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

1 Introduction

Due to their low demand for land and their high labor requirements, fruit and vegetable sectors are principally seen as sectors where small producers have a chance to participate. However, there is some concern that small producers' participation in international fruit and vegetable trade is diminishing because of the increasing prevalence of food quality standards in the sector. Standards lead to a process of redistribution (Gibbon and Ponte, 2005). While they open up opportunities to some producers by permitting market access for particular market segments, they exclude others by imposing prohibitively high barriers which are the result of the short-term and long-term efforts that go hand in hand with production under a certain standard.

This paper aims to analyze two particular questions. 1) Which producers comply, and which do not comply? And 2) Why do some producers comply with the standards while others do not?

This paper aims to analyze the two questions by offering a comprehensive empirical analysis of the compliance decision-making process based on a case study of the Moroccan tomato export sector where private certification is of particular relevance, since nearly 90% of the tomatoes are exported to the EU market. The survey analyses drivers for a compliance decision by comparing determinants of the decision-making processes of non-certified producers with those of certified ones.

The analytical framework is based on the decision model developed by Rogers (2003) as part of innovation diffusion research. The model provides the opportunity of placing the decision-making unit at the center of the analysis, while integrating it into a close network of economic, social and institutional determinants.

2 Theoretical Framework

The paper uses the decision model developed by Rogers (2003) as part of innovation diffusion theory as the theoretical concept. The link to innovation theory results from the fact that food quality standards are a specific form of innovation from a producer perspective.[1] However, some differences exist, since innovations lead from a traditional perspective to an increase in technical efficiency. By contrast, innovation in food quality does not necessarily lead to some kind of production advantage. Food quality innovations result in higher food quality and/or in a better information transfer of product and process information. At the same time, they may even be contraproductive to the technical production process of the firm (Walgenbach and Beck, 2003). Gains in food safety innovations only take place if the product with a higher quality is differentiable from lower quality products. Quality standards are used to differentiate products and to guarantee that production complies with a certain level of quality. Hence, food standards not only consist of innovations, the standard itself is a certain form of innovation.

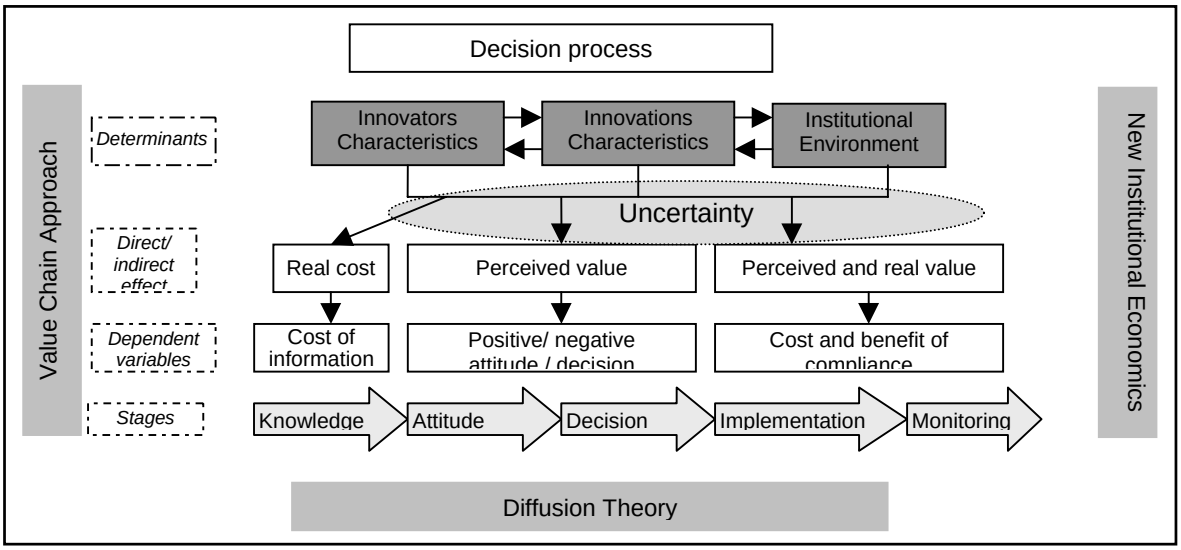
The compliance process with food standards is determined by the decision-making process of the decision-making unit. Rogers (2003) defines the decision-making process as an information-seeking and information-processing activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. The decision-making unit extends from the first knowledge of an innovation, to forming an attitude towards the innovation, to a decision to adopt or reject, to the implementation of the new idea and to a confirmation of this decision (Rogers, 2003). Rogers identifies several determinants that affect the decision-making process and puts them in a positive or negative direction.

All in all, three major groups of determinants affect the decision-making process 1) The characteristics of the innovator, 2) the characteristics of the innovation and 3) the institutional environment (Weinjert, 2002). Rogers puts a lot emphasis on the characteristics of the

[1] Rogers (2003) defines an innovation to be an idea, practice or object that is perceived as new by an individual.

innovation and the innovator, while he rarely includes the institutional environment and concepts of governance and sphere within value chains in his discussion. Rogers rather concentrates on the internal production process of the firm which can be explained by the fact that he developed the model to analyze decision-making processes with technical innovations. For this case study Roger's model has been modified by changing some of the determinants affecting the compliance decision. More emphasis is put on the institutional environment.

Fig. 1: Dependent variables in the decision-making process and their determinants



Source: Own illustration modified from Rogers (2003).

Figure 1 shows that the decision-making process is, to a large extent, not directly affected by the determinants, but indirectly through the perceived costs and benefits of the standard.[2] Hence, the conceptual framework for the analysis of the decision-making process has to include a second analytical level.

Each stage of the decision-making model is represented by a dependent variable which is determined directly or indirectly by the three groups of determinants. At the knowledge stage, the dependent variable is represented by the costs of information. These represent the costs of the decision-making unit to receive a certain level of information which is appropriate for him or her to formulate an attitude towards the standard. The knowledge which is needed to

[2] The perceived costs and benefits of compliance can be considered beliefs of the costs and benefits related to an innovation. This indicates the perceived value of compliance (Frambach and Schillewaert 1999).

formulate an attitude may differ tremendously among producers. At the attitude stage and the decision-making stage, the dependent variables were bivariate, since both the attitude and the decision of the decision-making unit can turn out to be positive or negative. Both stages are affected indirectly by the determinants through the perceived costs and benefits of compliance. On the implementation stage the dependent variables are the costs and benefits of compliance. The producers face at this stage, for the first time, the real costs of compliance (except for the costs of information at the knowledge stage). The benefits of compliance is seldom noticeable immediately, since investments in food quality standards are long term investments.

3 Methodological framework

Data collection for the research was conducted in 2006 by semi-structured interviews with 63 Moroccan tomato producers in the region of Souss Massa. More than 70% of total tomato exports come from this zone. In the Moroccan tomato export sector, the most important private certificate at farm level is the EUREPGAP standard (the shortage is a combination of the shortage of the European retailer producer working group and the shortage of good agricultural practices). The survey concentrates on the EUREPGAP standards, since it has turned out to be quasi mandatory for exports to the European market for some years.

The total sample was taken out of a population of approx. 600 producers who produce at least partly for the export market (APEFEL, 2006) and whereof around 207 were certified EUREPGAP (EUREPGAP, 2006). To guarantee a sufficiently high number of EUREPGAP certified producers the total sample was split in two sub-samples. 33 interviewees have not been certified while the other 30 interviewees have been certified EUREPGAP.

A questionnaire was developed for the two sample groups which contains qualitative as well as quantitative parts. The questionnaire was developed with respect to the theoretical background of the decision-making model and aimed to collect information on the drivers of the decision-making process.

Data was analyzed following the structure of the decision-making model and determinants of the decision-making process were linked to the stages. A comprehensive understanding of the decision-making process results, which allows one to identify particular differences among the group of compliers and the group of non-compliers.

4 The Compliance Decision with Food Safety Requirements; Results of the Survey

4.1 The Knowledge Stage

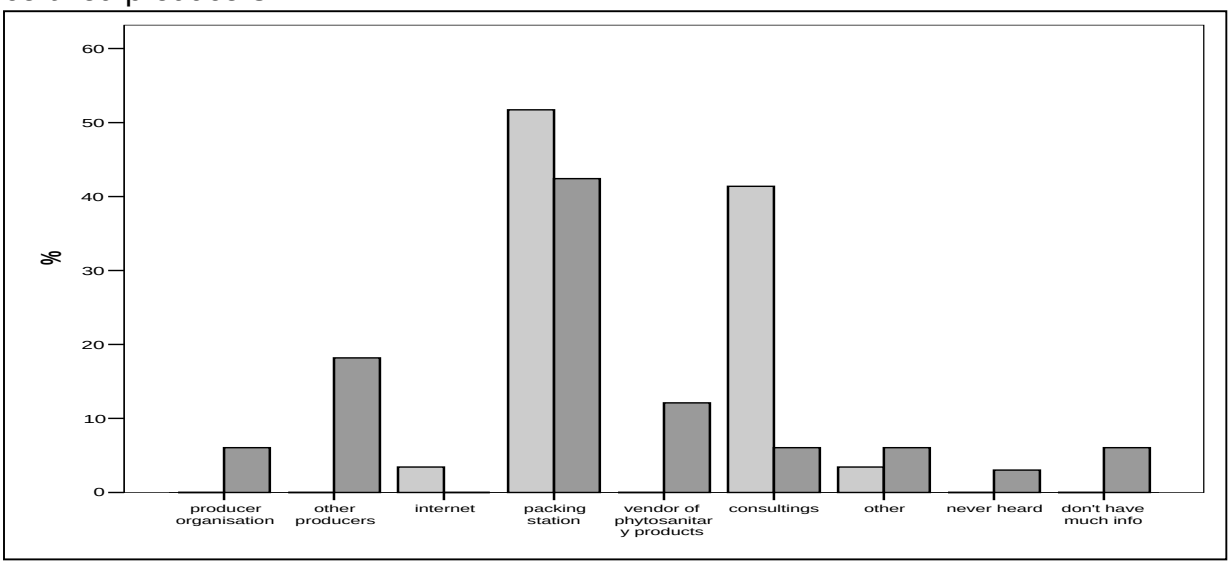
As shown in Figure 1, the dependent variable for the knowledge stage are the costs of information. They reflect the monetary and physical efforts the decision-making unit has to undertake to receive a certain level of information which is needed to formulate an attitude towards the standard. For this survey, indicators were identified reflecting whether producers tend to face higher or lower costs of information in the first stage of their decision-making process.

A first indicator is the appearance of the standard as part of the communication structure of the sector. The more a standard is included in the communication structure of the sector, the fewer individual efforts producers have to undertake to receive the initial knowledge of it. Results of the survey show that, except for one producer, all interviewees are familiar with the EUREPGAP standard.[3] Information on the standards' existence were communicated within the sector horizontally among farmers. Both groups, the certified and the non-certified interviewees, indicated the group of "other producers" as the most important source of initial information on the standard. As the second important source of initial information, certified producers mentioned the "packing stations". This show much lower importance as a source of information for non-certified producers. For the latter group, the second important source of information are phytosanitary vendors.

[3] The Nature's Choice standard in contrast was unknown to nearly 70% of the interviewees.

This difference provides a first impression of the existence of a structural difference between certified and non-certified producers. Certified producers receive information from downstream actors in the value chain while non-certified producers receive information from external agents. This difference is afforded even stronger relevance when turning away from the initial information to the principal source of information on EUREPGAP.

Figure 2: Principal Sources of Information on EUREPGAP for certified and non-certified producers



□ = non-certified; □ = certified;
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 significantly less information on EUREPGAP.

The results indicate that more specific information on EUREPGAP is not provided internally by the sector. By hiring a consultant organization, producers internalize the generation of required knowledge for the certification process. Consulting organizations supply "packages" which include consulting for the total upgrading process including all relevant steps up to the final external audit.

The reason why certified producers receive information to a larger extent, but also in a more detailed manner from downstream actors, can be found in their frequent tendency to forward integration in the value chain (22 out of 30 certified producers are somehow involved in the higher chain level. Either by being a member of a cooperative or being the owner of a company).

Summarizing the results for the knowledge stage, the survey shows that the costs of initial information for the EUREPGAP standard are relatively low due to the high prevalence of the standard in the communication system of the sector, while more specific information on the standard has to be generated internally by the producer (mainly by hiring a consultant organization either at production level or at the level of the packing station).

4.2 The Attitude Stage

At the attitude stage, the producer formulates a positive or a negative attitude towards the standard. The dependent variable is determined by the perceived costs and benefits of compliance. In a second order, the perceived costs and benefits were mainly affected by the decision-making unit's characteristics (how does the decision-making unit interpret and experience future costs and benefits) and by the external influences on the producer (does the producer experience any pressure from trading partners which pushes his/her attitude in a positive direction or does he or she receive positive or negative information from external sources).

The way the non-certified decision units experience the standard's cost, benefit, risk and feasibility of certified producers plays an important role for the process of formulating an attitude. Principally, the analysis showed that non-certified producers experience the direct benefits of the certification of other producers to be relatively low. As depicted in Table 1, only 11 interviewees out of 33 indicated that they know someone who experiences a benefit from certification. The most important benefit non-certified producers experience from

certified producers are the "better possibilities for commercialization". Only two interviewees indicated knowing someone who receives better prices due to his or her certification. Several interviewees underlined that, especially in the export season of 2005/6, prices decreased tremendously independently of whether producers were certified or not. This led to the fact that producers who had been certified within 2005 mostly received lower prices with a certification than the year before without it.

Table 1: Benefits of the EUREPGAP Standard; Experienced by Non-certified producers

Benefits of EUERPGAP	No. of Responses
Better prices	3
Preferential supplier status	0
Better commercialization	6
Other benefits	2
No one known with a direct benefit	22

Source: own elaboration

Nevertheless or even in contrast to this real negative experience of their colleagues' certification, nearly all non-certified interviewees had a positive attitude towards the certification. With the exception of one interviewee, all producers underlined their willingness to be certified whenever they would have the possibility to do so.

The most important motivation for certification is the great concern of losing a share of the market in future which was indicated by 20 out of 33 non-certified interviewees. However, the concern of losing a share of the market in future seems to be relatively abstract to most non-certified producers, as 88% of non-certified producers indicated that they had never faced nor heard of any sanctions because of their non-compliance with EUREPGAP. As depicted in Table 2, only three producers indicated facing any disadvantages because of their non-certification. One of them receives lower prices and the other two will be excluded from the packing station if they don't start the certification process in 2007.

Table 2:Sanctions in Case of Non Compliance

	Changing the Producer	Better Prices	No Sanctions	No Answer	Total
Certified	22	0	7	1	30
Non-Certified	2	1	29	1	33
Total	24	1	36	2	63

Source: own elaboration

On the contrary, the analysis of those producers who were certified shows that 22 out of 30 interviewees faced sanctions in their packing station in cases of non compliance. All 22

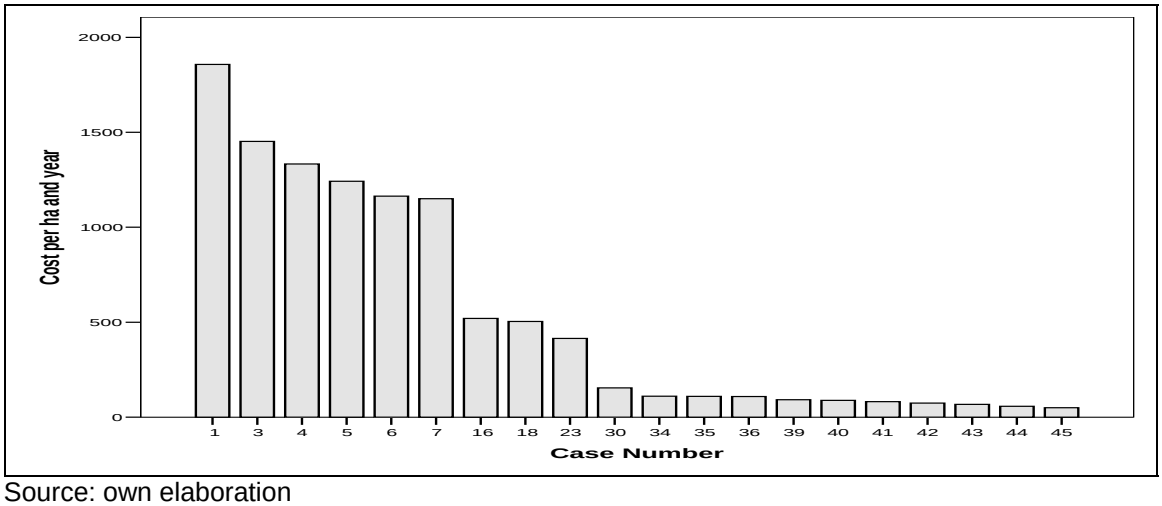
producers faced the risk of losing a share of the market, because of their buyers changing to other suppliers in the case of non-compliance.

Summarizing the results of the attitude stage, the survey shows that even non-certified interviewees tend to show a positive attitude towards the EUREPGAP standard even though they perceive the direct benefit of certified producers to be marginal. There is general concern about losing a share of the market in the case of non-compliance. However, results of the survey hint at the fact that market losses are perceived as relatively abstract to non-certified producers.

4.3 Decision-making Stage

At the decision-making stage, the producer actively undertakes activities which finally lead to a positive or negative decision. This might for example, the active way of searching for information about the standard. Twenty-eight out of the 33 non-certified producers indicated that they had a relatively concrete idea about the changes needed on their farm for the compliance process and at least 24 of them had an idea about the investment needed. The survey analyzed whether certain determinants of the compliance process affect the perceived costs and benefits of compliance and on the reasons why producers finally decided not to comply with the ERUEPGAP standard.

Figure 3: Perceived Costs of Compliance of Non-Certified Producers per Ha



Source: own elaboration

The figure depicts the extremely high variance of the perceived costs among non-certified interviewees. The lowest perceived costs of compliance sum is less than 50 €/ha and the highest is around 1,975 €/ha. One reason for the high variance in the perceived costs of compliance can be found in the knowledge of the producer concerning EUREPGAP. While some producers already showed concrete ideas of the costs of different components in the upgrading process, other interviewees only had a rough idea about investments in the technical upgrading process. Interviewees with a better knowledge on the standard indicated a higher perceived costs of compliance.

Even though nearly all non-certified producers tend to show a positive attitude towards the standard (which is expressed by their indication to become certified if they would see the opportunity), none of them has taken a final positive decision for certification. As the main reason for their non-certification, the interviewees indicated a lack of information on EUREPGAP and as the second important one, a lack of financial capacity. However, answers related to the lack of information on EUREPGAP have to be interpreted carefully, since all producers would have the possibility of hiring a consulting organization for better information and the accompaniment of the certification process. Consequently, the lack of information can indirectly be traced back to a lack of financial capacity.

The lack of financial capacity seems very convincing, as the large amount of short term investments are incurred for the technical upgrading process of the farm and these costs have to be borne immediately. Even though some producers receive credits from their cooperatives, access to credit remains difficult, especially for small, less organised and less-educated farmers. The third point which was indicated as an impediment for non-certified producers on the way to certification is the uncertainty producers face in terms of highly fluctuant prices. Especially producers without a constant relation to their buyers or their packing station are hesitant towards these investments, since they face unstable prices on the export market. Interviewees indicated that they need a guarantee on prices and quantity to become certified.

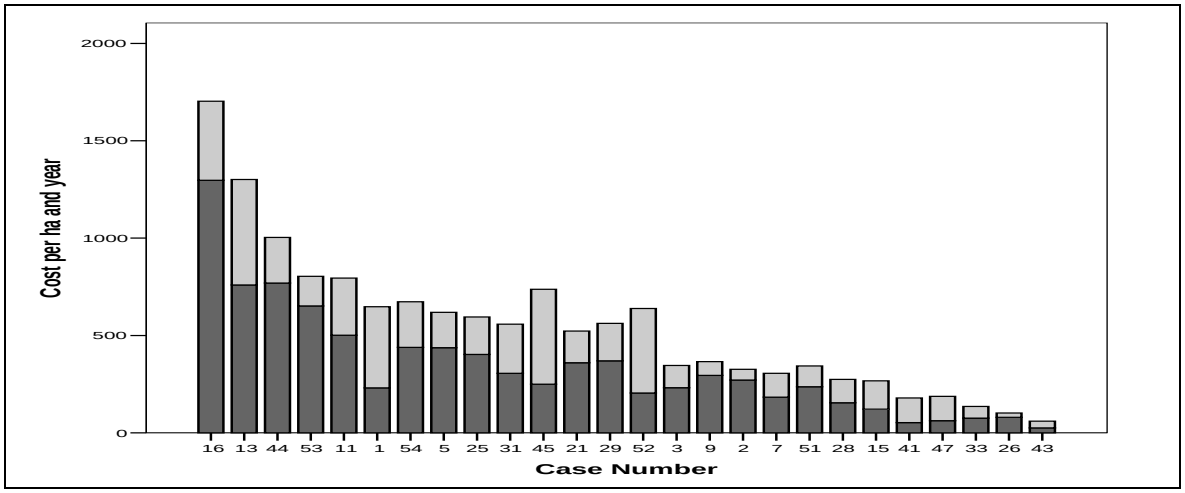
4.4 The Implementation Stage

At the implementation stage, producers are confronted for the first time with real costs and real benefits of the standard. The survey wants to analyze whether certain determinants of the compliance process affect the amount of the costs and the benefits of compliance.

Figure 4 depicts the real costs of compliance of the certified interviewees. The costs of compliance are divided into non-recurrent and recurrent costs. Even though the non-recurrent costs were experienced by most interviewees as more impeding, they add only the smaller part to the total costs of compliance. The major cost components of the non-recurrent costs were investments in the technical upgrading process of the farm (e.g. in buildings and markers)[4]. The largest part of the recurrent costs of compliance are the additional costs for skilled labor. On average, certified producers employ 1 additional skilled worker for every 15ha. Only 4 producers indicated that they did not employ additional labor at all. On average additional labor costs amount to 250€/ha and year. Other recurrent cost components, such as the certificate for the standard or investment in safety clothing add only a small part to the total costs of compliance.

The figure shows that costs of compliance differ immensely between interviewees. Minimum costs are about 35€/ ha and year, while the maximum costs are nearly 1500€.

Figure 4: Costs of Compliance per Ha and Year



Source: own elaboration

[4] Time periods for depreciation rely on own plausibility considerations.

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).[5] By contrast, the largest component of the recurrent costs of compliance is additional costs for skilled labor. 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 3 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 gain 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[6] was identified between the variables of farm size and cost of compliance per ha and year. These 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 costs 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.

The analysis of the benefits of certified producers showed that producers perceive the benefits of compliance to be very diverse. The largest part (41% of the interviewees) indicated having

[5] Time periods for depreciation rely on own plausibility considerations.

[6] Correlation is calculated by Sperman's ROH, since both variables were not normally distributed.

medium benefits[7] from the certification, 27.6% of the interviewees indicated having high to very high benefits and 26% indicated having very low to low benefits of compliance. Only two producers indicated receiving better prices since they were certified. However, both of them underlined that a certification alone does not change prices. It was rather the new marketing strategy which accompanied the certification which resulted in higher prices by conquering new markets. 13 producers indicated that they see themselves as having better marketing possibilities with the certificate. Another 10 interviewees indicated that they hope to have better marketing conditions in future. Most interviewees, however, indicated that the largest benefit of EUREPGAP is the fact that it minimizes the risk of potential market share losses.

5 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

[7] High benefits range on a scale from 1 to 8 between 7 and 8, medium benefits between 3 and 5 and low benefits 1 and 2.

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.

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 even 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.

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