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The Compliance Process of Food Quality  
Standards on Primary Producer Level:  
A Case Study of the EUREPGAP Standard  
in the Moroccan Tomato Sector



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## 1 Introduction

Fruit and vegetable sectors are principally seen as sectors where small producers are able to participate due to their low demand on land and their high labor requirements. However, the concern exists that small producers' participation in the international fruit and vegetable trade could be diminishing as a result of the increasing prevalence of food quality standards in the sector. Standards define the terms of chain membership, imply rules and conditions for participation, and hence lead to processes of (re)distribution within the chain (Gibbon and Ponte, 2005). For some producers, standards may open up new opportunities as they permit market access to particular market segments. At the same time, the process of (re)distributing market shares is accompanied by marginalization and exclusion, as standards may impose prohibitively high barriers for certain producers in terms of the short-term and long-term efforts needed for production under certification. This is particularly relevant since certification with private standards has become a major requirement for participation in fruit and vegetable markets worldwide. One of the most important private standards for fruit and vegetables is the EUREPGAP standard, which has now become quasi-mandatory for several export destinations (USAID, 2005).

This paper aims to analyze two particular questions with regard to the distributional effects of standards: 1) which producers comply, and which do not; and 2) why do some producers comply while others do not?

With respect to the first question, various surveys have mentioned the particular difficulties facing small producers within this new trading environment (e.g. Humphrey et al. 2004; Kleinwechter and Grethe 2006; Maertens and Swinnen 2006; World Bank 2005). However, most of these surveys have hypothesized that small producers are disadvantaged within the new trading environment on theoretical grounds without actually providing empirical evidence for this assertion.

Regarding the second question, various papers have argued, based on the theoretical background of economies of scale, that small producers tend to comply to a lesser extent because of the higher cost of compliance. Even though this argument may well be to some extent true, it can be criticized because it neglects the complex socio-economic and institutional framework that influences a farmer's decision to comply with a standard.

A multidisciplinary perspective is necessary to analyze decisions to adopt or not to adopt a standard, in order to obtain a deeper understanding of why some producers comply with food quality standards while others reject them.

This paper accordingly seeks to contribute to the debate by answering these two questions with regard to the Moroccan tomato export sector. It provides a comprehensive empirical analysis of the compliance decision behavior and the compliance process. The survey analyzes drivers for the

compliance decision by comparing the determinants of the decision process of non-certified producers with those of certified ones.

For its explanatory approach, this paper mainly draws on the theories of innovation adoption and diffusion research, since these make it possible to systemize the decision process and integrate it into a close network of economic, social and institutional determinants.

The Moroccan tomato sector was chosen as the case study because of the increasing importance of private certification in this sector. Nearly 90% of its tomatoes are exported to the EU, where EUREPGAP is a major requirement. Tomatoes are the second most important horticultural export product of the country, and a wide range of producers are involved in the sector, from large-scale plantations cultivating more than 200 ha, to small producers with less than 10 ha. In addition, the sector has a particular social importance in that it offers income possibilities to those with little access to land, and moreover provides possibilities of employment in rural areas, where there tend to be few other alternative jobs.

The remainder of this paper is structured as follows. Section 2 presents the theoretical background of the analysis, applying diffusion theory to the compliance process with food quality standards. Section 3 describes the methodology of the survey, including the theoretical framework and the data collection. Section 4 provides an overview of the structural and institutional environment of the Moroccan tomato sector, in order to provide an in-depth understanding of the compliance process. Section 5 discusses the results of the survey. Section 6 examines the similarities and differences among compliers and non-compliers. Finally, Section 7 draws some conclusions with regard to the impact of food quality standards on rural poverty in Morocco.

## **2 Theoretical Background**

### **2.1 Standards – Innovations from the Producer Perspective**

Different approaches offer a variety of evidence to explain decision behavior and the decision process. With regard to the objective of the survey, a multidisciplinary analytical approach offers the possibility of linking the individual decision process to the effects of the institutional environment and thus of identifying drivers for or against compliance with food quality standards. Diffusion theory offers a particularly suitable analytical framework that identifies the determinants of the innovativeness of the actors involved.

Diffusion theory is appropriate because food quality standards are, from a producer's perspective, a special form of innovation. Rogers (2003: 101) defines an innovation to be an idea, practice or object that is perceived as new by an individual. In this context, diffusion theory can be applied to various process innovations in agricultural food chains.

However, there are some differences, as innovations from a traditional perspective lead to an increase in technical efficiency. By contrast, innovations in food quality typically result in higher food quality and/or in better information transfer of information on products and processes, but do not necessarily lead to some form of production advantage. Indeed, such innovations may actually be counterproductive to the technical production process of the firm (Walgenbach and Beck, 2003). Food quality innovations only result in gains if the higher quality product is differentiable from lower quality products.<sup>1</sup>

With regard to the information asymmetry existing in the food trade<sup>2</sup>, quality standards are used to overcome these market failures. Nadvi and Wältring (2002: 6) define standards as agreed criteria by which a product or service performance, its technical and physical characteristics and/or the process and conditions under which it has been produced or delivered, can be assessed. Standards may consist of individual measures, or can take the form of a bunch of different measures which the producer has to fulfill and which are externally audited. Consequently, food standards not only consist of innovations – the standard itself is a form of innovation.

## **2.2 Applying the Innovation Decision Model to the Compliance Process with Food Standards – Strengths and Weaknesses**

Diffusion research identifies three time dimensions: 1) the innovativeness of an individual in relation to the other members of a social system; 2) the adoption rate within a social system; and 3) the decision process (König, 2006). This subsection concentrates on the third of these dimensions, the decision process.

Rogers (2003: 168) defines the decision process as an information-seeking and information-processing activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation.

Diffusion research relies on the assumption of a multistage decision model. Rogers (2003) has developed a five-stage model where the decision-making unit passes from hearing about an innovation for the first time, to forming an attitude towards the innovation, on to deciding whether to adopt or to reject it, to implementing the new idea, and finally to confirming this decision.

The decision model provides three main advantages when it comes to analyzing the compliance process with food standards. Firstly, it clearly systemizes the decision process, distinguishing the different stages of the whole process and thereby making it possible to identify the determinants of the decision process, which might differ according to the stage. Secondly, the model puts the

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<sup>1</sup> Akerlof (1972) explored this phenomenon for the “lemons” market.

<sup>2</sup> This asymmetry results from the fact that food products include various quality aspects, e.g. technical value, sensory quality, nutritional value, food safety as well as idealistic and psychological values (Brockmeier, 1993; Wiegand, 1997). The technical value and the sensory quality assessed by the consumer, and the nutritional value and food safety can be assessed in the final product by third parties (via laboratory tests); however, most idealistic values are Potemkin attributes (Tietzel and Weber, 1991) and cannot be assessed in the final good.

decision-maker at the center of the analysis, while at the same time taking interlinkages with the institutional environment into account. Thirdly, it combines various schools of thinking, including those of economics, education, rural sociology and geography to form an analytical framework of diffusion (Rogers, 2003).

However, the model can be criticized for formulating a relatively simplistic view of both the decision process and the final decision to adopt or reject an innovation. It is a mistake to see the decision process as linear; instead, it can be paused and rethought at every stage (Rogers, 2003). In addition, the model treats the adoption decision as a bivariate variable, where the only two possible options are either to comply or to reject. In reality, this decision is much more nuanced, and various potential responses exist. For compliance with food standards, Henson and Heasman (1998) explore compliance, which they show ranges from no-compliance to partial compliance and finally to full compliance. Kleinwechter (2005) even mentions over-compliance with standards, whereby larger firms in particular seek to obtain a marketing advantage.

Furthermore, the shortcomings of the decision model regarding the analysis of food safety innovations are reflected in the diffusion process, which excludes some aspects which are of major importance for the diffusion process of food standards. Rogers (2003: 5) defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Even though this definition covers much of what is important for the analysis of the compliance process with food quality standards, it is important to note the aspects that the definition does not include. Four major shortcomings can be identified in this regard.

First, as Strang and Meyer (1993) show, the definition excludes decision-making processes where actors' choices were not informed by the activities and choices of others. This aspect is of particular relevance for the compliance process with food safety and quality standards of small producers, who are extremely dependent on external sources of information (Henson and Heasman, 1998; Yapp and Freeman, 2004). A large enterprise may internally generate information, whereas a small enterprise is rather in the position of a recipient of information. With respect to compliance with food quality standards, this implies that whenever external sources of information are unavailable, small producers will be unable to start the compliance process.

Second, the diffusion process has been widely criticized for underestimating the institutional environment. Diffusion theory mainly concentrates on internal production processes, thereby failing to give the institutional environment of the decision-making unit sufficient importance (Walgenbach and Beck, 2003). DiMaggio and Powell (1983) pronounce the importance of institutional isomorphism<sup>3</sup> for the diffusion process. Walgenbach and Beck (2003) analyze this phenomenon in their survey of compliance decision processes with the ISO 9000 standard in Germany. They show that enterprises under uncertainty tend to conform more closely to the institutional expectations of their trading partners. Rational conformity with efficiency aspects of

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<sup>3</sup> Institutional isomorphism is defined as the tendency of institutions to form an homogeneous environment (Walgenbach and Beck, 2003: 499).



the production process is becoming less important, while the importance of institutional legitimacy which is guaranteed by homogeneous institutional structure is correspondingly increasing.

Third, the importance of concepts such as governance and pressure tend to be underestimated within value chains. Diffusion research includes the impact of the social system<sup>4</sup> with its horizontal network interrelations, norms and ethical values in the analysis (Rogers, 2003), but it does not provide an analytical framework to analyze it (König, 2006). Diffusion research has neglected in particular vertical coordination and vertical relations, including concepts of governance and power among participants of a value chain, even though vertical relations are known to be particularly important for information transmission (from the buyer to the producer) and in terms of pushing decision-making units in a certain direction (Humphrey and Schmitz, 2002). Vertical relations have been analyzed in particular in value-chain analysis literature, which analyzes the cross-border linkages between firms in global production (e.g. Humphrey and Schmitz, 2002; Gibbon and Ponte, 2005).

Fourth, diffusion research has been criticized for failing to take into consideration the dynamic interdependencies between the individual and its environment and their alternating effects (König, 2006: 101), despite the fact that these are seen as an important aspect explaining technological and structural development in the agricultural sector (König, 2006).

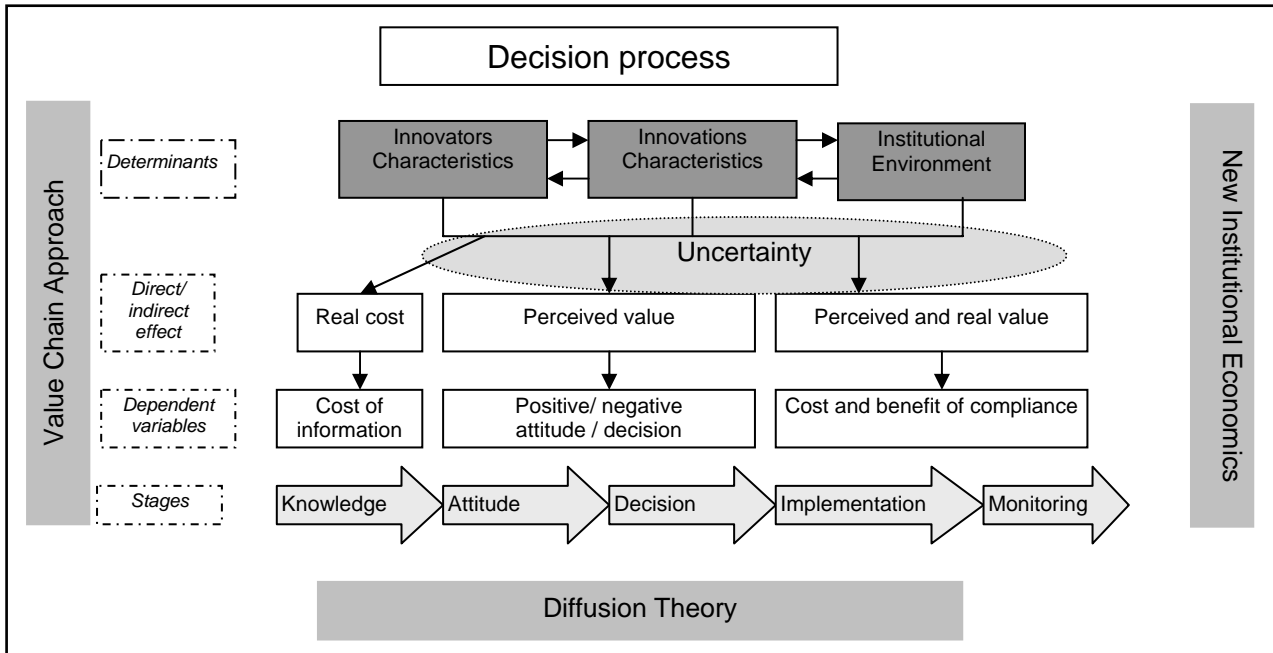
### **3 Methodology and Data Collection**

#### **3.1 The Analytical Framework**

The theoretical discussion has explored the explanatory potential of diffusion theory for the analysis. However, with respect to the shortcomings discussed in Section 2, the perspective of the decision model has been modified in order to make it easier to recognize the interlinkages between the decision-making unit and the institutional environment.

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<sup>4</sup> A social system is a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal (Rogers, 2003: 23).

**Figure 1: Analytical framework**

Source: own illustration

Figure 1 shows that the decision process is, to a large extent, not directly affected by the determinant variables, but also indirectly through the perceived value of the standard. The perceived value of compliance can be considered as belief in the costs and benefits related to the innovation (Frambach and Schillewaert, 1999, DeSarbo et al., 1998). The perceived value of compliance must offer some kind of social, institutional or economic incentive for the decision-making unit to consider adoption seriously. Imperfect information may lead to a difference between the perceived value and the real value of compliance. This difference is called the error cost (Ogus, 1992).

The decision process is determined by uncertainty, since the decision-making unit can never be informed about all the causal linkages in the decision situation, and it bases its decision on assumptions of future developments (e.g. market development). The extent to which the decision-making unit experiences uncertainty as an impeding factor for the decision process mainly depends on personal characteristics and the complexity of the decision.

Each stage of the decision model is represented by a dependent variable which is determined directly or indirectly by the three groups of determinants, as Figure 1 shows. At the knowledge stage, the dependent variable is represented by the cost of information. These represent the costs incurred by the decision-making unit in order to receive a certain level of information which is sufficient to formulate an attitude towards the standard. The level of knowledge needed to formulate an attitude may differ tremendously among producers, however. At the attitude stage and the decision stage, the dependent variables can turn out to be positive or negative. Both stages are affected indirectly by the determinants through the perceived value of compliance. On the

implementation stage, the dependent variables are the cost and benefit of compliance. The producers face at this stage for the first time the real cost of compliance (except for the cost of information during the knowledge stage). The benefit of compliance is seldom immediately apparent, since investments in food quality standards are of a long-term nature. The same takes place at the monitoring stage. This is partly affected by the real costs and benefits of compliance, as well as the perceived costs and benefits related to future market development.

### **3.2 Data Collection**

Research data were collected in 2006 by conducting semi-structured interviews with 63 Moroccan tomato producers in the region of Souss Massa (which was chosen because more than 70% of total tomato exports come from this zone). The survey concentrates on the EUREPGAP standards, since EUREPGAP has turned out to be the most important private certificate at the farm level in trading relations with EU partners.

The total sample was taken out of a population of around 600 producers which supply at least partly the export market (APEFEL, 2006) of which around 207 are EUREPGAP-certified (EUREPGAP, 2006). To guarantee a sufficiently high number of EUREPGAP-certified producers, the total sample was split into two sub-samples: one certified (30 interviewees) and the other not certified (33 interviewees).

A questionnaire was developed for the two sample groups which contains a qualitative as well as a quantitative part. The questionnaire was developed with respect to the theoretical framework discussed in subsection 3.1 and aims at collecting data on the determinants of the decision process.

The analysis of the data consists of two major steps. First, data were analyzed in order to identify any driving or impeding determinants in the decision process. In a second step, the analysis sought to identify particular differences among the two groups of compliers and non-compliers.

Before turning to the discussion of the results in Section 5, the following section will briefly provide an overview of the structure of the Moroccan tomato sector.

## **4 The Moroccan Tomato Sector**

### **4.1 Economic Importance and Structure of the Moroccan Tomato Sector**

Horticulture is one of the most relevant segments of the Moroccan agricultural sector. In addition to its economic importance, the sector is also socially important, accounting for a high share in rural employment (WTO, 2003). Within the horticultural sector, tomato production plays an important role. The Moroccan tomato sector has a dual structure. Production for the domestic and export markets is usually separated. While tomatoes for the export market are always produced in technically highly advanced production systems in plastic greenhouses, tomatoes for the national market mainly stem from open field production.

Nevertheless, interlinkages exist on both sides. Tomatoes originally produced for the export market but which are not of sufficient quality are finally sold on the national market. And greenhouse producers which mostly supply the domestic market sell their products to the export market whenever there is demand (Chemnitz and Grethe, 2005).

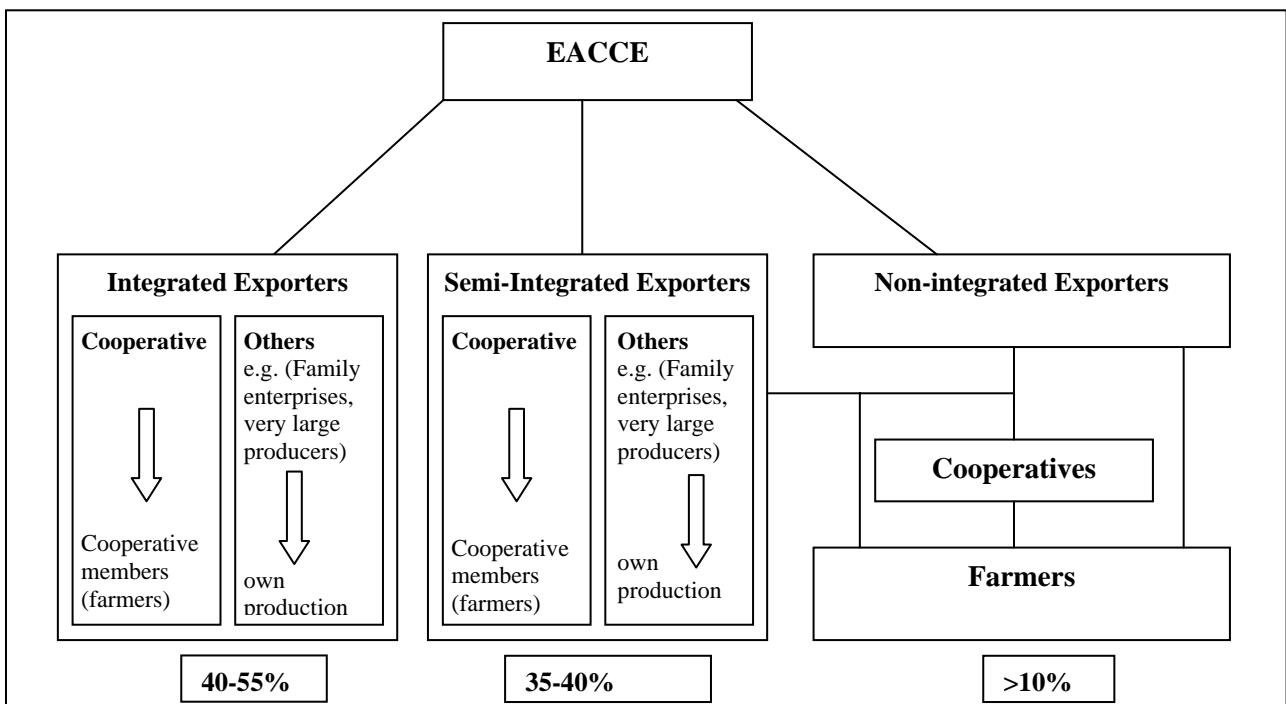
While open-field production for the domestic market takes place all over the country, the production of greenhouse tomatoes is mainly located in a regional cluster in the south Atlantic coastal strip in the region of Souss Massa. About 64% of the area is located in the region and 74% of total production originates there (APEFEL, 2002).

Tomatoes rank second on Morocco’s export list of agricultural goods, with an annual export value of €118 million in 2003 (FAO, 2007). On average, in 2003/04 and 2004/05 Morocco exported 228,738.50 tons of tomatoes, of which 207,158.50 tons were destined for the EU (EACCE, 2007).

Around 30% of tomato producers are smallscale farmers who cultivate less than 5 ha. Their production area represents only about 10-15% of the total production area for early tomatoes. The majority of the producers cultivate an area between 5-20 ha. Farms belonging to this group cultivate around 50% of the total tomato area. Only 10-15% of the farms are larger than 20 ha, but they represent around 40% of the early tomato area (Chemnitz and Grethe, 2005).

The production and marketing chain can be subdivided into three major levels: the production or farm level, the packing level, and the exporting level. The Moroccan export sector shows a highly integrated value chain (Chemnitz and Grethe, 2005).

**Figure 2: Structure of the Moroccan tomato sector**



Source: Chemnitz and Grethe, 2005.

As shown in Figure 2 the largest part of production, between 40 and 55%, is produced in completely integrated export structures. These may either take the form of producers of various sizes, which are organized into farmers' cooperatives at the packing station level, or in enterprises which contain all levels of the production and marketing chain (Chemnitz and Grethe, 2005). The second important organizational form of the sector is that of semi-integrated exporters. These are large enterprises which have their own private packing stations where they process products from their own farms. In addition, these enterprises process and sell tomatoes from other producers on a commission basis (Chemnitz and Grethe, 2005). The least important organizational form of the sector is that of the non-integrated exporters, which represent less than 10% of the exported early tomatoes. These exporters take the tomatoes on a commission basis or buy them from several different small and medium-sized producers. There are around 12-15 exporter groups in the sector, of which the largest three export around 70% of total tomato exports (Chemnitz and Grethe, 2005).

#### **4.2 Prevalence of Legal and Private Food Standards in the Moroccan Export Sector**

Since Moroccan exports concentrate on the European market, production is mainly determined by the legal and private requirements of EU buyers. While food safety, hygiene, traceability, social and environmental requirements are comparatively new, marketing standards for tomatoes for the EU market have been in place since the early 1970s. EU Regulation 1035/72 (OJ L118, 20/05/1972) clearly specifies the size, color and caliber of tomatoes imported to the European market. To date, the EU's acceptance of the maximum residue levels (MRL) of pesticide products and its requirements for traceability are of specific importance for the sector. The so-called umbrella regulation 178/2002 (OJ L 031, 01/02/2002) lays down the general principles and requirements of EU food law on all stages of production, processing and distribution. The most relevant articles for the Moroccan export sector are Articles 11-14 about food safety requirements, and Articles 14-20 about traceability requirements which came into force on 1 January 2005. Since January 2006 the umbrella regulation has been complemented by Regulation 882/2004 on official food and feed controls (OJ L 165/1, 30/04/2004). Finally, Regulation 90/642 fixes maximum levels for pesticide residues in and on fruits and vegetables (OJ L 350, 14/12/90).

However, private food quality initiatives are increasingly becoming more important than the legal food standards. In the Moroccan tomato export sector, the most important private certificate at the farm level is the EUREPGAP standard.<sup>5</sup> The normative documents representing the EUREPGAP standard include aspects of integrated pest management, traceability, hygiene measures and MRLs.

The importance of EUREPGAP to the EU market varies among individual member countries. According to several interviewees, the UK and the Scandinavian countries require the highest quality standards. Most retailers in these countries demand, in addition to EUREPGAP

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<sup>5</sup> The most important standard for packing stations is the BRC (British Retailer Consortium) certificate.

certification, private certificates from the particular buyer (e.g. Tesco's "Natures Choice" and Marks & Spencer's "From Farm to Fork"). By contrast, interviewees characterized the French, German, Spanish and Swiss markets as being in a state of transition; retailers prefer buying EUREPGAP-certified produce, but are still prepared to buy non-certified products when no EUREPGAP-certified products are available.

In Morocco, the number of certified producers has increased tremendously in recent years. To start off, some producers were certified in 2002 but, in the following two years, only a few other large producers followed (APEFEL, 2006). The rapid increase in certification only started in 2005. Today, around 207 out of 600 producers are certified (EUREPGAP, 2006). An unpublished survey conducted by APEFEL (2006) announced that in quantitative terms, Morocco could supply more than three-quarters of its exported tomatoes as EUREPGAP-certified. The largest ten exporters<sup>6</sup> can supply 140,000 tons of EUREPGAP-certified tomatoes and own nearly 1,000 ha of certified greenhouses (APEFEL, 2006). Hence, a tremendous gap exists in the Moroccan export sector regarding the certified quantity and the number of certified producers.

Various interviewees indicated that most very large exporters tend to be EUREPGAP-certified, whereas the picture is more heterogeneous for medium and small producers. The following section analyzes why producers finally decide to comply – or not to comply – with the EUREPGAP standard.

## **5 Compliance with Food Safety Requirements: Results of the Survey**

### **5.1 The Information Stage**

The cost of information reflects the monetary and physical efforts the decision-making unit has to undertake to receive a certain level of information that is needed to formulate an attitude towards the standard. Information costs can be split into two groups: 1) costs for initial awareness information; and 2) costs for knowledge information (Rogers, 2003).

Awareness information captures all the efforts the decision-making unit has to make in order to find out about the possible options for a decision, and it has to feel the need to enter into a decision process. Regarding compliance with food quality standards, the "awareness information" is defined as the first knowledge that a producer has of the existence and importance of a standard. This information on food standards may be transmitted to the producer by several means such as extension services, trading partners, mass media, as well by personal relations with other participants in the sector. The more communication about a certain standard is included in the communication structure of the sector, the less individual efforts producers have to make to find out something about it. However, the awareness information proves to be the first major burden of compliance in many cases, especially for producers that tend to be less included in information

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<sup>6</sup> These could take the organizational form of cooperatives or enterprises.

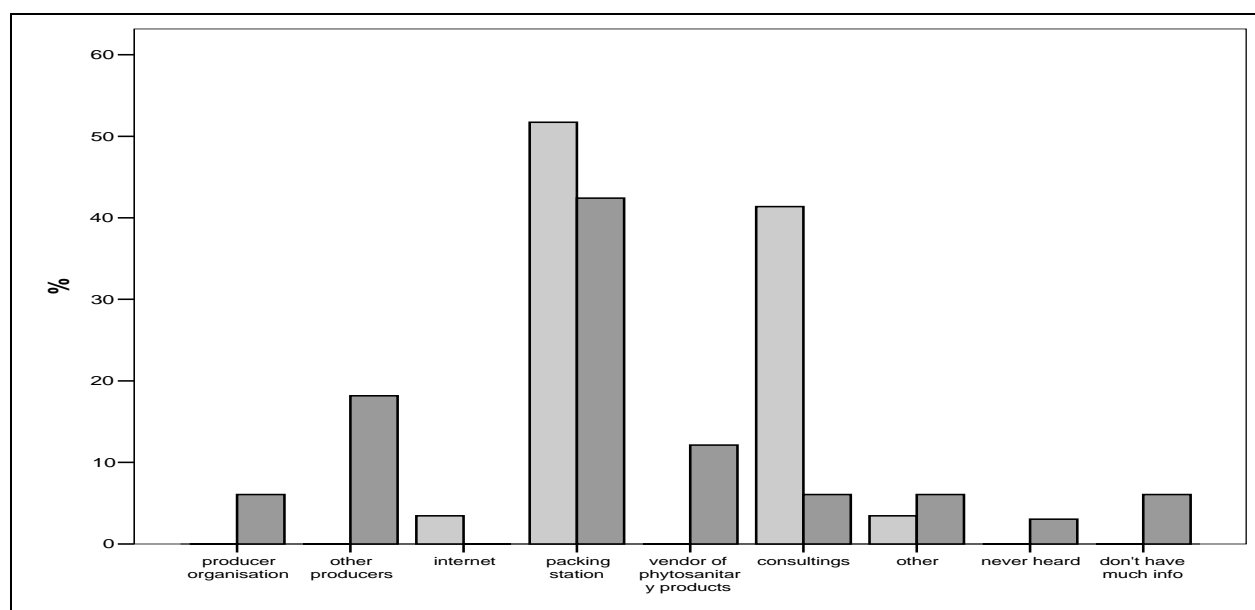
channels, that have less access to modern sources of information, and that are unable to find out information by themselves.

The survey results show that knowledge of public standards such as MRLs and Traceability has been widespread in the sector for more than five years. The picture is slightly different regarding knowledge of the EUREPGAP standard. Even though all interviewees bar one knew of EUREPGAP, most (30%) indicated that they had only known about it for a year. A further 27% had known about EUREPGAP for two years, and 17% for three years. Finally, most interviewees (70%) knew nothing about more specific standards such as “Nature’s Choice” (Tesco) or “From Farm to Fork” (Marks and Spencer).

These results indicate that public standards as well as EUREPGAP are part of the communication structure of the sector, and that information on the existence of standards is communicated horizontally within the sector. Both the certified and non-certified interviewees indicated that the group of “other producers” was the most important source of initial information on the standard. As the second important source of information, certified producers mentioned packing stations, while non-certified producers mentioned the vendors of phytosanitary products. This difference suggests that there are structural differences between certified and non-certified producers, with the former tending to receive information from downstream actors along the value chain, while the latter tend to receive information from horizontally involved participants.

The two groups differ further vis-à-vis the principal source of information on EUREPGAP, as Figure 3 shows.

**Figure 3: Principal sources of information on EUREPGAP for certified and non certified producers**



■ certified producers, ■ non certified producers.

Source: own elaboration

Nearly all certified producers indicated that packing stations or consulting organizations were their major source of information. The group of non-certified producers also stated that packing stations were their principal source of information on EUREPGAP, followed by the categories of other producers and phytosanitary vendors. However, even though both groups reported that packing stations were their most important source of information, non-certified producers possess less information on EUREPGAP. This can be interpreted in two different ways: either certification leads to better knowledge of the standard, or the certified producers possessed better knowledge of the standard to start with, which finally was the main reason why they decided to become certified.

One reason why certified producers tend to receive more detailed information on EUREPGAP from downstream actors can be found in their higher level of vertical integration in the value chain.

**Table 1: Producers' integration in the value chain**

	<b>Owner of a station</b>	<b>Not the owner of a station</b>	<b>Total</b>
<b>Certified</b>	22	8	30
<b>Non-certified</b>	6	27	33
<b>Total</b>	28	35	63

Source: own calculations.

As Table 1 shows, 73% of certified producers are involved at the higher chain level. This might take the form of being a member of a cooperative or being the owner of a company.

Packing stations employ quality managers who accompany the compliance process of their members. Consequently, the costs of information are indirect at the farm level. The certification process was not supported according to any of the interviews without the integration of the producer in the downstream level.

Certified producers which do not receive support from the packing station internalize the generation of the needed knowledge for the certification process by hiring consultant organizations. These supply “packages” contain consulting for the entire upgrading process, including all relevant steps up to the final external audit. Complete “EUREPGAP packages” cost, depending on the size of the farm, between 2,000 and 3,000 €

To conclude, the results of the survey show that the costs of obtaining initial information on the EUREPGAP standard are relatively low as the standard is commonly encountered in the daily communication of the sector. More specific information on the standard, however, has to be generated internally by the producer, either by hiring a production level consultancy or at the packing station level.



## 5.2 The Attitude Stage

The information stage is followed by the attitude stage, in which the decision-making unit forms an opinion on the standard. This reflects how it experiences the potential benefits and perceived value of compliance, which are mainly affected by how the decision-making unit perceives uncertainty regarding its knowledge of future costs and benefits.

This depends on the personal characteristics of the decision-making unit as well as on the external influence on the producer. The way that non-certified decision-making units experience the costs, benefits and risks of the standard and the feasibility of becoming a certified producer plays an important role in the process of formulating an attitude, especially since small producers often lack the possibility to receive information from various different sources (Fairman and Yapp, 2004).

**Table 2: Benefit of the EUREPGAP standard as experienced by non-certified producers**

Benefit of EUREPGAP	Number of responses
Better prices	3
Preferential supplier status	0
Better commercialization	6
Other benefits	2
No known producer with a direct benefit	22

Source: own calculations.

As Table 2 shows, non-certified producers believe the benefit of the EUREPGAP certification to other producers to be relatively low, with only 11 interviewees aware of someone who had benefited from certification. The most important benefits for certified producers according to non-certified producers are “better possibilities for commercialization”. Only two interviewees however indicated that they knew someone who receives better prices due to certification.

In contrast to this rather negative experience of their colleagues’ certification, nearly all non-certified interviewees had a positive attitude towards certification. Except for one interviewee, all producers underlined their willingness to be certified whenever given the chance to do so.

The most important motivation for certification is the fear of losing future market share, a concern stressed by 29 out of the 33 non-certified interviewees. However, the risk of losing market share in the future seems to be relatively abstract to most non-EUREPGAP certified producers, with 88% indicating that they had never faced or heard of any sanctions because of their non-compliance. As depicted in Table 3, only three producers indicated that they face disadvantages in the near future because of non-certification. One of them receives lower prices, while the other two will be excluded from the packing station if they fail to start the certification process in 2007.

**Table 3: Sanctions in case of non-compliance**

	Changing the producer	Better prices	No sanctions	No answer	Total
<b>Certified</b>	22	0	7	1	30
<b>Non-certified</b>	2	1	29	1	33
<b>Total</b>	24	1	36	2	63

Source: own calculations.

In contrast, the analysis of those producers that were certified shows that 22 out of 30 interviewees face sanctions from their packing station in case of non-compliance. All 22 producers indicated that they risked losing market share in case of non-compliance, as their buyers would change to other suppliers.

Summarizing the results of the attitude stage, the survey shows that most non-certified interviewees tend to be positive towards the EUREPGAP standard even though they experience the direct benefit of certified producers as marginal. A general concern exists that they could lose market share in case of non-compliance. However, the survey results suggest that non-certified producers experience market losses as a relatively abstract idea.

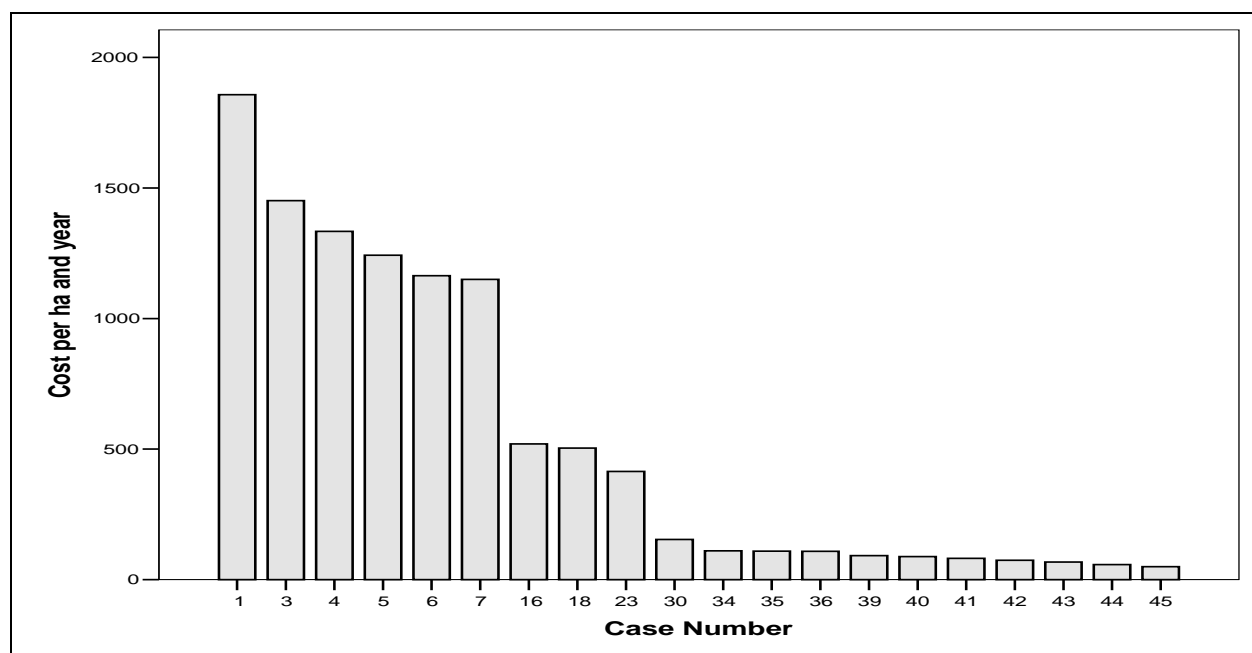
### 5.3 Decision Stage

In the decision stage the producer actively undertakes activities which finally lead to a positive or negative decision (Rogers, 2003). This might entail for example actively searching for information about the standard, or developing a deeper understanding of the specific steps needed to implement the standard at farm level.

28 out of the 33 non-certified producers indicated that they had relatively concrete knowledge about the changes needed on their farm for compliance, and 20 even expressed concrete ideas about the level of investment needed.<sup>7</sup>

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<sup>7</sup> It is important to outline that the survey does not assess whether the perceived cost corresponds to the actual cost.

**Figure 3: Perceived cost of compliance of non-certified producers per ha**

Source: own calculations.

Figure 3 depicts the extremely high variance of perceived costs among non-certified interviewees. The lowest perceived cost of compliance amounts to less than 50 €/ha, and the highest at around 1,975 €/ha.

The reasons why interviewees perceived the cost of compliance so differently varied, ranging from personal characteristics to the actual technical level of production to knowledge on the EUREPGAP standard. The survey results point to the fact that more informed interviewees indicated higher perceived compliance costs.

Even though nearly all non-certified producers tended to have a positive attitude towards the standard (as expressed by their indication to become certified if the opportunity arises), none had finally taken a positive decision in favor of certification. As the main reasons for non-certification, the interviewees indicated insufficient information on EUREPGAP and a lack of financial capacity. However, answers related to a lack of information on EUREPGAP have to be interpreted carefully, since all producers could theoretically hire a consulting organization to provide them with better information and to accompany the certification process. Consequently, the “lack of information” may also be another way of expressing a lack of financial capacity.

The lack of financial capacity as a reason for non-compliance seems convincing, since the largest part of short-term investment is required for technical upgrading of farms, and these costs have to be met immediately. Even though some producers receive credits from their cooperatives, access to credit remains difficult, especially for small, less organized and less educated farmers. The third obstacle to certification experienced by producers is the uncertainty they face in terms of highly fluctuating prices. This is especially true for producers without a steady relationship with buyers

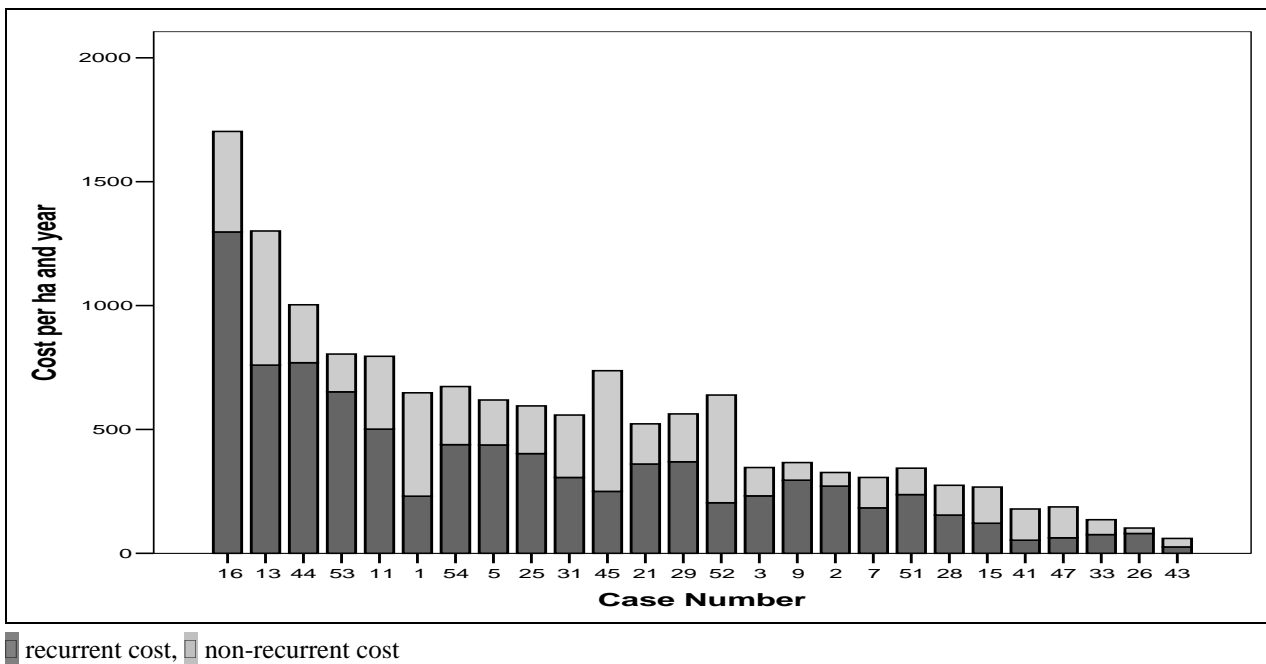
or packing stations. Interviewees stated that in order to become certified, they would need a firm guarantee on prices and quantity.

To sum up, most non-certified interviewees have concrete ideas on the requirements of the EUREPGAP standard. Nevertheless, none have decided in favor of certification up till now, which can largely be attributed to their reluctance to invest owing to uncertainty about price developments and export possibilities. All interviewees found the idea of certification rather abstract, and they do not see a direct need for certification as the benefits of certification appear marginal, and there is little pressure from their trading partners (see subsection 5.2).

### 5.4 The Implementation Stage

In the implementation stage, producers are for the first time confronted with the real costs and benefits of the standard. Figure 4 depicts the real costs of compliance for the certified interviewees.

**Figure 4: Cost of compliance per ha and year**



Source: own calculations.

The costs of compliance can be broken down into recurrent and non-recurrent costs. Even though most interviewees experience non-recurrent costs as more of an obstacle, they only add a small part to the total cost of compliance. The major cost components of non-recurrent costs are investments in the technical upgrading process of the farm (e.g. in buildings and markers).<sup>8</sup> By contrast, the largest component of the recurrent costs of compliance is additional costs for skilled labor. Only four producers indicated that they did not employ any additional labor at all. On

<sup>8</sup> Time periods for depreciation rely on own plausibility considerations.

average, certified producers employ one or two additional skilled workers for every 15 ha. A skilled worker earns between 200 and 250 €/month. Other recurrent cost components, such as the certificate for the standard or investment in safety cloth, only add a small part to the total cost of compliance.

Figure 4 shows that the degree of variance regarding compliance costs is strong. The minimum costs of compliance are about 35 €/ha per year, while the maximum cost of compliance are nearly 1,500 €/ha per year. To explain the high level of variance, data were analyzed with respect to farm size as a potential determinant for cost differences among producers.

A negative correlation of  $-0.589^9$  is identified between the variables of farm size and cost of compliance per ha and year. The survey results suggest that large-scale farms benefit from economies of scale both in terms of non-recurrent costs ( $-0.558$ ) as well as in recurrent ones ( $-0.327$ ). However, the degree of correlation only ranges between low and medium, which indicates that non-recurrent costs are influenced more by other determinants than by farm size (i.e. the technical level before compliance).

Furthermore, the data show a low level of correlation between recurrent cost and farm size. The largest component of the recurrent cost is additional labor costs. Even though some very small farms face relatively high additional labor costs per ha, no significant negative correlation is found between the size of the farm and labor costs per ha and year.

Another factor mentioned by Kleinwechter (2005) that has a relevant effect on the cost of compliance is the intention of the producer to which level he wants to upgrade its farm. Even though 34% of the producers indicate greater compliance in at least one category of the EUREPGAP protocol, no significant correlation is found among the compliance level and the cost per ha and year.

Analysis of how certified producers benefit shows that they experience very varied benefits from compliance. The largest number of interviewees (41.0%) indicated that certification had only brought them medium benefits<sup>10</sup>, compared with an almost equal number who stated that they had received high to very high benefits (27.6%) or low to very low benefits (26.0%). Table 4 below breaks down the benefits and perceived benefits of certified producers according to category.

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<sup>9</sup> Correlation is calculated by Spearman's ROH, since both variables were not normally distributed.

<sup>10</sup> On a scale from 1 to 8, high benefits are those that range between 7 and 8; medium benefits between 3 and 5; and low benefits 1 and 2.

**Table 4: Benefits of EUREPGAP certification**

Benefits of certified producers	Responses	
	Nr.	Percent
Better prices	2	3.7%
Better marketing conditions	13	24.1%
Better market access	7	13.0%
Better prices in future	1	1.9%
New market access in future	9	16.7%
EUREPGAP minimizes the risk of losing market share	22	40.7%
Total	54	100.0%

Source: own calculations

Only two producers indicated that they have received better prices since they became certified. However, both underline that certification alone does not change prices. Rather, new marketing strategies that accompany certification bring about higher prices by opening up new markets. However, several interviewees stated that, especially in the 2005/6 export season, prices had decreased tremendously, regardless of whether producers were certified or not. This finally led to the unfortunate fact that most producers that became certified in 2005 received lower prices with certification than prior to certification in 2004.

In terms of marketing, 13 producers indicated that they had better marketing possibilities with the certificate, while another 10 interviewees hoped to have better marketing conditions in the future. Most interviewees however stated that the most important benefit of EUREPGAP is that it minimizes the risk of potential market share losses. The potential of losing market share is seen as a very concrete threat in case of non-certification. As shown in Table 2 (subsection 5.2), 22 out of 30 producers fear losing customers in case of non-certification.

The results of the implementation stage can be summarized as follows. First, compliance costs are only weakly correlated with farm size. Second, EUREPGAP functions as an additional marketing argument regarding the benefits of compliance. However, the benefits of certification depend on the marketing strategy adopted: it is not the certification itself which contains certain benefits.

## 6 Similarities and Differences among Compliers and Non-compliers

This section aims to analyze whether any patterns exist for compliers and non-compliers.

The survey results affirm the existing assumption that large farms are certified to a larger extent than small and medium-sized farms. The two latter groups show a very diverse picture. While all but three of the farms in the sample larger than 25 ha are EUREPGAP-certified, no particular pattern is apparent for farms between 5 and 25 ha.

There are various reasons for the strong tendency on the part of large farms to become certified. According to the interviewees, certification primarily matters in order to fulfill the “wishes” of the trading partners. Hence, certification of large farms rather reflects the producers willingness and their understanding of the importance of the quality of their products to their trading partners. However, various interviewees of very large farms indicated that the EUREPGAP certification is probably not particularly necessary in order to guarantee the products quality as consumers in any case trust the high quality of their products as a result of the direct and constant contact that large-scale farms tend to have with their trading partners.

In contrast, certification of smaller farms which lack the direct contact to their buyers would increase their level of conformity and open up possibilities for strategic horizontal partnerships and for vertical coordination. As the picture for farms between 5 and 25 ha regarding certification is particularly varied, following discriminant analysis particularly concentrates on this group. Five main statements can be made in this regard.

- 1) Certified farms show a higher level of vertical integration. Discriminant analysis shows highly significant differences among certified and non-certified producers related to their level of vertical integration. While 75% of certified producers were integrated at the downstream level, only 12% of the non-certified producers were. This highly significant difference underlines the importance of vertical integration – or at least vertical coordination – in guaranteeing the information flow between producers and consumers in both directions. It seems that direct contact to clients in particular often leads to a positive decision regarding certification. This is again underlined by the fact that 81% of certified producers indicated that they had experienced sanctions in case of non-compliance, compared with only 33% of non-certified producers. Consequently, the survey results hint that even though size plays an important role, it is largely the organizational level which leads to a positive decision being taken by small to medium-sized farms.
- 2) Certified producers cooperate with certified packing stations. Another highly significant difference among certified and non-certified farms is the quality level of downstream actors. 79% of certified producers indicated that their packing station is certified with the British Retail Consortium (BRC), whereas only 11% of non-certified producers had trading relations with certified packing stations. This underlines how important the consistent fulfillment of quality requirements is along the whole value chain. Several interview partners stated that EUREPGAP certification without certification of the downstream actor makes no sense from a marketing perspective.
- 3) Certified producers have seen their market share develop positively over the last five years. Diffusion theory assumes that innovations take place in economically increasing branches of an industry. This assumption could be verified in the survey, since 75% of the certified producers indicated that they had benefited from positive exports within the last five years, compared with only 23% of non-certified producers.

- 4) Certified producers employ skilled workers. At least one highly skilled person works on 88% of certified farms; by contrast, only 24% of non-certified farms employ highly qualified employees. The employment of highly skilled workers tends to be of particular importance since the compliance with EUREPGAP demands a certain level of human capital not only from the owner of the farm but as well from the employees. A certain motivation and understanding of the standard is necessary for compliance.
- 5) Certified producers do not possess a higher level of education. Data analysis shows no significant difference between the educational level of certified producers in comparison to non-certified producers. However, since interviews were mostly conducted with farm managers and not with the actual owner of the farm, there may be some weaknesses in the data. In addition most producers participating on the exporting sector show a rather higher level of education.

## **7 Conclusions**

The analysis of the decision process, coupled with the comparison of the decision process of certified and non-certified producers, opens up various interesting results and possibilities for interpretation.

One of the most important results of the survey is that being small in size seems to be overvalued in the discussion, especially when talking about the technical upgrading cost of the farm. Even though very large farms tend to become certified to a larger extent than smaller ones, the results do not suggest that small producers are particularly disadvantaged in the compliance process, as farm size correlates only marginally with the cost of compliance.

Instead, the results rather point to the fact that less-organized or less integrated farmers tend to be less favored, especially as forward integration diminishes the cost of compliance. Forward integration tends to be of particular importance because of the direct access to information on the buyers' requirements. The vertical information flow plays a major role in the motivation to become certified. This is underlined by the finding that most non-integrated producers pay little attention to the importance of EUREPGAP in maintaining market share, in contrast to their vertically integrated colleagues.

Non-integrated producers mainly depend on horizontal information from other producers regarding all market developments in the EU. However, the results indicate that there is little interest in the sector in keeping non-integrated producers in the market by providing them information on particular market developments. One reason for that might be the very regulated EU import policy for Moroccan tomatoes. Morocco is only allowed to export a preferential quota of around 200,000 tons of tomatoes per year to the EU, and even though it has the production



capacity, Moroccan suppliers are keen not to exceed this preferential quota. Hence, exporters are extremely interested in aggregating much of the quota within a small group of producers. According to various interviewees, the already very limited number of non-integrated producers' products for the export market will disappear within few years. However, this trend could of course change if the EU were ready to abandon its entry price system.

Another factor which might favor the readiness of less organized producers to export would be a functioning information system on market development, prices and quality requirements in the most important export destinations. At the moment, no functioning extension service exists in the area of Souss Massa which could complete non-integrated farmers access to marketing information.

However, using the term "small" as a synonym for less organized, less educated and technically less advanced production, as is often the case when analyzing smallholders' production, tends to be false when looking at small producers participating in the Moroccan tomato export sector, where producers are often only small in relative terms, and frequently much larger in size and in capital and human capital than small or even medium-sized producers producing only for the domestic market.

The survey only provides limited information regarding the impact of EUREPGAP certification on poverty in terms of excluding certain producers from the export market on poverty. As mentioned above, small producers in the export sector are only relatively small. Owing to their level of human and monetary capital, it is unlikely that these producers could fall below the poverty line if excluded from the export market. The domestic market has started to provide a market for greenhouse tomatoes, especially since the importance of higher quality tomatoes is increasing as supermarkets become increasingly common in the larger towns.

Some surveys exist that find that the production of higher products improves the competitiveness of the sector and thus increases employment (Maertens and Swinnen, 2006 and Minton, 2006). Similar to these surveys, the producers excluded from production were only small in relative terms and do not belong to the group of smallscale farmers. However, while these articles find a positive poverty balance due to increasing job opportunities (resulting from increasing export capacity) for those who are "very poor" (e.g. migrant workers from other regions), this is not the case in the Moroccan tomato sector, since EU policy keeps Moroccan tomato production constant. If water were not a key limiting factor regarding increasing the production of high-quality tomatoes, the abolition of the entry price system could potentially show a positive impact on poverty in combination with producing high-quality tomatoes.

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