ALMERÍA'S TOMATO CHAIN ANALYSIS AND STRATEGIES TO UPGRADE THE CHAIN

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DEDICATION

I dedicate this thesis to my son, Victor.

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ABSTRACT

The Almeria's tomato value chain is currently reducing its competitiveness due to high production and processing costs as well as the maintenance of selling prices and the increase of competitors. Therefore, the purpose of this study was to assess the Almeria's tomato value chain in order to identify its leverage points and give recommendations to upgrade the chain.

A case study with qualitative data was used for the study. The research was based on interviews to relevant key informants of the Almerian tomato sector and desk study by exploring literature.

The analysis of competitiveness, logistic and costs was conducted to find out the leverage points of the tomato chain. The study of the competitiveness revealed problems in the chain production, processing, marketing and logistic level that limits its competitiveness. The small offer concentration, little product planning, poor information flow within the chain and the production of a standardized tomato are the most important factors to overcome. The logistic and cost analysis showed that it is necessary to improve the Almerian logistic system and reduce costs in all the stages of the chain, mainly at producing and marketing level.

The study proposed some recommendations to upgrade the chain at producing, processing, marketing and logistic level. The most important recommendation at producing level was to increase farmers' income by means of increasing production through the improvement of the technological level of the greenhouses, cost reduction and the control of inputs. At processing and marketing, concentration of the offer, shorten the value chain, improve the crop planning as well as give added value and promotion of tomatoes are possible strategies to upgrade the chain at this level. Finally, the use of intermodal transport, the reduction of transhipment and the use of new technologies to control the internal conditions of the trucks are some of the recommendations proposed at logistic level.

Chapter 1: INTRODUCTION

1.1. BACKGROUND

Tomatoes represent the 25,2% of the vegetables export in Spain and the 10,8% of the total vegetables. In the European Union (EU), the most important vegetable in terms of production is tomato with around 16.8 million tonnes (Eurostat, 2011). Approximately 90% of the EU tomato imports are from intra-EU trade. There are three competing countries that control 82% of tomato imports from EU, Spain (44%), the Netherlands (30%) and Morocco (7,7%) (Valenciano and Pérez, 2004).

Table 1. Most important tomatoes' exporting countries to the EU (2007)		
Country	Tonnes	%
Spain	883.326	44%
The Netherlands	848.184	30%
Morocco	297.593	7,7%
Source: *Eurostat, 2007*		

The Figure 1 shows the flow of tomatoes into the European Union. The main exporters of tomatoes are Spain, The Netherlands, Egypt, Turkey, Morocco, Belgium and Israel.

Figure 1. European Union tomato flow in 2007

Almería is the main European exporter of fruit and vegetables with a production of 2,759.260 tonnes in season 2009/2010 and a commercialized value of 2.253 M€ (Consejería de Agricultura y Pesca de la Junta de Andalucía (CAP), 2010). The surface area dedicated to horticultural production is 26.300 ha (CAP, 2011), accounting 51% of the total greenhouse area in Spain. Greenhouses are mainly located in 'Campo de Dalías' and 'Campo de Nijar'. Tomato the main crop cultivated in Almería as a winter crop with production peaks in December-January. The greenhouse area dedicated to tomato in season 2010/1011 was 8.639 ha producing 787.562 tonnes (CAP, 2010).

Almería is located in the region of Andalucia in south-eastern Spain. It has an average temperature between 15ºC and 20ºC and about 3500 hours of annual sunshine. Despite little precipitation (150-200 mm per year), this area enjoys ample provisions of subterranean water. Therefore, the mild winter temperatures, little temperature variation between day and night-time temperatures, high number of hours of sunlight, little humidity and frost, constant winds, flat surface and availability of underground water resourced constitute the main environmental factor favouring the development of early horticultural crops in Almería (Aznar and Galdeano, 2011). In addition, the geographical proximity of the European markets was a positive factor in the development of the sector.

The European tomato trade is currently facing a time of uncertainty due to overproduction in the European Union (EU) and a significant increase in competition from other Mediterranean countries. Spain as part of EU and specifically, Almería is under strong pressure due to competition from non-EU tomato suppliers such as Morocco, Israel, Turkey and Egypt (Pérez, Galdeano and Aznar, 2012). The competition between Almería (Spain) and Morocco is very intense because they have similar macroclimatic and geographic features (Valenciano and Pérez, 2004), target markets as well as similar technology and varieties. Morocco also has the same production calendar that produces a market overlap with Almería tomatoes. The new Moroccan tomato quota and the lower production costs make Morocco the Almerian main competitor. Besides this, other important competitor within the EU is The Netherlands.

Almería has become very competitive because it is relying on selling via high quality and not on low prices (Cantliffe and Vansickle, 2009). However, production and transportation costs reduce Almeria tomato competitiveness. For example, production costs in Morocco are lower than in Spain, for example the average agricultural wage in Almería (36 €/day) is six times higher than in Morocco (6 €/day) (Cantliffe and Vansickle, 2009). The distance from the European markets increases the transportation cost, limiting its competitiveness (Castilla, Hernández and Abou-Hadisi, 2002), overcoat considering that transportation costs has increased dramatically due to increase in fuel prices (Cantliffe and Vansickle, 2009). Besides this, the marketing system is atomized, heterogeneous and significantly difficult for raising funds from the individual partners in order to begin innovative projects (de Pablo, Pérez and Lévy, 2008).

1.2. RESEARCH PROBLEM

As it was mentioned before, Almeria tomato production has the features to be the first exporter of tomatoes in EU, with a volume exported of 451.348 tonnes in season 2010/2011 and a commercialized value of 412,104 M€ (CAP, 2011). However, it is now threatened by the increase of competitors from other non-European Union countries

like Morocco who produce similar products with lower costs. Because of this, the Almerian farmer could have to abandon the existing marketing system, which is appropriate for the European Union region.

The Almeria tomato sector is currently facing with an increase in competitors that produce similar tomatoes with lower costs and commercialise them in the same markets with lower prices. There is also an income reduction due to the increase of the tomato costs and maintenance in prices. Therefore, the main problem is a reduction in the competitiveness of the tomato industry due to the high tomato production and processing costs, maintenance of selling prices and the increase of competitors. This problem makes the Almerian tomatoes less competitive and reduce producers and processors income.

In this case, there is no specific problem owner, is a general chain ownership problem.

1.3. RESEARCH OBJECTIVE

The objective of this research consists of analysing the Almeria's tomato value chain in order to identify its leverage points. This study also aimed at recommending upgrading strategies in order to increase competitiveness focused on cost reduction, commercial strategies and added value to the chain to bring higher income for the actors.

1.4. RESEARCH QUESTIONS

Main Question 1: *What is the chain overview and which are its leverage points?*

Sub-question 1.1. Which are the main characteristics of the Almeria tomato chain?
Sub-question 1.2. How can the leverage points be solved?

Main Question 2: *How can the Almería tomato sector be more competitive?*

Sub-question 2.1. How can producers and processors reduce costs?
Sub-question 2.2. Which commercial strategies can be followed?
Sub-question 2.3. How can producers and processors give added value to their products?

1.5. METHODOLOGY

The research strategy will be a case study using quantitative data. The methodology used in this thesis consists of the use of different analysis tools such as PEST, Porter's five forces and Porters diamond, key informants and desk study to analyse the Almería tomato value chain.

Key informants are agronomists, managers of distribution centres and seeds companies. They provide information at farm, processing and marketing level because they have a close and direct contact with growers. They are also involved in quality control, market requirement and crop plan. Moreover, they are in contact with the commercial board.

Finally, the recommendations are based in the previous findings.

1.6. REPORT MAP

This thesis is structured in six chapters. The first chapter gives an overview of the sector and explains the research objective and methodology. The second one describes the Almeria's tomato sector and chapter three explains the methodology used along the report. Chapter four and five include the research analysis and findings respectively. Chapter four presents the chain by describing stakeholders and the most important features. It also analyses the chain using Pest, Porter's diamond and Porter's five forces tools in order to identify its leverage points. Chapter five includes the findings gathered in the analysis of chapter four and the discussion of the results. Finally, chapter six gives the conclusion and recommendations to upgrade the chain.

Chapter 2: LITERATURE REVIEW

This chapter describes the Almería tomato sector focusing on the type of tomato produced, cropping schedules and trends. Finally, the chapter describes the tomato consumers demand.

2.1. ALMERIAN TOMATO SECTOR

Introduction

Almería is Spain's leading area for the production and exportation of vegetables. It is the province with the largest area of greenhouses in the world (26.300 ha. CAP, 2011). Tomato is the main crop grown in the area in terms of volume and value followed by sweet pepper and courgette (CAP, 2011). The 46,7% of the growers produce tomatoes and the 63% of them grow tomatoes as long crops, around eleven months in duration.

The Almería tomato is marketed in the EU (95%) as well as the USA and Canada (5%). The most important tomato buyers, in order of volume are Germany, France, the Netherlands and the United Kingdom.

During the last 10 years, Almeria's tomato exports have increased more than the other Spanish producing zones (de Pablo, Pérez and Lévy, 2008). In season 2010/2011 the greenhouse area cultivated with tomato was of 8.639 has that produced 787.562 tonnes of tomatoes (Table 2). More than the 57% was exported mainly to EU markets, which gave a value of more than 412 millions of euro.

Table 2. Almería tomato production and marketing figures in season 2010/2011

Area	8.639 ha
Production	787.562 tonnes
Yield	91 tonnes/ha
Value of the production	385.905.000 €
Volume of tomato exported	451.348 tonnes
Value of the exports	412.104.000 €

Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*

Type of tomato

The main marketed tomato is the long life one, however in the last seasons this tomato has lost his dominance in favour of other types, that is, the trend is the tomato diversification. The production and marketing of tomatoes is oriented to the consumers' requirements that prefer more tasty tomatoes such as cluster, plum or ribbed tomatoes. Table 3 and Figure 2 show the mentioned trend in tomato marketing.

Table 3. Commercialized tomato production in the last season.			
Type of tomato	Commercialized tomato production (%)		
	Season 2008/09	*Season 2009/10*	*Season 2010/2011*
Long life	52	48	47
Green	7	9	10
Cluster	24,3	22	22
Plumb	7,1	9	10
Ribbed	5,4	7	7
Cherry	3	4	3
Others	1,3	1	1
Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*			

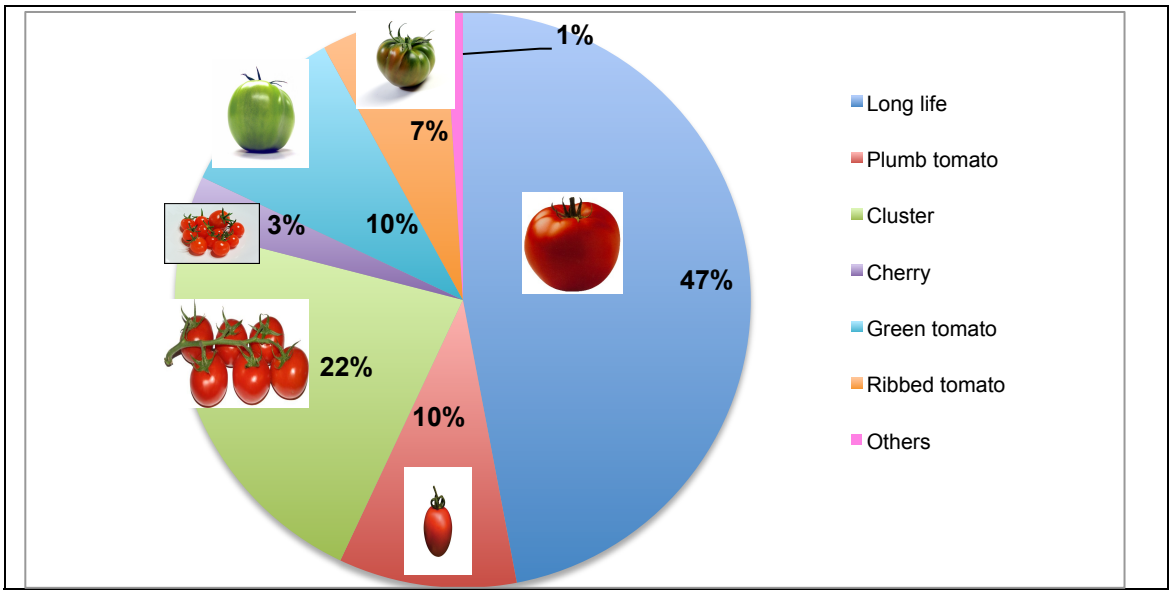


Figure 2. Type of commercialized tomatoes in season 2010/2011

Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*

According to my key informants:

- Long life tomatoes are traded in red colour in all the markets, mainly in size M and G (size M: from 57 to 67 mm and size G: from 67 to 82mm).
- Cluster tomato is the most important tomato for exporting in the EU. It is commercialized in all the markets in red with calliper M. Nevertheless, due to its branch short shelf life, the main markets are Germany, France, Austria and The Netherlands.
- Cherry tomatoes are mainly traded in the United Kingdom and The Netherlands. Because of the long shelf life individual biologic cherry tomatoes, they are exported to farer markets such as Sweden, Denmark, Norway or Ireland.
- The size of the exported plumb tomato is M and MM (size MM: from 47 to 57 mm) and they are marketed in United Kingdom, Russia, France and North European countries.

Cropping schedules

The monthly distribution of the volume of tomatoes commercialized and the monthly evolution of the exports are presented in Figure 3 and Figure 4. As it can be seen in both figures, the peak of the tomato distribution and export is from January to April.

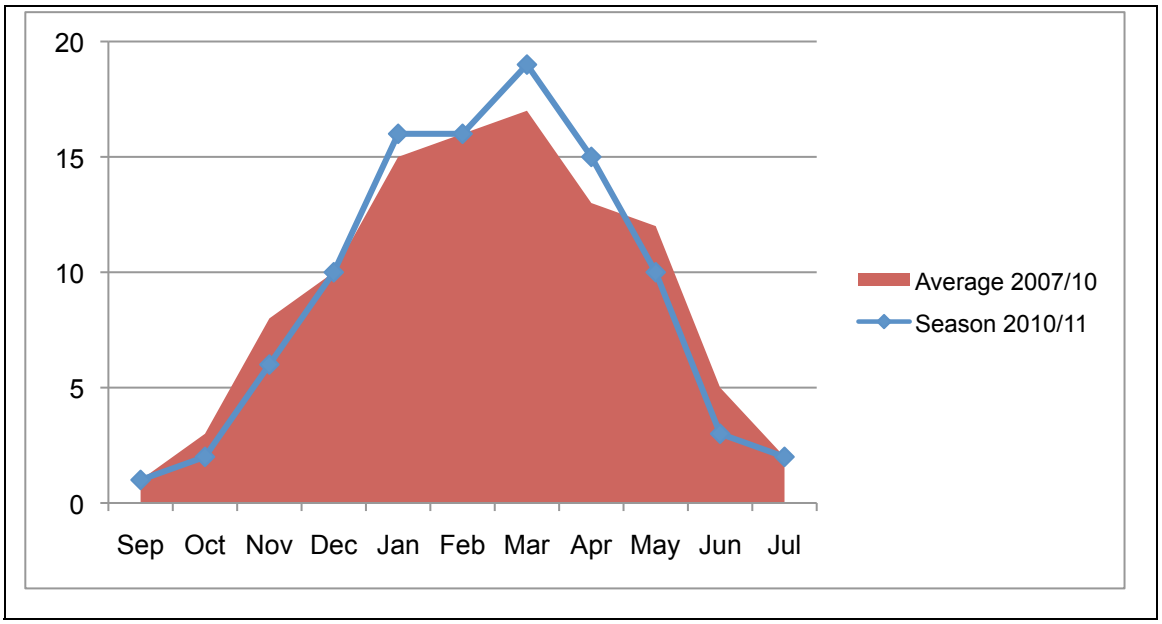


Figure 3. Monthly distribution of the volume of tomatoes commercialized in season 2010/2011 and the average from 2007/10

Source: *Observatorio de precios y mercados. CAP 2011.*
http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default

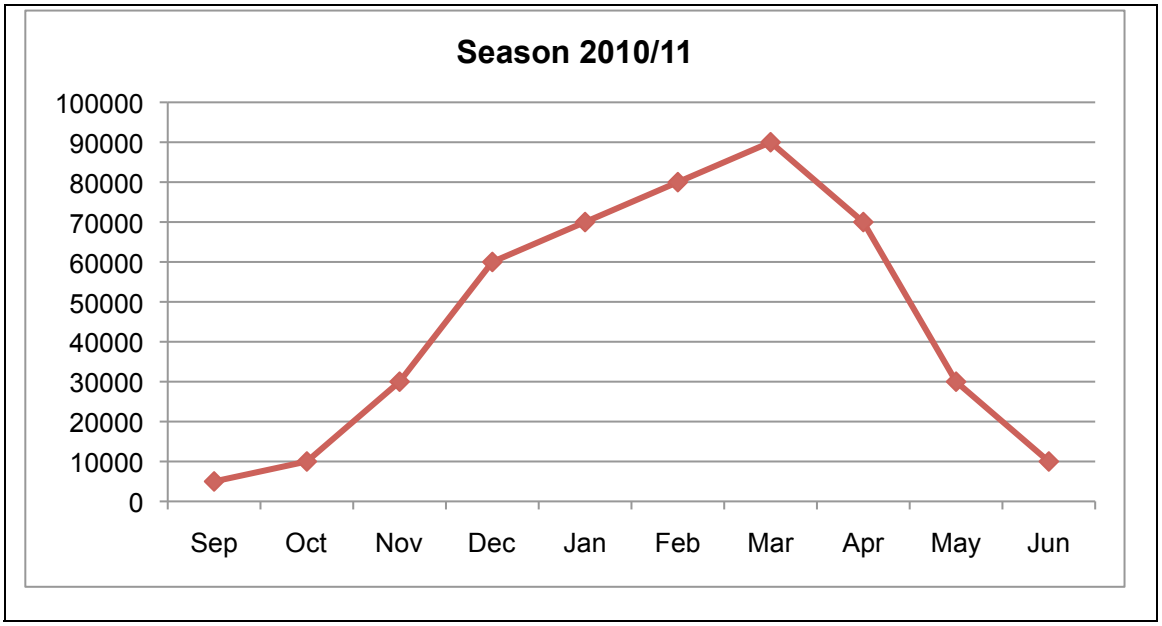


Figure 4. Monthly distribution of the exports of tomatoes commercialized in season 2010/2011

Source: *Observatorio de precios y mercados. CAP 2011.*
http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default

Trends

Tomatoes have to be produced safely even within socially accepted conditions and way of production (Castilla, Hernández, and Abou-Hadid, 2002). Traceability has become a necessity in order to provide consumer with the required security about the way of producing. Growers produce their high quality tomatoes in an environment-conscious, labour-safe and hygienic way to be able to demonstrate this and meet customer demand.

The diversification of types of tomatoes carried out in the last years is mainly characterized by new presentations rather than new varieties that require research and promotion in the market. These new presentations of the established tomatoes include variations in colour, shape and size as well as new labels such as eco-labels.

The most important product innovation carried out in the tomato sector in Almería was the establishment of the quality certifications such as UNE 150.000, Global-Gap, ISO 9000, ISO 14000 and British Retail Consortium, the advanced application of the Hazard Analysis and the Critical Control Points, widespread use of tracking systems and recently the introduction of processed products.

2.2. TOMATO DEMAND

According to Wijnands, 2004, the main driving force on competitiveness is to understand the consumers. The consumption of tomatoes in the main export markets is expected to grow. There are some driving forces that influence the consumption of tomatoes. These forces are the following:

1. The introduction of women to labour has decreased the time for food preparation. Therefore, families look for products available in convenience packages.

2. Fresh vegetables, easy to cook and pre-prepared substitute the traditional demanding vegetables.

3. Increasing prosperity stimulates the demand for more luxurious products. Families are willing to buy more tasty tomatoes or organic despite they have higher price.

4. Consumers are considering to buy ready-to-eat meals as an alternative for preparing a complete meal themselves. 'Fresh cut product such as salads are a very common combination with fast food or meals in-outdoors.

5. Health and consumer concerns are still of growing importance.

Chapter 3: METHODOLOGY

3.1. RESEARCH CONTEXT

There are three main horticulture-producing areas in the province of Almería: 'Campo de Dalías' with 20.511 has, 'Bajo Almanzora' with 4.482 has and 'Campo de Níjar' 3.421 has (CAP, 2002). The research was conducted in the two main tomato-producing areas, Campo de Dalías' and 'Campo de Níjar', where the production of tomatoes in 2002 was of 693.462 tonnes (CAP, 2002). Beside this, most of the greenhouses and distribution firms are concentrated in these regions.

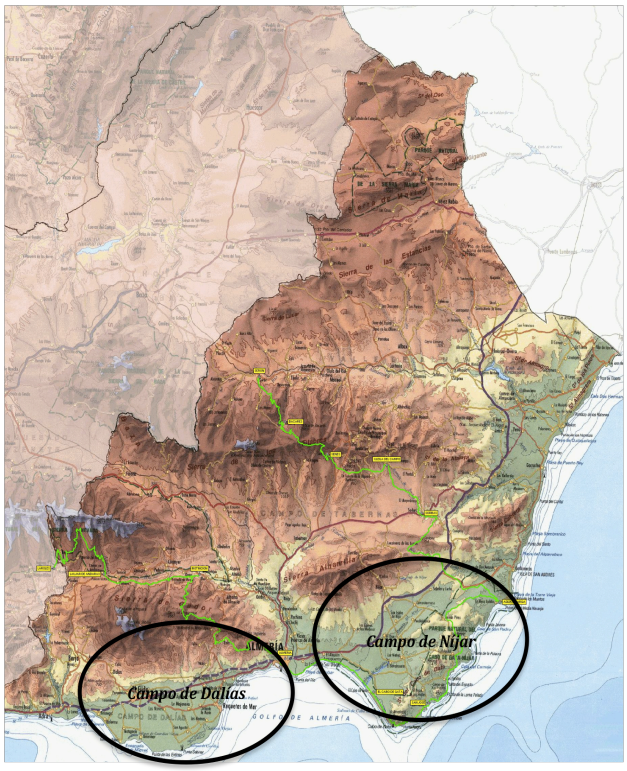


Figure 5. Overview of the research area

3.2. METHODS OF DATA COLLECTION

This research is a case study using quantitative data. This case study is based on interviews focused on key informant and desk study (literature and documents). The interviews were done through e-mail by sending a semi-structured questionnaire with the most relevant questions about the sector (see annex one). The questions were prepared by following a checklist with the most important topics to research. All the questions were open questions in order to obtain the maximum information about the characteristics and features of the Almeria tomato chain.

3.3. DATA COLLECTION

The research is based on desk study and key informants.

- Desk study: It was the initial data collection. It was carried out by exploring relevant articles, reports and documents about the tomato sector in Almería. These sources of information have offered me an overview of the sector, main figures of volumes, costs and values in tomato production as well as identification of the chain leverage points.
  It was used the information provided by the Public Administration such as annual reports, statistics and strategic plans as an important source of data and information.

- Key informants: They were chosen according to their experience and relevance within the tomato sector. They were agronomists working in distribution companies in the tomato processing area who were in contact with producers and marketing boards, a produce chain manage of a seed company who has a wide experience of the tomato sector and a manager of a distribution centre. These key informants gave me real information about the sector, marketing and production trend and the problems they have to deal with every season.

Chapter 4: RESEARCH ANALYSIS

This chapter analyses the Almeria tomato sector. First of all, the chain is described and then the analysis of the sector is carried out. PEST analysis offers an overview of the sector and Porter's Diamond and Porter five forces investigates the competitiveness and profitability of the sector in the long-term against its main competitors, Morocco and The Netherlands.

4.1. ALMERIA TOMATO CHAIN

4.1.1. Almería tomato chain map

The following Figure 6 shows and overview of the general Almería tomato chain. There are specific tomatoes chains according to the different type of tomatoes produced but they are simplifications of the chain showed bellow.

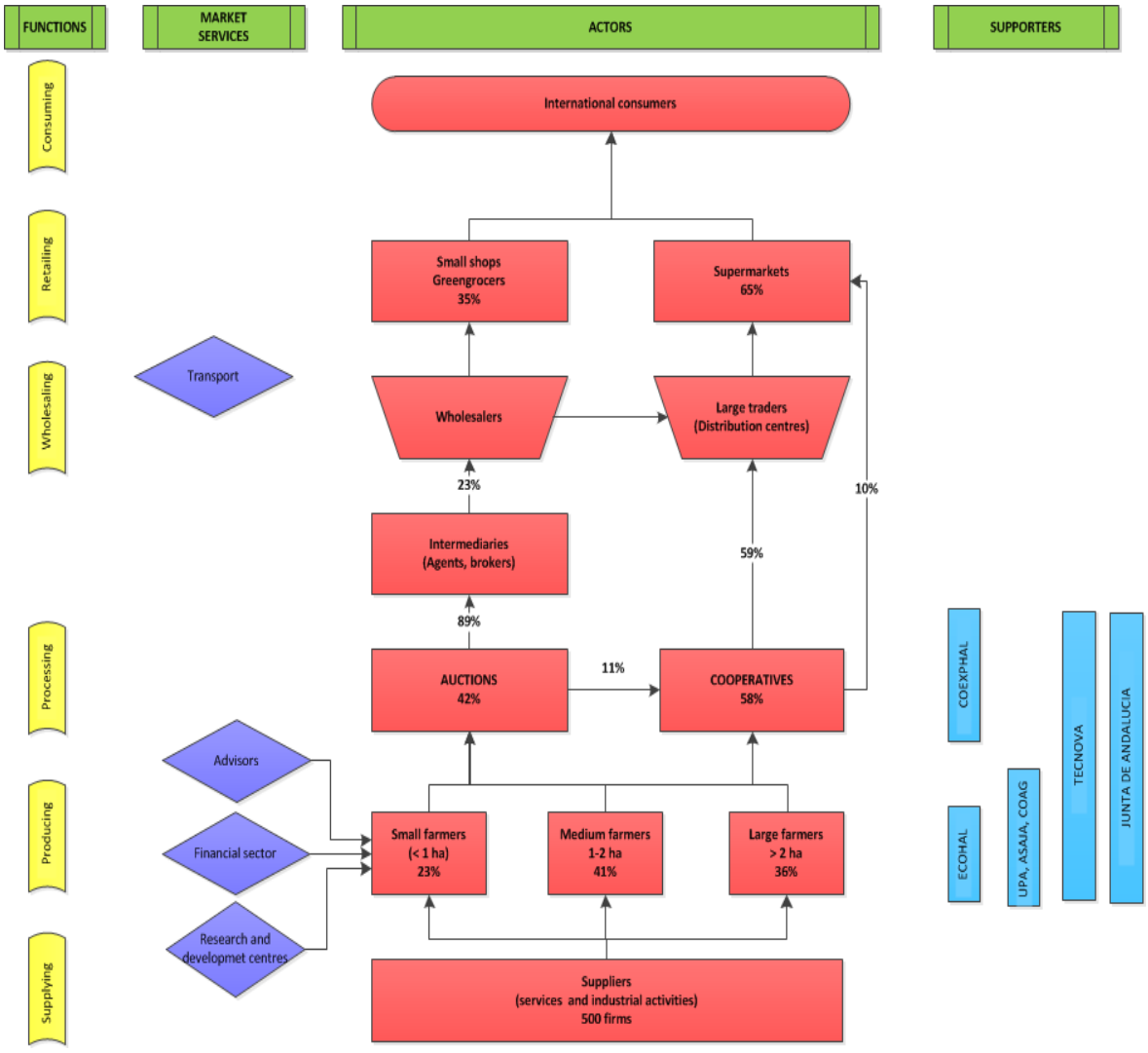


Figure 6. Tomato chain map

4.1.2. Chain actors

A. Suppliers (agroindustrial cluster)

From the late 1980's onwards an agroindustrial cluster began to emerge in Almería around the production and marketing of vegetables. In the 1990's a period of considerable growth commenced with the establishment of production and distribution centres and the creation of autochthonous firms in the different sectors of auxiliary activities around horticultural production, services and industrial activities (Aznar and Galdeano, 2011).

Nowadays there are around 500 firms supplying services and industrial inputs. Their turnover is in excess of 6.000 million euro and they directly employ almost 9.000 people (Aznar and Galdeano, 2011).

These companies supply the sector with inputs such as plastics, irrigation and fertigation systems, seeds, packaging, fertilizers, agrochemicals, biological control or services such as handling and marketing, transport, financial or agronomic counselling. Therefore, there is an important productive system established around greenhouse horticulture.

Besides this, there are several intensive agriculture research centres and professional associations.

There are numerous local suppliers and also the world leaders of each sector. There is a well-developed group of suppliers of all type of inputs with specialized personnel. Thanks to the continuous formation of new firms, the agroindustrial cluster is gaining in depth and width favouring the development of the sector. Costs and delays are reduced; repairs or problem solving become easier and they have better prices, services and products because of the high degree of competence. Finally, relationship with customers is more transparent and long-lasting (Aznar and Galdeano, 2011).

B. Producers

Tomatoes are produced in small-scale greenhouses, predominantly family-run affairs with low capital investment, however paid labour has become common in the last years. These workers are immigrants who are contracted with a fix salaries linked to production and provided with job stability in order to reduce illegal hire of workers and facilitate specialization (Aznar and Galdeano, 2011).

The 80% of the tomato is transplanted in August and September and it is pulled up in May and June (Céspedes et al, 2009) in order to leave at least a month between crops for clean up and pest control. The average plant density is 1,5 plants per square metre and 100% of the plants are guided and pollinated by bees. The tomato productivity is between 11Kg/m^2 and 13 Kg/m^2.

Before 2000, the main variety tomato grown was the long life with a little percentage of cherry tomato. After 2000, the trend was the diversification of varieties. Despite long life is the most common commercialized tomato; cluster tomato is the main type of tomato grown (44,5%) followed by long life (almost 40%) (Céspedes, 2005). In general, this variety diversification has helped to the development of new types such as plumb tomato or the increase in the growth of cherry tomatoes.

The greenhouse main structure is the high roof slope structure (new `parral type`) with roof vents equipped with climate control systems (Castilla, Hernández and Abou-

Hadid, 2002). These plastic greenhouses use polyethylene coverings and have an average surface area of 2,5 has (Aznar and Galdeano, 2011).

Approximately 90% of the cultivation for tomato production is done on artificial soil called `enarenado´. This culture utilizes over the original soil layers of clay, manure and sand from bottom to top as a crop system. The remaining 10 % use soilless media as perlite or rockwool. Nevertheless, many producers are switching to soilless media as crop system due to increase the management and efficiency of the greenhouse technology.

Other technologies of the tomatoes greenhouses are drip irrigation, thermal plastic or integrated pest and disease control which has led to improvements in yield.

Regarding irrigation, greenhouses increase crop water use efficiency by the use of high-frequency irrigation systems such as drip; however there are few high-tech greenhouses that use re-circulating soilless systems. Most of the greenhouses are provided with open pipes in the roof to collect rainwater in order to store it for future watering use. Some producers have their own pond but most of them have to face with water scheduling. They also have to deal with water salinity as constraint during irrigation management.

As it was mentioned above, the greenhouses are provided with drip irrigation systems where the nutrients are usually injected into the irrigation water (fertigation) from concentrated solutions in stock tanks (Heuvelink, 2005). Greenhouses are provided with a small warehouse were the tanks, pipes and injectors are placed.

Figure 7. Pictures of a tomato greenhouse in Almería.

Because of the Almerian climate conditions, cooling is the most important management aspect and heating is scarcely used in the greenhouses. The climate management is mainly controlled by the use of lateral vents and air fogging. Whitewashing is a common practice used to limit the temperature in high radiation periods. Carbon dioxide (CO_2) enrichment is scarcely used.

Integrated Pest Management (IPM) is a common practice in tomatoes crop management. Soil solarization, grafting on resistant rootstock, biological control, double doors, insect-proof nets or the use of bees are widespread techniques used in the Almerian tomato production sector.

C. Processors

In Almería, most of the growers are members of a co-operative. As individuals, growers are unable to effectively market their relatively small volumes of produce, but by combining resources, particularly packing and marketing resources, small businesses are able to gain better leverage with buyers (Heuvelink, 2005).

The advantages of growers forming groups are not limited to the economic benefits of increasing leverage with buyers. Information exchange and market development are two of the key windfalls of grower co-operation. Market development benefits everyone involved in the industry. By working together, growers are able to minimise competition with each other for part of a limited market and instead expand the market for the benefit of everyone (Heuvelink, 2005).

The tomatoes in Almería are traded by means of two different distribution systems: auctions and destination commercializing companies. The auctions are normally called limited societies (SL) and the destination commercializing companies are mainly Agrarian Transformation Societies (SAT) and Cooperatives (SCA) that are an expression of the social economic concept, where companies do not have a direct profitability interest. Each system represents about 50% of the total of the local production-export of fruit and vegetables (de Pablo, Pérez and Lévy, 2008).

The tomato commercializing sector is characterized by heterogeneous companies with different sizes: big cooperatives that work like auctions, limited societies (auctions) and other social economic companies that sell directly abroad (de Pablo, Pérez and Lévy, 2008).

The tomato marketing channels is connected by means of an autochthonous model consisting in two models which compete and complement each other. There is an initial phase of sale at origin by auction and a later phase of direct sales to consumers markets via the growers own marketing groups (SAT and SCA) (Aznar and Galdeano, 2011).

D. Wholesalers, retailers and markets

There is a concentration of retailers (mainly supermarkets); few supermarkets have a high power in the chain. Groups like Carrefour, Metro, Ahold, Aldi and Rewe control the retail sales to the consumer in EU both indirectly, by controlling the fruit and vegetable offerings, and directly, by imposing their rules (standards) of production and packaging (Valenciano, Pérez and Lévy, 2008).

The challenge to supply seasonal, perishable products of high quality year-round has favoured international trade (Castilla, Hernández, and Abou-Hadid, 2002). In the Almería tomato chain both domestic and export market focus production coexist, in different degrees of importance, prevailing the export market. High quality tomatoes are traded in international markets and second quality tomatoes are commonly traded in the domestic market. In season 2010/11, the 62% of the tomatoes produced were traded in international markets and the 38% were traded in the domestic one (CAP, 2011).

Almería exported 1.565.972 tonnes of vegetables with a value of 1.398,56 millions of euro in season 2010/2011 (CAP, 2011) in which tomatoes increased a 6% and 5% in terms of volume and value comparing to previous seasons.

The 95 % of the Almería tomato is marketed in the EU and the 5% in USA and Canada. The 70% of the commercialized tomatoes are exported to Germany, France, the Netherlands and the United Kingdom which represents the most important buyers of the Almerian tomatoes. Other tomatoes importers are Italy, Poland, Portugal, Sweeden, Czech Republic, Belgium and Denmark. The evolution in tomato export in terms of volume and value are shown in Table 4.

Table 4. Volume and value of tomato exports

Season	***2007/08***	***2008/09***	***2009/10***	***2010/11***
Volume (tonnes)	473.216	403.441	395.864	451.348
Value (million €)	396,072	378,822	408,115	412,104

Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*

The United Kingdom has the most stable demand during the season followed by France. The Netherlands import tomatoes in winter when the country has very little production and Germany buys tomatoes between weeks 36 and 46 and weeks 18 to 34 (de Pablo and Pérez, 2004a).

According to my key informants, few wholesaler supplies supermarkets because they know what the market demands. Wholesalers look for the qualities and varieties requested by their customers. Sometimes, wholesalers work with local agents who are specialist in the product and the buying area.

According to the Produce Chain Manager of a seed company, there are two marketing channels: discount and non-discount channel.

Price is the most important factor to consider in the discount channel. Companies compete in price and they do not mind to reduce the quality if they can reduce price. They use big packages to package the product in bulk in order to reduce the cost and offer a cheap product.

In the non-discount channel, there is equilibrium between price and quality, however it depends on the market. In one hand, there are supermarkets that only offer the best variety of each tomato so they have close contacts with the distribution centres in order to maintain a stable supply of products and price during the season. The product presentation and packaging plays an important role for these supermarkets. On the other hand, there are less demanding supermarkets, that offer minimum quality for a competitive price. They do not ask for any special variety but they request a minimum quality in terms of colour, size, sugar content or hardness. They ask for bulk tomatoes and tomatoes packaged in individual packaging.

E. Consumers

Consumers' expectations towards tomato depend on the consumer country. Sweet and acid tastes, tomato flavour intensity, and firmness are the most important traits for improving tomato fruit quality (Causse et al, 2010). Moreover, diversification of taste and texture is required to satisfy all consumers' expectations as some consumers prefer firm tomatoes while other prefer melting ones. The consumers' demand is more or less aimed in terms of sweetness and flavour intensity.

Regarding intrinsic attributes, consumer's preferences or expectations are the following:

- *Safety*: Tomatoes should be clean, this means, free of diseases, pesticides (or at least the level must be under LMR), and physical elements.

- *Sensory*: Northern European consumer prefers big tomatoes (size GG or G), medium-intense red colour, flat round, outstanding firmness, and absence of visual defect. Also they want tasty, juiciness and aromatic tomatoes.

- *Shelf life*: long shelf life to store tomato long time in their fridges.

According to intrinsic attributes, Northern European consumer's expectations are nowadays changing to an organic trend, consumers prefer buying organic tomatoes.

A part from the absence of pesticides tomatoes should fulfil the following expectations:

- *Absence of visual defects*: customers are demanding safety and healthy product, so if tomatoes present scratches, rotten parts, dirtiness, etc. customer would reject them immediately.

- *Colour*: uniformity in colour such as intensity makes the tomato more attractive.

- *Firmness*: if a tomato is soft it seems that it not fresh or even its self-life is finishing. As this tomato has a long life, it should be hard when the consumer buy it.

- *Taste*: Nowadays tomatoes are mainly composed by water so it means that they are not tasty. Consumers want to buy tomatoes with a proper sugar-acid ratio, low pH values (below 4.4) and sugar contents over 4-4.5% are required for good tomato taste and flavour.

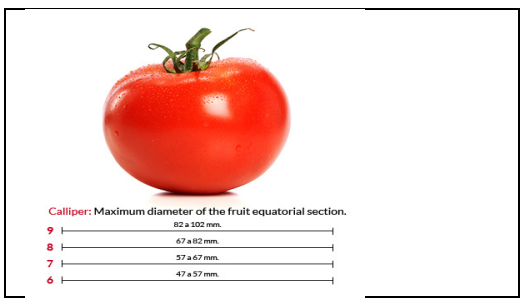
Tomato standards

The tomato qualitative parameters are the following:

- Classification (according to Codex Alimentarius):
  - Category I: Good quality. Exempt from apparent green back. Light faults in shape, development, epidermal colouring and surface may be shown.
  - Category II: Good quality. Exempt from apparent green back. Light faults in shape, development, epidermal colouring and surface may be shown.
  - Homogenity: Fruits will come from the same origin, quality, variety and calliper in each bulk. The visible part of the content should be representative of the group.
    In Category I: homogeneity in colour and ripeness.

- Calliper scale:

  - Size GG: more than 82mm
  - Size G: from 67 to 82mm
  - Size M: from 57 to 67 mm
  - Size MM: from 47 to 57 mm



4.1.3. Chain supporters

The Almerian tomato chain supporters are the following:

- The Association of Harvesters and Exporters of Fruit and Vegetables of Almería (COEXPHAL). It has 110 companies as members and it represents 70% of the Almería horticultural production and 75% of exports.

- The Growers Association of Almería (ECOHAL). It includes 6 limited liability companies (auctions) with large marketing volume. It represents about 20% of the production and 15% of the total Almería exports.

- UPA, ASAJA and COAG: National farmers associations.

- The Foundation for Auxiliary Technologies for Agriculture (TECNOVA). It includes 116 companies with services related to agriculture.

- JUNTA DE ANDALUCÍA. Public Administration. Since 1986, Spain has become a member of the EU and the Common Agricultural Policy and the Common Market Organization for Fruit and Vegetables represent important legislative frameworks in which the Almería sector has operated. It has implemented these institutional mechanisms to help farmers and processors to improve the factors available to them by providing funds for investing in production technology improvements, training, services and infrastructure. It has also contributed to creating a suitable environment for firms to achieve competitive advantages.
  Moreover, Junta de Andalucía controls and regulates the product safety, phytosanitary practices or environmental protection.

- Research and development centres

  - Research Institute and Agrarian and Fishing Training Centre (IFAPA): Public research centre belonging to Junta de Andalucía. It also trains farmers and agronomist in new technologies, crop management or pest and disease management.
  - "LAS PALMERILLAS": Research centre. It is a foundation belonging to the credit cooperative "Cajamar". It researches about new horticulture technologies and crop management.

4.1.4. Chain influencers

A. Transport

Land transport accounts for almost 100% of the flow of fruit and vegetables from Almería. There are an average of 85.785 lorries per year departing from Almería with exports for EU destinations (Pérez, Galeano and Aznar, 2012). Transport costs can be the 20%-30% of the total cost of an international transaction. Besides this, most of the time the trucks return empty which represents an extra cost of transport.

B. Advisor

There are many advisor companies that offer training and advices to farmers in terms of crop management. Distribution centres also have a team of agronomists who give advise to farmers and monitor the crops in fertigation, pest and diseases control, pruning or harvesting.

C. Financial sector

There is a wide range of financial institutions which facilitate the access to financing thanks to a well-developed capital markets (Aznar and Galdeano, 2011). The most important credit cooperative is Cajamar. It has its origin in Almería and it is directly involved in the emerge and expansion of the horticultural sector by providing credit and research with its research centre 'Las Palmerillas'.

4.1.5. Power in the chain. Information flow

The Almerian tomato chain is a market driven and production oriented chain. Supermarkets have a continuous contact with the consumer needs and demands so they have the power in the chain in which the information about the consumers needs is provided by an intermediary client. Furthermore, the sail chain is so long that it is almost impossible to reach the final client and to know firsthand what their habits and demand are. Distribution companies are in charge of gathering this information and providing this to producers.

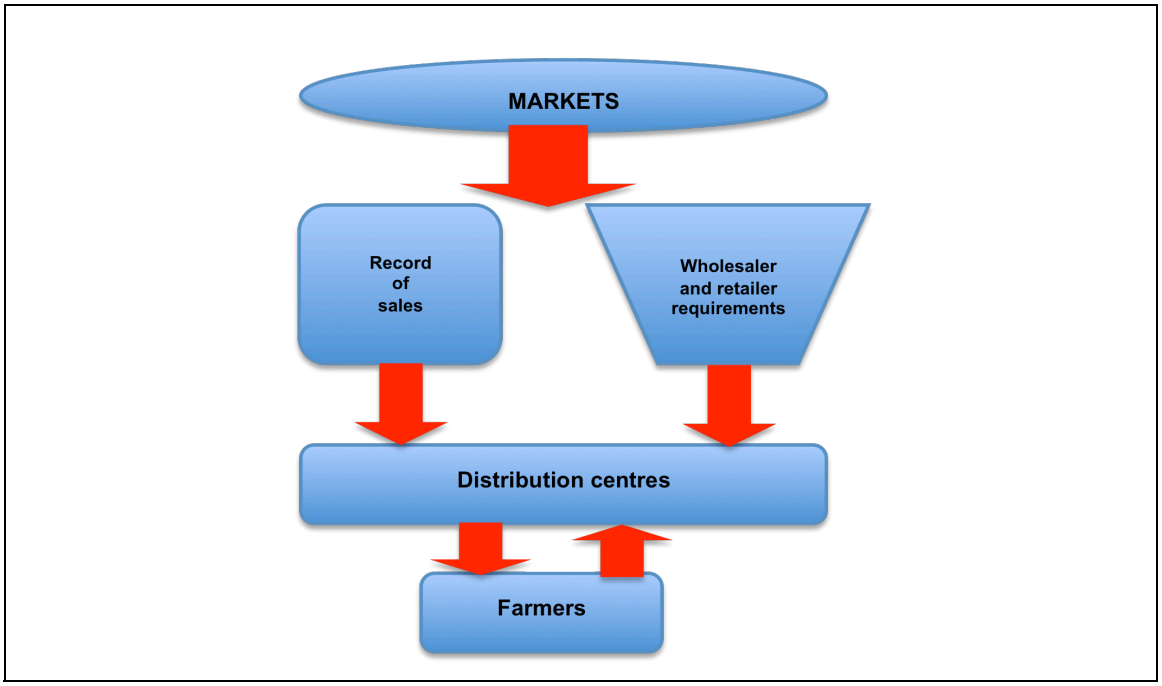


Figure 8. Information flow in the chain

The consumer order decoupling point (CODP) in this tomato chain is make-to-stock in the processing companies.

4.1.6. Market trends

According to the Produce Chain Manager of a seed company, customer demand more traditional and tasty tomatoes combined with the increase in shelf life in order to fulfil the exporting times. There is also an important trend in some Cherry tomatoes specialities marketed as healthy individual snacks to substitute the traditional snacks. Besides this, according to the agronomist of a distribution centre, there is an increase

in the demand of plumb tomatoes. Finally, according to the manager of a distribution centre, the taste and new packaging are the most important trends of the markets.

In addition, there is an increase in the demand of healthy food, safety tomatoes and organic products. Moreover, easy to cook and pre-prepared food or ready-to-eat meals are the one of the most demanding food.

4.2. CHAIN ANALYSIS

The chain is assessed using three tools, PEST analysis, Porter's Diamond and Porter five forces.

PEST analysis stands for the Political, Economical, Social and Technological aspects of the sector. It gives an overview of the sector and analyses the current situation of the chain.

Porter's Diamond analyses the competitiveness of the Almeria tomato chain and investigates the competitive advantages of the sector against its two main competitors, Morocco and The Netherlands.

The Porter five forces analysis identifies the forces that affect the level of competition (threat of entry of new competitors and substitutes, the bargaining power of buyers and suppliers and the rivalry between existing competitors). This analysis determines the long-term profitability of the sector.

4.2.1. PEST ANALYSIS

PEST analysis tool is used to analyse the external factors of the Almería's tomato chain. The Pest model covers the Political, Economical, Social and Technological general important aspects of the sector. The pest model is applied to analyse the present situation of the sector.

Political

The Almeria's tomato chain has to deal with the EU policy and CAP (Common Agricultural Policy) regulations. The EU supports the fruit and vegetable sector though its market-management scheme (element of the "common organisation of agricultural markets"), which has four broad goals (*http://ec.europa.eu/agriculture/fruit-and-vegetables/index_en.htm*): a more competitive and market-oriented sector, fewer crisis-related fluctuations in producers' income, greater consumption of fruit and vegetables in the EU and increased use of eco-friendly cultivation and production techniques.

On February 2012, the agreement between Morocco and the UE allows an increase in certain quotas for zero or low duty imports. It immediately reduces or removes 55% of tariffs on Morocco agricultural and fisheries products (up from 33%) and 70% of tariffs on EU agricultural and fisheries products within 10 years (rising from 1%). This agreement includes safeguards, for example by allowing only moderate increases to quotas of certain products, such as tomatoes, strawberries, cucumbers and garlic. The deal also provides for seasonal quotas to counter distortion of the EU market and says Moroccan imports should meet European sanitary standards. However, it represents a step towards a more extensive free trade agreement. This agreement has a direct

impact on the Almeria's tomato sector because Morocco produce similar products in the same markets and at the same time Almería does.

New European Community directives restrict the use of synthetic agrochemicals, protecting the environment and preserving food safety and human health. With the support of the public administration "Junta de Andalucía", the sector promoted controlled production, chosen to fit their production and trading systems, to comply with the new European standards. As a result, tomato growers have now adopted various certifications such as AENOR, GLOBALGAP, Integrated Production and Ecological Production, BRC, thus offering consumers a safer fruit of higher quality.

Economical

The marketing system for tomatoes in Almeria is atomized and very heterogeneous. There are many distribution centres which offer similar products to the same markets. The most important tomato importers in terms of volume are Germany, France, United Kingdom and the Netherlands. All of them have different requirements.

Almería transport almost the 100% of the tomatoes by truck. This mean of transport increases the cost of the tomatoes. Most of the trucks load in two or three companies to fill completely the trailer which increases the time of delivery. Moreover, when the cargo is delivered to the final customer, the truck return empty to origin, which increases the transport costs, thus, there is a poor logistic management.

There is a high competition with other producers such as Morocco or The Netherlands. Morocco competes with the Almería tomatoes in price and markets and The Netherlands competes in terms of markets and quality of products by looking at consumers and retail requirements.

The price is not a decisive variable in the offer-demand relationship. Almeria always exports the same percentage of its production. There is not a regulation for the export market when there is an excess of production and this situation provokes instability in the export market. This situation impedes any possible sector level joint action and in order to maintain the position in the tomato market the concentration of the offer at origin is the most important issue to consider.

Social

The Almería tomato sector is characterized by a strong association system. Farmers are part of a cooperative or a Producer Organization.

The immigrant labour is common in producing and processing. Immigrants, mainly coming from Africa, work in greenhouses. They work for fix salaries linked to production (about 36 €/day) and they are specialized in the job they carry out. They are also part of the processing companies, women are in charge of the sorting, grading and packaging while men use the forklift to transport them within the processing facilities.

Growing vegetables in greenhouses is one of the traditional employments in the rural areas. Farmers are low educated people, though new generations have a strong knowledge about the sector and crop management.

The Public Administration encourages young people and women to start with the farming business by offering them subsidies. It also has offered free training courses in order to prepare them for the business.

The sector is becoming concerned with the environment by reducing the use of synthetic agrochemicals in the last years. Controlled production, Integrated Production, Ecological Production and Biological control has become common in the crop management. Society is also becoming increasingly concerned with the environment and there is a general trend for reducing the use of energy, pesticides, chemicals and waste emerged. Nowadays, in the Almeria area, over 95 % of the greenhouse plastic cover residues are recycled. The lower energy inputs of simple climate control methods in Almerian greenhouses, for example whitewashing as compared with mechanical ventilation, contribute to reduce their environmental impact.

Technological

The presence of the most important suppliers companies provides the sector with all new technological innovations. Farmers and processors are willing to use new technologies, however the financial crisis jointly with the high production costs linked to a reduction in prices reduces stakeholders' incomes and consequently the investment in new technologies.

Sometimes, research activities are not liked to technological developments; there are no effective extension services. The extension services focus their research in crop management and pest and diseases control instead of developing new technologies.

Despite greenhouses have irrigation systems, insect-proof nets or soilless media, the low level of technology limits the potential yield, production quality and the timing of production. Nevertheless, there is a widespread of technical advise, agronomists visit the greenhouses to give advises to farmers in crop management or pest and disease control.

4.2.2. ANALYSIS OF COMPETITIVENESS

The analysis of the Almerian tomato chain is assessed by the Porter's Diamond tool. As the model focuses on competitiveness, it is used to seek out the competitive advantages of the tomato sector in Almería in the medium long term. There are four determinants that Porter distinguishes of competitive advantage: factor conditions, demand conditions, related and supporting industries and firm strategy, structure and rivalry.

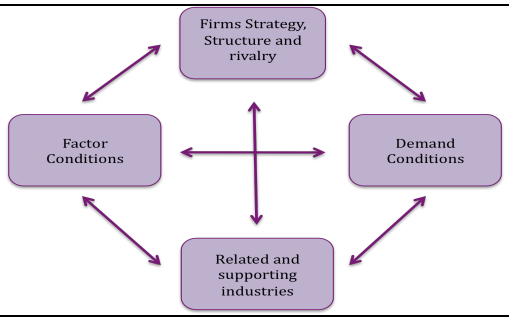


Figure 9. The Porter's diamond of competitive forces

The competitiveness of the Almeria tomato chain is compared with its two main competitors, Morocco and The Netherlands.

4.2.2.1. Almería tomato chain

Factor conditions

The natural, institutional, social and technological factors of Almería provide advantages for producing and commercializing tomatoes.

Climate conditions, physical environment and natural resources are optimal for the development of the intensive horticulture under plastic greenhouses. Beside this, these natural conditions are suitable for producing tomatoes out of season, which gives growers a competitive advantage over its competitors. It is important to highlight that this is not an advantage against, Morocco, as it produces tomatoes at the same time as Almería.

The proximity to the European markets facilitates the prompt arrival of the products to the destination markets. The high concentration of suppliers, producers and processors increases competitiveness, efficiency, specialization and flow of information.

Regarding human resources, plots are fewer than 2 has and they are family-run farms. There was a transition of workers in the greenhouses from family labour to a high percentage of hired labour. Nowadays, immigrants (mainly Africans) are the common workers in greenhouses. In general, workers of greenhouse have a low level of education, however new generations of farmers are highly qualified. The poor management of the incorporation of immigrant labour has been overcome by making the job more attractive by providing job stability. Besides this, there are many qualified and specialized labour such as agricultural engineers, marketing experts and advisers.

Because farms are family-run business, growers are highly involved in crop management as well as workers as they have job stability. The cost of labour has been maintained low thanks to the immigrants because they kept the salaries low. However, the labour cost is much higher than in Morocco. The average agricultural wage in Morocco is 6 € per day, while in Almería is 36 € per day (de Pablo and Pérez, 2004a).

The road infrastructure is suitable to overland access to the European markets. The existence of a port and the necessary facilities to transport vegetables by sea transport is an interesting alternative to road transport.

The access to finance is easy and cheap because there are plenty of financial institutions, however with the current economical crisis, the access to finance has become a difficult issue.

Home demand conditions

The distribution centres (destination commercializing companies and auctions) sell their products to national and international markets. The national market is well organized and there is a high demand. In spite of this, the Almería tomato production is exported oriented. Foreign markets have a high impact on the innovation and product requirement, as supermarkets know which are the customers' needs and have the power in the chain.

Related and supporting industries

As it was described in chapter two, there is a well-developed cluster of local, national and international suppliers in Almeria. The world leaders industries of each sector are present in the area. This supporting industries include plastics, irrigation and fertigation

systems, seeds, packaging, fertilizers, agrochemicals, biological control or services such as handling and marketing, transport, financial or agronomic counselling. They offer low price inputs and efficiency service in repairing, solving problems and products delivery which lead to a trusty and transparent relationship between producers and processors.

The presence of many advisor companies that offer training and advices to farmers and the existence of these supporting industries give an internationally competitive advantage to the sector.

Firm Strategy, structure and rivalry

The tomato sector is stable. Most of the producers are family-run business, so the commitment and involvement in the activity is very high. Producers are willing to gain know-how in order to produce better products to get higher incomes.

The presence of many distribution companies with an intensive rivalry among them encourages competitiveness and innovation of sector. Hearing through word of mouth and close relationships between actors helps to the introduction of new technologies and varieties, product innovations or new crop techniques.

However, these local marketing companies limit themselves to adopting an innovation if they have to change the methods they were using. Companies find hard to innovate and changes in the product take long time. Moreover, these companies do not carry out marketing studies or marketing campaigns; there is no attempt to approach consumers directly. They interpret what consumers' want by the information provided by an intermediary client. Therefore, there is a lack of initiative in the marketing companies.

Since Spain became a member of the EU in 1986, the sector has received funds to improve. The Public administration has helped the sector to improve in terms of training, new technologies and infrastructures in order enhance the sector competitiveness. Nevertheless, new EU norms regarding food safety, environmental protection or phytosanitary practices have encouraged firms to work in quality and product safety.

4.2.2.2. Morocco tomato chain

The 70% of the vegetables produced and exported in Morocco are tomatoes (Aznar, 2004) and the target markets are the same (mainly France). Therefore, Morocco is one of the most important competitors of Almería. This section analyses the competitiveness of the Moroccan tomatoes against the Almerian.

Factor conditions

The climate conditions are optimal for the production of tomatoes under plastic greenhouses and producing tomatoes out of season as Almería does. The production season is similar to Almería, from November to April.
There are two types of producers, small and big producers. Small producers have a plots of less than 5 has who sell their tomatoes to distribution centres. Big farmers produce and process tomatoes in their high-tech facilities.

The salaries in Morocco are about 6 €/day, six times lower than in Almería. Despite, there is a lack in work methodology, some employees are demanding better work

conditions and things are changing to a better labour control. In addition, people are poorly educated and they mostly have family problems.

Politically, Morocco is characterized by troublesome local governments. There are many administrative difficulties, legal and personal insecurity and no clear economical regulations. However, some preferential agreements with the EU offer to Morocco political stability and the chance of trading their tomatoes to the EU countries with less restrictive conditions.

Technologically speaking, only big firms are technologically developed, thus the technological level is highly variable. Big firms have modern machinery, are automated and have quality assured certifications, however small companies only have simple processing lines and the sorting, grading and packaging is done manually.

Home demand conditions

Morocco is an export tomato country. The EU Agrarian Policy forces Morocco to grow tomatoes the first months of the growing season, from October to February, (de Pablo and Pérez, 2004b) which exactly coincide with the Almerían production (see Table 5). The competition between Almería and Morocco is very intensive because their production season is similar, their target markets are the same, their technologies and varieties are similar and they also adapt their production to the demand as Almería does. Moreover, new European regulations have increased the quota of tomatoes traded in the EU .

Table 5. Entrance of Moroccan tomatoes to the EU

Season	*2006-2007*	*2007-2008*	*2008-2009*	*2009-2010*
From September to May	257.801	285.015	355.550	283.082
Total	264.274	292.843	367.717	283.082

Source: *Hortyfruta (www.Hortyfruta.es)*

Approximately the 60% of the tomatoes are traded in local markets. The tomatoes traded in local markets are the ones that do not fulfil the exporting requirements, they are not profitable exporting tomatoes or they are tomatoes smallholder farmers.

Local tomatoes are sold in the farm, in the processing companies, in local market or even small shops. The prices are variable; they depend on the exporting markets. If there is shortage of product, the price increases even it is higher than the exporting price but when the exporting season finishes the prices are very low.

Local markets do not have impact on innovation and product development; they are affected by the external markets.

The local market is characterized by a complex distribution with numerous middlemen who do not give important added value to the product but increase the price of the tomatoes. The tomatoes commercialized in local markets are not sorted and graded and they are poorly packaged (Aznar, 2004).

Related and supporting industries

The supporting industries are concentrated in the most important production area in Morocco, Agadir, where they supply all the needed inputs to the sector. There are fertilizer companies, packaging companies or logistic firms. These companies are foreign firms that have developed the tomato sector very efficiently.

Firm Strategy, structure and rivalry

The Ministry of agriculture in Morocco has projected a strategy focused in agriculture development in order to modernize the sector, develop the society and territory and improve the sustainable management of the natural resources.

The sector is characterized by:

- Low private inversion
- Insufficient training and innovation
- Big economical differences between actors
- Difficulties in the access to land
- Lack of water
- Low cost of labour
- Proximity to the target markets
- Competitive prices

The big advantage is the competitiveness of the tomatoes they produce and the disadvantage is the social and cultural issues of the population. It is very hard for local people, mainly individuals, to start with the agricultural business because of their culture and society structure.

4.2.2.3. The Netherlands tomato chain

Factor conditions

The Nederlands have high-tech and sophisticated glasshouses where computerization, soilless media and high productivity are the norm.

Despite the climate conditions in the Netherlands with poor light and low temperature in winter are not the optimal to grow vegetables, the high level of technology combined with adequate management strategies enabled profitable production systems. The average tomato yields in a high-light area (Almeria, Spain) are lower than in The Netherlands even though light intensity on a daily basis averages five times higher in Spain in the winter and 60% more on an annual basis (Heuvelink, 2005) compared with The Netherlands. These disadvantages have been overcome thanks to the sophisticated structures with high technological and energy inputs. However the cost of production, energy as well as labour increase the producing costs because they are high.

Technologically, the Dutch are the world leaders in research and development (R & D). They are very quick to adapt and innovate as any needs demand to improve their efficiency and effectiveness in production, for example, the productivity of tomatoes in a Dutch greenhouse is three times the Spanish. This rapid innovation capacity keeps Dutch producers competitive.

Most Dutch large greenhouses have automated packing lines. Greenhouse tomatoes are generally stored few days until they are marketed. The temperature and humidity is maintained at 10–13°C and 90–95% respectively (Heuvelink, 2005).

Dutch producers are associated in organizations of growers that are small groups of growers with the same specific crop and in the same area (Cantliffe and Vansickle, 2003) that meet to discuss matters related to production. Dutch agro sector is well integrated in the chain in order to improve competitiveness.

The Netherlands has become one of the main vegetables producing areas thanks to its strong commercial capacity.

Home demand conditions

The Dutch greenhouse tomato sector is export-oriented. The large majority of domestic production is destined for exporting; only the 13% of the vegetables are marketed in the local market (Bunte, 2009). The volume exported widely exceeds the volume traded in the local market. The Netherlands is also a re-expedition country, it means that it buys tomatoes from other countries and exports them to other markets.

Tomatoes are mainly traded in the five largest Dutch supermarkets. Greengrocers have almost disappeared against the gradual concentration of retailers.

More than 90 percent of the consumed vegetables are locally grown. At the moment the Dutch wholesalers are still nationally based (Wijnands, 2003). These wholesalers provide the part of the total assortment when there is a deficit at local production.

Related and supporting industries

The outstanding image of the Dutch greenhouse industry depends on the well-developed supporting industry (Wijnands, 2003). Most of the internationally operating plant and seed breeders have a Dutch origin. There is a well-developed cluster of suppliers around the horticulture sector in the Netherlands. The world leaders industries of each sector are present and offer all the inputs and services to the sector. Dutch companies are exporting greenhouse constructions and equipment all over the world however the Dutch market for greenhouse technology is not large enough (Wijnands, 2003) so they have to export their technology to other areas

The presence of many advisor companies that offer training and advices to farmers and the existence of these supporting industries give an internationally competitive advantage to the sector.

Firm Strategy, structure and rivalry

Dutch growers of tomatoes, sweet peppers and cucumbers enjoy a strong competitive position on the European market (Wijnands, 2003). The decreasing time for food preparation, because of relatively high labour participation of Dutch women increase the purchase of easy to cook, pre-prepared food or ready-to-eat meals. In addition consumers increasingly demand healthy food, safety tomatoes and organic products.

4.2.3. CHAIN PROFITABILITY

The five forces analysis is a technique for identifying the forces which affect the level of competition. Michael Porter explains that there are five forces that determine firm's business attractiveness and its long-run profitability. These five "competitive forces" are (see Figure 8):

- The threat of entry of new competitors (new entrants).
- The threat of substitutes.
- The bargaining power of buyers.
- The bargaining power of suppliers.
- The degree of rivalry between existing competitors.

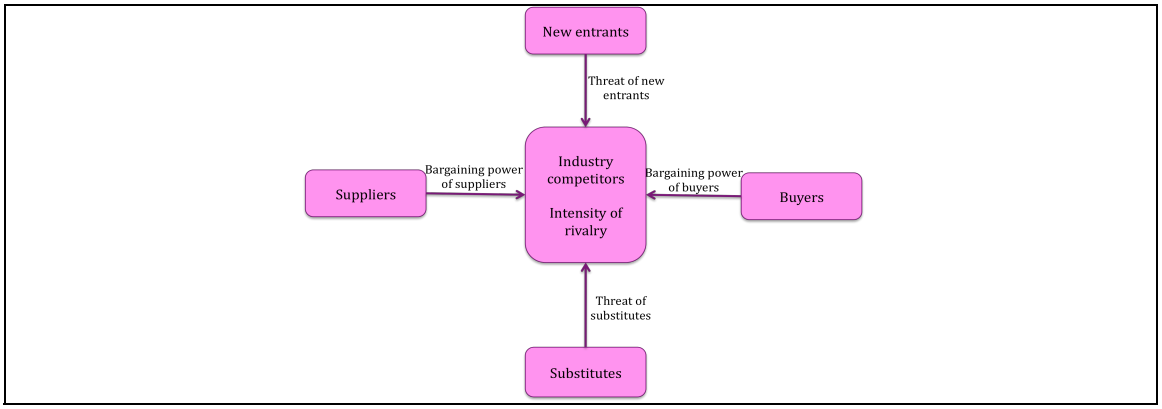


Figure 10. Five forces analysis

A. Threat of new entrants

The threat of new entrants can reduce the business attractiveness.

As it is shown in Table 6, the countries that export more tomatoes within the EU are Spain and The Netherlands and the non-EU countries are Egypt, Turkey and Morocco. However, the most important competitor within the EU is The Netherlands in terms of volume and Morocco in terms of volume and markets. Morocco exports less tomato than Egypt or Turkey but they produce tomatoes at the same as Almería and commercialize their products in the same markets (mainly France). Besides this, the EU has increased the quota of exported tomatoes to the EU, which means that the volumes of exported tomatoes will increase in the following years.

Table 6. Countries that export tomatoes to the EU in 2007

EU Countries	**Volume (Tm)**
Spain	883.326
Netherlands	848.141
Belgium	203.184
France	169.871
Italy	109.557
Portugal	101.859
Poland	81.786
Germany	39.918
Non-EU Countries	**Volume (Tm)**
Egypt	701.710
Turkey	370.613
Morocco	297.593
Israel	26.913
Source: Eurostat, 2007	

This analysis is focused in Morocco as it is the most important new entrant. The Netherland and Spain competes since Almería started marketing vegetables so I do not consider it as a new entrant.

Non-EU countries have barriers to export their product to the EU. They have a limit in the amount of exported tomatoes (quota), however this quota has been increased in 2012 thanks to a new agreement between Morocco and EU. There are some commercial agreements between the EU and Turkey, and EU and Egypt in order to

control the amount of tomatoes exported to the EU. Thus, although non-EU countries have barriers in terms of volume they have been increased because of increase in quota or preferential agreements.

The EU is a highly demanding market. Exporters need to produce a high quality tomato certified by quality standards such as Global-GAP. In Agadir (Morocco), only big firms produce tomatoes under Global-GAP, however small firms are trying to apply in order to have access to these markets.

Morocco produces and trades their products from November to April as Almería does. Besides this, big firms in Morocco sell their products to wholesales or supermarkets mainly in France (96%). Therefore, the entrance of tomatoes from Morocco threats the marketing of the Almerían tomatoes mainly in French markets.

Moreover, the way Moroccan exporting companies trade their tomatoes is quite similar to the Almerian. They have many brands and they use them according to the product and the market. They long life tomato is the main tomato commercialized and they transport their product by truck as Almeria does.

B. Threat of substitutes

Substitutes can lower business attractiveness and profitability. There are many types of tomatoes. Long life tomato is the main product commercialized but other types o tomatoes such as cluster, plumb or green tomatoes are increasing year on year.

Markets are looking for more tasty tomatoes and new presentations (packaging), therefore, buyers are willing to buy these kind of tomatoes. Price is considered an important factor in substitutes, however, more demanding markets are willing to pay more if the product has a high quality and cover their requirements.

C. Bargaining power of suppliers

As it was mentioned in the Porter's Diamond analysis, there is a wide range of supplying companies in Almería. There is no bargaining power among suppliers because of the strong competitiveness between the companies. They offer good products, competitive prices and efficient services. The relationship between suppliers and producers and processor is based on confidence and trust.

D. Bargaining power of buyers

The Almería tomato chain is characterized by the existence of few buyers and many sellers. There are few big supermarkets that control the retail sales and many distribution centres that offer similar tomatoes.

The Almerian tomato sector is characterized by:

- Low concentration of the offer (atomization of distribution centres). There are many distribution centres offering the same product to the same market.
- Commercialization of a standardized tomato. There is a low product innovation.
- The existence of few powerful supermarkets that control the retail sales by controlling the tomato offerings and by imposing their requirements in terms of quality and packaging.

Therefore, supermarkets dominate the sector and have higher bargaining power. Distribution centres have little power against them.

E. Intensity of rivalry

As it was mentioned before, in general, Almería produces a standardized tomato. There is little degree of differentiation; therefore firms have greater rivalry against competitors. Competitors such as Morocco, produce similar tomato and directly competes with the Almeria's one.
The Almería tomato companies have to focus their production on differentiation in order to give added value to their products and be more competitive.

4.2.4. LOGISTIC ANALYSIS

The packaging material, transportation systems and transport times are analyzed in this chapter in order to find out which are the leverage points in the logistic of Almería tomato.

Packaging

The packaging material and type of package used depends on the type of tomato and the market (customer requirements). Besides this, distribution centres use several brands (average of three) in order to discriminate the tomatoes in quality and customer. Tomatoes are packaged in open or closed fruit plastic, cardboard or wooden crates, depending on the final customer, for instance, supermarkets prefer returnable plastic boxes such us IFCO (see photo 2).

In the last years, the packaging of the tomatoes has changed into a more sophisticated and attractive ones in order to give added value to the product, however these efforts are not enough. It is common the use of controlled atmosphere and modified atmosphere packing that reduce tomato deterioration. They are flow pack, cardboard or plastic trays, plastic basket, omni-pack or net bags (photo 7, 8 and 9). Innovation in packaging and presentation gives added value to the tomatoes and makes them more attractive. It is also a way of differentiate the Almeria's tomatoes from the competitors and get higher prices

		
Photo 1	Photo 2	Photo 3
		
Photo 4	Photo 5	Photo 6

		
Photo 7	Photo 8	Photo 9

Figure 11. Packaging material used in tomatoes

The number of crates in the pallets depends on the type of box used. The pallets are assured with corners, stripes and most of them are covered with cardboard covers (photo 4 and 6).

Every crate and pallet is identified with a label that provides information about the type of tomato, weight, class and brand. A bar code is used in order to manage traceability.

Transportation system

Land transport accounts almost 100% of the flow of fruits and vegetables from Almería. Tomatoes are perishable commodities with low shelf life specially cluster tomatoes. It means that the time since the product is harvest until it is available to consumers must be as short as possible, that's why the road transport is the most common transportation system used in Almería.

The transit time is about one, two or three days depending on the final destination market. Tomatoes are transported in refrigerated trucks. The palletized tomatoes are loaded precooled in the distribution centres in a controlled temperature. Most of the time, the shipments are only composed by tomatoes but sometimes they are mixed with other horticultural products. In addition, the trucks load in different companies that increase the loading time and the damage risk. The tomatoes are loaded precooled and the temperature of the truck is set at +8ºC and the Relative Humidity at 80-85% in order to reduce damages.

There is a poor logistic management in the Almería tomato chain. Small transportation companies mainly carry out the transport. Most of the time, the trucks returns empty, which increases the transport costs.

4.2.5. TOMATO COSTS ANALYSIS

In this section, the average costs of producing tomatoes in long crops (eleven months long) are presented. It is organized into three subsections: producing costs, processing costs and transport costs.

Finally, the value share within the chain is analyzed.

A. Producing costs

The producing costs include the crop inputs (seeds, fertilizers, pesticides, water and energy), labour, structure of the greenhouse (considering the soil, irrigation system and other elements), repayment and general costs (insurance, consultancy or taxes).
The producing costs presented consider the high roof slope structure and the long life tomato, as they are the most common structure and type of tomato produced. The costs are calculated in euro per square metre.

Table 7. Tomato producing costs

Direct costs		Cost (€/m^2)
Inputs		
	Seeds and nursery	0,43
	Fertilizers	0,66
	Pesticides	0,25
	Water and energy	0,40
Labour		2,64
Indirect costs of a high roof slope structure		
Soil, irrigation system and other elements		0,41
Repayment		0,52
General costs		
Insurance, consultancy, taxes,…		0,24
TOTAL PRODUCING COSTS		**5,55 €/m^2**

Source: *CAP, 2010*

Therefore, the cost of producing long life tomatoes in a greenhouse with a high roof slope structure is 5,55 €/m^2. Considering that the productivity of a tomato crop is 12 Kg/m^2, the cost of producing 1 Kg of long life tomato is 0,4625 €.

(5,55 €/m^2) / (12 Kg/m^2) = 0,4625 €/Kg

B. Processing costs

It is considered as processing costs the cost of the distribution centres in sorting, grading, packaging and storing the tomatoes. They include the cost of labour, marketing and inputs (packaging material, labeling and energy). According to CAP, 2010 these costs are 0,38 €/Kg.

C. Transport costs

Almost 100% of the traded tomatoes are transported by land transport (trucks). According to Pérez and Galdeano, 2011, the average cost of transporting one kilo of tomatoes from Almería-Port Vendres-Perpignan-Almeria in a trailer of 20.000Kg is 0,1280 €/Kg.

D. Price value share

The price of a standard tomato in producing, processing, wholesaling and retailing is presented in Table 8.

Table 8. Tomato price in season 2009/2010			
Processor price (€/Kg)	Producer price (€/Kg)	Wholesaling price (€/Kg)	Retailer price (€/Kg)
0,56	0,94	1,12	1,61
Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*			

As it can be seen in Figure 12, the total gross margin in the standard tomato chain is 188% from the producer to the supermarket. The percentage of gross margin and the prices got by stakeholders are presented in the following Figures.

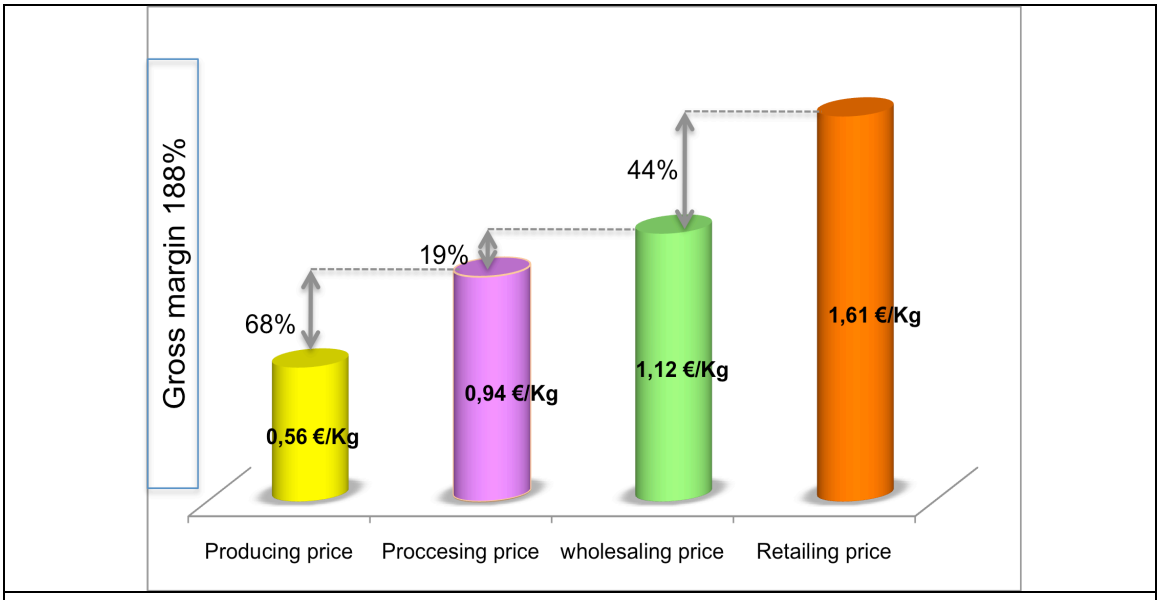


Figure 12. Gross margin in the Almeria's tomato chain in season 2009/2010

Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*

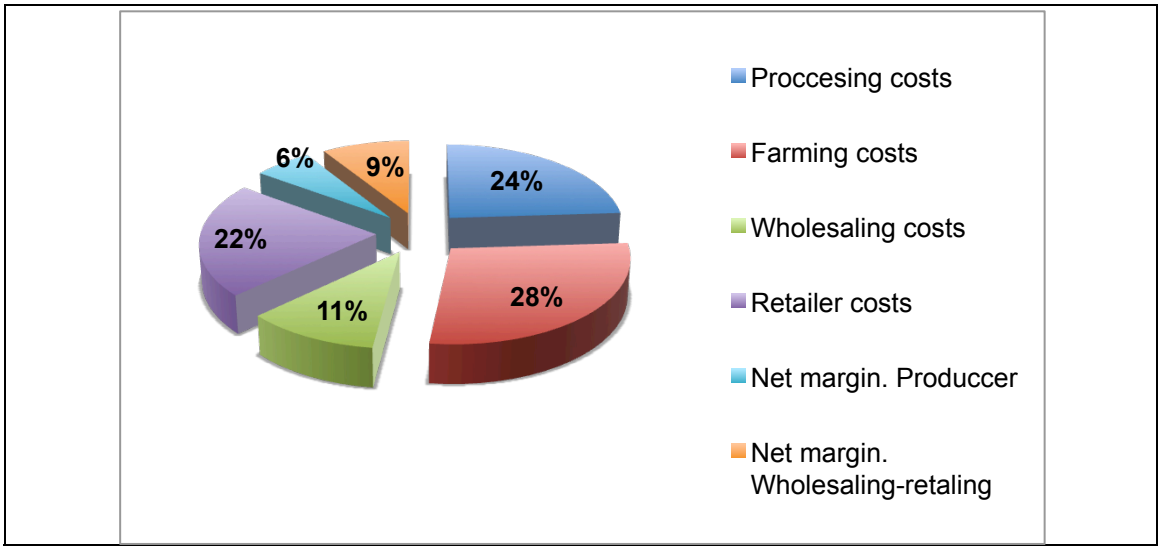


Figure 13. Price share in the Almerías tomato chain in season 2009/2010

Source: *Observatorio de precios y mercados. CAP 2011. http://www.juntadeandalucia.es/agriculturaypesca/observatorio/servlet/FrontController?ec=default*

Figure 12 shows that the highest gross margin is between distribution centres and producers (68%) and between supermarkets and wholesalers (44%). Figures 12 and 13 and the analysis of costs carried before show that the highest costs are the costs of production. Considering that the cost of producing 1 Kg of tomato is 0,4625 € and the price the grower get for them is 0,56 €, the turnover of producing 1 Kg of tomato is 0,0975 €.

0,56 €/Kg – 0,4625 €/Kg = 0,0975 €/Kg

Figure 13 shows that the 24% of the price of tomatoes is due to processing costs (sorting, grading and packaging) and the 28% of the price is due to the producing costs. The 22% and 11% of the tomato price is due to retailing and wholesaling cost. The retailer and wholesaler turnover is of 9% while the farmer turnover is of 6%.

Chapter 5: RESEARCH FINDINGS AND DISCUSSION

This chapter is dedicated to report the research findings. It consists of conclusions of the analysis of the tomato chain based on the information gathered from the literature review and key informants.

The aim of this chapter is to answer the research questions that seeks to get an overview of the tomato chain, the identification of its leverage points and the way of overcome them by improving its competitiveness. The last section that deals with the SWOT analysis summarize the result.

5.1. COMPETITIVENESS

The analysis of the competitiveness of the Almerian tomato chain assessed by the Porter's Diamond model shows that the sector has competitive advantages in all the vertices of the diamond against Morocco and the Netherlands. It is strong thanks to its climatic and geographical conditions, road network and well-developed tomato distribution system. Moreover the presence of related and supporting companies gives an internationally competitive advantage. Intensive rivalry and close relationships between actors encourage competitiveness.

Some factors such as the cost of labour, do not give an advantage against Morocco. The limitation in innovation and the lack of marketing studies and promotion campaigns reduce the competiveness of the sector.

However by considering these factors as a whole, the Almería tomato sector has competitive advantages over its competitors. Therefore, the sector has to highlight the positive factors and overcome its leverage points.

The five forces analysis shows that despite Almería has a greater export tomato diversification, Almería's marketing companies are lacking on product innovation. Almeria does not add value to their product and it sells a non-differentiated standard tomato. There is no attempt to approach consumers directly, which leads to a reduction in competitiveness against competitors. For that reason, in order to be more competitive, marketing companies have to invest in producing a different product in terms of flavour, packaging or variety.

5.2. LOGISTIC

There is poor logistic management in the Almería tomato chain. Land transport accounts almost 100% of the flow of fruits and vegetables form Almería. Small transportation companies mainly carry out the transport. Most of the time, the trucks returns empty, which increases the transport costs. The use of intermodal transport may help to reduce land transit between Spain and France over the Purenees. The cost of intermodal transport (sea + road transport) is 14% lower than land transport (Pérez, Galdeano and Aznar, 2012). However, total transit time is almost twice than for land transport. The use of intermodal transport in Almería will depend on the implantation of actions that will help to change exporter's perception and provide incentives for the use of shipping as a transport system.

There is a trend of using more sophisticated and attractive packages in order to give added value to the product. The use of Controlled Atmosphere (CA) and Modified Atmosphere Packing (MAP) reduce tomato deterioration and increase shelf life.

5.3. COSTS

The highest cost is the cost of production, approximately 0,4625 €/Kg, which means the 28% of the final price. The turnover of producing 1 Kg of tomato is 0,0975 €, considering that the average price of the tomatoes is 0,56 €/Kg. It means that growers if growers want to get higher income they have to increase productivity or get higher prices for their tomatoes.

The gross margin in the tomato chain is very high, 188%, which reduces the competitiveness of the tomatoes. The price increases more than one euro from farm level (0,56 €) to retail level (1,61 €) so the tomatoes reduce competitiveness as they move through the chain. In addition, the highest costs are set at producing (28%) and processing level (24%) which are not transferred in the price. Therefore, it is very important to reduce the retailing price of the tomatoes and costs at producing and processing level in order to improve competitiveness.

5.4. LEVERAGE POINTS OF THE ALMERIA TOMATO CHAIN.

This section identifies the leverage points of the Almería tomato chain focussing in producing, processing, marketing and logistic.

5.4.1. Producing

The leverage points identified in producing are the following:

- Low level of technology: Greenhouses in Almería are characterized by the use of simple structures with wide-ranging low level of technology and lack of equipment for climate control. In addition, poor climate management, lack of carbon dioxide enrichment or water scheduling limits the potential yield, product quality and the timing of production. For example, the tomato productivity in Almería is very low compared to The Netherlands which have high-tech greenhouses.

- No product planning: Growers do not plan their crops according to customer or market requirements because of the poor information flow within the chain. Thus, tomato production is no customer-oriented; Most of the growers produce a standardized tomato hence, there is a low tomato diversification and specialization.

- Pest and diseases: the most important pest and diseases that affect the tomato crops are the white fly, botrytis, *Alternaria* and fungus such as *Mildiu*. They reduce productivity and increase the cost of production, reducing grower's income. Despite Integrated Pest Management is a common practice; there is much to improve in this field.

- High producing costs: for example, the costs of labour, fertilizer or pest control are high. The tomato producing cost increases every season, however prices do not increase even they are low, thus growers loose income. As it was mentioned in chapter four, the 28% of the price of tomatoes is due to the producing costs and the growers turnover is 0,0975 € per kilo, hence, the farmer's margin is very low.

5.4.2. Processing and marketing

The leverage points identified in processing and marketing are presented below:

- There are more than 200 distribution companies in Almería that supply the market with big volumes of tomatoes. The tomato-commercializing sector is characterized by heterogeneous companies with different sizes; big cooperatives coexists with family companies. The sector is atomized and there is no offer concentration. Distribution companies compete against each other in the market instead of join forces in order to achieve better deals with buyers.

- As it was mentioned in chapter four, there are two different distribution systems; auctions and destination commercializing companies. Auction as a commercialization system is not the suitable way of getting good prices. Selling tomatoes in action with stop-out price generate very low prices, which reduce the farmers income.

- The gross marging from production until retailing is 188%. This is partially because there are numerous middlemen in the Almeria tomato chain who increase the final price of the tomatoes, reducing the profit of producers and processors.

- Good growers are not rewarded. Growers deliver the tomatoes in the processing companies where they are stored before the sorting, grading and packaging. Although the traceability system identifies every consignment, tomatoes are mixed before processing. Growers are not encouraged with rewards to produce better tomatoes so, sometimes they prefer to focus more on quantity rather than quality.

- Low production planning. Distribution centres as they are not customer-oriented, they do not plan the crops in advance thus they have to sell what they produce. Growers choose the type of tomato to grow according to prices in the previous season or knowledge about the variety and crop management. Only few companies plan about varieties, areas, volumes and dates. They seldom produce whatever the market is demanding.

- Distribution centres have difficulties in product specialization. Despite they use several brands and packages, new presentations and product innovation is hardly used. They usually process and market a standard tomato; Processors do not give added value to the tomatoes in terms of variety and packaging.

- Difficulties in obtaining funds from the individual partners in order to start with innovative projects, such as marketing investments. There is a poor investment in marketing. Only some companies carried out tomato advertising campaigns and marketing strategies in order to inform consumers about the Almerian tomatoes.

- The production of tomatoes is seasonal, from October to June. There is no a yearly production and stability in supply, so distribution centres cannot guarantee supermarkets a constant volume of tomatoes along the year, thus they loose bargaining power against retailers.

5.4.3. Logistic

The tomato sector in Almería needs a logistic development. The high cost of transport and the increase of competitors are putting the sector under pressure. Therefore, there is a need of improving the logistic in order to be competitive.

The leverage points in the logistics are:

- High packaging and transport cost jointly to the poor logistic system reduce the competitiveness of the tomatoes produced in Almería. The transportation costs have increased due to the high price of fuel, the use of two drivers and the empty return of trucks. New packaging presentations and returnable plastic boxes are costly, hence, the commercialization of tomatoes is not profitable if the tomatoes do not get a high price in the market.

- Dependence in road transport: the tomato sector depends on road transport, which increase the transport costs and in periods of high demand, companies have to deal with the scarcity of trucks.

5.5. SWOT ANALYSIS

This section describes the strengths, weaknesses, opportunities and threats of the Almerian tomato sector considering the analysis of the sector carried out in chapter four and the finding of the previous section.

The Almería tomato chain has many strengths related to the long experience in producing and exporting vegetables. Almería produce high quality tomatoes in wintertime thanks to its climatic conditions. Moreover, the sector has adapted its crop management to a sanitary and environmental friendly production. In addition, the proximity to European markets and the diversification of markets is an advantage against some competitors such as Morocco. Besides this, the high auxiliary industry development supplies the sector with all the requested inputs for a competitive price.
Finally, processing companies use high-technological and fashionable machinery for grading and packaging.

Regarding weaknesses, there is a small offer concentration (many companies commercialize small volumes of tomatoes) in the Almería tomato chain due to the atomization of distribution centres and a lack of coordination between them. Moreover, the production is not customer-oriented because of the poor flow of information within the chain, therefore there is no production planning. Processors have to sell what they produce so they loose negotiation power against supermarkets. In addition, numerous middlemen increase the tomatoes' gross margin that reduces their competitiveness. Furthermore, there is a low marketing and product promotion campaigns, so consumers do not know which are the characteristics of the tomatoes produced in Almería. Lastly, concerning transportation, despite there are facilities to transport the tomatoes by sea, the sector only use the road transport to deliver their products.

About opportunities, Almería has to take the advantage of the many opportunities in order to overcome the problems the sector is currently facing with. For example, Almería has port and airport with facilities to store and transport vegetables, so it is possible to diversify the mean of transport to reach new markets. In addition, the use of new packages which increase tomatoes' shelf life jointly with cold chain improvements, allow producers to reach new and farther markets. Besides this, the willingness of consumers to buy fresh cut products or buy vegetables on line offer new marketing opportunities to the tomatoes produced in Almería.

Finally, the most important threat in the Almería tomato chain is the increase of competitors that produce similar products in the same season that reduce the competitiveness of the Almerian tomatoes. European financial crisis is also a threat because consumers buy cheaper tomatoes and they opt to buy the low price tomatoes produced by the Almerían competitors. Besides this, new pest and diseases reduce yield productivity and increase cost of production.

The following Table 9 shows the summary of the SWOT analysis.

Table 9. SWOT analysis of the tomato sector in Almeria

	STRENGTHS	WEAKNESSES
Internal	• High-technological processing companies • Production market domination in winter • Excellent sanitary, environmental and quality assurance. • High auxiliary industry development • Proximity to European markets • Diversification of markets	• Atomization of distribution centres and lack of coordination between distribution centres • Small offer concentration • Limited plan of products • Low marketing and product promotion campaigns • High dependence of road transport • Poor information flow • High gross margin
	OPPORTUNITIES	THREATS
External	• Sea and air transport • New niche markets • New packages and cold chain management improvements to reach farther markets • Online marketing • Fresh cut products	• New competitors • Low prices of competitors • European financial crisis • New pest and diseases

Chapter 6: CONCLUSION/RECOMMENDATIONS

6.1. CONCLUSION

The Almería tomato sector is facing with an increase of competitors that reduce the incomes of the stakeholders and therefore makes the sector less competitive. The sector has to overcome its leverage points and use its competitive advantages in order to improve the producing and marketing of tomatoes. The small offer concentration, little product planning, high gross margin or the limited product advertising in European markets limits the growth and competitiveness of the sector.

High dependence on road transport and the need of a logistic development hamper reach new markets, reduce the efficiency in the deliveries and increase the cost of transport.

Giving added value to the tomatoes, costs reduction or new markets have come up as solutions in increase competitiveness. Produce whatever consumers are demanding such as more tasty tomatoes and the use of new packages is a way of differentiation against competitors.

6.2. RECOMMENDATIONS

The recommendations come from the analysis carried out in this report and the findings presented along it. The recommendations are focussed in producing, processing, marketing and logistic.

6.2.1. Producing

- Increase growers income by:
    - Increasing productivity by improving the technological level of the greenhouses in order to optimize their production system. Improving climate control, pest and disease control or soilless techniques are priorities in the upgrading of the technological level in the greenhouses. The use of cooling systems, air fogging systems, biological control, use of soilless media are effective methods to increase yield and quality.
    - Reducing costs by controlling inputs. Proper crop management and efficient use of inputs reduce costs.
    - Getting higher price for their tomatoes by for example increasing quality.
- Focus on a special part of the chain and try to serve small, special market segments, or niches, with innovating and high quality products such as *Raf* tomato, *Kumato* or tomatoes for snacks (see apendix 1).
- Strengthen the sector strategy in terms of marketing demand with conferences, meetings, workshops and training in order to link producers to markets. By this

transfer of knowledge, growers will have the information about the market demand so they can aim and plan their production according to the customer requirements.

6.2.2. Processing and marketing

- Promote the association of companies to concentrate the offer in order to improve the negotiation power against supermarkets. Nowadays, there are many distribution centres that commercialize their own products with few supermarkets, which have high bargaining power. By the merge of processors and consequently the concentration of the offer, there will be a balance between processors and supermarkets, so distribution companies will have more bargaining power against them.

- Shorten the value chain. Middlemen reduce the processors' profit margin. As it was shown in chapter four, the gross margin and the price between processing and retailing are very high. Thus, selling the product directly to the supermarkets or final customer increases the value share for processors and therefore increases their income.

- Crop planning:

    - Improve the information flow within the chain and conduct market surveys in order to identify the consumer's preferences and aim the tomato production to them. Almería needs to produce whatever consumers' demand and for that it is necessary to plan the production in advance.

    - Set up constant prices and volumes along the year in order to be able to plan the crops better. Processors can better plan the production, if they set yearly contracts with wholesalers or retailers in which the type of tomato, volume and prices are stated in advance.

    - Plan the production according to the destination market. For example, processor that focus their production to the United Kingdom should focus on cherry tomatoes, the ones that orient to The Netherlands or France should focus on cluster tomatoes or if they want to sell tomatoes in Germany they can produce organic tomatoes.

- Become a re-expedition market in order to supply the retailers year round and become more competitive. The Almería tomato chain only commercializes tomatoes from October to June, so there are three months where their clients buy tomatoes from other suppliers. If distribution companies can achieve a stable supply of tomatoes, by for example, becoming a tomato re-expedition market in summer months or in the months with low production, they can enhance their negotiation power with buyers.

- Avoid the production of a standardized tomato in order to improve competitiveness against competitors:

    - Focus on product specialization. Companies that are specialized in few tomatoes have better knowledge of the product, crop management, and postharvest handling, so they can produce high quality tomatoes. Moreover, they can reduce cost because of the efficient use of inputs.

- Give added value to the product. Focus on new tasty varieties, different sizes, colours, sustainable production methods and presentations that make the tomatoes different. For example, yellow and red dark tomatoes, new shapes, very tasty tomatoes or organic products are ways to innovation. Eye-catching presentations, such as individual bags, cups or colourful trays make the product more attractive (see appendix 2).

- Look for:

  - Niche markets and stable long-term clients. North European countries, Russia, Japan or USA are countries with relatively high living standards that demand high quality tomatoes and they are willing to pay high price them.

  - New customers such as restaurants, catering or gourmet retailers. They ask for innovative and very tasty tomatoes, such as tasty cherry, *Raf* or *Kumato*.

- Promotion and marketing of tomatoes. Focus the strategy in communicating to the European consumer about the organoleptic conditions and quality of the tomatoes produced in Almería. Advertising campaign such as brochures or commercial advertisements and supermarket tasting bring the product to the customer.

- Promote a brand for the tomatoes of Almería linked to the advertising campaigns. By means of this brand consumers can easily identify the Almerian tomatoes and their characteristics.

- Produce fresh cut products, jam or tomato sauces (see appendix 2).

6.2.3. Logistic

- Reduce transportation costs by:

  - The use of intermodal transport (sea + road transport) from Almería to Centre Europe reduces costs and increase competitiveness of the exporting firms. Processors can use the existing facilities in the port of Almería and the willingness of some shipping companies to transport vegetables by ship. There are some successfully tests and studies that conclude that the cost of intermodal transport is 14% lower than land transport.

  - Reduce the transhipment of commodities in order to reduce damages and therefore costs.

  - Use new technologies in order to control the temperature and relative humidity in transport and reduce customer complains and build trust.

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APPENDICES

APPENDIX ONE: Questionnaire

Types of tomato commercialized. Markets according to the type of tomato.

- Volume commercialized
- Prices according to the type of tomato (production prices, handling, origin, transport, destination…)
- Market trends. For example, if there are new packages or varieties /type of tomatoes.
- Biologic tomato. Markets, commercialized volumes, process…
- Wholesales/middlemen/supermarkets requirements
- Promotion campaigns.
    - Do you carry out promotion campaigns?
    - Which is the frequency?
    - Who are they directed to (consumers, wholesalers, supermarkets,…)?
- Competitors' countries. How do they affect to the tomato market ?
- New/potential markets. Niche markets
- Quality standards (ISO, UNE, Globalgap, etc)

Problems of the sector:

- Growers, which are the problems of the farmers that produce tomatoes?
- Distribution companies, which are the problems of the tomatoes' distribution centres?

Improvements:

- Which are the improvements needed to carry out by the growers in order to be more competitive and reduce costs?
- Which are the improvements needed to carry out by the distribution centres in order to:
    - Be more competitive?
    - Be different against their competitors?
    - Have access to new markets?
    - Reduce costs
- Do you think that sea transport is profitable?

Seed companies:

- New trends in varieties of tomato

APPENDIX TWO: Raf and Kumato tomatoes

Raf and Kumato are considered to be the finest varieties of tomatoes in the industry. These varieties vary in appearance from standard tomatoes and possess a much stronger aroma and taste, making them much more delicious.

The Kumato Tomato

This is a juicy tomato, brown in colour, with sweet taste and intense aroma. Although known for its sweetness, the Kumato is also easily recognisable due to it being dark in colour and very rich in vitamin C.

The Raf Tomato

The Raf is a unique product that is produced in Bajo Andarax and Campo de Nijar, in the province of Almería (Spain).

The Raf is visually recognisable due to its irregular shape oval and flattened at the ends, with deep grooves toward its centre. Its colour varies between bright green with almost black touches at the top and red. It is mostly known, however, for its sweet taste which is reminiscent of how tomatoes used to taste "in the good old days".

APPENDIX THREE: New packages and presentations