison to other CBs our CB is more thorough I like my current CB because they are not so thorough It does not make any difference which CB controls our farm
Attitudes towards the auditor	
Thoroughness of auditor	In comparison to auditors of other CBs our auditor is more thorough The auditor really tried to find the weaknesses The auditor is very tolerant if I sometimes do not follow the guidelines of the organic standard In does not make any differences which auditor controls our farm
Auditor's expertise	The work done by the auditors of my current CB, is very professional The auditor is an expert in organic production The performance of the auditor during the inspection control is very accurate

Annex III. Questionnaire used in the survey with answers' statistics

Questionnaire
Organic certification survey

Dear Sir/Madam,

The Department of Agricultural Economics of the University Göttingen in collaboration with INCAE is carrying out a survey on organic certification in Costa Rica. The study intends to extract farmers' perceptions about the functioning of the organic certification system, in order to obtain some feedbacks useful for the improvement of such system.

This is a good opportunity to share your experiences on organic certification and thus, contribute to further development of the organic production in Costa Rica. Your cooperation for the study is very valuable.

All collected data will be processed anonymously and neither you, nor your farm or organization will be identified with any response. Thoughtful and honest responses will be much appreciated since it will enable us to provide you with most valuable information and advice.

If you have any questions or concerns about completing the questionnaire or participating in the survey, please do not hesitate to contact me.

Thank you in advance for your cooperation!

Sincerely yours,

Gabriela Centeno

Master Student of International Agribusiness Program
University of Göttingen

Questionnaire with answers

Date:_____ **Start:**_____ **End:**_____ **Duration:** μ= 26 min (Min: 14; Max: 1:32)

1. **For how many years have you practiced organic agriculture?** μ= 11 (Min: 2; Max: 35)

2. **So far, how satisfied are you with the practice of organic farming?**

Completely satisfied	Very satisfied	Satisfied	Partially satisfied	Dissatisfied	Very dissatisfied	Completely dissatisfied
22.2	28.6	38.1	11.1	0	0	0
(14)	(18)	(24)	(7)	(0)	(0)	(0)

3. **In your opinion, what are the main strengths and weaknesses of organic farming? Please give at least three strengths and three weaknesses** [*].

Strengths	*Frequency*	*Percentage*
Better for human health (producer, family, workers, consumer)	41	65.1
Better for the environment (biodiversity)	40	63.5
Better prices and economy	17	27.0
Other strengths	15	23.8
Market advantages	13	20.6
Altruistic intentions (familiar integration, sustainability)	11	17.5
Higher quality of life / Self-consumption	10	15.9
Independence of agro-chemicals and cheaper inputs	10	15.9
Better products´ characteristics	6	9.5
Producers' satisfaction	5	7.9
Better for the soils	4	6.3

Weaknesses	*Frequency*	*Percent*
Lack of support (governmental, financial, marketing)	21	33.3
Problems with inputs' availability	17	27.0
Low prices	17	27.0
Problems with the market	14	22.2
Other weaknesses	13	20.6
Lack of technical assistance	11	17.5
Higher costs of certification and production	10	15.9
Difficult control of plagues and diseases	10	15.9
Lack of consumers awareness' and education	9	14.3
Technical production problems	9	14.3
High level of bureaucracy	8	12.7
Difficulties during the transition process	7	11.1
Problems of credibility in the sector	7	11.1

[*] Frequencies and percentages do not add 63 and 100% respectively because every farmer expressed three strengths and three weaknesses.

4. When you think about organic agriculture, what characteristics come to your mind? I think organic agriculture is:

Attribute	It totally applies	It applies	It partially applies	Neither nor	It partially applies	It applies	It totally applies	Attribute
Credible	23.8 (15)	69.8 (44)	3.2 (2)	1.6 (1)	1.6 (1)	0 (0)	0 (0)	Incredible
Effective	17.5 (11)	69.8 (44)	12.7 (8)	0 (0)	0 (0)	0 (0)	0 (0)	Ineffective
Motivating	22.2 (14)	60.3 (38)	14.3 (9)	3.2 (2)	0 (0)	0 (0)	0 (0)	Not motivating
Necessary	31.7 (20)	65.1 (41)	3.2 (2)	0 (0)	0 (0)	0 (0)	0 (0)	Unnecessary
Reliable	15.9 (10)	69.8 (44)	11.1 (7)	3.2 (2)	0 (0)	0 (0)	0 (0)	Unreliable
Good reputation	23.8 (15)	61.9 (39)	9.5 (6)	3.2 (2)	1.6 (1)	0 (0)	0 (0)	Bad reputation
Does work	22.2 (14)	63.5 (40)	11.1 (7)	1.6 (1)	1.6 (1)	0 (0)	0 (0)	Does not work
Important	41.3 (26)	57.1 (36)	1.6 (1)	0 (0)	0 (0)	0 (0)	0 (0)	Unimportant
Trustworthy	19 (12)	73 (46)	6.3 (4)	1.6 (1)	0 (0)	0 (0)	0 (0)	Not trustworthy

5. The following statements have to do with the usefulness of organic farming. Please give us your opinion, according to the experience that you have in this regard, using the scale that goes from 'I totally disagree' to 'I totally agree'.

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
My income has increased since I got the organic certification	0 (0)	20.6 (13)	0 (0)	15.9 (10)	15.9 (10)	44.4 (28)	3.2 (2)
The organic certification standard is very useful	0 (0)	0 (0)	0 (0)	4.8 (3)	14.3 (9)	71.4 (45)	9.5 (6)
Since I farm organic, my business relations have increased	0 (0)	6.3 (4)	0 (0)	3.2 (2)	14.3 (9)	60.3 (38)	15.9 (10)
The time expenditure for the certification process is exaggerated	0 (0)	61.9 (39)	1.6 (1)	6.3 (4)	9.5 (6)	19.0 (12)	1.6 (1)
The organic certification standard improves my productivity	0 (0)	14.3 (9)	3.2 (2)	0 (0)	17.5 (11)	63.5 (40)	1.6 (1)

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
The bureaucracy to obtain the certification has increased in the last years	0 (0)	19.0 (12)	0 (0)	6.3 (4)	3.2 (2)	61.9 (39)	9.5 (6)
The auditor gives me good ideas to improve the management of my farm	3.2 (2)	25.4 (16)	3.2 (2)	4.8 (3)	0 (0)	57.1 (36)	6.3 (4)
Organic certification standards enhance the effectiveness of my organic practices	3.2 (2)	9.5 (6)	0 (0)	3.2 (2)	6.3 (4)	73.0 (46)	4.8 (3)
Our course of business becomes clearer through the certification process	0 (0)	9.5 (6)	0 (0)	7.9 (5)	0 (0)	73.0 (46)	9.5 (6)
I am satisfied with the organic certification	0 (0)	3.2 (2)	3.2 (2)	1.6 (1)	12.7 (8)	71.4 (45)	7.9 (5)

6. We would like to know more about your experience with the organic certification system. Once again, please use the scale as before.

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
The cost for the organic certification is too high	0 (0)	12.7 (8)	0 (0)	23.8 (15)	25.4 (16)	22.2 (14)	15.9 (10)
The organic certification system is very bureaucratic	0 (0)	28.6 (18)	0 (0)	3.2 (2)	14.3 (9)	49.2 (31)	4.8 (3)
I have a better relationship with my buyers since I got the organic certification	0 (0)	3.2 (2)	1.6 (1)	7.9 (5)	9.5 (6)	71.4 (45)	6.3 (4)
The costs for the certification are higher than the benefits	0 (0)	52.4 (33)	4.8 (3)	6.3 (4)	9.5 (6)	23.8 (15)	3.2 (2)
I acquired the certification only to have market access	0 (0)	39.7 (25)	1.6 (1)	4.8 (3)	9.5 (6)	45.1 (28)	0 (0)
The inspection report gives me a clearer idea about the current situation in my farm	3.2 (2)	3.2 (2)	0 (0)	3.2 (2)	11.1 (7)	73.0 (46)	4.8 (3)
The fee for the certification process is not so high	0 (0)	28.6 (18)	11.1 (7)	31.7 (20)	7.9 (5)	19.0 (12)	1.6 (1)
I need the organic certification to be able to sell my products	0 (0)	11.1 (7)	0 (0)	1.6 (1)	4.8 (3)	74.6 (47)	7.9 (5)
The required documentation by the organic certification is exaggerated	1.6 (1)	46.0 (29)	1.6 (1)	1.6 (1)	19.0 (12)	28.6 (18)	1.6 (1)
I do a better quality management since I got the organic certification	3.2 (2)	12.7 (8)	1.6 (1)	1.6 (1)	6.3 (4)	69.8 (44)	4.8 (3)

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
I had more gains with conventional agriculture than with organic agriculture	3.2 (2)	50.8 (32)	0 (0)	27.0 (17)	3.2 (2)	14.3 (9)	1.6 (1)

7. You are also aware about how organic farmers manage their farms. Please give us your opinion about the following statements.

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
Not every organic farmer has the same level of reliability	0 (0)	25.4 (16)	0 (0)	7.9 (5)	0 (0)	63.5 (40)	3.2 (2)
Compared to most people I know, I like to take risk	1.6 (1)	23.8 (15)	1.6 (1)	3.2 (2)	3.2 (2)	63.5 (40)	1.6 (1)
Nowadays I would never change to organic farming	6.3 (4)	69.8 (44)	9.5 (6)	1.6 (1)	3.2 (2)	9.5 (6)	0 (0)
I care of maintaining a good management in my farm	0 (0)	1.6 (1)	0 (0)	1.6 (1)	1.6 (1)	85.7 (54)	9.5 (6)
I work with organic products because of the economic benefit	0 (0)	23.8 (15)	1.6 (1)	7.9 (5)	22.2 (14)	42.9 (27)	1.6 (1)
I do not believe that all organic producers are trustworthy	0 (0)	19.0 (12)	1.6 (1)	7.9 (5)	6.3 (4)	61.9 (39)	3.2 (2)
I am highly motivated to administrate in my farm right	0 (0)	0 (0)	0 (0)	0 (0)	4.8 (3)	81.0 (51)	14.3 (9)
If the prices do not improve, I will return to conventional farming	3.2 (2)	71.4 (45)	3.2 (2)	6.3 (4)	3.2 (2)	11.1 (7)	1.6 (1)
I avoid risky situations	0 (0)	4.8 (3)	0 (0)	6.3 (4)	0 (0)	77.8 (49)	9.5 (6)
I think there are organic farmers who would never cheat	0 (0)	6.3 (4)	0 (0)	7.9 (5)	4.8 (3)	73.0 (46)	6.3 (4)
I would never farm conventionally	1.6 (1)	19.0 (12)	4.8 (3)	1.6 (1)	1.6 (1)	68.3 (43)	1.6 (1)

8. Please provide your judgments with regards to the following statements on the organic certification process.

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
Cheating is not worth it because sanctions are too strong	0 (0)	9.5 (6)	0 (0)	1.6 (1)	1.6 (1)	82.5 (52)	4.8 (3)
Cheaters are discovered during the control	0 (0)	30.2 (19)	0 (0)	6.3 (4)	3.2 (2)	52.4 (33)	4.8 (3)
The certification process is reliable	0 (0)	3.2 (2)	3.2 (2)	0 (0)	11.1 (7)	74.6 (47)	6.3 (4)
Producers are aware that if any of them cheat, that could be detrimental to the name of their association	0 (0)	0 (0)	0 (0)	7.9 (5)	1.6 (1)	71.4 (45)	17.5 (11)
I am worried that the number of "black sheep" in the organic sector is increasing	0 (0)	27.0 (17)	1.6 (1)	14.3 (9)	1.6 (1)	46.0 (29)	7.9 (5)
If my neighbors discover that I do something wrong, they would denounce me	0 (0)	4.8 (3)	0 (0)	11.1 (7)	12.7 (8)	55.6 (35)	14.3 (9)
My family has no interest in my organic business	3.2 (2)	69.8 (44)	6.3 (4)	4.8 (3)	3.2 (2)	9.5 (6)	1.6 (1)
Violations against the guidelines are rarely discovered	6.3 (4)	57.1 (36)	4.8 (3)	9.5 (6)	4.8 (3)	14.3 (9)	1.6 (1)
The government does not monitor if farmers comply with the organic certification	1.6 (1)	42.9 (27)	3.2 (2)	4.8 (3)	4.8 (3)	34.9 (22)	6.3 (4)
My buyer controls that I keep close to the guidelines	1.6 (1)	19.0 (12)	1.6 (1)	3.2 (2)	4.8 (3)	63.5 (40)	4.8 (3)
The sanctions applied to cheaters are exaggerated	1.6 (1)	52.4 (33)	3.2 (2)	17.5 (11)	3.2 (2)	20.6 (13)	98.4 (62)
Inspectors are able to notice if other farmers sometimes do not follow the guidelines	0 (0)	3.2 (2)	0 (0)	9.5 (6)	7.9 (5)	73.0 (46)	4.8 (3)
Worries about an increasing number of cheaters in the sector are exaggerated for me	0 (0)	66.7 (42)	1.6 (1)	17.5 (11)	1.6 (1)	9.5 (6)	3.2 (2)
My organic certified neighbors monitor that I comply with the requirements of the certification	0 (0)	17.5 (11)	0 (0)	19.0 (12)	3.2 (2)	55.6 (35)	4.8 (3)
My family cares that I fulfill the requirements of organic farming	0 (0)	12.7 (8)	0 (0)	9.5 (6)	1.6 (1)	71.4 (45)	4.8 (3)
My buyer warns me frequently about the consequences of cheating	0 (0)	25.4 (16)	0 (0)	6.3 (4)	6.3 (4)	58.7 (37)	3.2 (2)

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
The government punishes farmers who show opportunistic behavior	4.8 (3)	27.0 (17)	0 (0)	27.0 (17)	3.2 (2)	38.1 (24)	0 (0)
Nowadays there are more farmers who do not follow the organic guidelines	0 (0)	44.4 (28)	0 (0)	20.6 (13)	9.5 (6)	25.4 (16)	0 (0)

From now on, we will deal with issues related to the certification bodies and auditors that control your farm.

9. Have you ever changed your certification body?

	Frequency	*Percentage*
☐ Yes	54	85.7
☐ No	9	14.3

10. Why?

_____

_____

11. What is your current certification body?

	Frequency	*Percentage*
☐ Eco-logica	47	74.6
☐ BCS Öko-garantie	14	22.2
☐ OCIA	1	1.6
☐ Ecocert	1	1.6

12. This section is about some criteria used in the selection of the certification body (CB). Please respond using the same scale as before.

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
I chose this CB because it has a good reputation	0 (0)	1.6 (1)	1.6 (1)	49.2 (31)	1.6 (1)	44.4 (28)	1.6 (1)
My CB usually approves all the farms that request its services	1.6 (1)	31.7 (20)	0 (0)	36.5 (23)	7.9 (5)	22.2 (14)	0 (0)
In comparison to other CBs ours is more thorough	0 (0)	7.9 (5)	0 (0)	58.7 (37)	1.6 (1)	30.2 (19)	1.6 (1)
It does not make any difference which CB controls our farm	1.6 (1)	15.9 (10)	0 (0)	76.2 (48)	1.6 (1)	4.8 (3)	0 (0)

	I totally disagree	I disagree	I partially disagree	Not agree, nor disagree	I partially agree	I agree	I totally agree
I like my current CB because it is not so strict	6.3 (4)	66.7 (42)	0 (0)	12.7 (8)	1.6 (1)	11.1 (7)	0 (0)
Our auditor tries to find the weak points in my farm	0 (0)	1.6 (1)	0 (0)	6.3 (4)	1.6 (1)	88.9 (56)	1.6 (1)
The work done by the auditors of my CB is very professional	0 (0)	3.2 (2)	3.2 (2)	3.2 (2)	1.6 (1)	85.7 (54)	3.2 (2)
I chose the CB that offered the lowest price for the certification	0 (0)	28.6 (18)	1.6 (1)	49.2 (31)	7.9 (5)	12.7 (8)	0 (0)
I chose this CB because the possibilities to get the organic certificate were higher	0 (0)	28.6 (18)	0 (0)	46.0 (29)	1.6 (1)	23.8 (15)	0 (0)
The auditor is very tolerant if I sometimes do not follow the organic guidelines	4.8 (3)	82.5 (52)	0 (0)	4.8 (3)	1.6 (1)	6.3 (4)	0 (0)
In comparison to auditors of other CBs, our auditor is more strict	0 (0)	4.8 (3)	0 (0)	82.5 (52)	1.6 (1)	9.5 (6)	1.6 (1)
It does not make any difference which auditor controls our farm	0 (0)	22.2 (14)	0 (0)	38.1 (24)	0 (0)	34.9 (22)	1.6 (1)
The auditor is an expert in organic production	0 (0)	7.9 (5)	3.2 (2)	6.3 (4)	19.0 (12)	61.9 (39)	1.6 (1)
The performance of the auditor during the inspection is very accurate	0 (0)	3.2 (2)	3.2 (2)	3.2 (2)	7.9 (5)	81.0 (51)	1.6 (1)

From now on, we would like to ask you some last questions about your farm/company:

13. In what province is your farm located?

	Frequency	*Percentage*
☐ San José	23	36.5
☐ Alajuela	12	19.0
☐ Cartago	11	17.5
☐ Heredia	2	3.2
☐ Guanacaste	2	3.2
☐ Limón	13	20.6

14. What is the total extension of your farm / company? μ= 153 ha (Min: 0.25; Max: 9,000)

15. What type of organizational structure does your farm / company have?

	Frequency	*Percentage*
☐ Cooperative	1	1.6
☐ Farmer's association	47	74.6
☐ Anonymous society - S.A.**	6	9.5
☐ Other type	9	14.3

** Corresponds to 'stock company' in English and 'Aktiengesellschaft' in German.

16. Approximately, how much does the farm sell a year:

	Frequency	*Percentage*
☐ Less than US$2.499	25	39.7
☐ US$2.500 - US$ 4.999	13	20.6
☐ US$ 5.000 - US$ 9.999	8	12.7
☐ US$ 10.000 – US$ 49.999	8	12.7
☐ US$ 50.000 - US$ 99.999	1	1.6
☐ More than US$ 100.000	6	9.5

17. How many persons work in the farm / company? μ= 7 (Min: 1; Max: 150)

18. We also have some questions about the products you work with. What is the main product of your farm / company?

	Frequency	*Percentage*
Coffee	12	19.0
Blackberry	18	28.6
Banana	7	11.1
Pineapple	6	9.5
Citrics	2	3.2
Vegetables	7	11.1
Cacao	2	3.2
Others	9	14.3

20. Where do you sell your products?

	Frequency	*Percentage*
☐ Local farmer's market	10	15.9
☐ Local supermarkets	7	11.1
☐ Exports	32	50.8
☐ Other place	14	22.2

Finally, we would like to ask you some personal questions:

21. What is your position in the farm / company?

	Frequency	*Percentage*
☐ Owner	50	79.4
☐ Manager / Administrator	6	9.5
☐ Employee	2	3.2
☐ Other position	5	7.9

22. What is your age? μ= 43 (Min: 22; Max: 77)

23. What was your last degree of education?

	Frequency	*Percentage*
☐ Primary school	34	54.0
☐ Secondary school	13	20.6
☐ Technician	4	6.3
☐ University Bachelor	8	12.7
☐ Higher	4	6.3

24. Gender

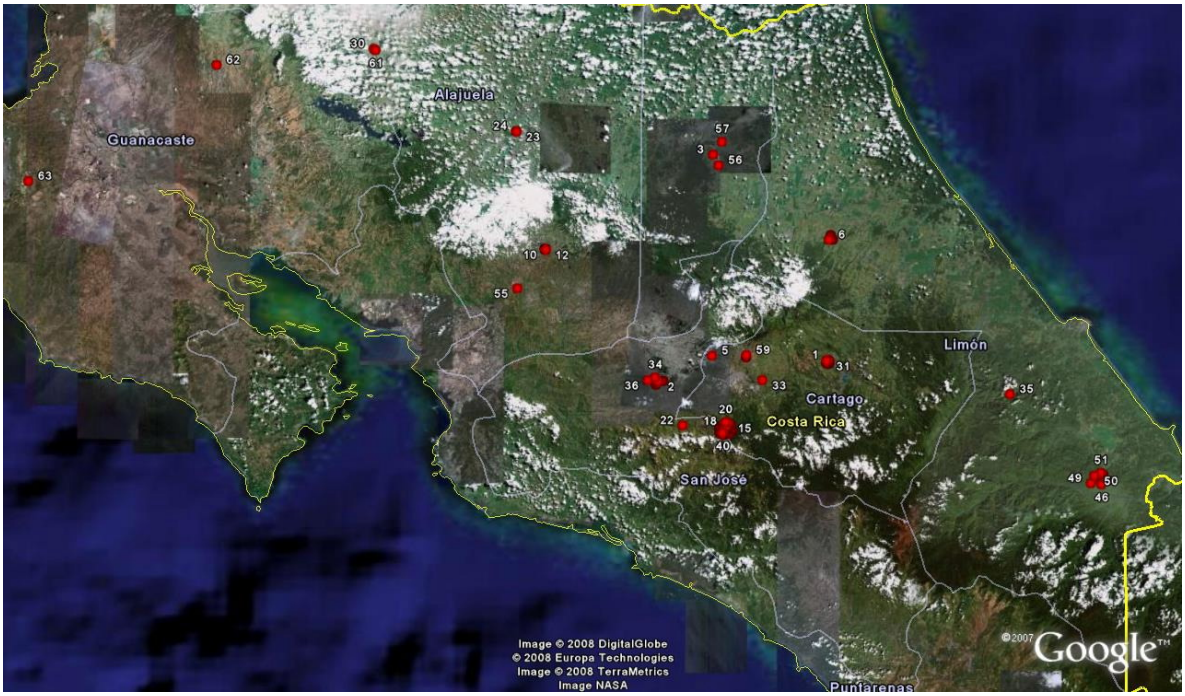
	Frequency	*Percentage*
☐ Male	16	25.4
☐ Female	47	74.6

If you are interested in getting the results of the study, please give us your e-mail address:

_____

Thank you for your participation!

Annex IV. Geographical location of producers participating in the survey



Annex V. Extracted factors, their statements and factor loadings (dependent variable)

FACTOR	STATEMENTS	FACTOR LOADING
Perceived reliability	The certification process is reliable	0.862
	Inspectors are able to notice if other farmers sometimes do not follow the guidelines	0.770
	I think organic agriculture is reliable	0.768
	I think organic agriculture does work	0.685

Extraction Method: Principal Component Analysis

Source: own calculations

Annex VI. Correlations between target variables

		F1. Perceived reliability	Satisfaction with organic farming	Satisfaction with organic certification	I think organic agriculture is credible	I think organic agriculture is trustworthy	I think organic agriculture is important	I think organic agriculture is necessary	I think organic agriculture is motivating	I think organic agriculture has good reputation
F1.Perceived reliability	Pearson	1	-,100	,458(**)	,047	-,107	,181	,047	,011	-,056
	Sig.		,434	,000	,717	,403	,157	,717	,934	,661
Satisfaction with organic farming	Pearson	-,100	1	-,004	-,073	,039	,113	,125	,009	,067
	Sig.	,434		,975	,567	,763	,378	,331	,944	,603
Satisfaction with organic certification	Pearson	,458(**)	-,004	1	-,146	,168	-,076	,076	,213	-,051
	Sig.	,000	,975		,253	,187	,554	,556	,093	,689
I think organic agriculture is credible	Pearson	,047	-,073	-,146	1	,314(*)	,371(**)	,243	,176	-,052
	Sig.	,717	,567	,253		,012	,003	,055	,168	,684
I think organic agriculture is trustworthy	Pearson	-,107	,039	,168	,314(*)	1	,418(**)	,347(**)	,404(**)	,166
	Sig.	,403	,763	,187	,012		,001	,005	,001	,194
I think organic agriculture is important	Pearson	,181	,113	-,076	,371(**)	,418(**)	1	,404(**)	,113	,166
	Sig.	,157	,378	,554	,003	,001		,001	,377	,193
I think organic agriculture is necessary	Pearson	,047	,125	,076	,243	,347(**)	,404(**)	1	,381(**)	,171
	Sig.	,717	,331	,556	,055	,005	,001		,002	,180
I think organic agriculture is motivating	Pearson	,011	,009	,213	,176	,404(**)	,113	,381(**)	1	,214
	Sig.	,934	,944	,093	,168	,001	,377	,002		,092
I think organic agriculture has good reputation	Pearson	-,056	,067	-,051	-,052	,166	,166	,171	,214	1
	Sig.	,661	,603	,689	,684	,194	,193	,180	,092	

** Correlation is significant at the 0.01 level (2-tailed).* Correlation is significant at the 0.05 level (2-tailed). n = 63
Source: own calculations

Annex VII. Extracted factors, their statements and factor loadings (independent variables)

FACTOR	STATEMENTS	FACTOR LOADING
Perceived Usefulness	I do a better quality management since I got the organic certification	,834
	The inspection report gives me a clearer idea about the current situation in my farm	,772
	The organic certification standard is very useful	,754
	Organic certification standards enhance the effectiveness of my organic practices	,688
	Producers are aware that if any of them cheat, that could be detrimental to the name of the association	,658
Perceived costs	The fee for the certification process is not so high	,804
	The required documentation by the organic certification is exaggerated	-,783
	The cost for the organic certification is too high	-,783
	The auditor gives me good ideas to improve the management of my farm	,583
Auditor's expertise	The work done by the auditors of my CB is very professional	,838
	The auditor is an expert in organic production	,805
	The performance of the auditor during the inspection is very accurate	,796
Perceived effectiveness	I need the organic certification to be able to sell my products	,772
	Our course of business becomes clearer through the certification process	,757
Familiar involvement	My family has no interest in my organic business	-,911
	My family cares that I fulfil the requirements of organic farming	,789
Sources of control	My buyer controls that I keep close to the guidelines	,831
	If my neighbours discover that I do something wrong, they would denounce me	,561
	My organic certified neighbours monitor that I comply with the requirements of the certification	,456
Awareness of sanctions	The government punishes farmers who show opportunistic behavior	,869

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a Rotation converged in 8 iterations.

Source: own calculations

Annex VIII. Results of the regression analysis (Stepwise)

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
,783(e)	,613	,579	,64874155	2,182

a Predictors: (Constant), I care of maintaining a good management in my farm, F2. Perceived usefulness, I work with organic products because of the economic benefit, F4. Auditor's expertise, F3. Perceived costs
b Dependent Variable: F1.Perceived reliability

ANOVA(b)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	38,011	5	7,602	18,063	,000(e)
Residual	23,989	57	,421		
Total	62,000	62			

a Predictors: (Constant), I care of maintaining a good management in my farm, F2. Perceived usefulness, I work with organic products because of the economic benefit, F4. Auditor's expertise, F3. Perceived costs
b Dependent Variable: F1.Perceived reliability

Coefficients (a)

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta	Tolerance	VIF	B	Std. Error
(Constant)	-1,602	,268		-5,972	,000		
I care of maintaining a good management in my farm	,770	,130	,508	5,935	,000	,927	1,079
F2. Perceived usefulness	,305	,084	,305	3,618	,001	,956	1,046
I work with organic products because of the economic benefit	,118	,054	,193	2,171	,034	,857	1,167
F4. Auditor's expertise	,208	,084	,208	2,487	,016	,969	1,032
F3. Perceived costs	,153	,087	,153	1,761	,084	,895	1,117

a Dependent Variable: F1. Perceived reliability

Excluded Variables (a)

	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
	Tolerance	VIF	Minimum Tolerance	Tolerance	VIF	Minimum Tolerance	Tolerance
F5. Perceived effectiveness	-,071(e)	-,832	,409	-,111	,936	1,069	,807
F6. Family	,063(e)	,746	,459	,099	,946	1,058	,822
F7. Sources of pressure	,041(e)	,434	,666	,058	,762	1,313	,655
F8. Awareness of sanctions	,039(e)	,461	,647	,061	,984	1,016	,844

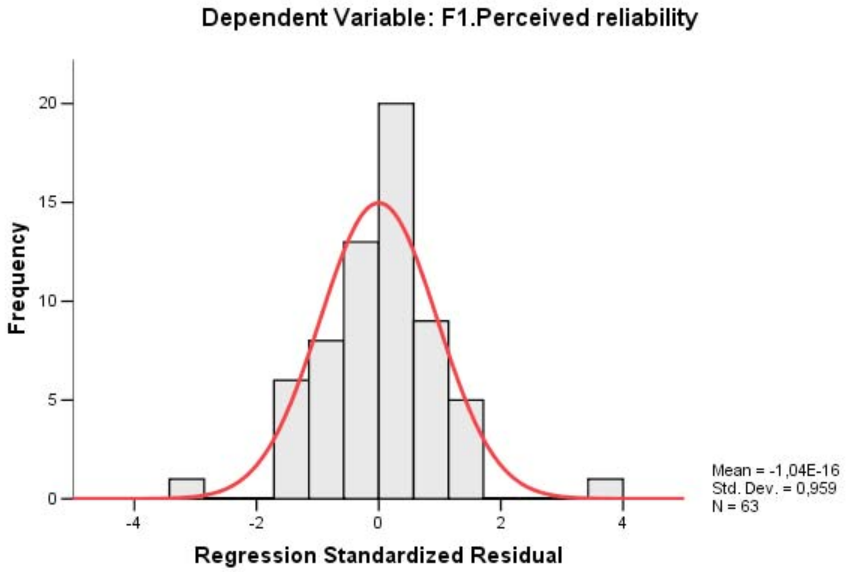
a Dependent Variable: F1.Perceived reliability

Collinearity Diagnostics (a)

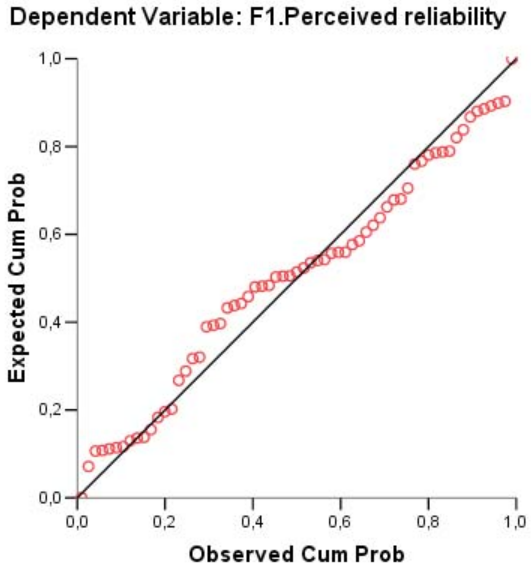
Dimension	Eigenvalue	Condition Index	Variance Proportions					
	(Constant)	I care of maintaining a good management in my farm	F2. Perceived usefulness	I work with organic products because of the economic benefit	F4. Auditor's expertise	F3. Perceived costs	(Constant)	I care of maintaining a good management in my farm
1	2,224	1,000	,02	,02	,00	,06	,00	,01
2	1,169	1,379	,01	,00	,15	,13	,13	,24
3	1,000	1,491	,00	,00	,00	,00	,65	,30
4	1,000	1,491	,00	,00	,69	,00	,09	,17
5	,560	1,992	,01	,01	,15	,80	,13	,25
6	,047	6,868	,97	,97	,01	,00	,00	,05

a Dependent Variable: F1.Perceived reliability

Histogram



Normal P-P Plot of Regression Standardized Residual



STATUTORY DECLARATION

I herewith declare that I composed my thesis submitted independently without having used any other sources or means than stated therein.

Date: Signature: