Sicilian floriculture companies and the role of transport in increasing their competitiveness

EMANUELE SCHIMMENTI[1], ANTONINO GALATI[1], ROSARIO CARAPEZZA[1]

Jel classification: Q130, L980

Abstract

The aim of this study is to provide a deeper understanding of the Sicilian floriculture sector, which has recently become one of the most important on a regional and national scale. By analysing production, sales and logistical aspects of its production companies and specifically looking at aspects regarding transport logistics, this study highlights the sector operators' preference for road transport that offers better guarantees in terms of delivery speed with respect to other means of transport, an essential requirement for the transport of flowers and plants. However, operators are increasingly showing interest in alternative means of transport that may reduce transport time and, especially, costs. Some of the operators interviewed believe that the expected building of 7 trucking terminals in Sicily represents an important move of the Regional Government to support companies; nevertheless, others think that this type of intervention represents an erosive element in competitiveness, because of the probable increase in the presence of goods coming from the southern Mediterranean shore. However, the improvement of the regional transport system is necessary to reduce inefficiencies in the sales and distribution network of the floriculture industry and, more in general, of the whole Sicilian agri-food industry.

Keywords: Flower and ornamental plant sector, Sicily, Competitiveness, Logistics and Transport.

Résumé

Cette étude vise à offrir une connaissance plus détaillée du secteur sicilien des fleurs et plantes, qui aujourd'hui est un des plus importants du secteur agricole régionale et nationale. Par rapport aux aspects liés à la logistique des transports, les résultats montrent que les opérateurs du secteur préfèrent avoir recours au transport routier qui assure une majeure rapidité de la livraison des marchandises par rapport à d'autres modalités, une condition indispensable pour le transport de fleurs et plantes.

Cependant, les opérateurs montrent de plus en plus d'intérêt pour les modalités de transport alternatives qui permettent de réduire davantage les temps de livraison des marchandises, et surtout les coûts de transport. Pour certains entrepreneurs interviewés, la réalisation prévue de 7 autoports représente une importante intervention du Gouvernement régional pour aider les entreprises; il y en a d'autres qui pensent que cette intervention va réduire la capacité concurrentielle, suite à l'augmentation prévisible des flux des marchandises provenant des pays du sud de la Méditerranée.

Quoi qu'il en soit, une amélioration du système de transport est une condition nécessaire pour augmenter la performance du réseau de vente et de distribution du secteur des fleurs et des plantes et, plus en général, de l'industrie agro-alimentaire sicilienne.

Mots-clés: *Secteur des fleurs et plantes, Sicile, Compétitivité, Transport et logistique.*

1. Introduction

Because of the evolution of the consumers' demand, the entry of new competitors into the international market and the increasingly important role of mass market, the deep changes in the international competitive scene have driven companies to reorganise themselves in order to better identify new strategies aiming at containing costs and improving production, both essential elements to be competitive on the market.

As a result of increased global competition, the strategic plans of companies currently tend to be more detailed than in the recent past. For any individual company aiming to obtain, maintain or improve its competitive edge, it is vital to review the internal organisation in order to improve productivity and impose cost reductions without adversely affecting production quality. These are traditional criteria that must be matched with the risk arising from the suppliers delays, errors and *défaillance*, and with the progress potentials, i.e. the combination of those factors influencing a company performance, such as social environment, the average age of employers, communication within the company, etc. (Abdelkader *et al.*, 2004).

Both small and large companies invest a significant amount of their energy in receiving orders, handling stock, planning production and purchasing from suppliers; at this point, it should be noted that in most cases companies do not use the term «logistics» to define these processes (Abdelkader *et al.*, op. cit.). On the basis of current literature references (Montigaud *et al.*, 2004; Lanini, 2004), we might define logistics as *"the efficient handling (planning, management and control) of the flow of material and information that occurs throughout the various phases from production, through transformation, to the distribution of the product, so that the latter may reach the client at the point in which he wishes to receive it, at the desired moment and at the best price».*

Thus, rationalising the flow of material and information becomes a necessary condition for a company in order to operate in an increasingly competitive market with positive effects both in terms of efficiency and costs, and positive benefits for the final user.

[1] Dipartimento di Economia dei Sistemi Agro-Forestali, Università degli Studi di Palermo, Italy. The paper arises from a joint effort of the authors. Nevertheless, E. Schimmenti coordinated research activities and drafted section 1, 2.2, 3 and 5, A. Galati wrote sections 2.1, 4.1, and 4.3 and R. Carapezza wrote section 4.2.

Today, however, the agri-food production, and similarly the flower and plant production, still involves a whole chain of processes that is often made up of numerous links (long production chain), which incur significant distribution costs. Hence, there is a pressing need to contain costs incurred between production and sales (Lanini*,* op. cit.).

From this perspective, a good logistical organisation becomes an important strategic tool for increasing the competitiveness of companies and, within this field, transport plays a vital role as it represents a significant quota of overall logistic costs. At this point, it is worth highlighting that according to research carried out by ISMEA, logistic costs make up nearly 1/3 of the company turnover; transport, in turn, accounts for about 34% of total logistic costs (ISMEA, 2006).

Floricultural products, among all agricultural products, are characterised by a very high perishability and fragility, making them very similar to fresh food produce. In this context, it is vital to distinguish between floricultural and pot plant products: indeed, whilst cut flowers are characterised by a short shelf-life and, therefore, need to be rapidly placed on the market, pot plants (for the presence of containers and soil) have a much slower deterioration rate.

These characteristics make all the operations of moving, stocking, packaging and especially transport much more complex; in the operation of transport alone, there may be delays, errors, or loss of produce that cause weakness in the logistical chain and decrease the product quality.

Precisely, since transport plays a fundamental role in rationalising the goods flow along the distribution chain on an international, national or regional level, important legislative provisions have been made with the aim of improving infrastructures and dealing with issues regarding road traffic congestion and the growth of transport requirements expected over the next few years.

After examining the local situation of goods transport in Sicily, this study offers a more in-depth understanding of some of the problems involved in the Sicilian floriculture sector, which has recently started playing an important role in both the regional and national agricultural sector. Exploring further, through a telephone sample survey on 153 floriculture companies, several aspects proved to be particularly interesting, such as production, trade and logistics. This study also analyses how the regional transport policy meets the companies' needs by considering a re-planning of the transport system, and it highlights needs and expectations of the floriculture producers working in the region.

2. Goods transport in Sicily

2.1. Movement of goods in quantitative terms

In 2005, overall goods transport in Sicily dealt with a volume of 137.1 million tonnes and was mainly by sea, where there was national and international movement of about 96.3 million tonnes (70.3% of total volume). About 38.6 million tonnes of goods moved along roads, 2.2 million tonnes by rail, and only 9 thousand tonnes of goods were transported by air (Table1). In relative terms, the importance of the individual means of transport is very different to the national scenario (which is mainly based on road transport), mainly due to the insular nature of Sicily.

Table 1 – *Total movement of goods in Sicily according to means of transport 2005 (thousands of tonnes).*

	National	International	Total	%
*Sea**	39,831	56,471	96,302	70.3
Road *of which:*	38,269	298	38,567	28.1
Sicily-Sicily	*(32,198)*	-	*(32,198)*	*(23.5)*
Sicily - Mainland Italy	*(2,396)*	-	*(2,396)*	*(1.7)*
Mainland Italy - Sicily	*(3,675)*	-	*(3,675)*	*(2.7)*
Abroad	-	*(298)*	*(298)*	*(0.2)*
Rail	2,060	163	2,223	1.6
Air**	-	-	9	..
Total	**80,160**	**56,932**	**137,101**	**100.0**

* Data relating to ports, *Source:* Conto Nazionale delle Infrastrutture e dei Trasporti.
** Including Catania, Palermo and Trapani airports.

In 2005, road transport involved the movement of 38.3 million tonnes of goods throughout the length of the peninsula as follows: 32.2 million tonnes remained in the region, 3.7 million tonnes were goods coming from other Italian regions, and 2.4 million tonnes were goods leaving the island. Foreign goods, 0.3 million tonnes, represented just 0.8% of the total movement of goods by road[2].

In the area of sea transport, 39.8 million tonnes of goods were nationally transported in 2005, and there were 56.5 million tonnes of international transport. In terms of quantity entering and leaving the island, the most important Sicilian ports included Augusta (34.3% of goods in transit), Santa Panagia (24.2%), and Milazzo (18.6%); Gela, Palermo and Catania were also very important ports.

Regarding sea connections, it is similarly important to observe connections between the main Sicilian ports and the mainland (cabotage) and those with other European countries (*Short Sea Shipping*[3]).

Analyses carried out on the basis of s*hort sea shipping* data collected in 2007 show a clear prevalence of cabotage (with a higher frequency of connections with Southern regions) over international connections.

By analysing the data, it becomes clear that within internal national movement of goods, goods and passenger transport service on Ro-Ro[4]/Pax ships is much more com-

[2] Regarding road transportation of floricultural products in Sicily, ISTAT does not provide separate data; however, data from 2005 regarding transport of «Agricultural products, livestock, foodstuff and forage», may prove to be significant (goods macro-set 1, including sub-groups of goods from 1 to 7, of which group 5 also includes plants and flowers) which totals 7.3 million tonnes, of which 81% is moved within the Region. Regarding sea transport, however, statistics do not show any results concerning floricultural products.
[3] Short Sea Shipping includes both national and international EU sea transport, as well as transport to non-EU ports in the Mediterranean Sea, the Black Sea and the Baltic Sea.
[4] Ro-Ro ships (Roll-on/Roll-off) are vessels fitted with loading ramps so that goods can be rolled on or off. The Ro-Ro/Pax is a type of ship that can transport rollable items (cars, wheeled vehicles, trailers, semi-trailers, industrial vehicles, etc.) as well as passengers. The term Container/Ro-Ro indicates transport of both rollable items and containers. The Ro-Ro/Pax/Ferry indicates a type of ship that carries out transport of rollable items, passengers and railway coaches. Finally, Container ships simply transport containers.

mon than other services, representing 87.1% of the number of debarkations from Sicilian ports; then, there is transport on Ro-Ro/Pax/Ferry (5.7%), Container/Ro-Ro ships and Ro-Ro (2.9%, respectively) and finally Container ships (1.4%) (Table 2).

Table 2 – *Short Sea Shipping: sea routes connecting the main Sicilian port - 2007.*

Port	Destination	N° of weekly departures	Type of vessel
	Coastal sea routes		
Palermo	Cagliari	2	Ro-Ro / Pax
	Civitavecchia	3	Ro-Ro / Pax
	Genova	7	Ro-Ro / Pax
	Livorno	3	Ro-Ro / Pax
	Livorno	1	Container / Ro-Ro
	Napoli	14	Ro-Ro / Pax
	Salerno	2	Ro-Ro / Pax /Ferry
	Salerno	1	Container / Ro-Ro
Termini Imerese	Genova	5	Ro-Ro / Pax
Trapani	Cagliari	1	Ro-Ro / Pax
	La Spezia	1	Container
	Livorno	3	Ro-Ro / Pax
	Napoli	1	Ro-Ro / Pax
Milazzo	Napoli	2	Ro-Ro / Pax
Messina	Salerno	7	Ro-Ro / Pax
Catania	Civitavecchia	2	Ro-Ro / Pax /Ferry
	Genova	2	Ro-Ro / Pax
	Livorno	2	Ro-Ro
	Napoli	7	Ro-Ro / Pax
	Ravenna	4	Ro-Ro / Pax
	International shipping		
Palermo	Antwerp (Belgium)	1	Container / Ro-Ro
	Tunis	3	Ro-Ro / Pax
	Bristol (England)	1	Container / Ro-Ro
	Southampton (England)	1	Container / Ro-Ro
	Tripoli (Libya)	1	Ro-Ro
	Valencia (Spain)	1	Container / Ro-Ro
	Valencia (Spain)	1	Ro-Ro /Pax / Ferry
Catania	Tripoli (Libya)	1	Ro-Ro
	Valletta (Malta)	3	Ro-Ro
	Valletta (Malta)	2	Ro-Ro / Pax

Source: www.shortsea.it.

As far as international connections are concerned, there is a clear predominance of transport on Ro-Ro/Pax and Ro-Ro ships, both representing 33.3% of the total number of weekly departures, followed by transport on Container/Ro-Ro ships (26.7%) and Ro-Ro/Pax/Ferry (6.7%).

2.2. Transport policy in the Sicilian Region

Environmental issues, the growing necessity to reduce goods traffic on the road, and problems of road and workers safety seem to pinpoint the benefits of combining different means of transport as strategic alternative to the current use of road transport, in terms of cost, time and services.

Over the last few years, increasing attention has been paid to sea routes as alternative to road transport, in order to resolve the above-mentioned problems above. The national government issued the decree no. 35 of 31 January 2007, then integrated with the decree of 26 March 2007, which applies an 'ecobonus' to transporters who use ships for part of their trip, setting an incentive of maximum 20% of the fare of each connection. This aid may rise to 30% if sea routes not indicated under the decree are used.

The national sea routes that start or end in Sicily, and which are financed through the 'ecobonus' are: Catania-Civitavecchia; Catania-Livorno; Catania-Genova; Catania-Napoli; Catania-Ravenna; Catania-Venezia; Messina-Salerno; Civitavecchia-Palermo; Genova-Palermo; Genova-Termini Imerese; Livorno-Palermo; Livorno-Trapani; Napoli-Palermo; Napoli-Termini Imerese; Napoli-Milazzo; Palermo-Salerno; Trapani-Formia. For international transport, the only sea route that receives public subsidies is the Palermo-Valencia.

For national and international routes, public funding for transport companies that use sea routes was defined by a decree of 8 January 2008 for the period 2008-2010 providing for a financing from 20% to 30% of costs, depending on the fare charged by the shipping line and the number of trips taken during the period 2007-2009, and the route in question.

Combined transport is also an advantageous choice because it allows companies to bypass some of the restrictions imposed by European norms on road transport operators (Commission Regulation (EC) no. 561/2006[5]).

The European Union White Book, which contains the guidelines of the common transport policy, and the General Transport and Logistics Plan laid out by the Ministry of Transport agree on the need to create incentives for combined transport.

For Italy, and particularly for Sicily that is in the centre of the Mediterranean, creating incentives for bi- or tri-modal transport would provide many new opportunities; in any case, it is closely linked to creating new transport infrastructures, improving existing networks and building new, more modern, faster, safer and bigger ships.

The current Plan for goods transport and logistics set out by the Sicilian Regional Government certainly goes some way towards this improvement of infrastructures, with improvements planned for road, rail, port and airport facilities. As far as combined transport is concerned, the plan includes the building of 2 ports of transhipment located in Termini Imerese (PA) and Catania Bicocca (CT) respectively, and the creation of 7 trucking terminals[6] to be located in Catania, Naro (AG), Trapani, Vittoria (RG), Polizzi Generosa, near Tremonzelli (PA), Milazzo (ME) and Siracusa Melilli (SR). There are also plans for the building of l-ogistic platforms that may function as minor intermodal structures. Trucking terminals, being distributed throughout the region, will help rationalising the goods flow, concentrating the services on offer, containing transport costs and reducing delivery times (with administrative services for people, vehicles and goods). Furthermore, they will also

[5] The new regulations the member States have to comply with tend to improve road safety and work conditions by establishing a maximum driving time for drivers on shifts and a daily and weekly obligatory amount of rest.
[6] D.A. no. 35 of 27 February 2004 and D.A. of 21 May 2004 – Sicilian Regional Government, Department of Tourism, Communication and Transport.

have excellent connections with road, sea and rail networks.

3. Survey methodology and the examined aspects

This study was carried out on a sample of 181 floriculture companies (6.3% of the entire sector on the island according to the 2000 ISTAT census) from all over the Region, selected from directories provided by public bodies (IPA, UOB, Sector Associations) and by private operators (experts and agronomists, production and sales companies) involved in various ways in production and sales. Once contacted and identified by telephone, just 153 floricultural companies expressed their willingness to undergo questioning in a telephone survey. Collected data refer to the year 2006.

The survey form proposed to the companies was organized in four different sections to help the following organisation and processing of collected data. The four sections were as follows:

First part: general information identifying the company (name, location, etc.);

Second part: information regarding the type of floricultural production carried out by the company, the land used, production figures (in terms of number of plants and/or stems), itemization of costs affecting management results and, finally, turnover;

Third part: sales and logistics aspects, especially destination markets, main buyers, types of agreements with clients, means of transport used and motives for using them;

In order to make data collection easier, bearing in mind the main aims of the study, second and third parts only refer to floriculture activities (excluding any other possible types of nursery production) of surveyed companies.

Fourth and final part of the survey: how the policy of the Sicilian Regional Government meets the needs of floriculture companies in terms of transport. More specifically, the company directors were firstly asked whether they were aware of the Regional plans to build 7 trucking terminals, and secondly, in what area they would like such a structure to be built.

On the basis of indications provided by the directors interviewed on the hoped-for location for the building of a trucking terminal, a Location Advantage Index (LAI) was drawn up, aimed at assessing the level at which the region policy meets expectations amongst floriculture companies. The LAI was fixed by comparing the distance in kilometres between each floriculture farm and the hoped-for location for the building of the trucking terminal with the distance in kilometres between the farm and the actual location of the closest trucking terminal amongst those planned by the Region[7].

[7] The LAI assumes a value of one unit when the hoped-for location for the trucking terminal coincides with the location provided for by the decrees; it takes a value lower than 1 when the hoped-for location is closer to the company than the proposed actual site; finally, the LAI acquires a value higher than 1 when the hoped-for location turns out to be more distant from the company than that planned by the Region.

4. Survey results

4.1. Production

The 153 companies that took part in the survey are nearly all located in the provinces of Messina (43 companies), Trapani (40 companies), Ragusa (36 companies) and Catania (26 companies), i.e. in the four Sicilian areas most involved in the floriculture sector. There is a very low presence of companies in the provinces of Palermo, Siracusa, Agrigento and Enna (8 companies in all); there are no companies in the area of Caltanissetta (Table 3).

Table 3 – *Company distribution, land area and production, by province and type of production - 2006.*

	Companies (n.)			Surface (ha)			Production	
	Nursery farming	Floriculture	Total	Nursery farming	Floriculture	Total	Plants (Thousand of product units)	Flowers (Thousand of cut stems)
Agrigento	1	1	2	0.5	0.5	1.0	1,000.0	16.0
Catania	25	1	26	633.4	2.0	635.4	6,882.0	60.0
Enna	1	-	1	0.1	-	0.1	60.0	-
Messina	42	1	43	121.1	0.3	121.4	4,688.0	18.0
Palermo	3	-	3	12.3	-	12.3	525.0	-
Ragusa	22	14	36	111.2	82.2	193.4	6,183.0	99,132.0
Siracusa	2	-	2	3.7	-	3.7	9.8	-
Trapani	23	17	40	304.7	10.4	315.1	3,413.5	10,130.4
Total	**119**	**34**	**153**	**1,187.0**	**95.4**	**1,282.4**	**22,738.5**	**109,336.4**

Source: Our breakdown of directly received data

A first characteristic that becomes evident from the survey is the clear majority of plant-growing activities (119 units) with respect to flower-growing activities (34 companies). It should be noted that in this study, the first type of activity refers to nursery farming in its narrowest sense, mainly dealing with ornamental plants, whilst the second exclusively refers to the cut flowers production. Nursery farming mainly takes place in the provinces of Messina, Catania, Trapani and Ragusa; floriculture, on the other hand, is almost exclusively found in areas around Trapani and Ragusa.

The land area dedicated to floriculture in this sample of nurseries surveyed in 2006 covers 1,282.4 hectares, that is about 50% of the total regional area; this figure is due to the fact that the sample included some of the most important floriculture companies in terms of land and turnover. Looking at the two sub-sectors of the activity, there is a clear majority of land dedicated to nurseries that, with 1,187 hectares, represents 92.6% of the total area; the remaining 95.4 hectares are used for floriculture. The province of Catania, with 635.4 hectares, contains about half the holdings of the sample of companies; then there are the provinces of Trapani (315.1 hectares), Ragusa (193.4 hectares) and Messina (121.4), whilst the rest of the land (17.1 hectares) is shared amongst the other four provinces in the survey.

The nursery production of the companies surveyed in 2006 totalled 22.7 million units, mainly obtained in the provinces of Catania (30.3%), Ragusa (27.2%) and Messina (20.5%). These data highlight the different product specialisations of the companies surveyed across the Region. As for product diversification, Catania and Trapani rank first for their production of leaf plants, and Ragusa for its flowering plants; in the province of Messina, on the other hand, there is a high level of specialisation amongst nurseries in producing ornamental fruit trees.

In 2006, the cut flower production by companies was equal to 109.3 million cut stems, of which 99.1 million were grown in the province of Ragusa and 10.1 million in Trapani. By analysing the results, it emerges that there is strong specialisation amongst floriculture companies to produce roses, especially in the province of Trapani, but also to produce gerberas; there is also intense production of chrysanthemums, almost exclusively obtained from one of the foremost producers in Europe, in the province of Ragusa.

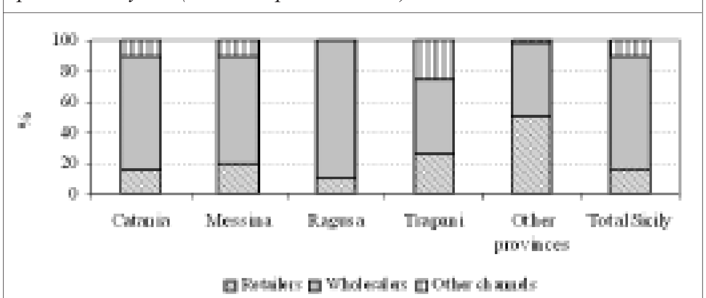
Regarding company costs with the strongest effect on the profitability of the companies in question, the most frequently-mentioned cost was that of manpower, followed by the purchase of purchasing materials, and transport; concerning this last item, the study shows how, in most cases, costs are borne directly by the consumer, who requires a reduction in price when buying directly from the company.

4.2. Commercial aspects

The analysis of sales channels used by Sicilian floriculture farmers shows the important role played by wholesalers, who buy a large proportion of total volume of saleable products compared to quantities going through other sales channels.

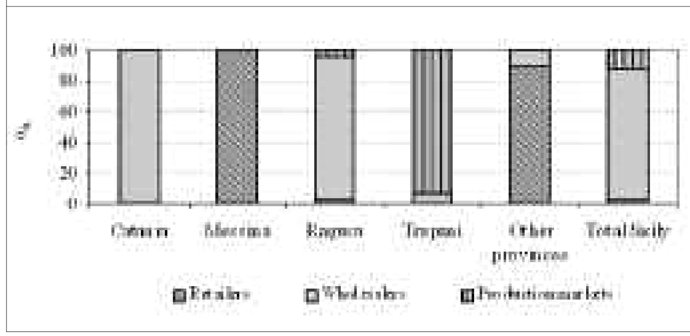
Regarding general plant production, data analysis shows that 74.1% of regional production is sold through wholesalers; 15.6% of ornamental plants are sold through retailers (this figure includes florists, garden centres and GDO) whilst the remaining quota of 10.3% passes through other sales channels, amongst which one of the most important is direct sale by companies (Figure 1). Looking at the data according to provinces, the provinces of Catania and Messina show values largely in line with the regional average, while in the remaining provinces there are some fairly wide variations compared with the sample averages.

Figure 1 – *Sales channels for nursery products in the sample of companies analysed (values expressed in %) - 2006.*



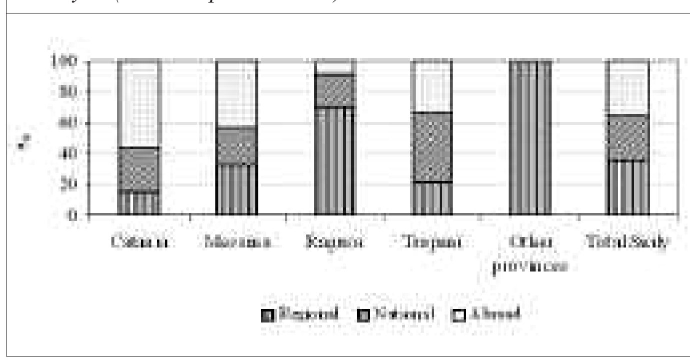
For flower-growers, 85.8% of produce is sold to wholesalers, 12.4% to flower markets and the remaining quota (1.8%) to retailers (Figure 2). On a provincial scale, companies work in a different manner; in the province of Trapani, 93.7% of produce is sold through the two main local flower markets, unlike the companies in the province of Ragusa, which sell their produce almost exclusively to wholesalers (94% of total volume).

Figure 2 – *Sales channels for flowers production in the sample of companies analysed (values expressed in %) - 2006.*



Regarding the markets that are reached, data analysis shows that 35.7% of plant produce is exported to foreign markets (mainly European Union), 35.5% remains in the regional market, and the remaining 28.8% is destined to the national market (Figure 3).

Figure 3 – *Target markets for nursery farm products in the sample surveyed (values expressed in %) - 2006.*



The provinces that show the highest rate of product export are Catania (55.9%), Messina (43.1%) and Trapani (33.2%); in the province of Catania this fact is largely influenced by the presence of one of the largest plant nurseries in Europe, whilst in Messina and Trapani, it is mainly due to a high demand for ornamental fruit trees and palms, mainly requested by northern European countries.

Regarding floriculture, 52.57% of produce remains in the regional market, 47.41% is sold on the national market, whilst the quota destined to foreign markets is negligible (0.02%) (Figure 4). Looking at the most significant production figures on the island, it emerges that in the province of Trapani, 98.6% of produce remains on the regional market, through two flower markets that operate in the area and supply retailers throughout Western Sicily; in the province of Ragusa, on the other hand, floriculture production is fairly equally distributed between the national market (52.1%) and the regional market (47.9%).

In terms of turnover, 32.0% of examined companies has a turnover of more than 200.1 thousand Euros, 30.1% has a turnover of between 100.1 and 200 thousand Euros, 26.8% shows a turnover of between 40.1 and 100 thousand Euros, whilst 11.1% of the companies is within the 10-40 thousand Euros range (Figure 5). To notice that none of the companies in the study declared a turnover of less than 10 thousand Euros. The analysis of the individual provinces shows substantial differences between the companies in question, with much higher average figures in the provinces of Messina and Ragusa.

Figure 4 – *Target markets for flowers production in the sample surveyed (value expressed in %) - 2006.*

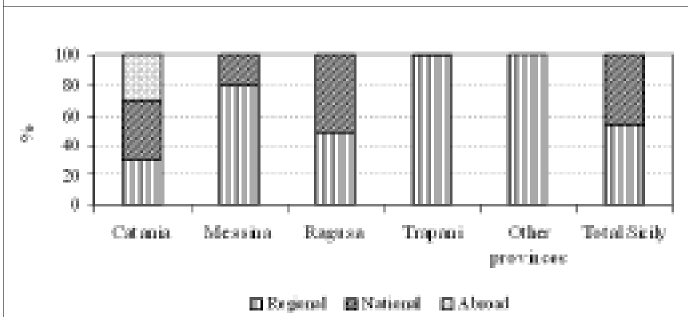
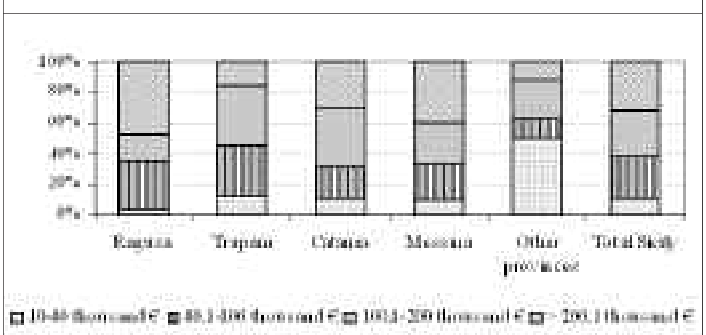


Figure 5 – *Turnover of surveyed companies (values expressed in %) - 2006.*



4.3. The transport role

This study paid particular attention to the logistical aspects of transport, considered as a vital tool to increase the companies' competitiveness. Hence, in floriculture, these aspects have been examined one by one for each province, bearing in mind different land specifications and particular transport infrastructures present in the Region.

All of the companies analysed in the province of Messina (43 units) make use of road transport means given the inefficiency of the rail network and the excessive cost of air transport. Among all the means available to companies, road transport is considered to be able to offer the best guarantees in terms of delivery time. Only 11 companies of the sample use bimodal road-sea transport, due to poor services offered by Messina and Milazzo ports.

From the study it emerged that 51.2% of company directors in Messina area were not informed on the regional plan to build trucking terminals, while the remaining 48.8%, besides knowing the plan, were also aware of the advantages that these structures could offer the companies in question. Directors believe that these trucking terminals might help in containing sales costs, which have exponentially increased over the last few years together with stagnation in sales prices of cut flower products.

Regarding the hoped-for location for the building of trucking terminals, the majority of the operators focused their interest on the area around Milazzo (69.8%), followed by Messina (18.6%). Areas including Barcellona, Falcone and Catania were less frequently mentioned (9.3% of all preferences); finally, one company (2.3% of the total) gave no indication of preference.

Based on the information collected, it was possible to set a Location Advantage Index to measure the extent to which regional transport policy meets the companies' expectations. By examining collected data, it emerged that 30 companies (representing a LAI equal to 1) would benefit from the planned regional transport policy as much as they would like the building of the trucking terminals exactly where they have been planned by the authorities. For 9 companies, the LAI has a value that is lower than 1, as they had hoped for trucking terminals to be built in a location being closer to their own companies than the planned structure; the remaining 3 companies are those who would benefit the most (LAI >1), having hoped for the building of trucking terminals in locations that were much more distant than the planned structures.

Regarding the means of transport used by companies operating in the province of Trapani (40 units), it emerged that 38 companies use road transport means; of these, 9 companies make use of road-sea transport, a solution that is exclusively used as means by the remaining 2 companies in the study. In these cases, whilst many operators make use of combined means of transport, they complain about the poor connections with other Sicilian ports.

Concerning transport policy, 65% of the companies in the study had not been informed about the regional plans on the building of trucking terminals, while 35% were aware of this. Among the interviewed company directors, those who operate in the sub-sector of flower production were somewhat perplexed about the usefulness of trucking terminal facilities, because, given the very short shelf-life of flowers, they preferred air transport to be developed.

When questioned about their hoped-for location for the building of trucking terminals, companies focused their interest on two areas in particular, Trapani (55.0% of preferences) and Marsala (27.5%). Among the other places cited, there were Palermo, Mazara del Vallo and Birgi (making up 10.0%). However, 7.5% of interviewed operators did not indicate any area of preference.

Having set the LAI values, it emerged that for 22 Trapanese companies, the LAI was equal to 1, for 13 companies it was lower than 1, and for 2 companies the value was higher than 1.

For the transport of flower products in the province of Ragusa, the companies questioned (36 units) make use of road transport in all cases; only one company makes use of a road-sea combination.

Regarding regional transport policy, this study shows that only 44.4% of the interviewed directors were neither aware nor appreciative of any usefulness of trucking terminals, showing perplexity regarding the fact that this type of structure might represent a transit point for products coming from other Mediterranean countries that might consider Italy to be the ideal bridge to reach North European markets, thus putting regional production sales at risk.

Regarding the interest of operators in where trucking terminals might be best located, 18 companies (representing nearly 50% of the sample interviewed) indicated Pozzallo as preferred area. Other areas of interest included Vittoria (16.7%), Catania (11.1%), Ragusa, Comiso and Scoglitti (together making up 11.1%). Finally, 4 companies (11.1% of the sample) gave no indication of preference.

For 16 companies, then, the LAI is equal to 1, whilst for the other 16 companies that expressed a preference, the index is higher than 1.

Amongst the companies operating in the province of Catania (26 units), 24 make use of road transport; of these, 7 companies also use a combination of road and sea, 1 company uses shipping and another also uses air transport. The remaining 2 companies only use a road-sea combination.

With regard to regional transport policy, the study shows how only 34.6% of the interviewed company directors knew about the regional plans for building trucking terminals.

Looking at the hoped-for location for the building of the trucking terminal facilities, among the above-mentioned floriculture companies, 15 (equal to 57.8% of the sample) indicated Catania; another area of interest was Riposto (27.0%), followed by Augusta, Fiumefreddo, Giarre and Messina (in total 15.2%).

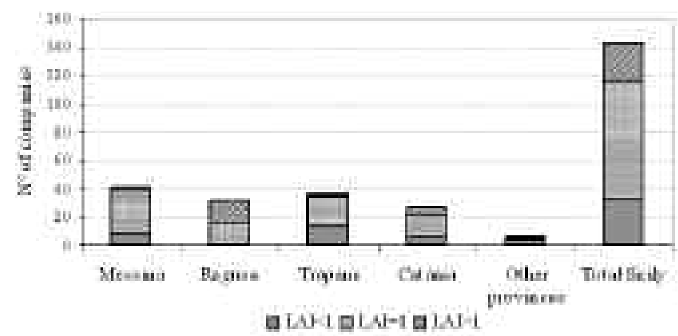
Analysing the data that emerge from the LAI, 15 companies show a value equal to one, 7 companies have an index value lower than one, and the remaining 4 companies have a LAI higher than one.

As for the remaining provinces (Agrigento, Enna, Palermo and Siracusa), it emerges that all examined companies (8 in total) turn to road transport also because the market destination of the produce is solely local.

By analysing the data resulting from the LAI, it seems that the floriculture companies in the provinces of Palermo and Agrigento would receive very little benefit (LAI < 1) from the planned location for trucking terminals. Of the two companies operating in the province of Siracusa, the first shows a LAI equal to one and the second shows a LAI higher than 1, the same value obtained from the only company analysed in the province of Enna.

From processing the data given by all the companies who indicated a preferred place for the building of trucking terminals (143 out of a total of 153 companies interviewed), it emerged that 83 companies show a LAI equal to one, 33 have a LAI lower than one, and the remaining 27 have a LAI higher than one (Figure 6).

Figure 6 – *Benefits from location of surveyed companies.*



Working with the same sample of floriculture companies, the locations with the highest rates of preference were identified. The most frequently mentioned locations were Milazzo (30 companies), Trapani (23 companies), Catania (21 companies) and Pozzallo (19 companies), which all together make up 65.1% of the total number of preferences expressed. At this point, it is important to note that the indications provided by companies in the province of Ragusa show a greater interest in the area of Pozzallo, where no trucking terminal building ahs been planned, rather than Vittoria which is where one of the 7 trucking terminals is going to be built.

5. Conclusions

This study, carried out by surveying a sample of floriculture companies, has highlighted some of the critical issues surrounding the Sicilian floriculture, including a certain structural dualism in which many small or very small companies find themselves with respect to very large, highly specialised companies that are well-placed on the market, struggle with the presence of many intermediaries in the sales chain, push up the distribution costs, and face significant increases in production costs and stagnation of sales prices.

Another interesting element that emerges from the study is the frequent use sector operators make of road means for transporting floricultural products. Among all means currently offered by the regional transport network, road transport is considered the best because it enables the quickest delivery time which, for floriculture products, is an indispensable factor to guarantee the quality. In effect, all operators are interested in possible alternatives to road transport, as they are well aware of the advantages in terms of cost, time and environmental impact with respect to what combined road-sea means (or air, for flower-growing activities) would offer.

However, the analysis of data regarding sea transport highlighted, on the one hand, the limited number of connections and, on the other hand, the prevalence of coastal routes and the limited number of international lines, all factors which inevitably affect business decisions.

The planned construction of 7 trucking terminals throughout Sicily, scattered all over the region to concentrate the services on offer, represents an important move of the regional government in planning a transport system and supporting the socio-economic development of the region.

Several of the directors involved in the floriculture subsector, when questioned on the building of these structures, showed some perplexity considering the very short shelf-life of flower products, for which air transport would be the best means to be hoped for.

Bearing in mind the geographical position of Sicily, right in the middle of the Mediterranean, the building of trucking terminals is seen by some companies as an element that may undermine the competitiveness of local companies. The main threats are due to the creation of the Euro-Mediterranean Free Trade Area. Indeed, Southern Mediterranean countries consider Italy and Sicily to be the ideal bridge for transporting their products towards Northern Europe, by putting the Sicilian production at risk.

In the opinion of other operators, however, the creation of trucking terminals could lead to definite advantages for the Sicilian floriculture companies, making them able to enter new and more important markets.

In this context, considering the importance of trucking terminals' ties with road, port and rail networks, it is vital to improve existing road and rail networks and to create new ones. At the same time, it is necessary to modernize ports by building the loading and unloading structures, to increase the frequency of the already existing connections between Sicily and the regions of central and northern Italy and between Sicily and foreign ports, and to provide the existing fleet with more modern, faster, safer and bigger ships.

Combining all these actions will help to reduce the inefficiency characterising the sales and distribution activities of the floriculture industry and, more in general, of the regional agri-food sector.

This research was financed by the Italian Ministry of Agricolture, Fund "Programma di sviluppo per il Mezzogiorno d'Italia: ricerca ed innovazione tecnologica" (Project 205/7303/05, Valorizzazione delle produzioni floristiche del meridione). Pubblication n. 57.

References

Abdelkader M., Bernard C., Catherine M., Chuzeville J., Colson V., Langbour K., Noyer M., 2004. *La logistique des produits alimentaires. Études de cas d'un grand groupe distributeur*. DESS Qualimpapa. Villeneuve d'Ascq (France).

Asciuto A., Carapezza R., Galati A., Schimmenti E., 2008. *The competitiveness of the Italian flower and ornamental plant sector.* New Medit no. 1/2008.

Crescimanno M., Galati A., 2007. *La logistica per i trasporti nelle produzioni ortofrutticole in Sicilia*. In Leve strategiche per lo sviluppo dei sistemi territoriali a vocazione agro-alimentare. Cesaretti G.P., Regazzi D. (a cura di). Franco Angeli. Milano.

G.U.U.E. n. L 102 dell'11/04/2006. *Reg.(CE) 561/06 - Armonizzazione di alcune disposizioni in materia sociale nel settore dei trasporti su strada e che modifica i regolamenti del Consiglio (CEE) n.3821/85 e (CE) n.2135/98 e abroga il regolamento (CEE) n.3820/85 del Consiglio*.

G.U.R.S. n.12 del 19/03/2004. *Approvazione della rete delle infrastrutture autoportuali della Regione siciliana*. Decreto dell'Assessorato del Turismo, della Comunicazione e dei Trasporti *n.35 del 27 febbraio 2004*.

G.U.R.S. n. 26 del 18/06/2004. *Approvazione della sede dell'autoporto di Siracusa, ricadente in un'area sita nel comune di Melilli*. Decreto dell'Assessorato del Turismo, della Comunicazione e dei Trasporti *del 21 maggio 2004*.

G.U.R.I. n. 6 del 9/01/2006. *Disposizioni per il riassetto normativo in materia di liberalizzazione regolata dell'esercizio dell'attività di autotrasportatore*. *D.L. 21 novembre 2005, n. 286.*

G.U.R.I. n. 35 del 12/02/2007. I*ndividuazione delle tratte marittime incentivabili per il trasporto di merci, in attuazione dell'art.3, comma 2 quater, della legge 22 novembre 2002, n.265*.

G.U.R.I. n. 79 del 4/04/2007. *Integrazione delle tratte marittime incentivabili per il trasporto di merci*.

G.U.R.I. n. 23 del 28/01/2008. *Misure percentuali dei contributi previsti dalla legge 22 novembre 2002, n. 265, articolo 3, comma 2-quater e successivi decreti attuativi, a favore degli autotrasportatori che utilizzano le vie del mare.* Decreto del Ministero dei Trasporti dell'8/01/2008.

ISMEA, 2006. *La logistica come leva strategica competitiva per l'agroalimentare italiano*. Imago Media Editrice. Dragono (CE).

ISTAT, 2007. *Il trasporto in Italia Anno 2005.* Statistiche in breve.

Lanini L., 2004. *La sfida logistica: limiti ed opportunità. Il sistema ortofrutticolo italiano di fronte ai nuovi scenari competitivi*. Edizioni Scientifiche Italiane, Napoli.

Lanini L., 2001. *L'ortofrutta italiana e la sfida logistica: limiti e opportunità*. INEA, Roma.

Ministero delle Infrastrutture e dei Trasporti, 2005. *Patto per la logistica. Un accordo di settore per la competitività del sistema paese.* Roma.

Ministero delle Infrastrutture e dei trasporti, 2007. *Conto nazionale dei trasporti e delle infrastrutture Anno 2005 - con elementi informativi per l'anno 2006.* Roma – Istituto Poligrafico e Zecca dello Stato S.p.A.

Montigaud J.C., 1996, *Les stratégies d'alliance dans le secteur des fruits et légumes. Le processus d'adaptation des producteurs-fournisseurs*, L'écho de Min. N. 117.86-87.

Montigaud J.C., Ferry J.M., 1995. *La logistique dans les filières agroalimentaires et ses conséquences sur la production agricole. Le cas de l'arc méditerranéen français*. Economie et sociologie rurales. Montpellier.

Montigaud J.C., Sabra R., Chahine H., Henri P., 2004. *Les filières fruits et légumes frais au Liban: structures, fonctionnement et perspectives*. Montpellier UMR MOISA.

Picchi A., 2001. *La logistica nella filiera ortofrutticola*. INEA – Ciclo di seminari: l'ortofrutticoltura italiana tra mercato e politiche di settore. Bari, 18 ottobre.

Regione Siciliana, Dipartimento Trasporti e Comunicazioni, 2003. *Studio delle infrastrutture autoportuali in Sicilia.*

Regione Siciliana, Dipartimento Trasporti e Comunicazioni, 2003. *Piano attuativo del trasporto delle merci e della logistica.*

Regione Siciliana, Dipartimento Trasporti e Comunicazioni, 2003. *Piano Regionale dei trasporti e delle mobilità – Piano Direttore.*

Schimmenti E., Di Franco C.P., Galati A., Artino Martinello S., 2007. *Aspetti economici del vivaismo agrumicolo ornamentale siciliano*. Relazione presentata alla Giornata di Studio sugli agrumi ornamentali in vaso: stato dell'arte e prospettive. Terme Vigliatore (ME), 3 novembre 2007.

Short Sea Shipping: *http://www.shortsea.it.*