The influence of district organization on supply chain logistics: the case of the Ligurian Riviera Flower District

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Abstract The paper focuses on the too often ignored links among supply chain, district organization and logistic issues. More specifically, this study is aimed at understanding how the belonging to a district affects logistic integration among supply chain members. The research hypotesis (based on a literature review) is that the district environment is not neutral but generates logistic opportunities and threats for supply chain logistics. In fact, on the one hand, the physical and cultural proximity of the supply chain members operating in a district context as well as their bent for co-operation help to improve logistic integration and to reduce supply chain management complexity. On the other hand, logistics requires high investments and long term partnerships and these requirements are difficult to achieve for district enterprises, which are often small firms whose collaboration is usually based on short term contracts. District governance also play an important role: logistics integration will be more successful if it is directed by a district leader while, if this leadership does not exist, logistic gaps will be more difficult to fill. The research hypotesis will be tested on the Ligurian Riviera Flower District. This case is particularly significant because of:

- the remarkable logistic problems related to the district production (plants and flowers, which are perishable and delicate products);
- the considerable logistic complexity related to the fragmentary flower and plant supply chain;
- the serious logistic problems related to the district organization, where there is not a leader firm.

With reference to the Ligurian Riviera Flower District case, the paper shows the first outcomes of a set of interviews to district operators aimed at

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investigating if the belonging to the district enables or hampers supply chain logistic flows.

Keywords district, supply chain, logistics, flower industry

1 Research design

This paper shows the first outcomes of a research in progress and it aims at formulating preliminary hypotesis about the following research question:

"do geographical concentration and district organization of flower industry operators enable or hamper logistics and supply chain management?"

The overall research project is composed of (1) a literature review, (2) a small number of case studies to test the literature review outcomes and (3) a comprehensive survey. This paper reports about the first activity and shows the first results of the second one, as the research is ongoing. The literature review includes the analysis of the main studies about districts, logistics and supply chain management and its main goal is to give a picture of logistic and supply chain management implementation issues mainly with reference to district context.Then, the emerging framework (opportunities and threats of district logistics and supply chain management) is tested in a number of case studies relevant to flower districts. More specifically, the paper compare the Dutch and the Ligurian flower district cases to show two different approaches to logistics. The Dutch case is developed only by a literature review, while the Ligurian case includes both a literature review and the main outcomes of a little set of interviews to local operators, which are expected to enrich the framework with further details.Future research programs include further interviews aimed at integrating information and defining a meaningful questionnaire to submit to a wide sample of Ligurian operators. The survey goal is to achieve significant outcomes about the role of district organization in determining logistic opportunities and threats for Ligurian Flower District.The next sections present a brief overview of a piece of literature about districts (section 2), logistics and supply chain management (section 3) and district logistics (section 4). Section 5 focuses on flower districts logistics, comparing the different approaches to logistic issues of Dutch (5.1.) and Ligurian (5.2. and 5.3.) flower districts. In section 6 there is a summary of the main preliminary findings.

2 The district

Industrial districts (Becattini 1989) are networks made up of many medium and small enterprises which carry out their activities:

- in a fragmentary production cycle spread over specialized firms;
- in a specific area, where there are also other organizations and institutions that support district operators.

The first studies about districts were made by Marshall (Marshall 1890), who stressed how the advantages which derive from a large scale production can be achieved both concentrating production in a single big company and gathering in the same district a huge number of small firms. In the district context there is a dense network of social relationships based on common territory, history, culture that forms the so-called "industrial atmosphere", which enables to:

- achieve satisfactory levels of efficiency and effectiveness by means of knowledge diffusion, firm specialization and gathering of activities in the area;
- decrease transaction costs, reducing information and agency costs (Cerruti 2005);
- build a barrier to the competitors who do not own the widespread and non-trasferable knowledge peculiar to districts.

In a district there is a complex mix of competitive and co-operative relationships among firms. In fact, on the one hand, district enterprises operate in the same industry and territory and this strengthens competition, stimulating continuous product and process improvement. On the other hand, the district survival is based on co-operation, coordination and trust among highly specialised operators who carry out repeated trades. Collaboration among district firms is highly flexible and networks change according to market needs. Each district firm has its own structure and goals and to better understand districts is important to analyse the links between single companies and the whole system (Varaldo, Ferrucci 1997). A meaningful district taxonomy is based on the different trading power among district firms. It distinguishes:

a. "hub and spoke" districts (Rama, Ferguson, Melero 2003);
b. "competitive" districts;
c. "fragmented" districts (D'Agostino 2001).

a. "Hub and spoke" districts include one or two leader firms, which often are multinational and listed companies operating on the global

market. These districts produce industrial products and have a hierachical organization. In this context, the district is only a production platform directed by leader operators;

b. in a "competitive district", on the contrary, there are tens of medium sized enterprises which have similar trading power and huge competition exists among them. This situation limits the opportunities to co-operate inside the district;

c. finally, "fragmented" districts are formed by many little enterprises, none of them more powerful than the other ones. Tipically, these districts produce handicraft and there is a strong need of co-operation among operators and common policies (e.g. territorial branding) to overcome single firms weakness in the global market.

Nowadays, districts are under pressure because of phenomena such as:

- globalization and growing international competition;
- technological innovation;
- increasing labour costs;
- decreasing transportation costs;

which, as a whole, are reducing the strategic importance of localization. For a long time, district competitive advantage has been based on manufacturing excellence but, in the new context, a change is required and single district firms and their marketing, innovation and relational skills have an important role to support the system survival [1]. To face the new challenges, district firms are implementing different strategies:

a. in some districts, made up of many little firms reluctant to development, firms are trying to repositioning in specific market niches in order to achieve satisfactory ROI performance with low investments and break even. Even if this strategy is allowing some district to survive, it denotes an adversion to risk and it depicts a serious obstacle to long run development;

b. in other districts, some firms are implementing internal growth strategies, often combined with external growth ones. Therefore, an increase in size is often a preliminary step to become leaders of more structured and long-term relationships with other selected district operators;

[1] Marshall explained district competitive advantage stressing the existence of external economies for the single firm which are, in the meantime, internal economies for the local system in which it is included (Marshall 1890)

c. another strategy is delocalization, but it is suitable only for firms operating in districts whose competitive advantage is based on cost leadership, which suffer of high labour costs and where required professional skills are relatively low.

By examining the literature about district firm strategies, the following hypotesis can be formulated:

- in the new competitive environment, there will be lower and lower room for fragmented districts, which will be able to survive only on "sheltered" market niches, where firms produce handicraft sparely attractive for big firms, because of their low level of standardization;
- external growth is an effective strategical option because it enables growing firms to reach a significant size without losing flexibility. However, to successfully implement this strategy, leader firms must be able to count on a set of selected district partners of excellent quality;
- external growth is a strategic option which protects the typical district competitive advantage sources (localization and specialization), which could be threatened respectively by delocalization and internal growth strategies;
- external growth strategy necessarily implies the development of complex management systems, aimed at managing districts as hybrid organizations, where relationships among members neither are based on simple contracts (as it is in traditional districts) nor on hierarchy (as it is required by internal growth strategy) but are based on trust and common goals shared by autonomous operators.

3 Logistics and supply chain management

Logistics has had a fast and significant evolution: it was born as a function devoted to transportation and warehouse management but it soon faced more complex topics related to distribution channels, such as the identification of the correct number of warehouses and the quality of the flows among plants, warehouses and clients. The following logistic evolution concerned stock management, whose dynamics depend on supply and production activities, which also became domain of logistics (Ferrozzi, Shapiro 2000). Then, logistics focused on process integration and the management of physical and information flows from the first supplier to final consumer, passing by production, packaging, storage, transportation, distribution and after sale service activities. A wider meaning of logistics includes reverse logistics, that is the management

of reverse flows (e.g.: packaging, waste) from clients to suppliers. Logistics is a key process both for value creation (because its effective management enables the final customer to obtain the desired product, when and where he needs it and with the more appropriate information) and for cost control (because its goals include the rationalization of activities and waste reduction). Inside a firm, logistics is a transversal function which integrates many firm functions, often intensively using Information and Communication Technology (ICT). Thanks to technological progress and the net economy, recently logistics started to go out to firm boundaries to manage the supply chain [2] as a whole. According to Christopher, today, logistics definition may be the following: "the process of strategically managing the procurement, movement and storage of materials, part and finished inventory (and the related information flows) through the organization and its marketing channel in such a way that current and future profitability are maximized through the cost-effective fulfilment of orders" (Christopher 2005).The integrated management of all the activities made by different operators along the supply chain is called supply chain management and, nowadays, it is considered more than the simple extension of logistics outside a firm, including the management of processes which are outside logistic domain (e.g.: research and development, marketing, finance) [3]. According to Christopher, the supply chain is not only a set of firms but it includes an objective element (the processes), a subjective element (the firms) and a common goal (the value creation for the final customer). He defines the supply chain management as follows: "the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole" (Christopher 2005). Christopher stresses that supply chain members act as a network where each firm can take part in many supply chains and the final customer receives the value created

[2] La Londe e Masters (La Londe, Masters 1994) define the supply chain as "a set of firms that pass materials forward" while Lambert, Stock e Ellram (Lambert, Stock, Ellram 1998) define it as "the alignment of firms that brings products or services to market". According to Tan e Shaw (Tan, Shaw 1998), the supply chain is"a network of business units and facilities that procure raw materials, transform them into intermediate goods and then final products, and deliver the products to customers through a distribution system".

[3] Ferrozzi and Shapiro wonder if a logistics which manages internal flows and also relationships among firms can still be called "logistics". They think that relationship management is so complex that it is impossible to think of concentrating it in a single function. In authors' view, logistics future is to come back to its origins (managing warehouses and transportations) and to support supply chain management (Ferrozzi, Shapiro 2000).

by the firms but also partecipates in value generation, overall by the information exchanges he carries out with the other network units [4].Even if supply chain management is more than logistic management, logistics plays a key role in co-ordinating and integrating supply chain processes and the logistic flow rationalization can be considered the first step to implement supply chain management. Supply chain management presupposes a remarkable rethink of the traditional relationship between supplier and customer in the supply chain. In fact, the traditional relationship is tipically conflictual, whereas supply chain management imposes co-operation to reach a common goal. The cultural change required by supply chain management is considerable and it is possible only in the long run: a starting focus only on logistics co-ordination can be a means to test the benefits of supply chain collaboration and to stimulate deeper kinds of integration in the supply chain [5].

4 District logistics and supply chain management

Logistics plays a key role in districts, where it acts as a connector among highly specialised district firms (Musso 2004). Geographical proximity of operators normally simplifies physical and information flows. Moreover, the district information transparency and the traditional bent for co-operation could be helpful elements to overcome the cultural and trust barriers to supply chain management implementation. Therefore, at a first glance, districts seem to be the ideal field to implement logistic and supply chain management strategies. Actually, some district characteristics represent heavy restraints to the realization of:

a. logistic innovations;
b. supply chain management initiatives.

a. First of all, it must be stressed that logistics has always been neglected by districts, which have always been focused on manufacturing excellence (Bologna 1998). The reasons of this lack of interest in logistics were the following:

[4] See Normann, Ramirez 1995

[5] The first successful cases of supply chain management implementation makes reference to SCOR model (see Bolstorff, Rosenbaum 2003), a Supply Chain Council framework. The model focuses on operation processes efficiency (plan, source, make, deliver, return) by means of co-ordination of transaction among operators. Explicitly, the model neglects the management of other processes, probably limiting the benefits related to a wider view of supply chain management goals but surely simplifying supply chain management implementation

- inbound logistics was marginal because most of supplies came from the district (generating few logistic problems) or from big foreign producers, who were charged with logistic organization;
- district products usually were "made in Italy" and did not require intensive promotional activities and, with regard to outbound logistics, it was normally charged to customers (Becattini 1998).

Therefore, district logistic inferiority is "daughter of manufacturing excellence" (Bologna 1998) and, in the past, it could be justified and not very harmful because district firms operated in stable markets producing unique products and their manufacturing skills were sufficient to keep a sustainable competitive advantage. Nowadays, markets are changing and districts must take logistic problems into consideration, facing them by their own or outsourcing logistic activities. The poor logistic culture of district firms, along with their small size and their traditional focus on manufacturing skills, suggest logistic outsourcing as the best choice. In fact, logistic outsourcing could bring many advantages to district firms, such as logistic cost reduction (thanks to specialized operators' economies of scale), the transformation of logistic costs from fixed to variable ones, the opportunity to focus on district firm core business, the greater effectiveness in logistic management due to logistic provider specialization. However, even if district firms could evaluate outsourcing advantages (but this is hard to believe because most of them does not even know their logistic costs), there would be serious negotiation problems with big logistic providers, the only operators able to appropriately face the wide and complex district logistic problems. In fact, big logistic providers find worthwhile to deal with big industrial groups (often not included in districts), which move huge quantity of materials and products and use standards to manage physical and information flows. Then, scarce logistic culture of district firms has removed the main logistic service providers even if districts are potentially interesting markets for them, gathering the demand of similar services in a limited territory;

b. supply chain management was born in big industrial companies to rationalize and integrate physical and information flows along the supply chain. In this framework, these leader companies make a centralized direction and control on supply chain management implementation. On the contrary, such a leadership is clearly present only in "hub and spoke" districts, while it is difficult to find in "competitive" districts (because of their internal hard competition) and

in "fragmented" districts (because of the lack of emerging firms). Anyway, to be implemented, supply chain management needs a centralized management: in districts where there is not a leader company, it could be carried out by a "metamanager" (Invernizzi 1993) (e.g.: institution, association of firms) with entrepreneurial skills, local context knowledge and local system growth goals. The metamanager has a complex role to play, because of the high number and heterogeneity of interlocutors, their different goals, the variety of tasks. Unlike leader firms in common supply chains, the district metamanager has not any hierachical power on district firms and this makes more difficult its function. Therefore, a metamanager is important to fill the gap between manufacturing excellence of districts and their scarce strategic skills. Finally, supply chain management requires huge investments to co-ordinate and integrate supply chain members: these investments generate strong links among firms and imply long term partnerships. This kind of relationship is unusual for districts, where tipically there are weak links among firms and where competitive advantage is based on flexible networks continously re-designed according to market needs. Actually, some scholars stress that sometimes supply chain integration can be looser (Bask, Juga 2001) but, anyway, a centralized management is required and relationship management cannot be spontaneous as it is in districts. The metamanager identification is insufficient to face district logistics problems. In fact, the gap between logistic service demand (that often does not exist because of small firms scarce logistic culture) and supply (that often is not interested in working for problematic client as district firms are) can be filled only by the real commitment of district firms. Logistic outsourcing is encouraged in districts where internal growth is coupled with external growth strategies: in fact, internal growth enables firms to reach a medium size, which means to be big enough to see and face logistic problems and not big enough to self-organize logistics or to receive personalized solutions by logistic service providers. Then, external growth implies a selection of partners based on specific parameters, such as entrepreneurial and learning skills, financial health, growth perspective, reliability (Visconti 1996): from a logistic point of view, in this framework, the firms which are not ready to adopt appropriate structure and information systems to suitably interact with logistic providers would be excluded by leaders' supply chains. Therefore, medium firms could drive the whole district to logistic

innovation, improving single firm and district logistic performance (Visconti 1996).

5 Logistics in flower districts

District logistics assumes peculiar features depending on district product. This paper focuses on flower districts whose logistic requirements are quite different from those of typical industrial districts because of:

a. the product perishableness and delicacy, which affect its transportation, handling and storage;
b. the rural nature of districts: rural district origins are different from industrial ones. In fact, they are not founded on firm specialization in single value chain activities but their creation is an attempt to re-propose, in a rural context, the typical district "industrial atmosphere" and its competitive advantages (easy knowledge diffusion, low transaction costs, ecc.) [6].

In this section, preliminary hypotesis will be developed about the above mentioned research question about the logistical effects of geographical concentration and district organization of flower industry operators. The focus is on Ligurian Riviera Flower District, compared with Dutch flower industry. The comparison is very interesting because Italy and Holland start from similar production conditions (roughly the same land devoted to flower cultivation [7], lack of land, high production costs) and have analogous supply organization (districts [8], which concentrates small and medium enterprises and support activity suppliers) but these two flower industries are surprisingly different in production value [9], exports [10] and logistic performance.

[6] See section 2

[7] In Holland, about 8.500 hectares, in Italy about 12.000 hectares, 2.700 of which in Liguria (data concerning flower and plant production, year 2000) (Delbufalo, 2005)

[8] In Holland, the main concentration of greenhouses lies in the province of South-Holland and in the local council Westland, which is known as "the Dutch glass village" (van Hemert, 2005) In Italy, the district acknowledged (or which are going to be acknowledged by law) are in Liguria (Imperia and Savona provinces), Piedmont (Maggiore lake) and Tuscany (Lucca and Pistoia provinces), but other areas (in Veneto, Latium and Campania territories) are districts in fact .

[9] In 2002, 3.478.000.000 euros for Holland, 1.550.000.000 euros for Italy (Tavoletti, Te Velde 2005).

[10] In 2002, Dutch flower exports are about twelve times higher than Italian ones: more than 6.700.000.000 euros for Holland and about 526.000.000 euros for Italy (Tavoletti, Te Velde 2005)

5.1 The Dutch case

Analyzing Dutch flower industry [11], it is possible to notice that:

a. it is overall aimed at developing excellent skills in support activities which generate customer value. This is consistent with the rural nature of flower districts, where co-operation incentive is not a production interdependence of operators but the necessity to reach a dimension sufficient to effectively manage support activities such as research and development, marketing and logistics. It is on these activities that the district organization can play a decisive role in building a sustainable competitive advantage for rural districts. Moreover, the production know-how necessary to enter the industry is low and emerging countries are becoming more and more important competitors [12]. Dutch operators are conscious that most of product value comes from marketing, trade and logistic activities and that "if an excellent logistical infrastructure is in place you can have international success and huge turnovers in the flower industry without producing any flower, but you cannot have flowers that are successful on the international markets without a logistical infrastructure" (Tavoletti, Te Velde 2005);
b. auctions are the heart of Dutch flower industry [13]. They were born with the aim of reducing middlemen power and are collectively owned by growers: originally, they acted as a place where products are sorted and prices are fixed [14] and, nowadays, they are evolving into service providers and shared service centers [15]. Auctions are a real connector for Dutch flower logistic chain and, in time, they

[11] The analysis is totally based on a literature review

[12] Fast growing competitors are Kenya and Zimbabwe

[13] The main Dutch auction is Flora Holland (in Naaldwijk), with a turnover of 1.9 billion euros.. It is specialized in cut flowers (70%) and pot plants (30%). This marketplace sells about 7,6 billion products, mainly coming from Holland (5,8 billion). Flora Holland is doing business with about 16.000 suppliers, 4.600 traders, 2.600 exporters. Another important auction is VBA (Aalsmeer) with a turnover of 16 billion euros (van Hemert, 2005). Nearly 90% of all flowers in the world are traded at the auction of Aalsmer and Naaldwijk (Tavoletti, Te Velde 2005).

[14] In Aalsmeer, transactions take place through different tools: transaction at the clock, transaction through mediation, electronic transactions and other purchasing/sales opportunities (cash and carry, brokers, exporters) (Tavoletti, Te Velde 2005)

[15] Nowadays, auctions offer a wide range of services in addition to pricing: internal logisitics, financial guarantee, procurement, a database with an overview of the flowers and pot plants available, ecc. (Tavoletti, Te Velde 2005)

have invested in technical, logistical and information structures to support flower trade, of which they are global leader. The effectiveness of logistical structures of Dutch auctions is witnessed by the fact that they are commonly used in international flower trade, including the ones concerning emerging countries products. In short, Dutch auctions are a European gateway for flowers, able to manage physical and information flows in an effective and economical way;

c. Dutch flower district strategy is a combination of delocalization, internal and external growth. Delocalization strategy, sometimes implemented even by Dutch small growers, is consistent with production features (low professional skills required, high labour costs)[16]. In the meantime, internal growth strategies are stimulated (also by local banks loan policies) to allow growers to reach a size sufficient to survive. Anyway, Dutch single growers will never be big firms (also because of land narrowness): the giant dimension of Dutch flower industry is due to external growth strategies, based on the bent for cooperation that Dutch growers have developed in time and which led to the creation of cooperative structures.

With reference to the Dutch case, it is important to notice:

1. the key role played by the district organization of supply;
2. the importance of logistic skills

to generate Dutch competitive advantage in flower industry.

1. Dutch competitive advantage is not due to original advantageous conditions but to the ability to react to unfavourable conditions, such as (but not only) land narrowness. Small and medium Dutch growers were able to overcome these barriers overall gathering in districts and developing together technical solutions to improve land productivity and production efficiency, innovations rapidly spread thanks to district mechanisms. Moreover, district played an important role in gathering together flower growers and traders, who also shared initiatives to promote Dutch product in Holland and abroad. In short, the case of Dutch flower districts shows how a network of small and medium enterprises can become a global leader and how district organization can help to generate a favourable climate to knowledge diffusion and co-operation among firms, with the support of local banks, institutions, service providers;
2. also logistic superiority of flower industry does not result from original favourable conditions. For example, the strengthening of flower

[16] See section 2

air transportation (which opened new markets to Dutch flowers) was a reaction to local congested road traffic. Anyway, logistic superiority of Dutch flower industry goes beyond transportation issues and it is based on the rationalization of physical and information flows along the logistic channel, with a well defined driver of change: the auctions. These structures have demonstrated to be able to settle apparently opposed goals and to support simultanously single operator and system performance. In fact:

- Dutch growers are highly specialized and auctions support their business (e.g.: forming bouquets), allowing them to maintain specialization advantages limiting risks (the negative effects of competition among producers of the same products are limited thanks to auction price regulation). In this framework, competition is mitigated and collaboration among district producers is stimulated;
- moreover, auctions are useful to stimulate co-operation between flower growers and traders. Thanks to auctions, in fact, there is a lower risk of unsuccesful sales because they assure wide markets to growers (and sometimes the auction grants an indemnity if the product has not been sold), quality products receive a premium price and prices are quite stable. In this framework, the antagonism between growers and traders is reduced and their co-operation is possible and desirable, because everyone success depends on auction success. For this reason, traders play an important role in auction organization and collaborate with growers to develop logistic and marketing initiatives (Tavoletti, Te Velde 2005).

5.2 The Ligurian Riviera case

The Ligurian Riviera has a rooted tradition in flower and pot plant production. This activity is supported by many flower traders, an important market (Sanremo), public and private research institutions, schools, universities and complementary handicraft and industrial firms. In 2001, a regional law acknowledged the existence of a flower district in Liguria, more specifically in the territories included in two provinces: Imperia (specialized in flowers) and Savona (specialized in pot and aromatic plants, whose production is concentrated in Albenga surroundings). Flower industry is particularly important in the Ligurian Riviera district, in terms of number of firms (11.761) and employment (about 21.800 workers, 15.700 as growers and 6.100 as traders and in complementary activities) (ISTAT 2000). In the district area, almost all the

firms are family businesses whose employees are overall enterpreneur's relatives. Also for the Ligurian case [17], it is possible to make some preliminary considerations about:

1. the role played by the district organization in flower industry;
2. the importance of logistic issues.

1. The Ligurian Flower District has some features typical of more traditional districts. More specifically, it is:
   - composed of many little firms, geographically concentrated and supported by providers of complementary activities;
   - focused on production activities;
   - based on flexible collaboration among firms.

   On the contrary, being a rural district, its production cycle is not fragmented and spread over many firms specialised in single value chain activities: in a word, there is a lack of production interdependence among operators. This is true also in the Dutch case but, as it was stressed before [18], in Dutch flower industry there are mechanisms which create an "economic" interdependence among operators (high product specialization of growers, all operators need of auction activities) which does not exist in the Ligurian context. In the Ligurian Riviera Flower district, firms are reluctant to delocalize production and they are not implementing internal growth strategies and external growth experiences are limited (Tavoletti, Te Velde 2005). Firstly, delocalization is often considered a threat to local production rather than a source of competitive advantage, a strategy which enables to reduce costs, gain new expertise, enter new markets and monitor international market opportunities and threats. The main focus of Ligurian flower growers is production, while trade and logistics importance is understimated. Moreover, Ligurian operators are reluctant to grow and there are not spurs to internal growth strategies: on the contrary, Italian small enterprises have many incentives/pressures which encourage to keep a small size. Then, external growth strategy is difficult to implement in the short run, because the Ligurian Riviera Flower District can be included in "fragmented" districts [19], where there is not a leader (company or institution) and most of relationships are based on spot contracts or even simply on trust: in this context, structured

[17] The analysis is based both on a literature review and on pilot interviews
[18] See section 5.1
[19] See section 2

partnerships (fundamental for external growth strategy) are absolutely unusual;

2. with reference to logistics, the Ligurian approach is very different from the Dutch one. My analysis puts in evidence serious logistical problems, related to:
   a) traditional logistics (e.g: transportations and infrastructure);
   b) more innovative logistic issues, such as supply chain integration.

   a) Transportation is fully carried out by lorries and, even if in Albenga there is an airport, it is not sistematically used to transport flowers. Often, lorries travel half empty, provoking an increase in transportation costs for district operators. The intensive use of lorries to transport flowers and plants causes traffic congestion, concentrated in few months of the year, because of product seasonability. Moreover, there is a serious lack of infrastructures: in Albenga area, for example, most of the road system is made up of small rural streets, where big lorries cannot transit. Therefore, the product is firstly loaded on little lorries and, after, it is transferred to bigger ones, usually on halting-places in streets full of traffic. To improve the situation, local operators often asked for an equipped area where it is possible to concentrate loading operations. This structure could also offer other services, such as parking and warehousing. Moreover, it could be a reference pole both for growers and dealers. There are many reasons which explain the delay in realizing this structure: for example, the lack of space and problems in finding other industry operators willing to share the project, because the product seasonability does not allow to saturate the structure capacity all year (Colla 2005);
   b) besides transportation and infrastructure problems, the Ligurian Riviera Flower District suffers problems related to supply chain integration (Colla 2006). Firstly, there is a difference in power between producers and dealers. In fact, in the district area there are many growers who sell their product to few wholesalers. Therefore, there is a sort of monopsony, where wholesaleres have much more power than producers in negotiations, tend to keep low origin prices and take the greater part of the product final value. In the meantime, local wholesalers are price-taker in the global market (where prices are mainly fixed in Dutch auctions) and their market power is very low. The result is low margins for all local operators, at each level of the supply chain. Besides, the lack of power of growers is an obstacle to

logistic channel shortening and this leads to long logistic chains and a consequent threat to process efficiency, service effectiveness and product quality. Finally, Ligurian flower industry suffers a lack of coordination. Most of negotiations are one-to-one, prices are quite variable and this does not stimulate co-operation between growers and wholesalers. What emerges is the need of a central institution able to play an enterpreneurial role, centralize negoziations and create a more stable environment favourable to partnership among operators. Moreover, such a "metamanager" could manage and control the system as a whole, centralizing also the demand of logistic services, allowing district firms to reach together a size sufficient to deal with logistic service providers.

5.3 The Ligurian Riviera case: outcomes of interviews

Main logistic problems stressed by literature have been confirmed by the small set of pilot interviews to Ligurian flower district operators. More specifically, the interviews have involved:

- three flower and pot plant growers (employees in 2006: between 3 and 8 units; turnover in 2006: between 200.000 and 450.000 euros; cultivated land in 2006: between 1,2 to 5 hectares);
- a consortium of growers and wholesalers (employees in 2006: 18 units; turnover in 2006: 6.000.000 euros; cultivated land in 2006: 10 hectares);
- a flower exporter (employees in 2006: 9 units; turnover in 2006: 400.000 euros).

The interviews aim was to understand how physical and information flows are managed by flower industry operators and their opinion (by scores) about the importance (1 = not very important, 2 = quite important, 3 = very important) and criticality (1= not very critical, 2 = quite critical, 3 = very critical) of some logistic issues [20]. The assessment about importance is useful to identify the main logistical requirements of Ligurian flower industry operators, while the assessment about criticality is direct to detect the logistic issues that, in Ligurian Riviera Flower District, are perceived as more difficult to manage. Thus, an issue can be considered important but not very critical because it is already managed in a satisfactory way, while another one can be perceived both important and critical (in this case, the issue represents a

[20] The paper shows only the outcomes useful for this paper aims

serious weakness in local flower industry system). The main outcomes are the following [21]:

- transportation and infrastructure inadequacy represent the most serious logistical problems for local flower industry and they are considered very critical points in local logistical framework (see table and figure 1). According to interviewees, product preservation during transportation is the most important need, but this issue is considered only quite critical. On the contrary, many interviewees stressed they are seriously worried about load sub-optimization (and the consequent increase in transportation costs) and infrastructure shortage, which are considered very critical issues. The choice of the best means of transport is considered a little less important and critical;
- to solve logistic problems interviewees think that it is important to increase in size, but they find that it is a very difficult goal to achieve (see table 2 and figure 2). About possible district strategies to grow, what emerges is that:
  - delocalization strategy is not considered at all. All interviewees, in fact, declared they cultivate only local soil and did not mention delocalization as a possible option to grow;
  - internal growth is considered a condition to solve logistical problems, but operators find difficult to increase in size;
  - Ligurian operators think that external growth strategies are quite important to face logistical problems, but they outline how competition makes difficult co-operation.

  With reference to supply chain integration need, operators outline that ICT should play an important role in supply chain integration but, nowadays, it is a very critical issue, mainly because of the lack of other operators will, high innovation costs and required time. Moreover, local firms think that co-operation among operators at the same level of the supply chain is important but very difficult to achieve and that co-operation among operators of different supply chain layers is equally important but a little less problematic. The exporter, then, outlines how supply chain relationships with "downstream" operators is an incentive to innovate, because clients (especially foreign big distributors) often require their suppliers to update their ICT systems and to attain product certifications. The centralization of district logistic management is considered a very important opportunity even if it is a quite critical goal. With regard

[21] Tentative outcomes are based on few pilot interviews but, up to now, they are quite significant because of the scarce variability of scores.

to this topic, the exporter outlines that such a "metamanagement" could play an important role to overcome the widespread lack of trust among local operators, especially by collecting and distributing data in an anonimous way, reducing the risk of opportunistic behaviours linked to information sharing.

Other significant outcomes are the following:

- inbound logistic is considered quite important but it is not basically considered very critical by interviewees (see table 4 and figure3). They are rarely charged with this activity, which is tendentially managed by suppliers (material suppliers or carriers). Most supplies come from the district (see table 4), followed by Italy and foreign countries (but there is an exception: a grower who declares that 80% of his firm supplies comes from foreign countries). Supply speed is considered the most important supply need, but operators are satisfied about present suppliers' performance. Supply accuracy and punctuality are a little less important but not very critical (overall, operators are very satisfied about suppliers' punctuality). On the contrary, supplier's assortment is less satisfactory and it is considered a quite critical issue. Finally, there is not a significant need of supplier after sale services;
- Ligurian flower operators consider internal logistics very important but not very critical (see table 5 and figure 4). They indicate as the most important issue production planning, which is also highly critical (the main complaint is about the lack of centralized planning and widespread knowledge about demand trends). Product customization, material handling and production flexibility result to be very important issues but they do not generate heavy problems to operators. Stock management is less important and operators are basically satisfied about their present performance;
- some outbound logistics issues are considered important (speed, accuracy and punctuality of order fulfilment), but none stressed these activities as very problematic (see tables 6, 7 and figure 5). In most cases, outbound logistics is managed by specialized carriers: this is especially due to product characteristics (flowers require special transport on refrigerated lorries) and the long distance to cover (only a percentage between 0% and 30% of the production is directed to district clients, while a significant part of production travels towards foreign destinations) [22]. Other interesting information emerges from this section of interviews. First of all, internationalization and the

[22] A peculiarity is that, in the district area, some foreign wholesalers placed their own warehouses, where growers bring their product

search for new markets are not considered top priorities but operators think that they are quite difficult goals to achieve (an operator made a specific reference to Eastern Europe, which is an interesting but risky market to enter for single operators, without any coalition). Moreover, on average, interviewees do not consider direct sales to final customer as an important goal (showing a scarce interest in logistic channel shortening) and they also do not consider very important to offer after sale services to customer (but answers are quite different and wholesalers are more sensitive about this issue) [23];

6 Conclusion

With reference to the research question about logistic advantages and disadvantages related to district organization of supply in flower industry, the preliminary outcomes emerging from this analysis are the following:

- the Dutch case is an example of success in logistic management where district organization of supply allowed small enterprises to overcome logistic barriers. Some years ago, Porter spoke about Dutch flower industry excellence mentioning the greenhouses of the Netherlands as the only Dutch diamond (Porter 1990) and stressing that the Dutch flower industry is able to achieve differentiation on freshness, quality and variety (Porter 1998). Dutch competitive advantage in flower industry is based on:
  - the existence of highly specialized research organizations in flower cultivation, packaging and shipping (factor conditions);
  - a strong home demand (demand conditions);
  - a highly efficient infrastructure in flower handling and air freight (related and supporting industries);
  - an active domestic rivalry on certain focused places and specialized home-based suppliers (firm conditions) (van Hemert 2005).

  In this analysis, geographical concentration of firms, district organization of supply and logistic superiority emerge as key sources of competitive advantage for Dutch flower industry. Moreover, this paper outlines how, in Dutch flower industry, geographical concentration has been combined whith peculiar relationships among operators, where competition and co-operation live together and co-operation prevails overall when it is a matter of managing support

[23] It must be pointed out that the scores relative to the importance of direct sales and after sale services are very variable ($\sigma = 0{,}98$) and this makes less significant the average score.

activities which create value for the whole system. This bent for co-operation is based on a well defined supply chain architecture, where there are a clear direction, precise rules and, overall, a strong economic interdependence among operators;

- also in the Ligurian Riviera Flower District case there is a geographical concentration of operators in a narrow area and production is stood by many support activities (research and development, distribution, training, ecc.) managed by specialized firms/institutions. However, applying Porter's analysis to the Ligurian context, what comes to light is that:
  - with reference to factor conditions, Ligurian Flower District can benefit from many key resources (e.g.: specific know-how, skilled workers, favourable climate conditions), while there are shortages in other ones (mainly, infrastructures);
  - there are lacks in demand conditions and, overall, there are lacks in demand knowledge;
  - related and supporting industries exist but they are tendentially less competitive than Dutch ones (so that, often, local operators buy Dutch services);
  - with reference to firm conditions, there is a strong domestic rivalry inside specific areas but the relationship context stimulates more price than quality competition. Moreover, the strategies of firms are not very consistent with product characteristics, which require to produce where labour costs are lower, search for economies of scale and focus on value added activities, such as logistics.

In Liguria, district organization did not succeed in improving logistical performance. According to the tentative analysis developed in this paper, the gap in logistic performance between Dutch and Ligurian flower industry is overall due to the different configuration of supply chain relationships. In fact, many elements drive to a strengthen of horizontal and vertical competition among Ligurian supply chain operators:

- first of all, the lack of a centralized management leads to an unstable environment, which feeds competition on price among growers and on value distribution between growers and wholesalers;
- then, Ligurian flower operators are less interdependent than Dutch ones and this stimulate individualism;
- individualist behaviour hampers collaboration and partnership, as well as information sharing among firms.

Interviews confirmed this lack of trust among operators and outlined that it is one of the most significant obstacles to logistic improvement and supply chain integration: however, almost all the interviewees think that it is absolutely necessary to overcome this limit and that the intervention of a central operator/institution could give a substantial help in stimulating co-operation. In substance, the lack of supply chain integration emerges from the interviews as the origin of most of Ligurian Riviera Flower District logistical problems. In fact, local operators are quite satisfied about inbound, internal and outbound logistic performance, but they complain overall about high logistic costs and shortages in information flows, problems whose solution can be found only by a rationalization which requires collaboration and centralized management. This paper hypotesis (to be confirmed firstly by further interviews and then by a comprehensive survey) is that district organization in flower industry is useful to improve logistic performance but it is not a sufficient condition and it is useless if it is not coupled with collaboration incentives. In fact, co-operation and trust among operators are not surely natural features of districts but, especially in present environment instability, they are goals to achieve. Certainly, heavy competition and shrinking margins are not a boost to co-operate ant to share strategic information: only the districts which are able to create a quite stable environment and to assure a global market to their product (even conforming their logistical structures) can fully benefit from the advantages of district organization. It is a sort of "virtuous circle" where:

- co-operation is required (and, in case, it must be stimulated by a district metamanager) to attain the logistic improvement necessary to compete on a global scale and to increase the overall value;
- as a result, the lower competitive pressure creates the right conditions to feed trust among operators, necessary firstly to rationalize district physical and information flows and then, in case, to gain expertise in logistic management to spend also outside the district boundaries.

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Tables and Figures

Table 1. Transportation and infrastructure issues

Issue	*Average score*	
	Importance	*Criticality*
Product preservation	3,0	2,0
Load optimization	2,8	2,8
District infrastructure	2,8	2,8
Choice of the best means of transport	2,6	2,4
Average score	**2,8**	**2,5**

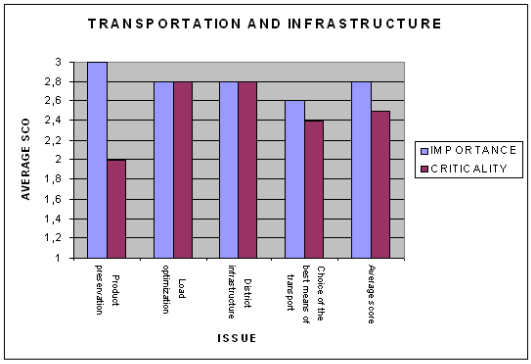

Fig. 1. Transportation and infrastructure issues

Table 2. Supply chain relationships and integration

Issue	*Average score*	
	Importance	*Criticality*
Firm size, trade power	2,6	2,6
Information flows based on ICT	2,6	2,6
Logistic partnership with operators at the same level of the logistic chain	2,6	2,4
Logistic partnership with operators at other levels of the logistic chain	2,6	2,3
Central management of district logistic issues	2,6	2,2
Average score	**2,6**	**2,4**

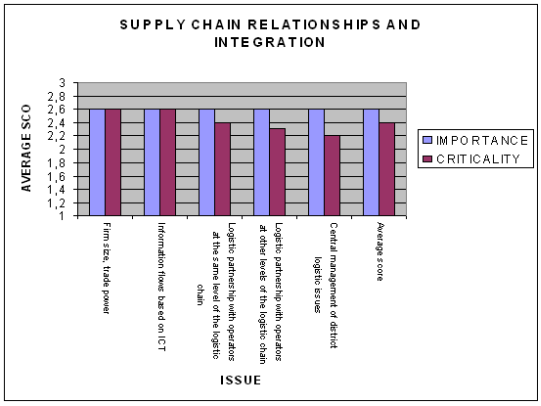

Fig. 2. supply chain relationships and integration

Table 3. Inbound logistics: supplies provenance

Supply market	*G1*	*G2*	*G3*	*GW*	*E*
Ligurian district	80%		80%	80%	80%
Italy	10%	20%	20%	15%	18%
Abroad	10%	80%		5%	2%

G1, G2, G3 - growers
GW - growers/wholesalers consortium
E - exporter

Table 4. Inbound logistics

Issue	*Average score*	
	Importance	*Criticality*
Supply speed	3,0	1,4
Supply accuracy	2,8	1,6
Supply punctuality	2,8	1,0
Assortment of supplies	2,4	2,0
After sale services provided by suppliers	1,6	1,4
Average score	**2,5**	**1,5**

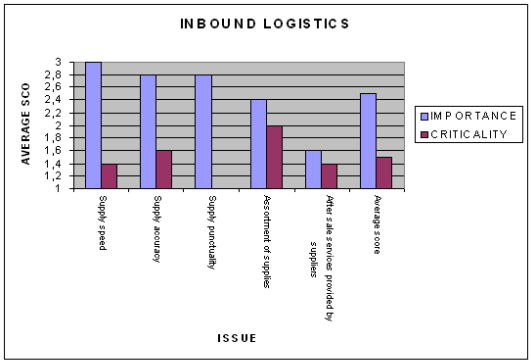

Fig. 3. inbound logistics

Table 5. Internal logistics

Issue	*Average score*	
	Importance	*Criticality*
Production planning	3,0	2,5
Product customization	2,8	1,6
Material handling	2,8	1,8
Production flexibility	2,7	1,5
Stock management	2,4	1,4
Average score	**2,7**	**1,8**

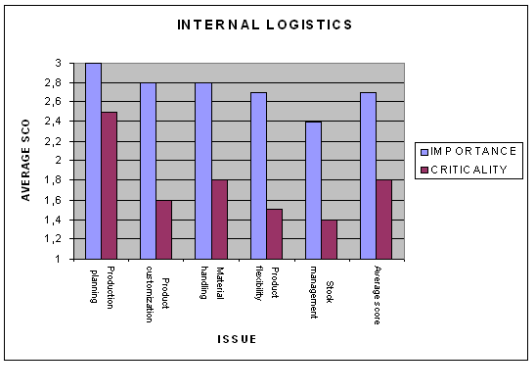

Fig. 4. internal logistics

Table 6. outbound logistics: product destination

Market	*G1*	*G2*	*G3*	*GW*	*E*
Ligurian district	30%		20%		
Italy		50%	60%	10%	
Abroad	70%	50%	20%	90%	100%

G1, G2, G3 - growers
GW - growers/wholesalers consortium
E - exporter

Table 7. Outbound logistics

Issue	*Average score*	
	Importance	*Criticality*
Punctuality in order fulfilment	3,0	1,4
Accuracy in order fulfilment	3,0	1,2
Speed in order fulfilment	3,0	1,0
Internationalization, search for new markets	2,2	2,2
Direct sales	1,8	1,0
After sale services	1,8	1,4
Average score	**2,5**	**1,4**

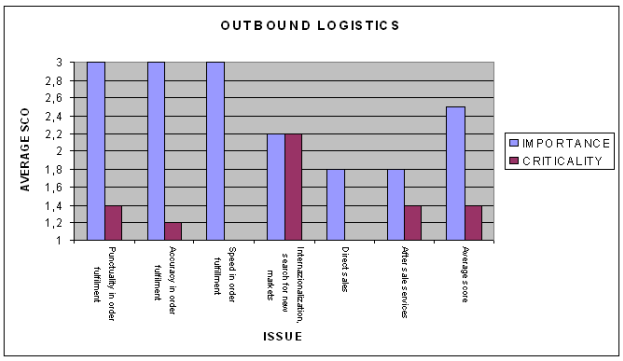

Fig. 5. outbound logistics