

Thesis report

Sourcing strategies for flora providers

in the detail scenario

A case study in the Dutch flower chain

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Colophon

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Acknowledgements

This report is the result of my master thesis which I conducted at the chair group of Management studies of Wageningen University. With this thesis I finalize the Master program Management, Economics and Consumer Studies, specialisation Management studies. The research has been carried out in the time period of May 2013 until December 2013.

The research is conducted for the DaVinc³i project with the guidance of Vereniging Groothandelaren in Bloemkwekerijproducten (VGB). The DaVinc³i project is a 4-year research project and started in 2011. It researches how the Dutch floricultural sector can remain its leading position as the (virtual) floricultural trading hub of Europe. The name of the project stands for **D**utch **A**gricultural **V**irtualized **I**nternational **N**etwork with **C**oordination, **C**onsolidation, **C**ollaboration and **I**nformation availability. The DaVinc³i project developed three scenarios that are possible in the future floricultural chain. The detail scenario is one of these scenarios and is applied in this research. This research focused on the logistics between a grower and a flora provider in the future detail scenario were most sales are traded direct and not at the auction clock.

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Linda de Kooter

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Executive summary

Introduction

This research has been conducted for the DaVinc³i project under supervision of Vereniging van Groothandelaren in Bloemkwekerijproducten (VGB). The research focuses on the logistics of flowers between Dutch growers and Dutch flora providers in the detail scenario. The detail scenario is a future scenario, developed by the DaVinc³i project, where consumers prefer buying flowers at a small scale shop like a flower shop. The market is served for 60% by the detail trade and 40% by retail and e-tail (Koppes et al., 2012). Today, flowers can be purchased at the auction clock or by direct trade. Direct trade occurs when a trader (e.g. flora provider) and a grower agree on a direct deal which is financially cleared by a third party e.g. the auction (Koppes and Ossevoort, 2012). In part due to the increase of the direct trade, the logistics network is changing. Currently, less flowers are transported to the auctions and more flowers are transported directly to the flora providers dock. This transport is arranged by the growers who outsource or in-house the logistics.

The research objective of this research is providing insight in the role that the third party logistics (3PLs) and flora providers currently have in the Dutch flower chain and how these roles will change in the detail scenario. And to give insight in the possible sourcing strategies a flora provider can choose from in the detail scenario. This led to the following main research question:

What are possible sourcing strategies for flora providers in the detail scenario of the Dutch flower chain?

Literature study

A literature study was conducted in order to define theoretical concepts that relate to the choice of a sourcing strategy. First, the activities of each actor in the chain were defined. The traditional role division in the flower chain is that growers produce, the auction connects the parties (growers and traders) by organizing a marketplace, traders buy large bulks and sell the smaller lots in national and international markets and organize the distribution. The logistics service providers (LSPs) provide the logistics between the different actors and to different outlets like retailers and florists.

Second, outsourcing logistics was discussed by the (dis)advantages of it. According to literature the advantages are a cost reduction (economies of scale), ability to focus on core competences, better service performance, better competitive position in market, higher flexibility and the availability of the expertise and experience of 3PL.

Third, the different sourcing strategies, single, multiple and local sourcing, were discussed in the literature review by their advantages and disadvantages. The sourcing strategy of a flora provider can be assessed with the logistics performance factors; service performance, costs, time, flexibility and geographical scope.

Finally, the services of a 3PL were discussed in the literature review. The services of a 3PL can be categorised in six main categories: transportation, warehousing, inventory management, value added services, financial services and information systems.

Methodology

The empirical study included a case study in the flower chain. The case study was carried out by means of interviews with the (co-)owner or logistics manager of a nursery (n=3), flora provider (n=7) and LSPs (n=3). Besides these thirteen interviews, one expert interview was conducted at the auction

FloraHolland. First, a within-case analyses for each actor was executed, by making detailed write-ups of the case studies. Second, a cross-case analysis was conducted. Third, the expert interview was held and analysed.

Results and conclusion

The results of the research show that the participating companies have a different view on the future sourcing strategy than was assumed. From the thirteen companies, ten companies and the expert believed that in the future detail scenario the current roles will remain the same. Growers will keep organising the transport and flora providers will not have to source the flowers themselves with the help of 3PL(s). The main reason for the disagreement was that the current logistics system, wherein the growers are responsible for the transport to the flora providers, is working well. Other reasons are that due to a lack of a shared ICT system between the growers, 3PLs and flora providers and the lack of a (central) hub in the detail scenario, the sourcing of the flowers will not be quick enough. The period between the direct trade in the morning and time to receive the flowers in the afternoon is too short to collect and distribute the flowers from different growers to the flora provider.

Furthermore, two flora providers and one LSP explained that the transport role will shift in the future detail scenario. Therefore, the three sourcing strategies that resulted from this research are:

- Flora providers outsource the logistics services to growers
- Flora providers source the logistics services from a single LSP
- Flora providers source their logistics in-house by their own small vans

Single outsourcing to a 3PL was chosen due to the experience and knowledge of a 3PL and ability for flora provider to focus on their own core competences. Furthermore, the 3PL can design a specific sourcing network for the flora provider since the trust between each other is high which will result in sharing business information. With sourcing logistics services from multiple 3PLs the relationship will be less close and on a short term to the flora provider. The sourcing strategy by in-house logistics of small vans is based on the emotional value, the believe that a flora provider is more flexible than a 3PL in their collection of flowers in order to provide a higher service performance to their customers, the outlets. However, the time that is needed to collect and organise the logistics itself makes the strategy not applicable to large flora providers, only to medium and small flora providers.

A remark to these results is that the type of sourcing strategy for direct trade is affected by the current strategies of the flora provider.

Concluding, most interviewed companies do not foresee a change in roles in the detail scenario although the growers, flora providers and LSPs are aware of the increase in direct trade. Different sourcing strategies will be used by the flora providers in the future detail scenario. However, from this research three strategies can be concluded: outsourcing the logistics to growers, single sourcing logistics from a 3PL and in-housing the logistics with small vans. The choice for a sourcing strategy will depend on the product and volume of transport, the business strategy of the flora provider, logistics performance of 3PLs logistics services and emotional value of the sourcing strategy.

Samenvatting

Introductie

Dit onderzoek is uitgevoerd voor het DaVinc³i project onder begeleiding van de Vereniging van Groothandelaren in Bloemkwekerijproducten (VGB). Het onderzoek richtte zich op de collectielogistiek van bloemen tussen Nederlandse kwekers en Nederlandse exporterende groothandelaren in het detail scenario. Het detail scenario is een toekomstscenario, dat voort komt uit het DaVinc³i project, waarin consumenten de voorkeur hebben voor bloemen van kleine winkels zoals bloemisten. Hierin wordt 60% van de markt bediend door de detail handel en 40% door de retail en e-tail (Koppes et al., 2012). Vandaag de dag kunnen bloemen zowel gekocht worden op de veiling als door directe handel. Directe handel is een verkoopmethode waarin een groothandel en kweker het eens worden over een directe deal die financieel afgehandeld wordt door een derde partij zoals bijvoorbeeld de veiling (Koppes en Ossevoort, 2012). Gedeeltelijk door de directe handel verandert het logistieke netwerk in de keten, minder bloemen worden naar de veilingen getransporteerd en het rechtstreekse vervoer naar de groothandelaren neemt toe. Dit vervoer wordt door de kwekers geregeld die het transport uitbesteden of zelf vrachtwagens bezitten.

De doelstelling van dit onderzoek is om inzicht te geven in de rol die de derde partij logistiek (3PL) en groothandels (flora providers) op dit moment in de Nederlandse bloemenketen hebben en hoe deze rollen zullen veranderen in het detail scenario. Daarnaast wordt er getracht inzicht te geven in de mogelijke collectiestrategieën voor een groothandel in het detail scenario.

Dit leidde tot de volgende onderzoeksvraag:

Wat zijn mogelijke collectiestrategieën voor groothandels in het detail scenario van de Nederlandse bloemenketen?

Literatuur studie

Een literatuurstudie is uitgevoerd om theoretische concepten te definiëren die betrekking hebben op de keuze van een collectiestrategie. Als eerste werden de activiteiten van de verschillende partners in de keten beschreven. De traditionele rolverdeling in de bloemketen is als volgt; kwekers produceren, de veiling verbindt de partijen (kwekers en handelaren) door het organiseren van een markt, handelaren kopen grote volumes in van bloemen die ze vervolgens verkopen in kleinere partijen in de nationale en internationale markten verder organiseren ze de distributie. De logistiek dienstverleners zorgen voor het transport tussen de verschillende partijen en distributie naar o.a. retailers en bloemenzaken. Ten tweede werd het uitbesteden van logistiek aan een logistiek dienstverlener besproken aan de hand van voor- en nadelen. Volgens de literatuur heeft uitbesteding van diensten de voordelen van; kostenreductie (schaalvoordelen), vermogen om als bedrijf te concentreren op kerncompetenties, betere dienstverlening, betere concurrentiepositie in de markt, betere flexibiliteit en de beschikbaarheid van de expertise en ervaring van 3PL. Als derde werden de verschillende collectiestrategieën; enkel, meervoudig en lokaal uitbesteden van transport aan een 3PL, besproken aan de hand van hun voor- en nadelen. Hieruit kwam naar voren dat de collectiestrategie van een groothandel kan worden beoordeeld met de volgende logistieke prestatie factoren; service prestaties, kosten, tijd, flexibiliteit en geografische oriëntatie. Als laatste werden de diensten die een 3PL kan bieden besproken in de literatuurstudie. Deze diensten zijn transport, opslag, voorraad beheer, diensten met toegevoegde waarde, financiële services en informatie systemen.

Methodologie

De informatie uit de praktijk werd verkregen door een case study uitgevoerd door middel van dertien interviews met een (mede-)eigenaar of logistiek manager van een kwekerij (n=3), groothandel (n=7) en logistiek dienstverlener (n=3). De analyse van de resultaten bestaat als eerste uit een analyse voor

elke partij: de kwekers, de groothandelaren en logistiek dienstverleners. Ten tweede werden deze aparte analyses vergeleken met elkaar wat resulteerde in de cross-case analyse. Als laatste werd een expert interview met een managementmedewerker bij de veiling, FloraHolland, gehouden en geanalyseerd.

Resultaten en conclusie

Uit de resultaten van het onderzoek is te concluderen dat de deelnemende bedrijven een vooralsnog andere kijk hebben op het toekomstig detail scenario en de collectiestrategie. Van de veertien interviews, waren tien bedrijven en de expert van mening dat in het toekomstig detail scenario de huidige rollen van de partijen hetzelfde zullen blijven. Kwekers zullen het transport blijven organiseren en groothandels zullen niet de bloemen zelf gaan collecteren of met behulp van 3PL(s). De belangrijkste reden hiervoor gegeven is dat het huidige logistieke netwerk, waarbij de kwekers verantwoordelijk zijn voor het vervoer naar de groothandels, goed werkt. Andere redenen zijn te wijten aan het gebrek van een gemeenschappelijk ICT-systeem tussen de kwekers, 3PLs en groothandelaren en het ontbreken van een (centrale) hub voor overslag van bloemen bij direct transport in het detail scenario. De periode tussen het afsluiten van een directe deal in de ochtend en de tijd om de bloemen te ontvangen in de middag is te kort voor het verzamelen en distribueren van de bloemen van verschillende kwekers door de groothandel.

Verder gaven twee groothandels en één 3PL aan dat er wel een verschuiving van de organiserende transportrol in het toekomstig detail scenario komt. De drie collectiestrategieën die mogelijk zijn in het detail scenario zijn daarom als volgt:

- Groothandelaren besteden de collectie en transport van bloemen uit aan de kwekers.
- Groothandelaren besteden de collectie en transport van bloemen uit aan één enkele 3PL.
- Groothandels besteden de collectielogistiek niet uit, maar organiseren het zelf met kleine bestelwagens.

De collectiestrategie van uitbesteding aan één enkele 3PL werd aangedragen vanwege de ervaring en kennis van de 3PL en de mogelijkheid voor de groothandel om zich te concentreren op zijn eigen kerncompetenties. Bovendien kan de 3PL een specifiek collectienetwerk voor de groothandel ontwerpen doordat er een goed vertrouwen is tussen beiden waardoor het delen van vertrouwelijke bedrijfsinformatie makkelijker is. Met het uitbesteden van de collectielogistiek aan meerdere 3PLs zal de relatie gebouwd zijn op korte samenwerking waardoor er minder snel vertrouwelijke informatie uitgewisseld zal worden. De collectiestrategie om zelf de collectielogistiek met kleine bestelwagens te organiseren werd deels aangedragen vanwege de emotionele waarde. De groothandel verwacht flexibeler te zijn in de collectie van bloemen om vervolgens een hogere dienstverlening te bieden aan hun klanten. Echter, de tijd die nodig is voor het verzamelen en organiseren van de logistiek maakt de strategie niet van toepassing op grote groothandels, alleen voor middelgrote en kleine groothandels.

Een opmerking die gemaakt moet worden over de resultaten is dat de keuze van de collectiestrategie in het toekomstig detail scenario werd beïnvloed door de huidige strategieën van de groothandelaren voor hun directe handel.

Afsluitend, de kwekers en groothandelaren zijn op de hoogte van de toenemende directe handel, maar handelen hier nog niet naar in hun toekomstig collectiestrategie. Dit onderzoek identificeerde drie mogelijke collectiestrategieën voor groothandels in het toekomstig detail scenario: uitbesteding van de logistieke diensten aan kwekers, uitbesteding van de logistieke diensten aan één 3PL en de collectie en logistiek zelf organiseren met eigen bestelwagens. De keuze voor de collectiestrategie zal afhangen van het product en volume van het vervoer, de bedrijfsstrategie van de groothandel, logistieke prestaties van de logistieke diensten van de 3PLs en de emotionele waarde van de strategie.

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1. Introduction

This chapter starts with the introduction to the research topic in section 1.1, after that background information is provided in section 1.2 on the developments in the Dutch flower chain, actors in the flower chain, the detail scenario and sourcing strategies for collection of flowers. Section 1.3 discusses the concept definitions.

1.1 Introduction of the subject

The motive for this research project is that within the Dutch flower sector a change in the trading of cut flowers (subsequently referred to flowers) has been noticed. In the past flowers were traded at one of the auction clocks in the Netherlands. Currently less flowers are traded at the auction clock and more flowers are traded direct between growers and traders (flora providers). This change in the way of trading will have its impact on the logistics in the flower supply chain. This research therefore researches the current and future roles of each actor in the supply chain and how the logistics between growers and flora providers can be organised.

The commissioners of this research are the DaVinc³i project and the Vereniging van Groothandelaren in Bloemkwekerijproducten (VGB). The research is part of the industry-wide DaVinc³i project and is supervised by Vereniging van Groothandelaren in Bloemkwekerijproducten (VGB). The name of the research project DaVinc³i stands for Dutch Agricultural Virtualized International Network with Coordination, Consolidation, Collaboration and Information availability. The DaVinc³i research has the aim to strengthen the international leading competitive position of the Dutch floriculture sector in a global, virtualized trade network (Van de Vorst et al., 2012). Multiple scenarios for the future flower sector regarding the logistics network have been developed by the DaVinc³i project. One of the scenario's, the detail evolution scenario, will be used in this research further named detail scenario.

The VGB supervised this research since they are the Dutch sector organization of national, exporting and importing wholesalers of flowers and plants. The members of VGB represent 3.5 billion of sales in the trading industry (VGB.nl, 2013). VGB is involved in the DaVinc³i project which as mentioned previously is an industry-wide project in the floricultural sector in which growers, trading companies and logistics service providers collaborate with universities to develop and research new concepts for the future. The DaVinc³i project started because developments in the floricultural chain were noticed and future innovations in the chain needed to be researched to maintain the global leader in the floricultural sector. The next section provides more background information about the developments, the Dutch flower supply chain, the detail scenario and sourcing strategies to organise the logistics when direct trade is used.

1.2 Background information

This section provides background information on the research subject to explain it in more detail. First, developments in the flower chain are discussed, second the actors in the flower chain are described. Third, the detail scenario from the DaVinc³i project is explained which will be the focus of this research. As fourth, the different sourcing strategies are provided which are suggested from literature when flora providers will have to organise the logistics in the detail scenario.

1.2.1 Developments in the flower chain

The Netherlands is the world best class floricultural sector in the world. Although the Netherlands have a leading position the Dutch floricultural sector needs to look forward and innovate.

‘Today, most floricultural products physically pass through the auction houses on their fixed routes from (inter)national growers to (inter)national customers to allow for physical inspection and quality control. However, several market developments stimulate the chain to become an efficient (virtual) floricultural network, in which cut flowers, plants and other products are delivered to customers taking different (direct) routes (van der Vorst et al., 2012)’.

The floricultural chain is developing from a supply driven production chain to a demand driven production chain. The sale of the floricultural products is increasingly regulated by the growers own sales subsidiaries (Hartkamp et al., 2009). Fewer sales proceed therefore through the auction and a new type of logistics service provider and sourcing strategy is needed.

The auction clock was traditionally the main pricing mechanism. Today, the products can be purchased at the auction clock or by direct trade (Koppes and Ossevoort, 2012). A direct trade occurs when a trader and a grower agree on a direct deal which is financially cleared by a third party like the auction, FloraHolland, or come about by mediation of a FloraHolland employee (Koppes and Ossevoort, 2012). This gives the advantage of risk hedging. Agreements about quantity, quality and sourcing logistics can be made upfront between grower and customer, the trader or retailer. The agreement provides certainty to the grower and customer about flower purchase and sales price.

Within the floricultural chain a distinction can be made between the plant and flower industry. The plant industry is more modernised and in 2012 70% of the plants was traded direct and only 30% was traded by the clock. The flower industry is more traditional and 84% of flowers was purchased by the clock (Van der Vorst et al, 2012) but a number of parties (ING, VGB, FloraHolland) in the floricultural chain believe that this will decrease in the next years. More transactions are made by virtualisation through remote buying, image auctioning and direct trade (Koppes and Ossevoort, 2012; VGB, 2010). Remote buying is when traders are bidding via an online registration program on their own computer. Image auctioning is when the original auction clocks have been replaced by projection screens at the auction locations. The buyers purchase flowers based on product information and representative grower’s images. Virtual auctioning is when the products do not appear physically in front of the auction clock. The trade is made on the basis of photos and other information. Buyers bid at a dedicated workplace which can be either, the Flink (flexible customer) workstation, the auction room or using remote buying (Floraholland.nl, 2013). The increase in virtualisation and growing purchasing power of end customers led to a shift in the traditional roles in the Dutch flower supply chain. The flower chain is changing and developments are noticed. The main developments will be described below.

Scale optimisation is a development that is noticed in the floricultural chain. The number of traders and growers is decreasing but the total turnover increases. The companies are becoming bigger and efficiency driven developments are getting more important (VGB, 2010; Koppes and Ossevoort, 2012). This development makes it difficult for growers who provide small batches of flowers to the auction since the batches are difficult to pass through the chain (ING economisch bureau, 2012). These smaller growers have no economies of scale and their production costs will be higher than for the larger growers who can sell them for a lower price.

Furthermore, specialisation by growers and traders is seen more often. The growers and traders specify to a certain product or look for niches in the market to increase their position in the market. A third development which is named here is the integration in the flower network which shortens the chain. Organisations in the chain broaden their activities and take over a number of roles of other actors in the chain (VGB, 2010).

Other trends which are noticed in the flower chain are that traders order smaller quantities on a more frequent base and service levels are differentiated for different segments (Koppes and Ossevoort, 2012).

1.2.2 Flower chain

The Dutch flower chain includes domestic and foreign growers, auction, traders (wholesalers, importers and exporters), logistics service providers and retail and detail sales channels, see figure 1. The traditional role division in the flower chain is as follows: Growers produce, the auction connects the parties (growers and traders) by organizing a marketplace, traders buy and sell the products in national and international markets and organize the distribution, logistics service providers like shippers and transport companies provide transportation between different actors and retailers and outlets sell the flowers to the end consumer.

In this research the focus is on the flow of flowers from domestic growers to the auction and/or wholesalers (traders) distributed by logistics service providers to the detail sales channels.

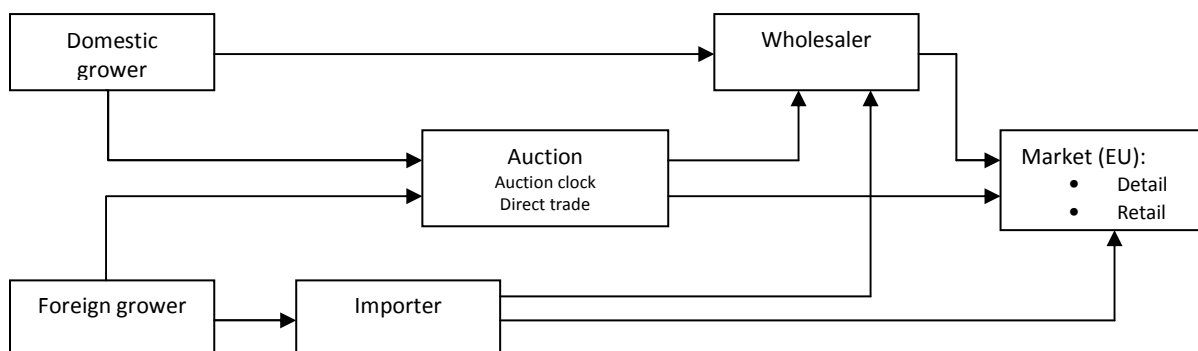


Figure 1. The floricultural network (from Van der Vorst et al., 2012)

Auction - In the Netherlands there are two flower auctions, FloraHolland and Plantion. FloraHolland has a market share of 98% (VGB, 2010). The auction centres of FloraHolland are located in the five regional green ports of the Netherlands. Plantion has a market share of 2% with one auction location in Ede. Plantion is excluded in this research.

Traders- The traders can be categorised into three groups: the wholesaler, exporters and importers. In the Netherlands are about 1200 Dutch traders who operate with (inter)national customers. The top importing countries for flowers are Kenya, Ecuador, Ethiopia and Colombia. The top exporting countries for flowers are Germany, United Kingdom, France, Italy and Belgium (VGB, 2010). The wholesalers in the flower chain can be categorized by the two purchasing methods: purchasing at the clock or purchasing directly. Another way to categorise wholesalers is by local, national or international trading.

Market- The sales channels are the domestic and foreign retail and detail market. The retail market includes the sales channels of the supermarket, garden center and construction center. The detail market includes the detail outlets e.g. the florists, garden centers and street markets. In the current flower chain is 70% sold to the detail market. The detail outlets are known for their special and personal service but also for their broad assortment of flowers. In this research is only focused on the detail market.

Logistics service provider- The transportation of the flowers, between actors in the chain, is traditionally outsourced to a logistics service provider, also called third party logistics (3PL). Collection of flowers from growers is done by the 3PLs who are contracted by the growers to deliver their products to the auction. With direct trading of the wholesaler is it possible that a trader has his own transport company to collect the flowers.

3PLs in general can provide services such as inbound transport, outbound transport, warehousing and reverse logistics (Mothilal et al., 2012). These services are respectively the transport to the auction, transport from the auction to customer (e.g. trader or florists), storing the flowers until further distribution and the reverse logistics activities such as return of the trolleys from end consumer to grower/auction. 3PLs could also provide activities like quality control, handling and packaging (processing activities) (Van der Vorst et al., 2012). The last named services are now done by the auction most of time but when the flowers are directly transported to the buyer that is no longer possible and another actor in the chain will have to take up that role.

The logistics service provider can for example have different roles (Hertz and Alfredsson, 2003):

- The *standard 3PL provider* supplies the standardized 3PL services like warehousing, distribution and pick and pack.
- The 3PL can also be seen as *service developer* when offering advanced value-added services. These value-added services could be differentiated services for different customers: forming specific packaging, cross-docking, track and trace and offering special security systems.
- The 3PL can also adapt to the customer when it takes over the customers' existing activities and improves the handling efficiency without making a major development of services. The 3PL is part of the company and provides dedicated solutions which involve basic services for each customer. The 3PL will redesign or change the supply chain for the customer in order to become more efficient.
- The fourth role a 3PL can adapt to is the *customer developer or logistics integrator role*. This form involves high integration with the customer. The services that are offered are not only transport related but also business related. The integration is related to the logistics operations of the customer and supply chain solution, change management, management capabilities and value added services. The customer developer is similar to a fourth party logistics (4PL). The 3PL shares the risks and rewards of the logistics management with the customer.

In the current flower chain a lot of traders are needed to offer the broad assortment for the detail. The commercial and logistics sourcing of flowers is currently done by the auction, which is the market place where the flowers are traded and passed through the chain. At the auction the flowers

are passed to exporters, wholesalers and cash & carries who supply the flowers to the detail sales channels (Koppes & Ossevoort, 2012).

1.2.3 Detail scenario

As discussed previous, this research uses one of the future scenarios from the commissioner, the DaVinc³i project. The DaVinc³i project identifies three sales channels in the flower chain: retail (unspecialised shops like retailers), detail (small scale specialised shops like florists) and e-tail (web shops). For each of these three sales channels are two scenarios developed, the evolution and revolution scenario. The evolution scenarios are based on the idea that the traders, here named flora providers, are part of the flower chain. The revolution scenario is based on the idea that the supply chain is integrated and shorter. The revolution scenario excludes the flora provider and assumes that all purchases are traded direct between the growers and retailer, detail outlet or consumer.

This research focuses on the detail market because from the DaVinc³i project was asked to look at changes in the flower chain that are caused by small order purchases and deliveries to the detail market.

With the detail scenario is meant that consumers prefer buying flowers at a small scale shop like a flower shop. 60 % of the market is served by the detail trade and 40% by retail and e-tail. The detail outlets are known for their good quality products (Koppes et al., 2012). Figure 2 illustrates the detail evolution scenario which is used in this research as future model for the flower supply chain. The detail evolution scenario is further referred to as detail scenario since the detail revolution scenario is not part of this research.

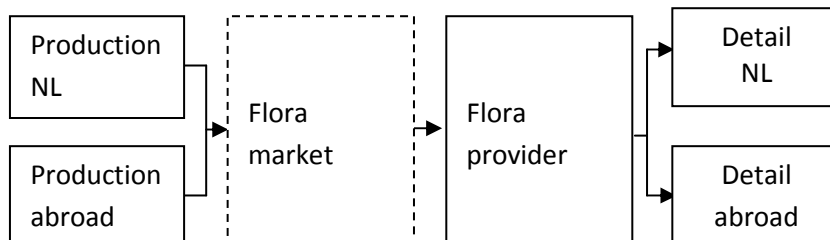


Figure 2. Detail (evolution) scenario

The trader in this scenario is called the flora provider. The flora market is the place where supply and demand is brought together. This is assumed to be a virtual market. Within the DaVinc³i project the detail scenario is described as follows "The flora market is the place that brings together the supply of the national and international growers and where flowers are traded" (Koppes et al., 2012). The flora market sources only commercial and provides the (virtual) supply of flowers but has no ownership of the products. "It supports the flora provider in global sourcing so that the flora provider can focus on deliveries to the detail sales channels" (Koppes et al., 2012). The logistics sourcing from growers will be done by the 3PLs.

In general Dutch growers supply niche products to flora markets and international growers provide bulk. In this way Dutch growers can distinguish themselves by their assortment and maintain a good market position (Koppes and Ossevoort, 2012).

In this research the focus is on small batches that are ordered by the detail market. The trade of small batches will cause more frequent transport between grower and flora provider since flora

providers will no longer hold inventory as they were used to in the past. Therefore, the flora provider will order smaller batches too due to the demand of his customers otherwise will a lot of flowers deteriorate. The transport between growers and flora providers will be outsourced by the flora provider to logistics service providers, called 3PLs in this report. Figure 3 presents the physical flow of goods in the Dutch flower chain when dealing with the detail scenario. The first part of the chain which is marked with stripes, from grower to flora provider, will be the focus for this research. The sourcing strategies for 3PLs are explained in the next section.

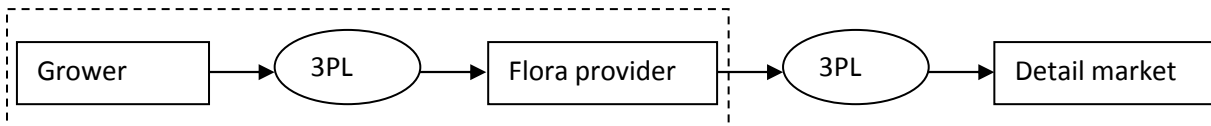


Figure 3. Physical flow of goods in detail scenario

1.2.4 Sourcing strategies

Dutch traders use currently two sourcing strategies for the collection of their flower assortment. Flowers are collected at the auction, meaning that the growers have transported the flowers, or the flowers are collected direct at the grower by 3PLs or the flora providers own transport company.

This research states that in the future detail scenario flora providers will source the flowers by outsourcing the transport to 3PLs. Flora providers therefore need to choose between different sourcing strategies. Single sourcing and multiple sourcing are all options of sourcing strategies that are considered for the design of a new logistics network in the detail scenario. Besides these strategies the flora providers can consider local sourcing in addition to single or multiple sourcing.

Larson and Kulchitsky (1998) use the definition of *single sourcing* from Newman (1988) who states that single sourcing implies that multiple suppliers are available but the buyer selects only one supplier. Translating this definition to the flower chain means this that a lot of 3PLs are available to outsource the logistics between the flora provider and grower but only one 3PL is chosen. Single sourcing refers therefore to the collection of flowers by one 3PL to a flora provider where the flora provider is always supplied by the same 3PL.

Multiple sourcing refers to the strategy in which multiple 3PLs deliver flower purchases to one flora provider. Multiple 3PLs supply the flowers from growers to one flora provider.

Local sourcing means that flora providers outsource their transport to local transport companies in their own region. The pool of 3PLs is decreased by choosing local sourcing and specialized or large 3PLs might or might not be located in the region of the flora provider. When 3PLs want to operate only local it can reduce the transportation time, costs and improve the quality. This sourcing strategy then can also decrease the assortment that flora providers can trade with their detail sales channels.

1.3 Definitions of concept

In this section the main concepts of this research are defined.

Flora provider = The flora provider is the actor in the flower supply chain who supports firms in the detail sales channel (e.g. florist, garden centre) in their assortment. The main function of a flora provider is to break large batches into smaller batches. In this research the name flora provider is referring to a Dutch trader or wholesaler.

Third party logistics (3PL) = A third party logistics is an external company who carries out various logistics activities (Carbone, 2005; Hertz et al., 2003; Delfmann et al., 2002). The activities that are performed by the 3PL include all kinds of logistics activities but the management and execution of transport and warehousing are the main services (Hertz et al., 2003). In this research refers a 3PLs to logistics service providers (LSPs) who perform various logistics activities for a customer either completely or only in part (Delfmann et al., 2002).

Logistics = In this research logistics refers to the activities of transportation and transportation management between grower(s) and a flora provider. Logistics activities such as transportation, distribution, warehousing, inventory management, order processing and material handling (Rabinovich et al., 1999; Razzaque and Sheng, 1998).

Sourcing = In literature is sourcing described as purchasing raw materials from one or more different suppliers (Zeng 2000). In this research no raw materials are sourced but logistics services from 3PLs. Sourcing refers in this report therefore to the sourcing of 3PL who can transport the flowers that are purchased by the flora provider from a grower to the flora provider.

Sourcing refers also to the collection of flowers by 3PLs from domestic growers direct to the Dutch flora providers. With the sourcing strategy is referred to the strategy a flora provider chooses for (out)sourcing his logistics activities to a 3PL.

2. Conceptual design

The conceptual design focuses on clarifying and limiting the field of research. The conceptual design deals with determining the subject of the research project and consist of the research objective, research questions and research framework (Verschuuren and Doorewaard, 2005). In this chapter the conceptual design is detailed and contains the problem analysis (section 2.1), the research objective and research questions (section 2.2), conceptual model (section 2.3) and the research framework (section 2.4). The chapter comprises in section 2.5 with the outline of the report.

2.1 Problem analysis

As explained in chapter one, currently most flowers from the domestic and foreign growers are sourced by the auction. When it is assumed that the flower supply chain will change according to the detail scenario, the sourcing strategy of collection and cross docking of flowers at the auction will change. In the detail scenario flowers will be traded by the virtual auction but are no longer physically passing the auction. The collection of flowers from the domestic growers will be sourced by the flora providers who trade them to domestic and foreign detail outlets.

The impact of an audio visual auction in the Dutch flower sector was already studied a long time ago by Sluys (1991). He concluded from his research that the product flow of cut flowers will change due to the early information exchange regarding the name of the purchaser. Therefore, it will be possible to interact on the distribution process towards the purchaser. Benefits of this scenario are according to Sluys a reduction in transport distances and a decrease of inventories and processing steps. These benefits will result in a shorter distribution network and decrease in lead times which will have a positive impact on the quality of the cut flowers (Sluys, 1991; van Beek and Beulens, 1999). The outcomes of Sluys research are applicable to this research with a virtualized auction in the detail scenario were the trading of flowers will remain at the auction in a non physical phase. However, the batch sizes will decrease because small, frequent deliveries with high qualities of flowers are demanded by the small detail outlets. Therefore, flora providers will have to distinguish themselves to the detail outlets by providing value added services like bouquets making, assembling assortment and delivering the flowers at home (Koppes & Ossevoort, 2012). Which services the 3PL and flora provider should provide and how the logistics sourcing of the flowers should be designed in the detail scenario will be researched in this study. The role, determined by the activities of each actor in the flower chain, will also change when the whole flower supply chain is redesigned according to the detail scenario of DaVinc³i.

Research about the changes in the flower supply chain caused by the upcoming trends of e-commerce and virtualization concern mostly logistics networks. However, little research has been done on the effect on the role each actor performs in the chain and how this will change regarding their activities. Benchmarks projects were conducted by the DaVinc³i project on the changes of the different scenarios on the logistics network but did not focused on the roles and services of 3PLs and flora providers. This research does include the effect of the detail scenario on the services and roles of especially the flora provider and 3PL.

2.2 Research objective

This research focuses on the roles of the different actors in the Dutch flower chain, especially the flora providers and 3PLs. An overview is provided on the current and future roles of the growers, auction FloraHolland, flora providers and 3PLs in the flower chain. The choice of which sourcing

strategy, single or multiple sourcing combined with local sourcing, is chosen by the flora provider is analysed. The result of the research provides a recommendation about possible sourcing strategies in the future detail scenario for flora providers in the Dutch flower supply chain.

With this aim, the following research objective is defined:
 Providing insight in the role that the 3PLs and flora providers currently have in the Dutch flower chain and how these roles will change in the detail scenario. And to give insight in the possible sourcing strategies a flora provider can choose from in the detail scenario.

The main research question (MRQ) in this research is formulated as:
 MRQ. *What are possible sourcing strategies for flora providers in the detail scenario of the Dutch flower chain?*

To answer the main research question the following sub research questions (SRQ) are formulated:

- SRQ 1. *Which roles are present in the current flower supply chain in the Netherlands?*
- SRQ 2. *What are the main differences between the single sourcing, multiple sourcing and local sourcing strategies in the Dutch flower supply chain?*
- SRQ 3. *What are the key services a 3PL can provide?*
- SRQ 4. *What are the effects of different sourcing strategies on services that can be provided from a 3PL perspective in the detail scenario?*
- SRQ 5. *What will the effect of different sourcing strategies be on services that can be provided from a flora provider perspective in the detail scenario?*

This research contains a literature study and an empirical study. The coherence of the SRQ's is explained in the research framework (section 2.4) and conceptual model (section 2.3).

2.3 Conceptual model

The conceptual model is presented in figure 4. The models shows different research elements: the services provided by growers, 3PLs and flora providers, roles of these actors in the flower supply chain and the sourcing strategy of the flora provider.

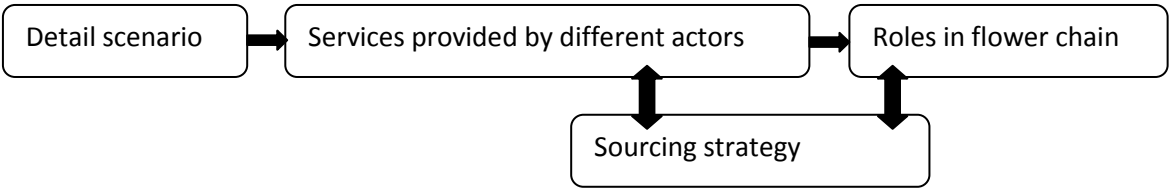


Figure 4. Conceptual model

The detail scenario can be seen as a system innovation of the flower supply chain due to virtualization in the flora market. This research assumes that the detail scenario has an effect on the current services provided by growers, logistics service providers (3PLs), the auction and flora providers. The current services will shift among the different actors which will have an impact on their role in the chain. Due to a change in services and roles the sourcing of flowers from growers to flora providers has to be redesigned. The role of who is responsible for the transportation and in which way the 3PL will be part of the actor that has a contract with the 3PL is influenced by the sourcing strategy.

2.4 Research framework

The research framework stated below consists of four parts: a theoretical research, an empirical research, an analysis of the results and a conclusion. The outcome of the research framework, the right side of the model, is the answer to the general research question.

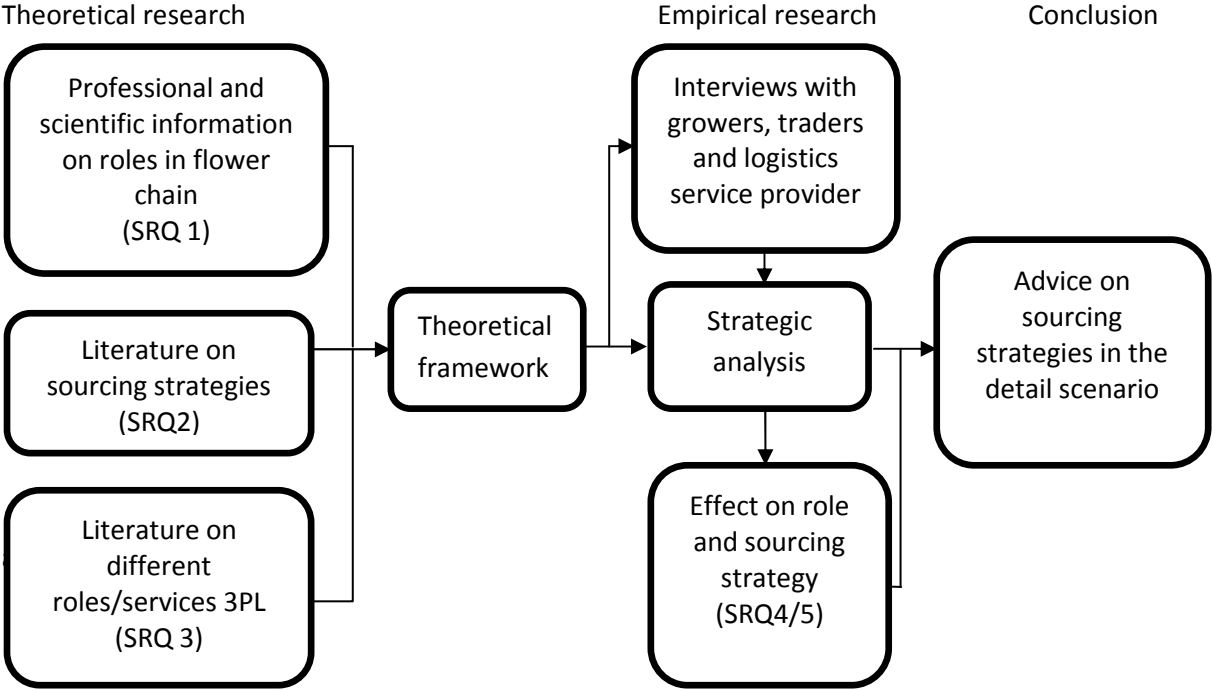


Figure 5 Research Framework

Theoretical Research: Literature on roles in flower chain is assessed from scientific journals, company information of VGB and other professional information. Reports on the strategic sourcing strategies of single sourcing, multiple sourcing and local sourcing are assessed from scientific journal articles. For each strategy advantages and disadvantages are identified by means of logistics performance factors. Literature on logistics service providers (3PL) is also researched to analyze their role, activities (key services) and type of services the 3PLs perform in the flower chain. All the findings in this part of the research contributed to the design of the theoretical framework.

Empirical Research: The findings of literature research provide an overview of: the three sourcing strategies, their key elements, advantages and disadvantages and the different service levels of 3PLs. The results of the literature study form the basis for the theoretical framework. In the second stage new information in the form of interviews with growers, traders, flora market and logistics service provider provided information about their vision of their current role, the sourcing strategy, bottlenecks and about their view on design of a new sourcing strategy when the detail scenario is implemented by the flower supply chain.

After the interviews, the results were analyzed in two stages. First, the current state of the role and sourcing strategy of growers, flora providers and 3PLs was analyzed. Second, the view of these actors on the detail scenario is discussed together with the services that should be considered when designing a sourcing strategy.

Conclusion: The final stage of the research framework includes combining all the material that were found into a recommendation for the VGB and DaVinc³i project. The recommendation will be on possible realistic sourcing strategies for flora providers that will correspond with their new role in the chain.

2.5 Outline of report

Chapter 3 presents the literature review of the literature study. The different topics of roles in flower supply chain, reasons to outsource services, the determination of logistics performance, sourcing strategies and logistics services are each discussed. Chapter 4 discusses the methodology and explains how the empirical research was done. The results from the interviews are discussed and analysed in chapter 5. The last chapter, chapter 6, includes the conclusion, discussion and recommendation.

3. Literature review

This chapter discusses the literature study. First an overview of the roles and activities in the current Dutch flower supply chain will be provided (3.1). Second, logistics outsourcing is discussed (3.2). Third, the factors and indicators of logistics performance of sourcing strategies are given (3.3). Fourth, the three sourcing strategies are discussed by advantages and disadvantages (3.4). Fifth, order sharing is discussed and in section 3.6 the services of third party logistics are given. The final section of this chapter, section 3.7, presents the theoretical framework.

3.1 Roles in current flower chain

The roles of each actor in the Dutch flower chain, see figure 6, are described in this section. The definition of Porter was used to define the flower chain which is a the chain that can be seen as a value chain. The value chain consists of activities in which a company operates in a special industry in order to deliver valuable products or services to the market (Porter, 1985). The growers, flora provider, auction and LSPs all intend to add value to the flowers by different activities. The main activities and services are listed for the grower, auction, flora provider and LSPs to answer the first sub research question: Which roles are present in the current flower chain in the Netherlands?

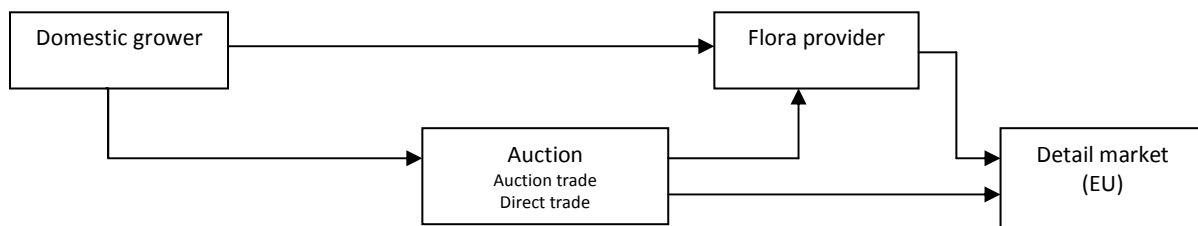


Figure 6 The focus of this research in the Dutch flower chain (adjusted from Van der Vorst et al., 2012)

3.1.1 Grower

In the Netherlands there are about 4400 plant and flower growers who are associated with the auction. Of these growers, 1450 growers are producing cut flowers (LEI, 2012). The nurseries of these growers are located in different regions in the Netherlands, these cluster are around Eelde, Naaldwijk, Rijnsburg, Bleiswijk, Aalsmeer and Venlo.

Growers have as main role in the chain the production of flowers. Since a few years growers have taken up extra value added activities such as the marketing of their products (Porter et al., 2011). Grower cooperatives took on their own salesmen to increase the amount of direct trade.

The growers are responsible for the transportation of their flowers to the auction location of FloraHolland or Plantion when selling by clock trade. The transportation often is outsourced to 3PLs as mentioned in the previous chapter. Information about the direct traded flowers was not found in literature.

Since most growers in the Netherlands are restricted to their small production area the growers cannot compete with international growers who produce large volumes. These Dutch growers therefore try to distinguish themselves by growing flowers who are in niche markets, the higher segmented flowers (VGB, 2010; Van Klink and Visser, 2004).

3.1.2 Auction

The auction, which is collectively owned by the growers (Tavoletti and teVelde, 2008), is the centre of the Dutch flower supply chain. The auction has the traditional role of bringing supply and demand physically together at one place. Besides this main role the auction, FloraHolland, has developed other services which they offer to the growers, traders and logistics service providers.

The services the auction provides to third parties can be categorised in five categories (FloraHolland.com, 2013):

- Auction and intermediary services
- Product quality and risk management
- Marketing, information and advise
- Logistics, handling and resources
- Financial services

Auction and intermediary services

The trading of flowers can be done by clock services or by direct trade. One of the services the auction offers to growers who sell at the clock are sample buses. Sample buses has the aim to advertise (new) products and increase customer familiarity by displaying flowers and plants. The bus visits customers in auction regions that passes by at a fixed time every week. Other services are clock watching from distance for purchasers, tailor made advice from specialists and information supply of number of lots at auction and number of items.

FloraHolland provides also a web shop for direct trade called FloraHolland E-trade, an online channel to sell or buy special products by direct trading in Europe. Buyers can view in the flower catalogue which flowers are offered by which grower, location and batch size. From the web shop direct transactions are made.

Product quality and risk management

The auction inspects and approves the products that are traded at the auction to insure good quality products. Besides the general quality inspections the auction has a knowledge centre that can conduct independent research for growers on the vase life and product quality of their flowers.

Marketing, information and advise

The auction provides also information about up-to-the minute prices, market information and industry trends. This information can help growers to react on the specific demand. Market information such as colour of the flower, varieties and bouquets flowers are preferred by growers (Porter et al., 2011). The auction provides also market advice on the positioning of new products.

Logistics, handling and resources

The auction offers his logistics network to third parties and provides internal transport from the auction to the buyer. Logistics services provided by the auction include among others (cooled) warehouses to store flowers. The handling of flowers which are sold through the clock and intermediary trade and product quality checks of flowers are examples of handling services.

Financial services

The trades that are made by clock trade and direct trade are financially cleared by the auction. The auction processes the administrative transactions for the growers and flora providers and provides the relevant documents for the deal.

Currently a trend is seen that clients want to use only parts of the services provided by the auction like logistical support or financial intermediary. The auction is bypassed by (international) retail and trader organisations to start direct trading or use only parts of logistics and financial infrastructure of the auction (Porter et al., 2011).

3.1.4 Flora provider

Flora providers, as explained in the previous chapter, refer in this research to wholesalers who purchase their flowers in the Netherlands at the auction or by intermediary trade (direct trade) of the auction. In 2011, 729 flora providers were located in the Netherlands who were exporting flowers. Almost all flowers, 97%, are exported within Europe by the flora providers. From these 729 flora providers approximately 499 flora providers serve for 60% of their sales the detail market. The role of the flora providers in the (detail) chain is to facilitate flowers to their detail sales channels. To be more specific, in 2011 24 flora providers were specialised in cash & carry, 18 flora providers served (importing) wholesalers and cash & carries, 236 flora providers focused on (importing) wholesalers, 32 flora providers sold to wholesalers and florists and 189 flora providers were specialised in serving the (foreign) florists (van Willegen & Ensink, 2012). Cash and Carry is when flora providers display their assortment in a shop on location and florists and other consumers can buy the flowers direct.

All these flora providers buy their assortment of flowers from growers at bulk and split the lots into smaller batches. The smaller batches are offered to their clients, the detail sales channels (e.g. florist and street markets). Flora providers also provide services such as bouquets making (Porter et al., 2011; Vander Vorst, 2012). Some flora providers offer the service of shelf management which means that the flora provider is responsible for the display of his flowers in the shop and partly responsible for the sales (VGB, 2010).

As explained in the previous chapter, flora providers can be categorised in having their own transport company or outsourcing of logistics. Although, transportation to the consumer is organised by the flora provider it will be neglected in this study as a role since this research focuses on the flow from grower till flora provider. The collection of flowers from growers, with direct trade can be executed by flora providers if they do not outsource the logistics. However, most of time the logistics are outsourced to third parties.

3.1.5 Logistics service provider

The logistics service providers in the flower chain can be seen as a third party logistics (3PL). A 3PL is an external company that manages, controls, and executes logistics activities on behalf of someone else, in this case the grower or flora provider. The activities that are performed by the 3PL can include all kind of logistics activities but management and execution of transport and warehousing are the main services (Hertz et al., 2003). The logistic service providers make sure that the activities of different firms in the flower supply chain are connected and deliver the products to their final customer.

The logistics service providers aim to optimise time and space by providing information, material handling and transport management services, including order handling, inventory control, secondary production, process design services, and supply chain management (Van Klink and Visser, 2004).

The main reasons of why the logistics activities are outsourced to a 3PL are that the 3PLs can develop special expertise and skills that focus on a particular activity needed by the flower supply chain. When 3PLs do this they are able to execute these services more effective and at a better price than when these services are executed by the grower or a flora provider. The services 3PLs can provide are discussed in section 3.6 of the literature review.

3.1.6 Conclusion

The different actors in the Dutch flower chain all have their own roles. In this section an answer is provided to the first sub research question: Which roles are present in the current flower supply chain in the Netherlands?

The actors in the flower chain are the grower, auction, flora provider and logistics service provider. The main role of the grower is to produce flowers. Growers also have to arrange transport for their products to the auction. The auction has as main role to be a place for demand and supply. Other activities the auction provides are the logistics network, warehouses, sharing information about trends and prices and determination of the quality of products.

The flora provider is the actor who breaks the bulk of flowers for the end customers, the retail and detail market and distributes the flowers to them. The flora providers purchase the flowers from the auction (clock trade) or grower (direct trade) and sell their assortment to the retail and detail market. The role of the flora providers is therefore to break the bulks in order to sell and distribute the smaller batches to the market.

Logistics service providers have as main role to take care of the logistics between the different actors when the logistics is outsourced to them. The management of the logistics is also for them. LSPs can also provide other services besides logistics. These 3PLs take over the role of other actors when this is outsourced to them.

3.2 Outsourcing logistics

This section discusses reasons of why companies outsource logistics in order to understand why growers and flora providers outsource their logistics. The advantages and disadvantages of logistic outsourcing are discussed below.

3.2.1 Advantages and disadvantages of outsourcing

The logistics between the grower and a flora provider, as stated before, are often outsourced to a 3PL. The decision to outsource logistics is often based on the need for cost saving and to focus on their own core competencies (Rabinovich et al., 1999) or as Zarraque and Sheng (1998) stated "third party logistics are employed for their expertise and experience in logistics activities which are difficult to acquire and expensive to have in-house". Flora providers and growers have their core competencies respectively, in the trading and production of flowers. 3PLs core competencies are in the logistics activities that vary between transportation, warehousing, distribution and information services. By outsourcing logistics firms can spend more time to pursue strategic planning and management issues and focus on their core competence (Zarraque and Sheng, 1998). Other reasons for firms to outsource their logistics besides the focus on core competences and cost reduction are according to Jharkharia and Shankar (2007) the development of supply chain partnerships, restructuring of the company, success of the firms using contract logistics, globalization, improvement of services and efficient operations. Jharkharia and Shaker (2007) state that the major

reason for firms choosing outsourcing is because a 3PL can offer more expertise and experience to their clients for a lower price than when a firm would perform the same service in-house.

Furthermore, Hsaio et al. (2010) summed up benefits of outsourcing as a manufacturing food company. The benefits Hsaio et al. identified are applicable to this research since food products and flowers are both fresh products with a high perishability and a short shelf life. Hsaio et al. (2010) researched the direct effect of logistics outsourcing on logistics service performance and the moderating effect of supply chain complexity. The researchers described in their literature review that outsourcing of a non-core business, as logistics, has a positive impact on innovativeness, cost efficiency, profitability and flexibility of logistics (Hsaio, 2010; Power et al., 2007). They described that (logistical) innovativeness is driven by the focus of a firm that outsources training and payroll activities to outside specialists. The outsourcing will give the firm competitive advantage.

According to Jiang et al. (2006) outsourcing can reduce the operating expenses, fixed costs and overhead costs by contracts that are used on a call basis to provide development skills to the firm. Therefore cost efficiency is a result of cost reduction which is one of the advantages of outsourcing. Outsourcing to 3PLs is often less expensive than firms carrying out the same function in-house. Working with a 3PL enables a firm to respond faster to production and distribution changes which helps in improving on-time delivery (Zarraque and Sheng, 1998). Flexibility of volume and lead time therefore is improved by outsourcing logistics.

Reduction of costs is often caused by better use of capacity and capital allocation. Therefore, reduction only refers to the variable costs not the fixed costs. The capacity is used more efficient by the service provider that transports the goods since the 3PL can balance the transport quantities of peaks and drops easier due to serving different clients. 3PLs have therefore the advantage of economies of scale (Hsaio et al., 2010; Rabinovich et al., 1999). The growers and flora providers can allocate their capital by deciding not to invest in storage or trucks since this activity will be performed by the service providers. The 'flower manufacturers' reduce therefore their risk since no investment will be made for purpose of distribution. Outsourcing decreases therefore capital investment in facilities equipment, information technology and manpower. The flora provider then has greater flexibility to adapt to changes in market (Zarraque and Sheng, 1998).

Most advantages of outsourcing are related to financial performance but Hsiao et al. (2010) wrote also about outsourcing performance relationship and configuration of the organization. They explained that Salimath et al. (2008) found that the size or age of the organization have an effect on the performance of the outsourcing activities. Large firms have more benefits when outsourcing due to better negotiating level in outsourcing contract by volume discounts. Large firms have also the ability to manage resource dependency relationships.

Disadvantages of outsourcing are that the firm can lose control over the 3PLs, the outsourcing firm can lose touch with important information e.g. the 3PL makes unreliable promises to them or are not able to meet with changing requirements. A lack of understanding of the buyer's business goal and difficulty of changing from one 3PL to another are other disadvantages of outsourcing logistics (Zarraque and Sheng, 1998).

An obstacle for outsourcing logistics to 3PL is the lack of confidence in an outside company. Trusting a 3PL that they will deliver the right level of service is a main obstacle for outsourcing. Failure to select the right 3PL is another obstacle for choosing to outsource (Zarraque and Sheng, 1998).

In-house

When the logistics are executed by the organisation itself it is called insourcing or performing the logistics in-house. In Italy a study was done on the distribution of logistics for a retailer. Transporting food products to the retailers by outsourced transport companies was the research topic. From the interviews with 54 companies they concluded that there are certain advantages of performing own-account transport. The advantages are that the company has control over the service quality, direct relationship with customers, joint services, advertisement, joint inventory and transport management (Danielis et al., 2012).

Based on interviews of Italian retailers (n=54) the most important factor of choosing insourcing to perform own account transport is the direct relationship with the customer and ability to control the service quality of the transport. Danielis et al. (2012) concluded also disadvantages of performing own-account transport. These disadvantages are that the companies have to buy vehicles and maintain the vehicle and need to have drivers. Also a disadvantage is the unsuitability for long distances and the need to have a person in charge of organising deliveries.

3.2.2 Conclusion

Concluding, from literature follows that companies have two options: outsourcing or insourcing logistics. When firms choose for outsourcing logistics to a 3PL this can result in multiple advantages. Table 1 summaries the advantages of outsourcing. The main advantages are cost reduction for the variable costs and focus on own core competences. Cost reduction is caused by better use of capacity and capital allocation. Outsourcing reduces the operating costs and due to a better efficiency results outsourcing in economies of scale.

Table 1 Advantages and disadvantages of outsourcing logistics to 3PL

Advantages	Disadvantages
Variable cost reduction (economies of scale)	Loss of control of processes
Focus on core competences	Loss of information
Better service performance	Trusting and selecting right 3PL (high risk)
Better competitive position in market	
More flexibility	
Expertise and experience of 3PL	

Outsourcing logistics has the advantage of responding quickly to a change in distribution, demand volume or delivery time since a 3PL is more flexible to cope with the change than the hiring firm.

Outsourcing results in flexible responding in changes to the market. Another advantage is that 3PLs have a lot of knowledge on the services they provide and experience. By outsourcing, the firm can focus more on their own core competences which can lead to improvement of their competitive position in the market and advantage of providing better service performance.

When a firm does not choose for outsourcing they choose to do the activities in-house. A firm can own its own transport company. In literature can be found that logistics are often outsourced but insourcing can have its benefits too. Advantages of insourcing are an increase in service quality,

direct relationship with customers, joint services, advertisement, joint inventory and transport management. Disadvantages of doing in-house logistics are the maintenance of the trucks, the flexibility of deliveries is decreased with long distance transport and the firm has to hire people for the management of logistics.

When the firm has made its decision on outsourcing or insourcing the next step is to decide on the further sourcing strategy. As Razzaque and Sheng (1998) pointed out that outsourcing of logistics is a provision of a single or multiple logistics services on a contractual base. The different levels of outsourcing services therefore are discussed later on in this chapter. The number of 3PLs a firm works with is another issue, flora providers can choose for a single 3PL or multiple 3PLs. The geographical area a 3PL serves is another point of discussion in choosing a sourcing strategy. To compete 3PLs have differentiated their value-added services on sectors, products and geographic areas (Mothilal et al., 2011).

3.3 Logistics performance

Logistics performance refers to the ability of a LSP or flora provider to deliver the requested products within the criteria set for the logistics. The criteria can be set on the delivery time, fixed and variable costs, product conditions and more. The advantages and disadvantages of outsourcing that were named in the previous section can be related to the factors of assessing a company.

Fawcett et al. (2010) described factors for logistic distribution networks which are according to them flexibility, variability, costs and geographical coverage. Beamon (1999) described factors to analyse a supply chain. According to Beamon can a supply chain be analysed by the four factors of cost, activity time, customer responsiveness and flexibility. Although the scope of this research is not on the whole supply chain but on sourcing strategy the analyzing factors are still suitable since the strategy effects besides the organizational performance also the supply chain performance. Based on these researchers the performance of a sourcing strategy in the flower chain will be assessed by the logistics performance factors of service performance, flexibility, time, costs and geographical scope. These factors are used since the choice of logistics sourcing in the flower chain depends on the total costs of sourcing strategy, the flexibility of the 3PL logistics services and the time it takes to deliver the products since flowers are preferably handled the same day as they arrive and are distributed by the flora provider. The last factor geographical scope is added to assessment since the flower producers are located in different cluster in the Netherlands which can impact the logistics network of the 3PL.

Based on the factors that were found in literature (Hsaio et al. (2010); Fawcett et al. 2010) the different sourcing strategies are discussed on their advantages and disadvantages in the next section. To understand these factors, indicators were searched in literature to define the factors.

3.3.1 Indicators

Power et al. (2006 cited by Hsaio et al., 2010) listed a lot of performances for logistics which are customer satisfaction, inventory control, capacity management, productivity, service quality, flexibility, sales growth, net profit, cycle times, cash flow, general cost management, backlog management and transportation cost management. However, they were not categorized to supply chain factors or logistics performance factors. This section discusses the indicators for each logistics performance factor.

Service performance

Hsaio et al. (2010) stated that the most common named service performance indicators for service performance are delivery lead time, delivery flexibility and delivery reliability. Service performances indicators that Chopra and Meindl (2010) use for distribution networks are response time, product variety, product availability, customer experience, time to market, order visibility and return ability. Responsiveness or trust to a 3PL is another measure named in literature (Zeng, 2000). Product quality is an indicator which is also named when discussing sourcing strategies (Larson and Kulchitsky, 1998; Fredriksson et al., 2010) since the quality of the flowers after transport should still be good. No deterioration could be seen otherwise the flowers will decrease in value which will impact the logistics performance.

The service performance indicators which will be used in this research are reliability, variability (product variety), availability (product volume) and product quality. Reliability indicator refers to the ability to perform the promised service dependably and accurately. Delivering the right flowers from the growers to the right flora provider at the right time under agreed conditions like for example time, place and product quality. Availability refers to the amount of flowers that can be transported by a 3PL. Variability is the indicator referring to the assortment of flowers that could be transported by the 3PL. Another indicator is product quality, the ability of 3PLs to deliver the products under the agreed conditions.

Costs

The costs factor includes not only transport costs but also inventory costs, facility costs (warehouse costs) and information costs (Chopra and Meindl, 2010). Beamon (1999) identified total costs as distribution costs, manufacturing costs and inventory costs. For logistics the costs of distribution or transport are most important. Distribution costs refer to total cost of distribution, including transportation and handling costs (Beamon, 1999). These costs include inbound costs of the flowers from growers to flora providers. Outbound costs are not included since this research studies the product flow till flora provider and not the distribution to the end customers. Facility costs can be neglected in this research since it is about sourcing to one flora provider and direct transportation. Inventory costs refer to warehouse costs and information costs to information infrastructure.

Time

The third factor, time refers to the indicator lead time or delivery time, the time it takes to deliver a product to the customer (Hsaio et al., 2010; Power et al., 2007). In this report refers lead time to the transport time between a grower and a flora provider. A long lead time requires inventories for flora providers in order to serve their customers within a quick time span. The long lead time and stocking will have a negative impact on the freshness of the flowers, the product quality. When outsourcing logistics 3PLs will reduce the lead times due to faster mode of transport and direct transport (Hsaio et al., 2010), less stocking is needed and flowers will have a better product quality. However, when the products are transported under optimal circumstances, like cooled transport, the product quality will be less effected by the length of the lead time. Therefore 3PLs offer cooled transport in the flower chain to provide the best services. The indicator lead time is sometimes referring to the response time (Chopra and Meindl, 2010), the time it takes from the moment of receiving the order and delivering the order.

Flexibility

The sourcing strategy has an impact on the firm and the supply chain therefore flexibility refers in literature often to supply chain flexibility. Flexibility in the chain adds the requirement of flexibility within and between all partners in the chain, including departments within an organization and external partners, suppliers, carriers, third parties logistics and information system providers (Duclos et al., 2003). This includes the flexibility to gather information on market demands and exchange information between organisations. Six components of flexibility were identified by Duclos et al. (2003); operation flexibility, logistics flexibility, operation system flexibility, market flexibility, supply flexibility and information flexibility. Operations flexibility and logistics flexibility are two components that apply to flexibility when discussing sourcing strategy. Operations flexibility is defined as the ability to configure assets and operations to react to emerging customer trends at each node of the supply chain. It refers to the flexibility of responding to the market changes in volume or time. If a service provider can react quick to the changes and gains or maintains his competitive advantage this would mean that they are flexible. Logistics flexibility refers to the ability of cost effectively receive and deliver products as sources of supply and customer change. Other indicators for flexibility of logistics are the ability to react on the change of customer location and delays or disruptions (Duclos et al., 2003).

Geographical scope

If a buyer closes a long-term contract with one single 3PL to handle all of its physical activities, it has to be sure that this 3PL covers all relevant geographical regions (Delfmann et al., 2002). Flowers are grown in multiple regions in the Netherlands. To get a varied assortment a flora provider will have to collect flowers from different growers and regions. The indicator for geographical scope therefore is the region the 3PL operates in.

3.3.2 Conclusion

As described above the choice of a sourcing strategy can be effected by the logistics performance. The logistics performance is determined by the factors of service performance, costs, time, flexibility and geographical scope. Figure 7 illustrates the relationship between the factors and indicators.

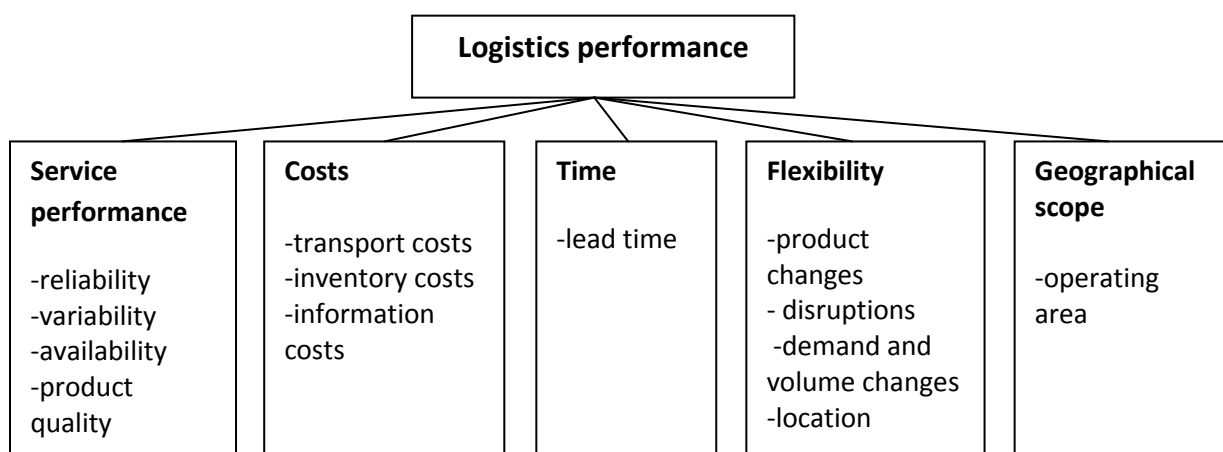


Figure 7 Factors and indicators of logistics performance

As presented in figure 7, the indicators for service performance are reliability, variability, availability and product quality. Cost indicators are transport costs, inventory costs and information costs. The time factor is determined by the lead time. The indicators for flexibility are product changes,

disruptions, demand and volume changes and location. The last factor, geographical scope, has the indicator of operating area.

In the next section the three sourcing strategies are discussed when choosing logistics outsourcing to a 3PL. The logistics activities can be performed by one or more 3PLs which depends on the strategy the flora provider chooses.

3.4 Sourcing strategies

This section of the literature review provides information on the (logistics) sourcing strategies of single, multiple and local sourcing. For each strategy the key elements are discussed with advantages and disadvantages. The conclusion of the chapter will provide an answer on the second sub research question: What are the main differences between the single sourcing, multiple sourcing and local sourcing strategies in the Dutch flower supply chain?

The sourcing of transportation is discussed in the following sections. Zeng (2000) discusses the fact that sourcing no longer only refers to purchasing materials for a desired price but that the decision should be incorporated in the buying firms operations strategy to support or improve the competitive advantages. Partnerships with firms suppliers have turned out in total costs reduction, better product quality and faster delivery. The selection of a logistics service provider or 3PL can be seen as a (out)sourcing decision since they offer the service of transportation between grower and flora provider.

Currently growers choose the quantity they want to transport to the auction but in the detail scenario this will change to quantities that are ordered by the flora provider. Other changes are that the production of flowers is split at the grower if smaller batches are purchased by the flora provider. These batches have to be transported to the flora provider which results in more transport connections between grower and flora provider. Currently most flowers are transported to the auction with the whole batch and sometimes direct to the purchaser.

3.4.1 Product characterization

When determining the sourcing strategy for flora providers that is applicable in the Dutch flower chain, the product and organisations that are involved should be determined first. The organizations were discussed in section 3.1, the characterization of the product is discussed below.

In this research the focus is on cut flowers that are transported between different actors in the flower chain. The flowers are highly perishable and vulnerable, therefore the product quality (e.g. vase life and deterioration) is important. The flowers have a short (vase) life due to the loss of quality during the period between harvest and consumption, even if the conditions are optimal during distribution (Sloof et al., 2006). Van Meeteren (2009) stated too that the transport conditions and handling in the supply chain influence the quality of the cut flowers.

The flowers that are mainly transported to the detail sales channel are presented in table 2. The Productschap Tuinbouw performed a survey in 2010 that included 272 florists in the Netherlands. The florists were asked which flowers they mainly buy during the seasons. The florists mentioned that it is important to offer customers a standard assortment as well as seasonal flowers to specialize from the retailers. The seasonal flowers make their assortment varied and renewing (PT, 2010).

To determine the sourcing strategy that would apply best, the frequency of deliveries to the flora provider from the grower are important. The size of batches and time are other issues to take into consideration. In this research the small lot sizes are ordered at the (visualized) flora market on a frequent base by the flora providers. The small batches are directly delivered to the flora providers. The transport will be performed by a 3PL who will be hired by the flora provider.

Table 2. Season flowers that are most ordered by florists (Productschap Tuinbouw, 2010).

Spring	Summer
Tulip Ranunculus Anemone	Sunflower Summer flowers Delphinium
Autumn	Winter
Chrysanthemums Berries	Amaryllis

3.4.2 Single sourcing strategy

In literature single sourcing strategy is often discussed as a strategy to source raw materials for a manufacturing company. Though, single sourcing of services is discussed too in literature and will be used.

Single sourcing refers to the sourcing of one single 3PL by a flora provider. Larson and Kulchitsky (1998) use the definition of single sourcing from Newman (1988) who state that single sourcing implies that multiple suppliers are available but the buyer selects only one supplier. Translating this information to the flower chain means this that a lot of third party logistics are available to outsource the logistics of the flora provider and grower but only one is chosen. Order sharing will be considered for the grower when deliveries to different flora providers have to be made.

Larson and Kulchitsky (1998) described in their article that two well-known management gurus, W. Edwards Deming and Michael E. Porter have different views on single sourcing and purchasing performance. To Deming means single sourcing working closely with a supplier to improve quality and reduce costs. According to Porter means single sourcing "lower quality" and "higher costs", and less corporation and greater buyer dependence, most of time due to lack of competition among suppliers (Larson and Kulchitsky, 1998). To find out were single sourcing leads to Larson and Kulchitsky researched if single sourcing leads to higher supplier quality, lower buyer total costs, greater buyer/supplier cooperation and no impact on buyer dependence on the supplier. Larson and Kulchitsky conducted a survey from 560 companies and concluded that in an industrial market single sourcing has a positive impact on product quality, buyer/supplier cooperation and negative impact on total costs and buyer dependence.

A number of researchers discuss the single sourcing strategy. Dumond and Newman (1980; Larson and Kulchitsky, 1998) state that it leads to a number of benefits such as delivery reliability, fewer incoming defectives, lower lead times, and higher inventory turnover. Other factors that can be noticed are lower costs and better product quality. Burke et al. (2007) said that single sourcing strategies strive between buyers and suppliers to foster cooperation and achieve shared benefits. Larson and Kulchitsky (1998) agree with the fact that single sourcing results in a cooperative and closer relationship between the outsourcing firm and 3PL. Advantages that Burke et al. (2007) described are reduced order lead times, order confirmation and logistical cost reduction. Swift (1995) discussed single sourcing as a strategy for a long-term relationship. The reliability of the product and

technical support are according to her attributes that are valued as important in choosing single sourcing since the strategy includes a long term relationship. Firms that choose single sourcing emphasize less on low initial price but concentrate on total life cost of the product.

Zeng (2000) provided also advantages in her article about sourcing strategies from multiple researches. The advantages she listed were 1) that the buyer (flora provider) has a good communication due to the close buyer-seller (3PL) relationship, 2) the buyer pays a lower price due to decrease in costs of ordering, transportation and material handling, 3) single sourcing strategy improves the stability for both parties and 4) they can work together on a new quality system and share output data with each other.

Zeng (2000) mentioned also disadvantages as one of many researchers. She identified three disadvantages; 1) when a disruption or something else goes wrong it causes major difficulties, 2) the buyer has no bargaining power and 3) the relation must be a sincere cooperation otherwise it will fail.

The single sourcing strategy can in the detail scenario be implemented by the flora provider when outsourcing the logistics to one single 3PL. This 3PL sources direct from the grower to the flora provider. Order sharing between purchases of different grower to the flora provider is possible and will be discussed later on in this chapter.

Concluding, in literature a lot has been written about single sourcing strategies. An overview of the single sourcing strategy is provided in table 3 by summing up the advantages and disadvantages.

Table 3. Advantages and disadvantages of single sourcing strategy*

Advantages	Disadvantages
<ul style="list-style-type: none"> -High product quality ¹ -Good buyer/supplier cooperation ¹ -Negative impact on total costs and buyer dependence ¹ -Good delivery reliability ¹ -Fewer incoming defectives ¹ -Low (order) lead times ^{1,2} -High inventory turnover ¹ -Logistics cost reduction ² -Good communication with single supplier/provider ^{1,2,3} -Reduced costs ^{2,3} -Improve quality system by working together ³ 	<ul style="list-style-type: none"> -Disruptions cause major difficulties (no flexibility) ³ -Buyer has no bargaining power ³ -Great dependency of 3PL ³

* ¹ = Larson and Kulchitsky, 1998, ² = Burke et al., 2007, ³ = Zeng, 2000

As explained previous five factors can be determined to evaluate the logistics performance. When assessing the single sourcing strategy for a 3PL the five factors can be used: service performance, costs, time, flexibility and geographical scope. In literature almost all indicators of these five factors were found relating to single sourcing. The advantages which were found in literature that related to service performance are that the product quality is high and delivery reliability is also good in single sourcing. Some other advantages that are named can be related to flexibility and time like the fewer incoming defectives and low order lead times. The costs factor is according to literature positive related to the single sourcing strategy, the advantage of reduced (logistics) costs. A disadvantage of flexibility is that if some disruption occurs it causes major difficulties since only one company can

solve the problem. Other reasons are that the communication between buyer and supplier are good and the cooperation in single sourcing logistics services.

3.4.3 Multiple sourcing strategy

Multiple sourcing refers to the strategy in which multiple 3PLs deliver flower purchases to one flora provider. The flora provider is not contracted to one specific 3PL but chooses different 3PLs for different orders. The 3PLs are not restricted by one flora provider and can therefore collaborate orders from the same grower to different flora providers if they are allowed to by the flora providers. This can benefit the flora providers too with lower costs prices and higher efficiency of the logistics.

In literature advantages and disadvantages are discussed for this sourcing strategy. Burke et al. (2007) described the advantages of multiple sourcing as the following: the deliveries have a higher chance to be on time during interruptions than with single sourcing and volume flexibility is greater due to the diversification of firm’s requirements.

Zeng (2000) describes the multiple sourcing strategy as the strategy when a firm has relationships with multiple suppliers, in this study the third party logistics. A number of transport companies meet up to the requirements of the buying firm (grower/flora provider). Due to a large pool of firms, who can offer the same services, the buyer can set up a competition between 3PLs to get the lowest price. Therefore flora providers can have the advantage of bargaining power when sourcing logistics from multiple 3PLs.

According to Zeng (2000) an advantage is the low risk of shortage in time of failure. Disadvantages for multiple sourcing are the short duration contracts. It takes time to negotiate on the time and price since the relationships are not that close as with single sourcing.

Burke et al. (2010) states that with multiple sourcing the risk of a monopolistic supplier in the market and supplier is reduced forward integration.

Concluding, in table 4 an overview is given of the advantages and disadvantages of choosing the multiple sourcing strategy by a firm.

Table 4. Advantages and disadvantages of multiple sourcing strategy*

Advantages of multiple sourcing	Disadvantages
-Collaboration in order sharing leads to lower costs ¹ -Reliability on time is high ¹ -Flexibility is also high due to more suppliers ² -Bargaining power ² -Large pool of 3PLs to choose from ² -Low risks ²	-Short duration contract ²

* ¹ = Burke et al., 2007, ² = Zeng, 2000

The multiple sourcing strategy has some advantages and disadvantages that are mostly related to the logistics performance according to literature. The advantages of high reliability on time can be related to the lead time indicator and low risks and high flexibility due to multiple suppliers are referring to the flexibility factor of logistics performance. Based on this an assumption can be made that the multiple sourcing strategy has an high variability cause multiple 3PLs can offer different kind

of logistics services and transport from different growers. Other advantages named in literature were the large pool of risks and collaboration in order sharing which leads to lower costs. Only one disadvantage was found which is that the duration of contract are most time short due to the large pool of 3PLs.

3.4.4 Local sourcing strategy

The local sourcing strategy is the third sourcing strategy that is evaluated in this research. The strategy refers to a flora provider who sources its logistics from a 3PL who operates within a limited region. The local sourcing strategy could be implemented next to the single or multiple sourcing strategy by a flora provider. The 'local' 3PL operates in a region and therefore is the number of growers decreased of which a flora provider can purchase from.

Fredriksson et al. (2010) stated that when companies source locally it will offer them benefits like short lead-times, better flexibility and improved quality. The short lead-times are caused by the short distance between the grower and flora provider and 3PL and flora provider. The flexibility is an advantage since the 3PL can easily change his route or destinations since the distances between the different actors are short and it has a low impact on their efficiency. The third benefit Fredriksson (2010) named was improved quality, as explained before flowers are a perishable product and time matters a lot in the deterioration process. If the flowers can be picked up and delivered on a short period of time the flora provider can offer better quality products to his customers and might get a higher price for his products due to the higher product quality.

A disadvantage of sourcing local is that the flora provider cannot be that efficient as other companies who use a different form of sourcing such as nationwide sourcing. Lower efficiency is caused by the experience of the local companies and innovations in logistics activities will be limited in the supply chain. Local 3PLs tend to be smaller than 3PLs who operate on a larger scale and therefore have less money for innovations. Other 3PLs who operate on a larger scale outside the local area could offer better services (Reinier, 2009). To conclude, the advantages and disadvantages are presented in table 5 below.

Table 5. Advantages and disadvantages of local sourcing strategy*

Advantages of local sourcing	Disadvantages
-Short lead-times ¹ -Better flexibility ¹ -Improved quality ¹	-Less efficient due to geographical boundaries ² -Limited experience ² -Less innovations ²

*¹ = Fredriksson et al., 2010 ² = Reinier, 2009

Determining the service performance of the local sourcing strategy is not as easy as for the other two strategies. Less information could be found in literature about the advantages and disadvantage and factors that influence the performance. The information that was found is about the short lead times due to regional operating area. Flexibility is also a named factor, due to the local area the company is working in it can react quickly and is therefore flexible. The distances for logistics are short and therefore lead times will be low. A disadvantage is that the company will not go outside his geographical boundaries and another logistics provider has to be contracted if a flora provider would like to buy outside these boundaries. Also the number of logistics providers is limited if the pool consists of only local logistics providers.

3.4.5 Conclusion

To conclude this section the answer to the second sub research question is given. The question was formulated as: What are the main differences between the single sourcing, multiple sourcing and local sourcing strategies in the Dutch flower supply chain? The advantages, disadvantages and their factors for logistics performance are a good way to compare the strategies.

The differences between single and multiple sourcing are that with single sourcing a flora provider works with one single 3PL who performs the logistics services. In the case of multiple sourcing a flora provider chooses to work with different 3PLs to collect their flowers from the growers. When choosing local sourcing next to single or multiple sourcing a firm chooses to work with a 3PL who operates in a limited area. In the flower chain are local 3PLs operating around one auction location/trade parc for example.

The geographical scope of single and multiple sourcing can be limited with local sourcing. The service performance of single sourcing is assumed to be high due to the better relationship between the 3PL and flora provider caused by the close relationship. When a firm has outsourced the logistics to multiple 3PLs the relationship is for a short period of time and no close relationship is made.

In literature is stated that single sourcing and multiple sourcing have both low lead times which is mentioned as an advantage. A difference between these strategies is that multiple sourcing has a lower risk than single sourcing due to more flexibility of disruptions in demand, volume or location. Multiple sourcing has the advantages of shifting between 3PLs to perform the service. With local sourcing is risk of disruption probably also not high due to short transport times.

The costs for transport, inventory and information are in the case of local sourcing assumed to be lower than with single sourcing. The transport costs will be lower with local sourcing since the flora provider and 3PL are closer located to each other. The other costs will be more or less the same with single sourcing. Multiple sourcing has the advantages of sharing the costs between multiple 3PLs which can lower transport costs and inventory costs. Although the information costs will rise caused by more communication between the different 3PLs and flora provider.

3.5 Order sharing

As mentioned before, currently the transportation is sourced by the grower who needs to transport his flowers to the auction. In this research is assumed that the transport will be sourced by the flora providers since the volumes of flowers that are transported from one grower will be reduced. Each order is transported direct to the flora provider which complicates the logistics for the grower. The grower will have less interest in the transportation since the flowers are already sold at point of transportation. If the flora provider sources his logistics the advantage is that the flora provider can choose their own transport company by their business strategy and choose if they prefer single, multiple or local sourcing. The flora provider can decide to use order sharing in his outsourced logistics. The flowers of different growers who are a customer of the same flora provider could be combined in one truckload. This will mix the truckloads of flowers from the growers. The flora provider can also choose for direct delivery from grower to flora provider which means that the orders are separately transported or in combination with orders from other flora providers. The orders will be cross docked by the 3PL at a hub. The impact will be that the growers are delivered to the planning of flora providers and will see lot of trucks from different buyers. When growers would

do the outsourcing they will still have the number of trucks due to the small batches that are sold on a frequent base.

Stefansson (2006) studied collaborative logistics and the role of third-party service providers. His aim was to describe and analyse the role of different parties in outsourced logistics setups and to develop a model of collaboration logistics management that specifies the services by different parties. He states that the third party logistics will take over the activities of transportation and warehousing services. In the next section is more written about different services of a 3PL.

The degree of outsourcing between 3PLs differs as well as the service they provide. 3PLs can provide straight forward arm's-length relationships involving everything from a few, rather simple logistics activities to advanced logistics solutions like value adding activities as merge-in-transit setups (Stefansson, 2006).

3.6 Services of third party logistics

Third party logistics in literature often refer to logistics service providers, as mentioned earlier in this report. According to Carbone (2005) the third party logistics is defined as activities that are carried out by an external company and they consist of at least provision of management of multiple logistics services. The services a 3PL can provide are discussed by different researchers (Delfmann et al., 2002; Hertz et al., 2002; Carbon, 2005) and reviewed below.

3.6.1 Different services of a 3PL

Activities that are often mentioned in literature are transportation and warehousing. These two activities are by Carbone (2005) called the basic services a 3PL provides. Hertz and Alfredsson (2002) wrote that these activities are most common outsourced services to a 3PL. Other activities a 3PL can provide often aim to an integration and control of a part or whole process from logistics network. These other activities that are performed by 3PLs are according to Delfmann et al. (2002) inventory management, order processing and information systems. Hertz and Alfredsson (2002) stated that services as transport, warehousing, inventory, value-added services, information services and design, and reengineering of the chain are typical services that are outsourced to a 3PL. Rabinovich et al. (1999) stated the services of transportation, warehousing, inventory management, order management, distribution, product marking, material handling like labelling and packaging, cross docking, product returns and logistics information systems. Value added services refer to quality control, assembly and handling of products (Carbone, 2005; Delfmann et al., 2002). Some 3PLs only focus on selling software and consulting services that help their customers to improve their transportation network, and are not involved in moving any goods (Razzaque and Sheng, 1998).

Services that are related to transport are shipping, forwarding, brokering, (de)consolidation and contract delivery (Delfmann et al., 2002; Sink et al., 1996). However, shipping is not applicable to this research since the focus is on transport in the Netherlands therefore the service is transport by truck. Consolidation is combining different batches of products for one truck to reduce transport costs. Deconsolidation is when the batches are divided in order to be separately transported to their customer. Brokering refers to mediation however this is the role of the flora provider and not for a 3PL in flower chain. Warehousing services are storage, receipt, assembling of components, returning of goods, labelling of products and packaging. Inventory management includes services as forecasting, location analysis, layout design and tracking and tracing (Delfmann et al., 2002; Sink et al., 1996).

Stefansson (2006) categorised order administration, forecasting and inventory management as administration services.

The traditional activities that 3PLs perform, as stated earlier, are transporting and warehousing (Rajesh, 2012; Stefansson, 2006). Today are different kind of logistics services provided by 3PLs as discussed above. Third parties play often a role in determining where goods are stored, how the goods are packed and transported. An increase in value added activities provided by 3PLs as assembly and quality control expands the list of services of 3PLs they can provide (Razzaque and Sheng, 1998). Quality control refers in this research to the quality check of a cut flower that is checked after arriving of product at the flora provider.

3PLs are important in the flower chain since without them, growers and flora provider would not have the time and effort to increase their efficiency and focus on their core competences to strengthen their position in the flower market. Delfmann et al. (2002) studied the impact of e-commerce on LSPs. Their study is applicable to this research since the flower chain has to deal with the same implications as a sector where e-commerce is increasing. The 3PLs are confronted with changes in their respective market environments (Delfmann et al., 2002). To study the impact on the functions of 3PLs the services or activities are defined in this section. The different activities a 3PL can provide with related services are given in table 6.

Table 6 Activities and services 3PLS can provide (Delfmann et al., 2002; Sink et al., 1996; Engelseben, 1999).

Transportation	Transport by trucks, forwarding, (de) consolidation, brokering, contract delivery
Warehousing	Storage, receipt, assembling, returning of goods, labelling of products, packaging
Inventory management	Forecasting, location analysis, layout design, tracking and tracing
Other value added services	Quality control, merchandising, assembling, handling goods
Financial services	Factoring, invoicing, insurance services
Information systems	Routing, scheduling

Besides services differ 3PLs on other issues like their degree of customization which will be discussed further on. An often seen typology for LSPs and 3PLs are the types of services, geographical scope of operations and type of goods handled (Delfmann et al., 2002). A characterisation of products is already discussed earlier as well as the geographical scope in the sourcing strategies part. The activities and level of customization will be used in this research to characterize the 3PLs and to answer the third sub research question.

The degree of customization is a way to categorize 3PLs. Delfmann et al. (2002) identified three levels of customization for LSPs: standardized LSP, bundled LSP and a customized LSP. Stefansson (2006) used the same levels for typifying LSPs in his research. He stated that advanced services are more customised, a service provider develops a long-term relationship with beneficial solutions rather than quick fixes. Hsaio et al. (2010) and Razzaque and Sheng (1998) pointed out four levels of 3PLs were the first two are similar to the other researchers. Figure 8 presents the four roles to which a 3PL can adapt to in a matrix, the numbers 1-4 refer to these four roles.

		Ability of customer adaptation					
		Low	High				
General ability of problem solving	High	Integrators DHL, Fedex, TNT, etc	<table border="1"> <tr> <td>1</td> <td>2</td> </tr> <tr> <td colspan="2">TPL firms</td> </tr> </table>	1	2	TPL firms	
	1	2					
TPL firms							
Low	Standard Transport firms	<table border="1"> <tr> <td>3</td> <td>4</td> </tr> </table>	3	4			
3	4						
		Traditional house brokers or warehousing firms					

- 1= Service developer
- 2= Customer developer
- 3= Standard 3PL
- 4= Customer adapter

Figure 8 Matrix of 3PLs typified by ability of customer adaptation and ability of problem solving (Hertz and Alfredsson, 2003).

The matrix illustrates the degree of adaptation to a customer and degree of ability of problem solving by a 3PL. The matrix was used by Hertz and Alfredsson (2003) and ranges from low to high degree of customization and problem solving. According to them the standard transport firms can be typified as low ability of customer adaptation and low ability in problem solving. The integrators, the transport companies who integrate in the outsourcing firm like DHL and TNT score high on ability of problem solving but low on ability of customer adaptation. The 3PL firms are according to Hertz and Alfredsson high in ability of customer adaptation and high ability of problem solving. The numbers in the matrix of figure 8 refer to the different categories of 3PLs and are marked in the text between brackets. Standardized 3PLs (3) provide only the basic services, transportation and warehousing. These 3PLs plan implement and control their own logistics system. Examples of standardized 3PLs are traditional carriers (Delfmann et al., 2002; Hsaio et al., 2010). These 3PLs work together with a lot of different firms.

The advanced 3PL combines selected standardized services to bundles of logistics services according to customers' wishes (Delfmann et al., 2002). The second level of 3PLs includes therefore more value added activities. The activities refer to tasks normally performed by manufacturers but now being moved into distribution as part of final processing. (Hsaio et al., 2010). The operational coordination and arrangement of the services are provided by the 3PL, the disposition is the responsibility of the buying firm. Often consist the services of a bundle of core logistics activities as transportation and a few secondary services such as assembly and quality control (Delfmann et al., 2002). The second level is referred by Hertz and Alfredsson (2003) as service developer (1), the 3PL can offer differentiated services for different customers. Examples of advanced services are specific packaging, cross-docking and track and trace. The focus of these advanced services is to create economies of scale and scope.

The third level is the customized 3PL, 3PLs design logistics services and logistics systems for their customers. 3PLs take over activities of the buying firm such as coordinative and administrative responsibility. Hertz and Alfredsson (2003) called this type of 3PL the customer adapter (4), when a 3PL takes over a firms customers existing activities and tries to improve the efficiency in handling of products without making a major development of services. The 3PL will be part of the buying firm and provides dedicated solutions which involve basic services for each customer. This kind of 3PL will

redesign or change the supply chain for the customer in order to become more efficient. Because of the close working relationship with the buying firm serves the 3PL only a few very close customers.

The fourth level is the extended version of the customized 3PL, Hertz and Alfredsson (2003) call it the customer developer (2). This level involves high integration with the customer. The services that are offered by the 3PL are not only transport related but also business related. The integration is related to the logistics operations of the customer and supply chain solution, change management, management capabilities and value added services. The customer developer is similar to a fourth party logistics (4PL). The 3PL shares the risks and rewards of the logistics management with the customer since the 3PL often taking over the whole logistics operations. The number of customers of this type of 3PL service is limited due to the specialized services and extensive work for each customer (Hertz and Alfredsson, 2003).

When combining the different services with the different roles of 3PLs a figure as illustrated in figure 9 is given. Delfmann et al. (2002) made a figure to illustrate the relation between the functions of a 3PL and the degree of customization. Their figure is adjusted with previous named services and is presented in figure 9. As mentioned before the basic services are transport and warehousing, when these services are provided the 3PL is a standard 3PL (1). When besides these basic services other value services as quality control, assembling, packaging etc. are offered the 3PL is an advanced 3PL/service developer (2). Number 3 and 4 in the figure refer respectively to the customer adapter and 4PL.

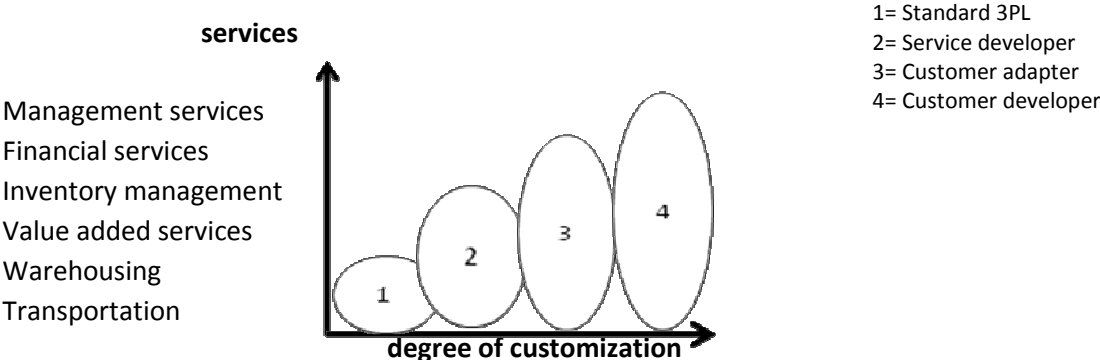


Figure 9 Different types of 3PLs (adjusted from Delfmann et al., 2002).

When looking from a flora providers perspective, the different levels discussed above can be used as well. Instead of offering the service as the 3PL, outsources the buying firm the service. Level one is when only basic services are outsourced but in the other levels are more services outsourced. Until total outsourcing of the business in the fourth level. The third level refers to the outsourcing of logistics planning and control activities, such as inventory management and transportation management. When total outsourcing is chosen, the buying firm works with a 4PL. Like for example a flora provider who outsources transportation (level 1), packaging (level 2), transportation management (level 3), and distribution network management (level 4) is categorized in the highest level, total outsourcing.

3.6.2 Conclusion

In the previous section was explained which services a 3PL can provide and which levels correspond with that. To conclude the literature review on 3PL services the answer to the third sub research question is given. What are the key services a 3PL can provide?

As stated earlier a lot of services are related to logistics. The services that were most named in literature were the services of transportation, warehousing, inventory management, other value added services e.g. quality control, merchandising, assembling and handling goods, financial services and information systems or management services named. These six services are the main service categories that are performed by 3PLS when providing logistics activities. These services can be used for categorising 3PLs.

The degree of customization gives a categorization of the different logistics services a 3PL provides. When a 3PL is adapting to a hiring firm, there can be concluded that more services are outsourced to the 3PL. The first level of a 3PL is called the standard adapter, second level the service developer, the third level the customer adapter and fourth level the customer developer. When a firm outsources transportation and warehousing the 3PL is in the first level. When more service are outsourced to the 3PL the degree of customisation will be higher.

3.7 Theoretical framework

This last section of chapter three discusses the theoretical framework. The theoretical framework which is presented in figure 10, integrates the concepts from the literature study. The framework provides an outline of the concepts that are applied in the empirical study and therefore contributes to the answer of the main research question.

According to the literature study the choice for a sourcing strategy by a flora provider is affected by three elements: the logistics services that are outsourced to a 3PL, the aimed logistics performance and the advantages and disadvantages of a sourcing strategy. Each arrow in the figure represents a relationship, the proposition, which is researched in the empirical study.

The first concept in the theoretical framework is logistics services. From the literature is found that these services can be categorized in six service categories: transport, warehousing, value added services, inventory management services, financial services and management services. The main logistics activities of each service category are presented in the theoretical framework in figure 10. From literature was found that the number and kind of logistics services flora providers outsource to a 3PL will influence the service level of the 3PL. For example when a flora provider outsources the basic logistics services as transportation and warehousing to a 3PL the logistics performance of a 3PL will be lower compared to a flora provider who outsources also value added services to the 3PL. The 3PL will provide a higher logistics performance due to the higher customization level of the 3PL to the flora provider. Based on this a relation between the logistics services and logistics performance is proposed in the first proposition (P1).

P1: The more logistics services are outsourced by a flora provider, the higher the logistics performance of a 3PL will be.

Section 3.3 discussed the logistics performance concept. From the literature study followed that it consists of five factors which are service performance, costs, time, flexibility and geographical scope.

The performance can be determined by analyzing the different indicators of each factor. The indicators for service performance are reliability, variability, availability and product quality. With these indicators it is possible to determine the service performance of logistics in a sourcing strategy. The cost indicators are transport costs, inventory costs and information costs. The time factor is determined by the lead time. The indicators for flexibility are product changes, disruptions, demand and volume changes and location. The last factor, geographical scope, has the indicator of operating area.

The outsourced logistics services of a flora provider have not only an influence on the logistics performance but also on the type of sourcing strategy that is used by the flora provider. For example when a flora provider chooses to outsource the basic level of logistics services, the transport and warehousing, the flora provider can choose from a large pool of available 3PLs. However, when the flora provider would choose to outsource more services the pool of 3PLs decreases due to the fact that not all 3PLs serve the same kind of logistics services. Therefore, single sourcing is the sourcing strategy that will be chosen when more services are outsourced since that requires a 3PL that is more integrated and able to customise then when only the basic services as transport are outsourced which can be provided by multiple 3PLs. Therefore, proposition two (P2) is formulated.

P2: When a small amount of services are outsourced to a 3PL the sourcing strategy will be multiple sourcing. When more logistics services are outsourced to a 3PL by a flora provider the sourcing strategy will be single sourcing.

The arrows (p3) between logistics performance and the different sourcing strategies refer to the relation between the indicators and factors of the logistics performance to the single, multiple and local sourcing strategy. From literature was found that the performance of logistics can be discussed in terms of advantages and disadvantages, see table 3,4 and 5. It is assumed that these advantages and disadvantages are used in the decision of which sourcing strategy is used by the flora provider and the arrows (p3) illustrate that in figure 10. From literature was found that the advantages of single sourcing related mainly to service performance factor of logistics performance. The advantages of multiple sourcing related mostly to flexibility and the cost factor. Local sourcing was assessed in literature by the geographical scope of the company and the effect this has on the other factors of logistics performance. Based on the literature study the third proposition (P3) is split into three propositions, for each sourcing strategy one.

P3a: Flora providers who value the indicators that relate to service performance are more likely to choose a single sourcing strategy.

P3b: Flora providers who value the indicators that relate to costs and flexibility are more likely to choose a multiple sourcing strategy.

P3c: Flora providers who value the indicators that relate to geographical scope are more likely to choose a local sourcing strategy next to single or multiple sourcing a 3PL.

Since the above described propositions are not only applicable in an one-way relation the arrow between sourcing strategies and logistics performance is also illustrated the other way around. For example, the strategy local sourcing will limit the operating area of a flora provider since the 3PL operates within a limit region. This effect can be seen positive or negative. When this is seen as a negative influence flora providers will not use local sourcing. Therefore, the kind of sourcing strategy has also an influence on the logistics performance.

The relations between these factors will be researched in the empirical research with the aim to gather more specified information about each strategy and preferences of the flora providers.

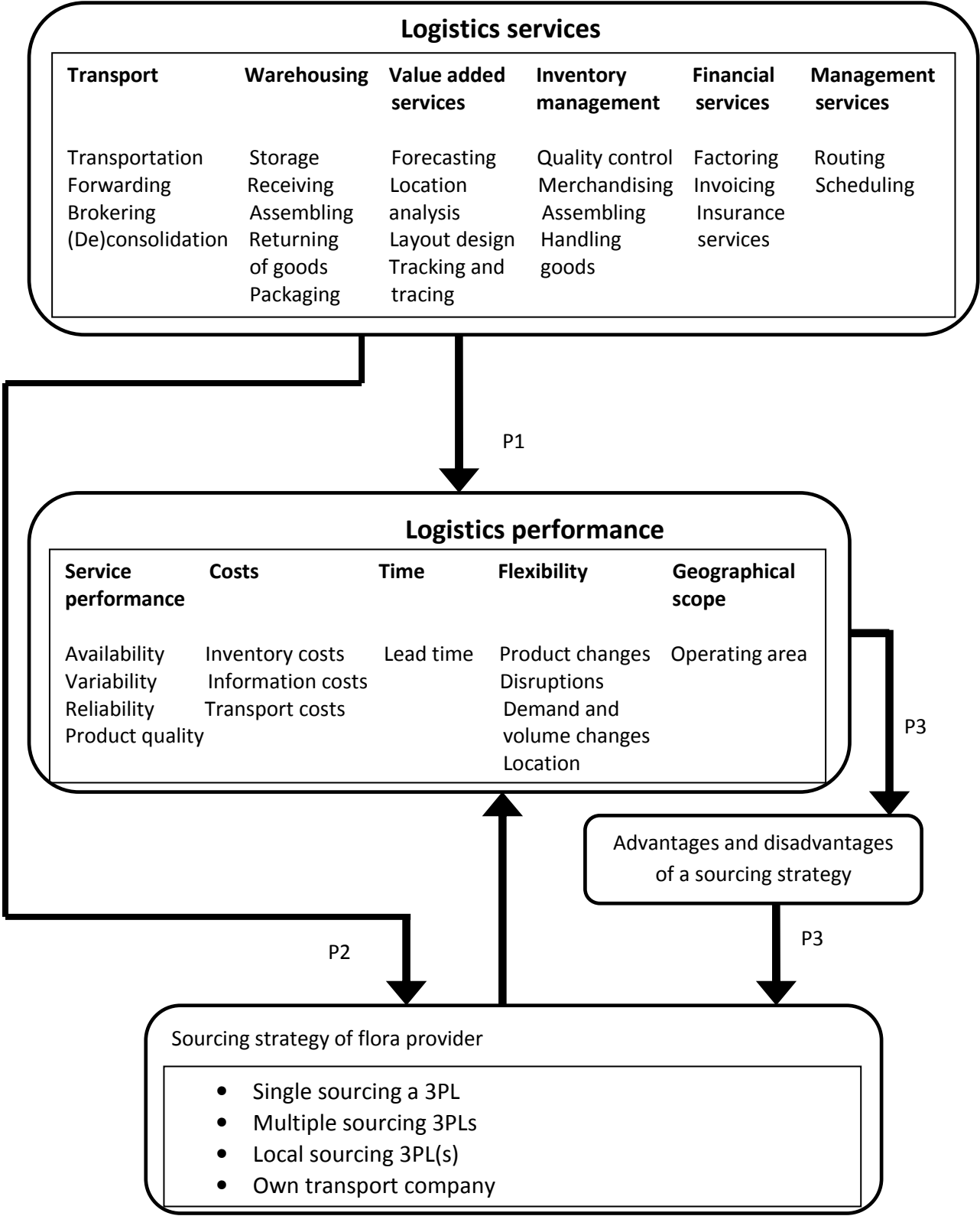


Figure 10. Theoretical framework

4. Methodology

This chapter provides an overview of the research methodology that was used to gather the appropriate data. The research strategies are discussed in section 4.1, section 4.2 describes the selection of the data sources. The operationalization is described in section 4.3 and the method of data collection in section 4.4. At last, the validity and reliability is discussed in section 4.5.

4.1 Research strategies

For this research the strategy of a case study is selected. The case study can be defined as "an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used" (Yin, 2003). A characteristic of a case study is the small number of research units, the cases. This research focuses on the cases of flora providers (wholesalers) who are operating in the Dutch flower supply chain. Besides flora providers, growers and logistics service providers are interviewed to get a broader picture of the logistics in the supply chain and the interaction between the actors. Based on the fact that multiple cases are included in this research it is therefore a multiple case study. This case study aims to gain insight in the reasons of choosing a sourcing strategy as flora provider and what the impact of a future scenario, like the detail scenario will be (detail scenario, see paragraph 1.2.3).

The methods of data collection are the desk research and interview in this case study. The information gained from the interviews together with the information from the literature review will provide a qualitative insight on the research subject. The next section describes these two research methods, desk research and interview.

4.1.1 Desk research

The desk research is the research strategy in which the researcher does not gather empirical data herself but uses material produced by others (Verschuuren & Doorewaard, 2005). The literature study, provided in chapter three, is the result of the desk research. A review has been given from material that was produced by others. The sources of material are literature articles from scientific journals, and some secondary data provided by the VGB, the DaVinc³i project and the website of the auction FloraHolland. The choice for desk research is made to get more insight in the roles of each actor in the flower chain, the concepts of logistics outsourcing, logistics services, sourcing strategies and the advantages and disadvantages of each strategy that is presented in literature. The information gathered from the literature study is used to formulate the propositions of the theoretical framework.

4.1.2 Interview

The empirical research was performed by conducting interviews. The purpose of the interviews is to gather relevant information from the selected cases in order to answer the research issue. An interview is a conversation between the researcher and interviewer. The interviews in this research can be characterised as semi-structured interviews, in which the respondents were asked about facts as well as opinions (Yin, 2003). The interviews included open questions and multiple choice questions, see appendix A. The open questions allow the respondent to express an opinion or explanation about the subject. The multiple choice questions were given on a form to the respondent in order to read all the answers and to fill the question in. The topics were constructed before the interview. In section 4.3 the concepts and questions are operationalized. The interview was done face-to-face,

which allows the researcher to have direct contact with the interviewer and interact immediately if necessary to get a good quality response on the questions. In this research, interviews were used to gather information from the participating companies on the role of them in the flower supply chain, the logistics network, logistics services, sourcing strategies and their opinion on it in advantages and disadvantages.

Beside the semi-structured interviews to the flora providers, growers and LSPs one expert interview was held with a management employee of the auction FloraHolland. This interview was conducted after the cross analysis to gather information on validity of the outcome and to hear their opinion of the topic since the auction is also part of the flower supply chain.

4.2 Data sources

This section discusses the sample that was used for this research project and the selection process of the companies. The specified population of growers, flora providers and logistics service providers was selected by using the non-random sampling methods of purposive sampling and snowball sampling. Purposive sampling allows a researcher to select a sample based on certain criteria like location of company, purchasing method and operating in a specific market (‘t Hart et al., 2005). This sampling is useful when the researcher wants to select participants in preferred categories. Snowball sampling is the process of selecting a sample using networks (‘t Hart et al., 2005). The commissioners of this research used their network to find relevant companies who were meeting the criteria for the sample. The first constraint for the cases are that they have to be located in the regions around Aalsmeer, Naaldwijk and Rijnsburg, since that are the main trading locations in the Netherlands. The second constraint is that they have to be part of the detail flower supply chain either by, producing flowers for flora providers (growers) who export to the detail market abroad, supplying flowers to the outlets in the detail market (flora providers) or by transporting flowers between actors in the chain (LSPs). Furthermore, the cases that are included in this research were first contacted by the VGB or DaVinc³i to increase the probability of cooperation in this research. For each case, the aim was to interview companies who are familiar with direct trading by either purchasing or selling. Besides these companies it was aimed to include one company of each case who sold or purchased almost all flowers at the auction clock(s). Therefore, two growers were interviewed who sold direct to Dutch (exporting) flora providers and one who did not. Of the seven flora providers, five purchased direct. The distinction of direct trading was not made for the LSPs. In total thirteen interviews were conducted, excluding the interview with the auction. This interview was done after the cross analysis as check on the validity of the results and the realistic view of the research topic.

The respondents of each company were preferably directors (owners) of the company when this was not possible a logistics manager was interviewed. The director was chosen as interviewee since it was assumed that he would know the strategic decision making process of the collection of flowers and logistics of his company. In table 7-9 the participating companies are listed with their respondent and location. Due to confidentiality the names of the companies and respondents are not mentioned. A small description of each company is given below the table.

Table 7. Interviewed Growers

Company	Function interviewee	Location
Grower A	Owner	Westland
Grower B	Co-owner	Moerkapelle
Grower C	Co-owner	Bergschenhoek

Grower A is a flower producer since 1979. His nursery is located at Westland and six acres big. The flowers are almost all sold (90%) at one of the auction clocks of FloraHolland. The buyers are flora providers who distribute their flowers to florists and garden centres. The yearly production of the nursery is about 220.000 flowers a year.

Grower B produces flowers since 2000 before that the nursery produced vegetables. His nursery is located at Moerkapelle and has a surface of six acres. This grower sells currently 90% of his flowers direct to flora providers who mainly export. The turnover of the nursery was between 0-5 million euros in 2012 with a production volume of about 18 million flowers.

Grower C produce flowers since 2002. Before 2002 the nursery produced vegetables. His nursery is located at Bergschenhoek and is six acres big. The production of flowers is for 60% currently direct traded to flora providers who mainly export. Grower C had a turnover between 0-5 million euros in 2012.

Table 8. Interviewed Flora providers

Company	Function interviewee	Head office location
Flora provider A	Logistics manager+buyer	Rijnsburg
Flora provider B	Logistics manager	Honselersdijk (Naaldwijk)
Flora provider C	Logistics manager	Aalsmeer
Flora provider D	Co-director	Aalsmeer
Flora provider E	Director	Aalsmeer
Flora provider F	Director	Rijnsburg
Flora provider G	Director	Aalsmeer

Flora provider A is a family business who trades in flowers (60%) and plants (40%). The flora provider exports to florists and flora providers mainly in France, Italy and other European countries. Flora provider A has grown a lot the last 6 years, the employee number grown from 200 to 350. The head office is located in Rijnsburg but the flora provider buys also from other auction locations by remote buying. The turnover of 2012 can be categorised in the largest turnover scale above 25 million euros.

Flora provider B is an exporting company in the Netherlands who only trades cut flowers and no plants. The main location of flora provider B is located in Naaldwijk who provides the retail and detail market. Their customers are flora providers in European countries but also outside Europe, the flora provider exports to forty different countries. Recently, flora provider B merged in the summer of 2013 and their turnover in 2012 is categorised in scale above 25 million euros. Currently the company employs 150 full time employees and forty payroll employees.

Flora provider C is located in Aalsmeer and focuses on the retail and detail market, with customers as garden centers, flora providers and florists to which they sell flowers (60%) and plants (40%) too. The flora provider exports to European countries, with England and Germany as their main markets. The

turnover of flora provider C was above 25 million euros in 2012 and the company employs about ninety people.

Flora provider D focuses on trading flowers to the detail market, the florists and small flora providers in West-Europe, with Switzerland as their main market. The flora provider also trades with countries in the Middle-East. The location of the flora provider is in Aalsmeer. The company employs about 75 people and had a turnover between 5-25 million euros in 2012.

Flora provider E is located in Aalsmeer and focuses on flora providers and florists in mainly Germany, Switzerland, Qatar and United Arab Emirates. The company has about 30 employees and did not like to share their turnover of 2012 due to confidentiality.

Flora provider F is a family business and is located in Rijnsburg. The flora provider trades flowers to Dutch florists and do not export. The company is a flora provider/cash & carry who sells their products to the florists in their truck. The turnover of 2012 is unknown and the flora provider employs six employees.

Flora provider G exports flowers to mainly Denmark, Sweden and Norway to flora providers and the larger florists. The flora provider is located in Aalsmeer. The company employs five employees and had a turnover below 5 million euros in 2012.

Table 9. Interviewed Logistics service providers

Company	Function interviewee	Head office location
Logistics service provider A	Supply Chain Manager	Naaldwijk
Logistics service provider B	Director	Naaldwijk
Logistics service provider C	Director	Aalsmeer

LSP A is the biggest LSP in the Netherlands within the Dutch floricultural sector. The company has 250 employees, divided over the three locations of Naaldwijk, Rijnsburg and Aalsmeer. The LSP transports flowers and plants for growers and flora providers. LSP A has a network to all auction locations in the Netherlands, in combination with other LSPs and transport companies.

LSP B is also a big player in the Dutch floriculture sector, where the LSP transports flowers (70%) and plants (30%). The LSP has locations in Aalsmeer, Rijnsburg and Naaldwijk and in total work 130 employees at these locations. Their turnover in 2012 was between 5-25 million euros. The customers of LSP B are growers (40%) and flora providers (40%) but also florists, garden centres and foreign flora providers.

LSP C is a logistics service provider who works as a cooperative transport company in Aalsmeer. The LSP does not own trucks but does offer a place for other transport companies for cross docking at the auction to their customers. The LSP can also arrange transport by the members of their cooperation. LSP C focuses on local logistics provider (LPs) and 45 transport companies are currently a member. The company employs fifteen people and had a turnover below five million euros in 2012.

4.3 Operationalization

The interviews for the growers, flora providers and logistics service providers are based on the concepts of the theoretical framework. The theoretical concepts from the theoretical framework are discussed in the literature study (see chapter 3). This section explains how these concepts are

operationalized and measured in the empirical research in order to draw conclusions on the proposition of the relations between the concepts and to answer the research question.

Although the interviews were not all the same, due to different perspectives, the concepts were all questioned to each actor. The interview protocol (list of questions) for the flora providers was used as fundamental base for the other two. The interview is divided in five parts, it starts with general questions about the interviewee, the company and direct and clock purchasing/selling percentages of the past years. The general questions are asked to gather background information from the interviewee and the company. In part two questions were asked related to the concept of logistics services. Part three concerns the concept of logistics performance, part four of the interview is about the three sourcing strategies and part five concerns order sharing between companies. Below the concepts are operationalized.

The second part asked question related to logistics services. Questions about who is currently responsible for the transport between grower and flora provider and if the companies notice a shift in responsibility of the transport were asked. For each company was also asked which logistics services they outsource and which service are performed by themselves. In table 10 the concept of logistics services is operationalized. The activities for each logistics service category are named. The reasons for outsourcing were identified as well, reasons for outsourcing is operationalized in table 11.

Table 10. Operationalization of the concept logistics service

Service	Activities	Reference
Transportation	Transportation, forwarding, brokering, (de)consolidation, contract delivery	Delfmann et al., 2002; Sink et al., 1996; Engelsleben, 1999
Warehousing	Storage, receipt, assembling, returning of goods, labelling of products, packaging	Delfmann et al., 2002; Sink et al., 1996; Engelsleben, 1999
Inventory management	Forecasting, location analysis, layout design, tracking and tracing	Delfmann et al., 2002; Sink et al., 1996; Engelsleben, 1999
Value added services	Quality control, merchandising, assembling, handling goods	Carbone, 2005; Delfmann et al., 2002; Engelsleben, 1999; Razzaque and Sheng, 1998
Financial services	Factoring, invoicing, insurance services	Delfmann et al., 2002; Engelsleben, 1999
Information systems	Routing, scheduling	Delfmann et al., 2002; Sink et al., 1996

Table 11. Reasons to outsource logistics

	Indicator	Reference
Advantages	Cost reduction (economies of scale) Focus on core competence(s) Better service performance Better competitive position in market More flexible Expertise and experience of 3PL	Zarraque and Sheng, 1998; Jharkharia and Shaker, 2007; Hsaio et al., 2010; Jiang et al., 2006; Rabinovich et al., 1999
Disadvantages	Loss of control Loss of information Trusting and selecting right 3PL	Zarraque and Sheng, 1998

As mentioned before, the third part concerns the concept of logistics performance. The interviewees were asked to order the five factors of logistics performance from high to low. In table 12 logistics performance is operationalized by the factors and indicators. Although the aim was to indicate the importance of the indicators as well in a 7-point Likert scale, this was not done due to the fact that the first two interviewees indicated that all indicators were important. Therefore the interviewees were asked in an open question to name indicators of the different factors of logistics performance.

Table 12. Operationalization of the concept logistics performance

Factor	Indicator	Reference
Service performance	Reliability Variability Availability	Chopra and Meindl, 2010
Costs	Transport costs Inventory costs Information costs	Chopra and Meindl, 2010; Beamon, 1999
Time	Lead time	Chopra and Meindl, 2010; Hsaio et al., 2010b
Flexibility	Disruptions Demand and volume changes Product changes	Chopra and Meindl, 2010; Duclos et al., 2003
Geographical scope	Operating area	Delfmann et al., 2002

The fourth part had the aim to indicate which sourcing strategies the companies currently use and which strategy they would use in the detail scenario. The reasons for choosing one specific sourcing strategy was derived and their view on the advantages and disadvantages of this specific sourcing strategy. The sourcing strategy reasons are operationalized in table 13. The fifth part concerned cooperation between companies like order sharing. Questions were asked about cooperation between flora providers or growers or LSPs to cooperate their logistics.

Table 13. Operationalization of sourcing strategy reasons

	Indicators	Reference
Reasons	Better product quality Lower transport costs High reliability Low risks Delivery time Flexibility Communication Cooperation	Larson and Kulchitsky, 1998; Burke et al., 2007; Zeng, 2000; Fredriksson et al., 2010; Reinier, 2009

4.4 Data analysis

All interviews were recorded and transcribed afterwards. From the transcripts summaries were made to analyse the data more easily by filtering out the non-related research information from the interviews. The analysis of the data is done in two phases; within-case analysis and cross-case analysis. From each interview a summary was made (see appendix B¹) and used in the within-case analysis, e.g. the three growers are compared to each other. Of every interview the results are

¹ Due to confidentiality the appendixes are not publicly available.

explained for the theoretical concepts. These write-ups can be found in section 5.1. After the within-case analysis a cross-case analysis was executed. The data of all interviews were compared to each other on the separate topics of activities of each actor in supply chain, outsourcing, logistics performance and sourcing strategies for the detail scenario. After the cross-case analysis, the results of each theoretical concept are related to each other per case to find out whether the propositions seem to be supported or rejected. The expert interview was conducted and analysed after the cross analysis in order to be used in the analysis of possible sourcing strategies and final conclusion.

4.5 Reliability and validity

This section discusses the reliability and the validity of the empirical study in order to assess the quality of the research. First the validity and second the reliability are discussed.

4.5.1 Reliability

The reliability of a research depends on the consistency, accuracy and predictability of the research instruments used (‘t Hart et al., 2005). To ensure the reliability of this research, methodological triangulation has been used, which is making use of different methodologies to collect data in order to strengthen the outcome when replication of the research is executed. The desk research and interviews were conducted in this research for the case studies. To increase the reliability of this research, the interviews were recorded and transcribed, a summary of the transcriptions was made to facilitate the data analysis (see appendix B and D) and provided to the interviewees for confirmation. Furthermore, the questions of the interviews were prepared upfront to increase the consistency of the interviews, see appendix A and C.

Although the respondents were all in charge of a part or the whole logistics processes of the company, they were not all the owners of the company. Therefore they did not all determine the strategy for their business. It would have been more beneficial for the reliability of the research if only the owners of the companies were interviewed, which was not the case in the interviews of flora provider B and D.

4.5.2 Validity

The validity of a research concerns whether the results of the study reflect the research studied (‘t Hart et al., 2005). Validity can be defined into, the internal and external validity, both are discussed below.

Internal validity refers to the research logic and quality of the research process (‘t Hart et al., 2005). The internal validity of this research is increased by the use of data triangulation. Data triangulation involves using different sources of information (‘t Hart et al., 2005). Sources which are used in this research are desk research and interviews with owners or logistics managers of growers, flora providers and logistics service providers. The expert interview with the employee from the auction was done to increase to internal validity of the analysis. The view from the auction was asked about the scenarios to verify the reliability and realistic view of the outcome.

The external validity deals with the question whether the research findings can be generalised beyond this particular research (‘t Hart et al., 2005). This research included thirteen companies which is a small sample of the total number of companies who are operating in the flower chain. However, the flora providers who were participating were representative for the different categories of flora providers that are active within the flower chain. The research included large, medium and small

flora providers. Therefore, the research can be generalised to other flora providers who are located near the regions of Aalsmeer, Naaldwijk or Rijnsburg and who are exporting their flowers. Concluding, the results can be generalised for the flora providers who are a members of the VGB.

5. Analysis

The first four sections of this chapter, discuss and analyse the data of the thirteen cases for each actor in the Dutch flower chain. Section 5.1, 5.2 and 5.3 present respectively the within-case analysis of growers (n=3), flora providers (n=7) and logistics service providers (n=3). For each case the results from the interviews will be described according to the theoretical concepts which can be found in chapter three. In addition, these results will be analysed in order to assess whether the formulated propositions are supported for this particular case. In section 5.4 a cross-case analysis will be conducted, to find (dis-)similarities across the cases and to relate this with the theory. Section 5.5 discusses the outcomes of the expert interview regarding the scenarios. The propositions from the theoretical framework will be answered in section 5.6.

5.1 Within-case analysis: Growers

To gain information about the current situation of the logistics networks in the Dutch flower chain three growers were interviewed. Although, the participating growers are a small sample of the total number of growers they do represent the growers perspective in the flower chain. Grower B and C represent the growers who are currently trading more than 50% of their sales direct, which is also assumed in the detail scenario. Therefore, these two growers have a realistic point of view how the logistics for direct trade need to be organised in the detail scenario. Grower A has another point of view, he represents the growers who are still selling their flowers by clock trade.

The interviewees were the owner or co-owner of the nursery. A description of the three growers can be found in section 4.2. Table 14 presents the growers with their turnover, number of acres of nursery, production volume, location and customers. The growers who participated in this research were all flower producers who sell their flowers direct or indirect to flora providers. Grower A is producer of a seasonal flower, grower B is a producer of a mainstream flower which are produced in large volumes and grower C produces just as grower A a higher segment flower.

Table 14. Interviewed growers

	Turnover in 2012 (€)*	Number of acres	Flower production volume in 2012*	Location	Customers
Grower A	-	6	220.000	Westland	Flora providers
Grower B	0-5 million	6	18 million	Moerkapelle	Flora providers
Grower C	0-5 million	6	-	Bergschenhoek	Flora providers

* unknown information is presented as -

5.1.1 Role of growers

Grower A, B and C all produce cut flowers, although different species. Grower A performs less activities than the other interviewed growers. Grower B and C both are trading direct with flora providers and therefore offer more services to their customers. They offer customised services like specialised orders (specific colour sampling) and packaged flowers in plastic foil and/or boxes. All three growers are responsible for the transportation to the auction of their clock trade and of their direct trade to the flora provider. The main activities that growers perform are listed in table 15. The activities growers B and C perform are producing flowers, arranging transport for distribution to auction and/or flora provider, packaging and assembling flowers like combining different flowers in special orders and merchandising for their direct trade channels. The logistics services of the growers

are currently in the category of transport and warehousing although no inventory is held at the grower, all flowers are day fresh transported to the auction of flora provider.

Table 15. Activities of the interviewed growers

Activities	Grower A	Grower B	Grower C	Total # of growers
Production of cut flowers	x	x	x	3
Transportation to auction	x	x	x	3
Direct transportation to flora provider	x		x	2
Packaging of flowers		x	x	2
Assembling and special packaging		x	x	2
Marketing		x	x	2

5.1.2 Sales

Grower A currently sells 90-95% of his flowers at the auction clocks. The other 10-5% of the flowers are sold by direct trade to flora providers. In the last ten years grower A has noticed an increase in direct trade, in the past he sold all his flowers at by clock trade.

An advantage of selling flowers by direct trade is according to grower A the price certainty. As grower is it possible to decide on the price to aim a sales price above the cost price. When flowers are sold by clock trade growers have no input on the price. Grower A mentioned this advantages because his flowers sometimes are sold under the cost price at the clock. The grower knows that more flowers are traded direct just as in the plant sector and arrangements are made upfront. "In the past the price was determined by the auction clock but this is no longer so". The reason for selling his flowers still at the auction clock is the difficulty of forecasting the harvest period for the flowers. The flower he produces is dependent on the weather for the harvest time. "With flowers or plants that are less dependent of light and weather it is easier to control the flowers and to forecast like chrysanthemums". Grower A also mentioned that it is easier to do direct trade when your products can be forecasted. In the last ten years the direct trade increased from nothing to 5-10%. Grower A thinks that flora providers prefer the customised packaging from the growers. Flora providers also like to know in advance which flowers growers will trade in order to advertise to their customers. Retailers for example like to know in advance from the flora providers for their marketing. However, grower A is not aiming to increase his direct trade since he can get a better price with clock trade.

Grower B sells currently 90% of his production direct to flora providers. The direct trading of the grower has increased the last five years from 15-30% to the current 90%. In the years 2010-2012 it was respectively 45-60%, 60-75% and 75-90% of direct trade. At the beginning the grower took the initiative for direct trading and contacted the flora providers. Currently, flora providers are contacting the growers to buy direct from them.

Reasons for choosing direct trade instead of clock trade are according to grower B the advantage of being closer to the market, the better (higher) sales price, contact with the customer and the variety in work. Being closer to the market means that the grower has direct contact with his customers while with clock trade he did not know his customers. He can therefore interact more easy on the demand of his customers which makes him more flexible. This is all based on the contact with the customer and the relationship that is built by direct trade. The last reason grower B mentioned was the variety in work, he likes to do different things on a work day at his nursery caused by the direct

trade. Although the trading is done direct, the administration transactions still go via the auction. The administration transaction are the clearing of the trade. The auction takes care of the financial transactions between the grower and flora provider and operate as a bank.

Grower C sells currently 60% of his sales by direct trading. In 2008 till 2012 it was respectively 40-55%, 25-40%, 40-55%, 40-55% and 60% direct trade of the total sales. The grower also mentioned just as grower B that the transactions are still going through the auction. “The auction is good for the financial part, it gives the guarantee that we get our money”.

Reasons for grower C to trade direct with flora providers are the price arrangements and customised orders he can offer to flora providers to attract more customers, like offering one specific colour. Other minor advantages are that the flowers are faster delivered and therefore more fresh, which gives a better product quality and longer vase life.

From the three growers can be concluded that the direct trade between growers and flora providers is increasing. The direct trade has increased in the past years as can be seen in table 16. It has to be mentioned that these numbers are the total percentage of sales to retailers and flora providers who deliver to the retail and detail market. The numbers are not specified for sales to flora providers who distribute to detail outlets.

Table 16. Estimated direct trade percentages of total sales between 2008-2013

	2008	2009	2010	2011	2012	2013
Grower A	5%	5%	5%	10%	10%	10%
Grower B	15-30%	15-30%	45-60%	60-75%	75-90%	90%
Grower C	40-55%	25-40%	40-55%	40-55%	60%	60%

The different reasons for growers to trade direct are:

- price certainty
- customised orders
- relationship building between grower and purchasers
- fresh delivery
- fast delivery

Concluding, with direct trade growers can set their own sales price above cost price, at the auction that is not possible. Customised orders are referring to special packaging or specific flower colours packed in one box. For example grower B trades only mixed colours of his flowers at the auction clock for the certainty of the price. When buying directly from the grower customers can order the same coloured flowers. The other reasons of fresh delivery and fast delivery refer to the better flower quality because the flowers are delivered the same day of cutting with auction trade are the flowers less fresh.

5.1.3 Distribution strategies

Grower A has outsourced his transportation for clock trade to the auction locations in Naaldwijk and Rijnsburg to one local logistics provider (LP). He works together with the local logistics provider of Fleurplaza. For the transportation of the direct trade grower A does not use one strategy. He said that there is no system or strategy in his flower distribution to flora providers for the direct trading part. Sometimes flora providers organise the transport and collect the flowers from the nursery. In other cases with small volumes, the grower delivers the flowers himself to the flora provider.

Another possibility is that grower A transports the flowers with the logistics provider direct to the flora providers. The distribution strategy grower A uses depends on the transport costs, delivery time and flexibility of the specific distribution transport together with the product volume that has to be transported. The grower prefers low transport costs, short delivery times and flexibility in a distribution strategy. Grower A also mentioned a disadvantage of outsourcing which is that he sometimes has to wait for the logistics provider to come while the flowers are not stored in right conditions at his nursery, which leads to a lower product quality of the flowers.

Grower B does not outsource his distribution for the clock trade, he owns two trucks. He uses these trucks for the clock trade transport to the auction locations of Naaldwijk, Rijnsburg and Aalsmeer. The flowers that are clock traded and the direct traded flowers all go to one of the auctions since most clients are located near or at the auction. The flowers that are traded direct are delivered to one dock at the auction which gives the advantages of quick deliveries and quick return of the truck. The grower makes also use of the shuttle services, the transport between auction locations, by LSPs. He then transports the flowers first to one of the auction locations and outsources the second transport part to a LSP. The LSP transports the flowers to another auction location in the Netherlands where his customers are located. Grower B also outsources his clock trade transport to the auction locations in Venlo and Eelde due to the large distance from his nursery. The logistics is then outsourced to small transport companies because the grower believes these companies are more flexible in their time schedule and routing than bigger LSPs. Grower B uses own transportation to close located auctions because he believes he is then more flexible in time and quantities of his deliveries. Another reason is that he likes to be responsible for his own planning.

Grower C has outsourced his transport for the clock trade at Aalsmeer, the direct trade for customers at Aalsmeer (90%) and Naaldwijk (10%) are also transported by the same logistics provider. Although the common direct trade orders are outsourced, small orders of direct trade are transported by the old owner in small vans to the customers. Grower C has chosen for outsourcing to a logistics provider because his nursery and the auction are too far away from each other to do the transport by himself. The grower explained that it costs too much time if he would do it himself and the volumes that are traded are not constant enough to make it efficient. The choice for single outsourcing is based on the fact that the grower prefers a family logistics provider who takes good care of their flowers. The grower finds it very important that he can trust the logistics provider.

Table 17. Distribution strategies of growers for direct and clock trade

	Direct trade distribution	Clock trade distribution	Future detail scenario
Grower A	-Distributed by grower A -Outsourced to local LP -Collected by flora providers	-Outsourced to single local LP	-Grower cooperates with multiple LSPs
Grower B	-Distributed by grower B to close located auctions -Occasionally outsourced to multiple LPs	-Distributed by grower B to close located auctions -Occasionally outsourced to multiple LPs	-Grower in-houses logistics -Outsource occasionally to multiple LPs
Grower C	-Outsourced to single LP -Distributed by grower C (small volumes)	-Outsourced to single LP	-Grower outsources to single LP

To summarise, table 17 presents an overview of the distribution strategies from grower to flora provider. The first column gives the direct trade distribution strategies and the second column gives the clock trade distribution strategies of the growers. Grower B and C distribute their direct traded flowers most of time to the auction location of their customers where the flowers are further distributed by the logistics network of the auction to the flora providers (Connect). Furthermore, grower B and C do not offer direct transport from the nursery to the dock of the flora provider. Grower A occasionally delivers direct traded flowers direct to the dock of the flora provider.

Grower B does not outsource his transport to the auction but has its own trucks for the transport to the auction locations. Though he sometimes outsources the transportation to a LP when the transportation is for a long distance. Grower A outsources his transport to a single local LP. Grower C outsources his transport for direct trade and clock trade to a single LP. Reasons for outsourcing the transport according to grower A and C are lower transport costs and the ability to focus on their own core competences as producer. Besides these distribution strategies the growers sometimes use different ways. Grower A sometimes works with other LSPs and grower C also transports small quantities occasionally by himself. Grower B has insourced the logistics in his own company and outsources only occasionally if transport is too far from his nursery.

Detail scenario

The detail scenario is characterised by frequent transport of small volumes and more than 50% of trade is done direct. Grower A, B and C believe that in the detail scenario the growers will stay responsible for the logistics to their customers. Grower B likes to think that he as grower can keep arranging the transportation by his own trucks. Grower C thinks that the role of the auction will be a distribution place and a bank, to guarantee the transactions. Grower A mentioned that due to higher frequency and smaller volumes, small vans will do the transportation in the future since the current trucks costs are then no longer efficient. The transportation will cost too much with the small volumes.

5.1.4 Logistics performance

The choices of the distribution strategies for growers are based on the factors of logistics performance. All three growers ranked the five factors according to importance for logistics performance when outsourcing logistics. An overview is given in table 18 below.

Table 18. Rating of logistics performance factors on scale 1-5 by growers.*

Grower	Service performance	Time	Flexibility	Costs	Geographical scope
Grower A	5	3	4	2	1
Grower B	3	1	2	4	5
Grower C	3	2	1	4	5
<i>Average total score</i>	3.67	2	2.33	3.33	3.66

* 1= most important, 5= less important

Grower A said that from the five factors of logistics performance geographical scope is most important to him of a logistics provider. He likes to work with local LPs also because he trades his flowers at the auction nearby and he wants to be flexible. Transport costs and time are second and third. Flexibility of planning and delivery is automatically received by working together with others according to him and it is not something you want from your logistics provider. Grower A finds it also

important that there is trust between the driver and the grower. He explained that the flowers are picked up in the night when the grower is not present at his nursery.

Grower B said that "The logistics performance should be good to your customers. If flowers need to be transported it may cost something. The important thing is that it will be delivered on time and that there is some flexibility in the organisations of it". The grower therefore organises his own transport because he thinks he is then more flexible and can make the planning himself. Working customer oriented is also an important reason for his distribution strategy and therefore the logistics performance. The location of the auction plays a minor role in his decision, but because he is located near enough he has insourced most of his logistics. If flowers have to be transported to an auction at longer distance grower B does outsource to small LPs because the bigger providers are according to him not flexible enough. In the detail scenario grower B would like to keep the distribution insourced. He finds flexibility very important and time scheduling with a logistics provider is according to him difficult.

Grower C finds it important that the flowers are delivered in good condition. "You have to trust the company. However, service performance is not the most important factors when deciding on LSP and assessing the performance. Although he mentioned that "It is good to show your face once a while to your customer" which means that he prefers a build on a relationship with the customer. Flexibility and time are more important. The transport could probably be cheaper arranged but certainty and trust are also important". The grower does not want to think about the transport and therefore he has it outsourced. The LSP collects at different growers and has knowledge of the logistics. Also the ease and distance are reasons to outsource. The small orders of this grower are delivered themselves since the old owner of the nursery prefers to keep working and likes to ride on a vans to customers.

Some other remarks that came out of the interviews are that grower A does not think his direct trading will increase in the future. However, if grower A would trade more direct he would cooperate with the flora providers to arrange the logistics. Growers B and C think it is more efficient if growers bring the flowers to one location nearby the flora providers, as is currently done at the auction, then that the flora providers will take the responsibility of it. The growers are persistent about their current way of working and do not like to change it.

5.1.5 Conclusion

Based on the data from the three interviews with the growers can be concluded that the direct trading in the flower chain has been increasing in the past years. This is caused by the different advantages of direct trade like price certainty for grower and buyer, customised orders for buyers, relationship building between growers and purchasers to gain either market or production information on fresh and faster delivery.

The value added activities that are currently performed and will be performed in the detail scenario are that growers will take up handing activities like assembling customised orders and special packaging. The transportation of flowers between grower and flora provider will be organised by the growers and not as was proposed in the detail scenario that flora providers will take over this role. The growers based their future distribution strategies on the current strategies that are used. The reason for the strategy of arranging transport by growers is that growers already are active in the field of transportation and flora providers not. When using the theoretical framework from figure 10, the strategy choice of growers is affected by the logistics performance factors and the advantages or

disadvantages that come with it. The logistics services do not play a role in this decision because the all LSPs can offer the transportation between grower and auction. However, the performance of outsourcing or organising transport itself play a role too. Below the main performance factors, for all three growers, are described that influence their distribution strategy.

Grower A currently has small volumes with direct trade which makes it still efficient to do it himself. In the future detail scenario with higher direct trade volumes the grower chooses to outsource because in-housing the transport will become too time consuming. The multiple LPs will be local because he prefers to know the companies and their reliability. Flexibility of planning and delivery will be achieved by cooperating with multiple LPs. Grower B chooses his strategy based on the fact that the flowers will be delivered on time and his planning is flexible. Therefore he chooses to distribute his flowers currently and in the future himself with direct trade. the grower believes he performs better logistics than a LSP or local LP. Due to the short distance of transport to his customers it is also cost efficient. When this is not the case with a longer distance he will outsource to multiple LSPs, so he can choose the best performance option. Grower C outsources in the current and future scenario his direct trade to a single LSP. He chose this because of the fact that the LSP delivers on time and because the LSP has the knowledge of logistics. Due to the good logistics performs and relationship with the LSP he prefers working with the same company over time.

5.2 Within-case analysis: Flora providers

In total seven flora providers were interviewed, five companies who buy direct from the grower and two who buy almost all flowers from the auction clock. The flora providers are all located at one of the auction locations in Aalsmeer, Rijnsburg and Naaldwijk. In table 19 the flora providers are listed with their turnover, number of employees, location and customers. The description of each flora providers is already given in section 4.2.

Of the seven flora providers, five flora providers (A-E) buy more than 15% of their total purchases direct from the growers. Flora provider F and G are smaller flora providers who buy about 90% of their total purchases by clock trade at their own auction location.

Table 19. Interviewed flora providers

	Turnover in 2012 (€)*	Number of employees	Location	Customers	Export percentage
Flora provider A	>25 million	350	Rijnsburg	Florists (80%) and flora providers (20%)	Yes, 98% of sales
Flora provider B	>25 million	190	Honselersdijk (Naaldwijk)	Flora providers for retail and detail market	Yes, almost everything
Flora provider C	>25 million	90	Aalsmeer	Retail market and garden centres, flora providers and florists (5%)	Yes, almost everything

	Turnover in 2012 (€)*	Number of employees	Location	Customers	Export percentage
Flora provider D	5-25 million	75	Aalsmeer	Florists and small flora providers	Yes, 99.5% of sales
Flora provider E	-	30	Aalsmeer	Flora providers and florists	Yes, 99% of sales
Flora provider F	-	6	Rijnsburg	Florists	No
Flora provider G	0 - 5 million	5	Aalsmeer	Flora providers for detail market and the bigger florists	Yes, 97 % of sales

* Unknown information is -

5.2.1 Role of flora provider

The role of the flora providers can be explained by the activities the flora providers perform. Table 20 presents the activities for every interviewed flora provider. In the interviews the core activities of the flora providers were discussed. All seven flora providers perform quality control at incoming, breaking bulk (splitting flower batches), packaging of flowers and the distribution to their customers. Other activities are bouquets making, transportation between auctions locations, stocking and route planning for distribution. Stocking of flowers is done on a daily- or weekly basis, flora providers A and B keep a broad variety of stock multiple days, the others keep only daily stock. The routing for distribution and or transport between auction locations is performed by the flora provider A and E since these companies have own trucks. The flowers which are bought direct from growers are most of time ready-to-go for further distribution and need less care taking because these flowers were special ordered and packaged.

The flora providers discussed also the activities that are outsourced to a LSP. From the seven flora providers, four outsource logistics services to LSPs. However the services which are outsourced to the LSPs relate to the transportation and no other value added service or inventory services are outsourced. LSPs only do the incoming control and collection, transportation, routing and schedule making.

Table 20. Activities of flora providers

Activity	Flora provider	A	B	C	D	E	F	G	Total # flora providers
Quality control check		x	x	x	x	x	x	x	7
Breaking bulk		x	x	x	x	x	x	x	7
Packaging		x	x	x	x	x	x	x	7
Labelling			x			x			2
Bouquets making*		x		x	x	x	x		5
Stocking		x	x		x	x			4
Routing		x				x			2
Transportation between auction locations		x				x			2
Distribution		x	x	x	x	x	x	x	7

*Flora provider B and G can provide bouquets but outsource the bouquet making then to another company.

5.2.2 Purchasing channels

The flora providers were asked to estimate their direct trade purchase between 2008 and 2013. In table 21 the answers are given for all flora providers. From this table can be concluded that the flora providers differ in their purchasing percentages by direct trade. Although the interviewees estimated the percentages of each year between 2008-2013, it can be concluded that the flora providers are buying more direct from the growers. Flora provider F and G are small flora providers who still purchase almost every flower at the auction clock. Furthermore, direct trade is currently more common for the medium and large flora providers.

Table 21. Estimated direct trading percentages of the flora providers

Year*	2008	2009	2010	2011	2012	2013
Flora provider A	10%	-	-	-	25%	27%
Flora provider B	0-10%	0-10%	0-15%	20%	40%	60%
Flora provider C	15-30%	-	-	-	35%	35%
Flora provider D	20%	-	-	-		50%
Flora provider E	0-15%	0-15%	15-30%	15-30%	15-30%	15-30%
Flora provider F	0%	-	-	-	-	5%
Flora provider G	0%	-	-	-	-	5-10%

* unknown information is presented as -

Reasons for the increase of direct buying are according to the interviewees the ability to make agreements on price and quantity, respectively six and five interviewees named this reason. Other common reasons are the certainty of purchasing flowers (n=5) and better product quality (n=4) due to fresh flowers and therefore a longer vase life. The relationship with producer was only named once while growers do find it important. This is caused by their different point of view, growers like to know their customers to make them a regular customer. However flora providers can choose from a lot of growers to buy the same flowers. In table 22 all reasons are listed that were given by each interviewee of the flora providers.

When comparing the direct trade percentages from the growers and flora providers, it can be concluded that flora providers are less active in direct trade than the growers. The reason for this difference is that flora providers cannot buy their whole assortment by direct trade and it takes more time and effort to buy direct due to all the different agreements that need to be made with grower. Direct trade is also more attractive when a flora provider buys a large volume and not a small batch since the costs will be too high.

Table 22. Reasons for direct trade

Reason	Flora provider	A	B	C	D	E	F	G	Total
Price agreements		x	x		x	x	x	x	6
Quantity agreements		x		x	x		x		5
Certainty		x	x		x		x	x	5
Delivery agreements						x			1
Better product quality			x	x	x	x			4
Relationship with producer					x				1
Preferred packaging				x			x		2

5.2.3 Sourcing strategies

For the collection of their flowers different strategies can be used by the flora providers. In table 23 the strategies for each flora provider are given. A distinction is made between the two purchasing channels: clock trade and direct trade.

Table 23. Sourcing strategies of the flora providers

	Current sourcing strategy (direct trade)*	Transport between auction locations (clock trade)	Future detail scenario (direct trade)
Flora provider A	-Arranged by growers (delivered at auction and dock)	-Own trucks	-Arranged by growers
Flora provider B	-Arranged by growers (delivered at auction)	-Single LSP	-Flora provider will collect with cooperation of LSP
Flora provider C	-Arranged by growers (delivered at dock) -Outsourced to single LSP	-Single LSP	-Arranged by growers
Flora provider D	-Own small vans -Arranged by growers (delivered at auction and dock)	-Single LSP	-Flora provider will collect without outsourcing
Flora provider E	-Arranged by growers (delivered at auction)	-Multiple LSPs -Own trucks for auction Herongen	-Arranged by growers
Flora provider F	-Arranged by growers (delivered at dock)	-Commissionaires	-Arranged by growers
Flora provider G	-Arranged by growers (delivered at dock)	-Commissionaires	-Arranged by growers

Clock trade

The flora providers buy not only at their own auction location but also from other auction locations, called remote buying. Therefore transport between the auction locations is created in the form of shuttle services by multiple LSPs. The flowers bought from the auction clock(s) are logistically sourced by a single LSPs for flora provider B, C and D. Flora provider A does his own collection and transport between the auction locations. Flora provider E makes use of different sourcing strategies: outsourcing to multiple LSPs for the transport between auctions and for the auction of Herongen the company uses their own trucks. Flora provider F and G only buy at their own auction location and make sometimes use of commissionaires from other auction locations. Flowers that are bought by clock trade from their own auction location are delivered through the 'elektro hangbaan' (EHB system). Which is an electronic automatic system from the auction that transports trolleys with flowers from the auction clock to the different flora providers that located at the same auction location.

Flora provider B outsourced the logistics to a single LSP because this LSP is a big player in the sector. Other reasons according to B, C and D were the high frequency of trucks in the shuttle service between auction locations and the ability to focus on their own competences and LSPs already have the knowledge in-house. Flora provider C used to take care of own transport but there came too

much laws and rules² to make it legal, which increased the costs too much. Although flora provider D outsources logistics between auction locations he mentioned that outsourcing has also a disadvantage. He stated that when logistics is outsourced you have no control of the activities and are not aware of where the products are during transport.

Flora provider E chooses for using own transport because of trust issues with outsourcing logistics. He said that the big LSPs work with foreign employees who have no understanding of flowers and care taking of it. According to the interviewee foreign people have no knowledge about the product quality and he finds his flowers too costly and fragile to outsource the logistics to them.

In table 24 the reasons of outsourcing logistics to a LSP are summarised and presented for each flora provider. The reasons for outsourcing were asked for the current transport between the auction locations (remote buying) and direct trade in case the flora provider outsourced logistics to one or multiple LSPs.

Table 24. Reasons of outsourcing to logistics service provider

Reason	Flora provider	A*	B	C	D	E	F*	G*	Total
Lowering of costs				x	x	x			3
Focus on core competences			x	x					2
High flexibility (frequency of trucks)			x	x	x				3
Knowledge and experience of LSP			x	x					2
Insourcing got too difficult				x					1
Geographical scope						x			1

*no outsourcing by flora provider

Direct trade

The sourcing of direct trade is different than for the clock trade. The logistics of the direct trade between the grower and the flora provider is currently not the responsibility of the flora provider. The logistics between the grower and flora provider is in general arranged by the growers. Other options are that the flora provider sources his flowers by himself with own trucks/vans or that he outsources the collection of the flowers from growers to a LSP.

When the transport is arranged by the growers then there are two ways to deliver the flowers to the flora provider. One option is to receive the delivery at your own dock (flora provider A, C, D, F and G) the other option is that the growers deliver it at the auction and the distribution system of the auction will bring it indoors to the flora provider (flora provider A, B, D and E). It also occurs that the grower transports their flowers to an auction nearby and that the flora provider brings it to his location with the use of a LSP (flora provider C).

The reasons of the current sourcing strategies of direct trade are based on the fact that the growers have always took care of the transport. The flora providers are used to this idea and some believe it is a customer service to the flora provider when growers arrange the transport. Flora provider B is the only one who thought about the change and contacted their logistics service provider about this. The flora provider believes that if you are responsible for the transport and work together with a LSP

² Inspectie leefomgeving en transport, www.ilent.nl/onderwerpen/transport/vrachtauto, 20 November 2013

it could become an advantage for them. This because the flora provider can make the planning of incoming goods and is less dependent of the growers. Currently the transport arranged by the growers and trucks are late or delivered at the same moment which makes it difficult for the flora provider to process all flowers at his dock. When the flora provider is in charge the company could make agreements with a LSP on delivery time. The flora provider could then diminish the peak hours at own docks and spread the deliveries over the day. The agreements can be made with a single LSP but not with multiple LSPs since that would costs too much time to invest in relationships with multiple LSPs. Below the views of each flora provider are given about the detail scenario and the collection of flowers.

Flora provider A believes that growers should take care of the transport since the flora providers are their customers. Besides that the flora provider finds it too difficult to arrange the collection of flowers from all their growers and it is currently not included in the price. The provider also has no knowledge of logistics while the LSP does in-house the services. The owner of flora provider C said that it is not applicable to start thinking about a problem when there is not yet a problem with the direct trade logistics. The flora provider expects that when more frequent transport between growers and his company will occur his company can handle the organisation. Due to their high number of docks, the flora provider has the ability of ten docks who can all unload a truck. Flora provider D has its own vans because the provider believes that makes him more flexible in their planning of making orders for customers and it will be an advantage in the delivery time. Flora provider D does not want to be dependent of a LSP and likes to build a relationship with a grower which is possible when collecting your own flowers. The opposite was said by the owner of flora provider E, he believes that growers will keep arranging the transport despite the increase in direct trade.

Flora provider F and G do not outsource any logistics because both buy almost everything at their auction location. The flora providers F and G both hope to remain buying at the auction clock in the future. Both flora provider do not have a clear view on the detail scenario because it is too far away from their reality. However, flora provider F said that growers should do the transport because it is their service to them. It would not be more efficient if we, as flora provider, ride to every grower in the corners of the Netherlands. The owner of flora provider G mentioned that the growers are doing a good job on the transport towards them and the auction and that growers should keep it this way.

Flora providers A, B, C, D and E think that the main function of the auction will be providing a logistics network to collect and distribute the flowers. Flora provider F and G think that too but hope that the auction will keep providing a trading place as the companies do now.

5.2.4 Logistics performance

In the interview was asked to the flora providers to order the factors of logistics performance from 1-5, were 1 is the most important and 5 is the less important factor. The performance refers to the performance of direct transport between grower and flora provider. The answers of the flora providers are presented in table 25.

Table 25. Rating of logistics performance factors on scale 1-5 by flora providers.*

Flora provider	Service performance	Time	Flexibility	Costs	Geographical scope
Flora provider A	2	1	3	4	5
Flora provider B	1	2	3	4	5
Flora provider C	3	2	1	4	5
Flora provider D	3	2	1	4	5
Flora provider E	2	3	4	5	1
Flora provider F	1	3	4	2	5
Flora provider G	1	2	3	4	5
<i>Average total score (n=5, A-E)</i>	<i>2.2</i>	<i>2.0</i>	<i>2.4</i>	<i>4.2</i>	<i>4.2</i>
<i>Average total score (n=7, A-G)</i>	<i>1.86</i>	<i>2.14</i>	<i>2.71</i>	<i>3.86</i>	<i>4.43</i>

* 1= most important, 5= less important

Although the participated flora providers are not of the same size, the ranking of factors is evenly important. No scaling was used since the aim of this research is to give insight in the views of all flora providers and not to provide qualitative research results. From table 25 can be concluded that on average (n=7), the interviewed flora providers, find service performance the most important factor, then time and flexibility, costs and geographical scope. When flora provider F and G, the small sized flora providers, are excluded the ranking of factors is a bit different. Service performance is then ranked as second and delivery time as first. Flora provider B mentioned that the service of a LSP is important, especially the reliability of the LSP. "You should be able to trust them since LSPs transport large volumes of us". Time and flexibility of the deliveries are also important that is why flora provider B choose one of the big LSPs to be flexible and to have a good availability of frequent transport. Costs of the logistics is less important compared to the previous named factors. Flora provider F agrees with flora provider B, he also mentioned reliability of a LSP and quality of care taking during transport as indicators for service performance. Trust towards a LSP was named as indicator of service performance by flora provider E, which refers to the reliability of the outsourced firm. Flora provider A explained that the company prefers a quick delivery and flexibility in their planning over low transport costs. Flora provider C finds flexibility and time also important to be independent of a LSP, a quick delivery is valuable to them. Flora provider D agrees with that, to be independent is also important, in order to be flexible in transport planning and quick delivery. Geographical scope is given the last score because the flora providers who outsource to LSPs do not have to worry about that because these LSPs operate in every auction location. The only flora provider who finds it important is flora provider E. This flora provider defines the type of sourcing strategy on the location of the grower/auction location. "When it is on our (distribution) route towards Germany we do the transport ourselves, if not we outsource".

As conclusion on the logistics performance factors: service performance, time, flexibility, costs and geographical scope the following indicators were identified from the interviews. Service performance referred to indicators as trust (reliability) and availability (frequency) and quality of products (care taking during transfer of goods). The interviewees mentioned that costs referred to them to transport costs. Time referred to delivery time between buying/ordering and receipt, with the auction trade this depends on the clock but with direct trade flora providers can set their own time for delivery with agreement of growers. The geographical scope of a logistics provider is not an

important issue for the interviewed companies. Most outsourced logistics are outsourced to a LSP who have a nationwide network in the Netherlands by cooperation with other LSPs (flora provider B, C and D). Only flora provider E finds geographical scope important due to the advantage of lowering transport costs on distribution route.

5.2.5 Conclusion

From the within-case analysis of the flora providers can be concluded that the direct trade percentage is increasing for large and medium sized exporting flora providers. All five flora providers who are currently active with direct trade have seen an increase. Reasons for the increase in direct trade are according to them the price and quantity agreements the firms can make with growers, the certainty of trade and the better and secured quality of flowers. Overall the flora providers prefer direct trading by the guarantees that can be made between the grower and them.

The role of the flora providers can be determined as the actor who breaks bulk, adds value to the flowers (e.g. packaging, bouquets making) and distributes them to the retail and detail market. This role will not change in the detail scenario according to the participating interviewees. From the seven flora providers, five believe that the growers will keep arranging the transport. This is based on the reasoning that growers currently perform a good job and that the flora providers do not see the problem of chaos at their docks by the high number of trucks of growers. The providers prefer to think that the auction will remain as hub in the detail scenario were growers can unload the flowers all at once. The flowers will be distributed by the auction towards the flora providers. However, two flora providers did believe that the role of transportation should be shifted to the flora provider in the detail scenario. One of these two flora providers preferred to think he could keep arranging the transport himself in the future detail scenario by collecting the flowers with his own vans. The other flora provider agreed with the proposed detail scenario and choose for outsourcing the collection of flowers to one LSP.

Although, five flora providers do not agree with the suggested detail scenario the choice for their sourcing strategy, the collection of flowers, can still be determined. The flora providers based their sourcing strategy on the logistics performance of growers who currently arrange the delivery of flowers to the flora providers. The services that are outsourced do not affect the sourcing strategy because all would outsource the same service, like transportation between grower and flora provider. The performance was determined by the reliability of performance since the growers perform currently well. The availability of the deliveries and quality of products are according to the flora providers on the right level. Therefore, the five flora providers do not see a point of shifting the responsibility to them. The flora providers do not believe the transport can be arranged more efficient in time and transport costs due to the broad assortment the flora providers offer to their customers and the scattered locations of these growers.

As mentioned previous, flora provider B did choose to source the flowers by himself with cooperation of a LSP. This flora provider believes that this strategy will turn out in an advantage where the flora provider will have more power in the organisation of logistics. The choice for this sourcing strategy is based on the logistics performance of transport between grower and flora provider. Currently, the flora provider is not content with the logistics performance of the growers who deliver not on time and have no flexibility in other delivery times. Therefore, the company is searching for other ways to coordinate the transport. The flora provider values the reliability of a LSP

and good delivery performance that can be spread during the day. A remark on this choice of sourcing strategy has to be made since this flora provider already purchasing 60% direct and is facing some troubles with the deliveries. Currently, all other flora providers trade less than 30% direct and do not yet face problems.

By performing the logistics himself with small vans flora provider D believes he can collect the flowers quicker than other actors in the chain. He values the logistics performance of delivery time and flexibility in planning, transport costs are less important. Ordering throughout the day is a service the flora provider offers to his customers. The provider delivers also throughout the day and therefore he needs to be flexible in the collection of flowers and cannot be dependent on the logistic network of a LSP who delivers on set times during the day.

5.3 Within-case analysis: Logistics service providers

Three logistics service providers were interviewed who are operating in the Dutch flower sector. All three provide logistics services to growers and flora providers. In table 26 the LSPs are listed with their turnover, number of employees, head office location and customers. Descriptions of each LSP can be found in section 4.2.

Table 26. Interviewed logistics service providers

	Turnover in 2012 (euro)	Number of employees	Head office location	Customers
LSP A	-	250	Naaldwijk	Growers and flora providers
LSP B	5-25 million	130	Naaldwijk	Growers and flora providers, florists and garden centres
LSP C	< 5 million	15	Aalsmeer	Growers and flora providers

* unknown information is presented as -

All participating LSPs provide their service to growers and flora providers. LSP A and B are both big players in the sector, and own their own trucks. LSP C is a smaller company who does not own trucks but is a cooperation of mostly regional logistics providers.

5.3.1 Role of logistics service provider

The role of a LSP can be described by their activities. Table 27 presents the activities each interviewed LSP currently provides.

Table 27. Activities of logistics service providers

Activity	LSP A	LSP B	LSP C	Total # of LSPs
Incoming control	x	x	x	3
Cross docking	x	x	x	3
Transportation	x	x	x	3
Packaging	x	x		2
Breaking bulk	x			1
Stocking	x			1
Order preparation			x	1
Return of goods		x		1
Quality control check		x		1

The main activities the three LSPs currently provide are the incoming control, cross docking and transportation. These activities of the LSPs are the basic services a transport company offers. Besides these basic services the LSPs offer other activities to their customers as quality control, packaging, breaking bulk for foreign flora providers, stocking, order preparation and return of goods as containers and trolleys. These activities are the value added services to their customers, the reasons why the companies are a LSP and not a logistics provider. The services of all three LSPs are currently based on the remote buying of the clock trade which causes the product flows between auction locations. However, all three LSPs believe that their current logistics network will change in the future due to the decrease in transport between auction locations caused by the decrease in clock trade.

The reason why only LSP B offers quality control on products is that this LSP employs people who have knowledge of the products. The other two have not that knowledge in-house. LSP A provides his services also to foreign flora providers which is the reason why he is active in the value added services as breaking bulk, packaging and stocking. The LSP offers the foreign companies flower batches that are ready for international transport.

5.3.2 Increase in direct trading

Each of the interviewed LSPs is aware of the increase in direct trading and the effect on their company activities. LSP A notices the change in more direct trading in the shift of the transport time. With auction trade the flowers needed to be transported during the evening or at night, with direct trade transport is this performed during the day. The LSP noticed that the internal logistics in the auction building has increased due to the increase in direct trading however, it will not affect their business as long as the flora providers are not planning to organise the sourcing from growers themselves.

LSP B has noticed an increase in the direct transport between growers and flora providers. The owner explained that it does not matter how the flowers are traded; direct or at the clock. The LSP will keep collecting the flowers first at their docks before the flowers are distributed to the end customers. The owner believes that the increase in direct trade will have an impact on the process of smaller transport companies since these companies have less hubs to collect and cross dock the flowers. Although the increase in direct trade will not change the process of LSP B he does react on the increase in frequent transport and less volumes that are transported. The LSP has invested in smaller trucks for the collection of flowers from growers to increase his efficiency. Though, large scale growers still provide high volumes due to the combination of clock and direct trade transportation to an auction location, smaller growers are transporting small volumes.

The owner of LSP C argued that the company would not exist if the direct trading did not increase in last years. The activities of the LSP are for about 37% based on the flow stream of direct trading. Clock trade has almost no logistics outside the auction and is therefore less important to them. The small volumes are in favor of this company since LSP C focuses on the customers with small volumes. The owner believes that the auction will stay a place for logistics activities because the sector needs a place to collect and assemble the goods.

5.3.3 Detail scenario and sourcing strategies

Currently, the LSPs use the auctions as hubs for their distribution and collection between the growers and flora providers. The LSPs are actors in the chain who follow others and become active in the

chain when growers, flora providers or other companies ask them to take care of the transport. In the interview the LSPs were asked about their view on the detail scenario, especially the transport between grower and flora provider and their role in it.

As stated before LSP A believes that more direct trading will not affect their business as long as the flora providers are not changing their way of collection. The interviewee believes that if flora providers take over the role of transport between grower and flora provider LSP A can become more efficient in their logistics for the flora providers. "Less docking will then occur at the flora provider which will make it less chaotic at their docks". He has tried to communicate this view, of collection by flora providers, to these companies but the flora providers are not open to it.

LSP B explained that in the plant sector the increase in direct trading was earlier than in the flower sector. In the plant sector was therefore also argued about this logistics issue and traders wanted to source the plants themselves from the growers. However, this never happened. The interviewee stated that on paper the idea sounds great but in practice it is too expensive. The owner suggests that to be efficient in time and costs, growers should make sure their direct and clock trade can be transported at the same time. When growers do this the efficiency of the truck load is higher due to larger volumes. A remark to this is that growers can then transport one time a day. Working with hubs in the sector is therefore most efficient according to him. As stated before LSP B believes that growers will stay responsible for the direct transportation and LSPs will divide the two streams of direct and clock trade. The LSP will only react on the increase in direct trade with their own interest, like investing in smaller trucks for the collection of flowers from growers due to the decrease in volumes because of more frequent ordering. LSP B will not invest in stimulating flora providers to arrange the sourcing from the growers. However, the owner thinks that single sourcing by flora provider would be the best strategy to limit fragmentation of logistics by different LSPs. It is a service as a LSP can offer a complete nationwide network. LSP B also invests in new locations at the auction, due to the increase in direct trade the LSP wants to be located close to the flora providers to offer quick delivery from grower to flora provider. Like in Aalsmeer and Naaldwijk there are different trade parcs and on every trade parc the LSP has a hub to cross dock the flowers for direct trade. The internal system of the auction to deliver trolleys is too crowded and takes too much time according to the interviewee.

The owner of LSP C believes that the auction will remain, the auction is important for their logistic network because the sector will need a place to collect and divide the different products. His view on the detail scenario is that the growers will stay responsible for the transport to their customers and that growers will outsource to local logistics providers. LSP C is not in favour of single sourcing by growers or flora providers because that would limit them. The advantage might be lower fixed costs but he does not know any flora provider who works together with only one LSP. He believes that flora providers should not be dependent on one LSP in order to get the most out of outsourcing. With single sourcing you are in a relationship and cannot go to another although he is cheaper or performs better. Table 28 presents an overview of the sourcing strategies of the three LSPs on the next page.

Table 28. Sourcing strategies

	Current sourcing strategy (direct trade)*	Transport between auction locations (clock trade)	Future detail scenario (direct trade)
LSP A	Growers outsource to LSP A who collects and cross docks at one of their locations at auction, delivers to flora provider.	Yes, shuttle service	Flora providers outsource transport to LSP.
LSP B	Growers outsource to LSP B who collects and cross docks at one of their location at auction, delivers to flora provider.	Yes, shuttle service	Growers outsource transport to LSP. LSP collects and cross docks at hub (auction) to flora provider.
LSP C	Growers outsource to local LSP and LSP C collects and cross docks at their location, delivers to flora provider.	Yes, no shuttle service	Growers outsource transport to local LSP who cross docks at auction by LSP.

*The direct sourcing of flowers by LSPs is currently not done for the detail market, for the retail market do LSP A and B collect from grower and transport direct towards the flora provider or sometimes even the retailer.

5.3.4 Logistics performance

The LSPs all answered the question of which logistics performance factors are according to them important as LSP. In table 29 the results are presented, 1 indicates the most important factors and 5 the less important factor.

Table 29. Rating of logistics performance factors on scale 1-5 by LSPs.*

	Service performance	Time	Flexibility	Costs	Geographical scope
LSP A	1	3	2	4	5
LSP B	1	3	4	2	5
LSP C	1	4	2	3	5

* 1= most important, 5= less important

LSP A ranked service as first, since the LSP can offer all kind of services to their customers. Since the company is the largest LSP in the sector their flexible in the delivery time is high due to the high number of trucks in shuttle service and therefore the LSP can provide quick delivery.

The owner of LSP B said that "As logistics service provider service to your customer is of course the most important. LSP B aims to be not just the wheels of the customer, but like to offer quality as well. Quality refers to the owner as good care taking of the flowers by conditioned transport and working with employees who have knowledge of the vulnerability of the flowers. Costs are for them second important due to the fact that the costs will pay off the investments that are made.

LSP C ranked service as most important, without a good service you fail as LSP. Flexibility is also important, the ability to adjust to the changing demand of the customers. "We as LSP do not want to sell no to our customers". The service performance is trust and the ability to please the customer for his demand.

The interviewed flora providers agree on the most important and less important factor. The three LSPs ranked service performance as most important factor for them as logistics service provider. The

LSPs agree that without service a LSP fails as a service provider. LSP A, B and C all offer a nationwide network to their customers, therefore the participated LSPs find geographical scope not important.

Cooperation

The three LSPs cooperate with other transport companies to offer a broader logistics network to their customers. LSP A has his own locations in Aalsmeer and Naaldwijk and works together with other LSPs to get a nationwide network in Netherlands. LSP B has locations in Naaldwijk, Rijnsburg and Naaldwijk and works together with other LSPs to get a nationwide network in Netherlands. According to the owner of LSP B it is a service to their customers that the LSP offers the opportunity to outsource all logistics to one company, independent of geographical location. LSP C is a cooperative organisation based on collective transportation, the LSP combines transportation companies with each other. However not on a nationwide network but local. LSP C works with mainly local, small logistics providers who do not have own docks at the auction.

5.3.5 Conclusion

The role of LSPs in the supply chain is that the LSPs provide the transportation between the actors in the chain. The LSPs do this on demand of the growers and flora providers, who both outsource their logistics. The main activities (services) of a LSP in the flower supply chain to a flora provider can be identified as the cross docking, transportation of flowers and receipt control. The services to growers are mainly the transportation of flowers either from the nursery to the auction or from an auction location to another auction location or direct transport to the customer (e.g. retailer or flora provider). The participating LSPs can therefore be categorised as service providers which means that the basic logistics services and other value added services are offered to actors in the flower chain. However, the LSPs do not integrate with a customer, the LSP even have no contract with their customers. The outsourcing is based on relationships and short term agreements.

Concluding, the suggested detail scenario is according to the LSPs currently not realistic. Their customer will not shift the responsibility of transportation from growers to flora providers. LSP A does believe the increase in direct trade will change the sector and that the LSP should interact on it. However, the LSP has talked to different flora providers about the future logistics network but the flora providers do not see the advantage in sourcing the flowers themselves with help of the LSP. All three LSPs ranked service performance as most important factor of logistics performance and this could be a reason why the LSPs follow the demands of growers and flora providers and do not take the lead themselves. As LSP the companies are dependent on the logistics that are outsourced to them. LSP B and C both believe that in the detail scenario growers will outsource transport to a LSP and the LSP will collect and cross dock the small amount of flowers at a hub (auction or own LSP location) to the flora provider.

Due to the increase in direct trade LSP A and B noticed that the transport times are changing. In the past transport from the growers had to be picked up in the evening or midnight (clock trade). Currently more transport is performed during the day. Another remarks is that the internal logistics at the auction location have increased during the day. For LSP B was this the reason, together with quicker delivery, to open a new hub at the auction location of Naaldwijk in order to be closer located to the final customers of their deliveries.

5.4 Cross-case analysis

For the cross-case analysis, the results of the three individual case analyses are compared to assess whether there are cross-case similarities or differences on the theoretical concepts that are named in the theoretical framework. The topics that will be discussed are the roles in flower supply chain, outsourcing decisions, logistics performance factors and the sourcing strategies.

5.4.1 Roles in flower supply chain

As explained in chapter 2 each actor in the flower supply chain has a different role. Due to the changing market, more direct trades are made between growers and flora providers. At the beginning of the research was assumed that some activities or services would shift among the actors in the flower chain. Therefore, the results of the within-cases are assessed whether the data corresponds with the literature review in chapter two.

The results indicate that from the thirteen interviewed companies only two companies had the intentions to change the organisation of transport between grower and flora provider in the detail scenario compared to the current situation. These two companies were LSP A and flora provider B, who currently are working with each other with the shuttle service. Both companies are big players in the detail flower supply chain and are currently more active with direct transport than the other companies which could be a reason why these two have another point of view. The other companies were aware of the direct trade increase but did not foresee a change in roles since the current sourcing strategy of outsourcing to growers does not yet provide problems.

Grower

The current role of the grower in the flower supply chain is the production and the transport of the flowers to the auction or customer. These basic activities followed from the interviews and correspond with the information found in literature. Although the basic activities of the grower are not changing due to the increase in direct trade, the growers are performing more value added activities. As Porter et al. (2011) stated growers are doing marketing, this is confirmed by grower B and C. The marketing is needed for their direct sales channel or as grower C said "Branding of your product is important to become familiar in the market so that customers know who you are and what you offer". Other activities that are performed by the grower due to the increase in direct trading are the packaging of flowers and the assembling of customised orders. However, currently most growers trade directly for the retail market and a smaller amount is directly supplied to the detail market.

Flora provider

The main activities of the flora providers that were named in chapter two correspond with the information gathered from the seven interviews. Their main activities are breaking bulk, packaging of flowers and the distribution of the flowers. Other value added activities that are performed by the flora providers are bouquets making (n=5), stocking (n=4) and labelling of flowers (n=2). Only two out of seven have insourced the transport between auction locations. The activity of quality control on flowers is performed by the flora providers themselves since providing good quality products is their core business. Therefore outsourcing is too valuable. Overall, the interviewed flora providers liked to perform most of the above named value added services in-house. Reasons for this are that the flora providers earn profit by adding value to the flowers by handling activities. Table 30 presents an overview of the logistics activities performed or outsourced by the flora providers.

Logistics service provider

The literature review in chapter three discussed that a 3PL can provide all kind of services. Although the literature provides no specific information about LSPs in the floricultural sector the basic services of a 3PL correspond with the service of the interviewed LSPs. Transportation, warehousing, inventory management, and even some added value activities are offered by LSP A, B and C to their customers. Their main activities are the logistics services between the auction locations and collection and distribution of direct traded floricultural products which involves cross docking, stocking and checking the incoming products. The value added services as packaging, breaking bulk services, order preparation and quality control check are mainly offered to foreign flora providers who import flowers from the Netherlands. These companies ask the LSP to provide extra services besides the logistics services of order preparation for transport.

The interviewed LSPs can be categorised by their services and customisation towards the customers as a 3PL. Based on the information of the literature review it can be concluded that LSP A, B and C can be categorised as service developers. All three LSPs offer, besides the basic logistics services, value added services to different customers (growers and flora providers). The value added services are customised services like packaging. However, the LSPs are not integrated with their customers, the companies perform only outsourced services. Furthermore, from the interviews followed that there are no long-term contracts between the LSPs and the growers and flora providers about the logistics. The relations are all based on short term agreements.

Table 30 Overview of the activities provided by the grower, flora providers and LSPs.

Growers	
Production	Production of flowers
Transportation	Direct transport, transport to the auction
Value added services	Packaging, assembling customised orders, marketing
Flora providers	
Transportation	Direct transport, transport between auction locations, cross docking, forwarding
Warehousing	Quality control, storage, receipt (income control check), returning of goods
Inventory management*	Forecasting, location analysis, network consulting
Other value added services	Merchandising, assembling (bouquets making), handling goods, packaging, labelling
Financial services*	Factoring, invoicing, insurance services
Information systems	Routing for distribution, scheduling for distribution
Logistics service providers	
Transportation	Direct transport, transport between auction locations, cross docking
Value added services	Breaking bulk, packaging, order preparation, quality control check, incoming control check
Inventory management	Stocking

*not specifically named by flora providers, since not related to logistics services in this industry

Conclusion

Overall, the participated companies agreed that there will be no shift in the activities each actor currently performs. However, more direct trade will affect their current activities and time span in their processes. The companies believe that the growers will provide more customised services as packaging and assembling of batches. Growers take over the role of the flora provider, like the value

added activities as customised orders and packaging of flowers. Clock trade requires growers to deliver flowers in containers but with direct trade flowers are often packed in the foil and paper boxes to deliver them direct to end customers without further processing. However, it has to be mentioned that this is most often done for the retail market and not for the detail market according to the growers and flora providers. Flora providers will have more contact with the growers and have to invest time in building a relationship. The LSPs will provide less logistics between the auction locations and will focus more on the direct transport from growers to flora providers. Their main activities will shift from the shuttle service between auction locations to shuttle service between growers and flora providers. The transportation between grower and flora provider in the detail scenario will be organised by the growers, who can outsource it to LSPs or do it their selves.

Another remark has to be made on the time schedule of a grower. The traditional grower makes sure that his flowers are ready for transport at beginning of the evening (before 19.00). However, direct trading requires the grower to work harder during the day because it has to be ready by the end of the morning (before 12.00 a.m.). These time limits are set in order to deliver the flowers at the same day to the flora providers. Therefore, the direct trade has an impact on the time line of the whole supply chain which is a schedule of the daily activities regarding a trade and the logistics. Figure 11 presents an example of the clock trade time line and direct trade time line. In the direct trade time line have growers less time for the harvest and assembling of flowers since the flowers have to be transported in the morning in order to deliver the flowers in the afternoon to the flora providers. The advantage for the flora providers is that the flowers are more fresh due to no stocking over night at the auction. The flowers are received within 2-8 hours compared to 24-27 hours with clock trade.

	Grower	Transport	Auction	Transport	Flora provider
Clock	8.00-19.00	between 19.00-4.00	clock trade 6.00-10.00	6.00-11.30	delivery 1.5 hour after clock trade
Direct	8.00-12.00	12.00-14.00	-	-	before 14.00

Figure 11 Example of time line with clock trade and direct trade

Due to the higher quality of flowers with direct trade growers can ask a higher price for their flowers than at clock trade. As mentioned before, the direct trade will cause less stocking at the auction which will downsize the auction building. Currently, the transport costs are paid by growers to the auction for stocking and clock trade but these costs will be saved by the growers. However, the growers will make more transport costs on the direct transport to the flora providers since the growers can no longer unload the truck at once like was done with clock trade at the auction. The growers will have to deliver small batches separately to the dock of each flora providers. The docking at each flora provider will cost extra time. At the moment, the transport costs for clock trade are paid by the growers but are charged to the flora provider since it is included in the flower price, transport costs for direct trade are also included in the flower price.

5.4.2 Outsourcing

Section 3.2 explained why companies can outsource services to other companies. The advantages that were found in literature will be compared with the reasons given by the flora providers and growers. The LSPs are not included in this analysis because the LSPs are the companies to which is outsourced. The outsourcing of logistics can be split into the incoming logistics (the collection of the flowers) and the logistics between the auction locations, the shuttle services. Flora providers can also outsource their distribution to the retail and detail outlets but that is not included in this research.

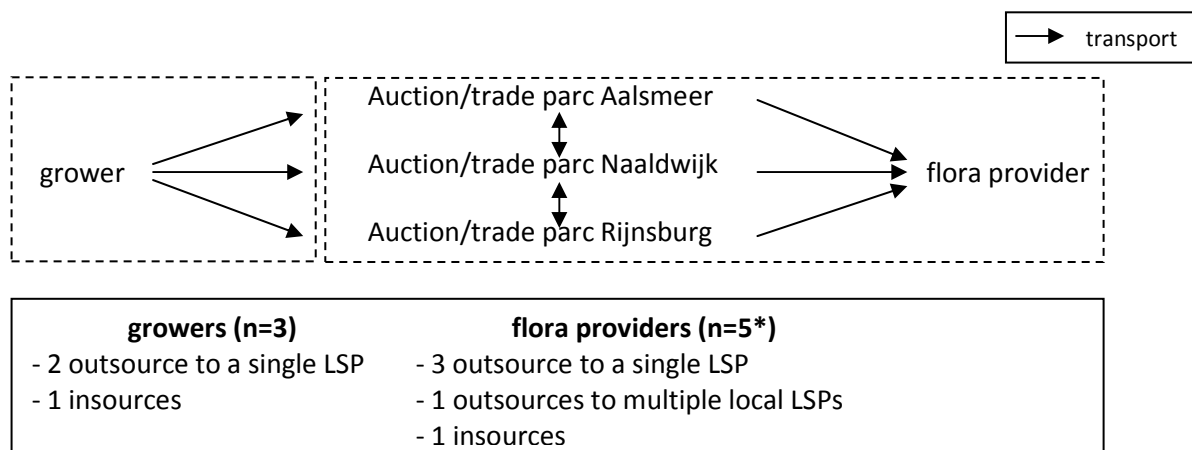
Below the reasons of outsourcing logistics are discussed for the participating growers and flora providers together with their motives for choosing single or multiple outsourcing and local LSPs.

Incoming logistics for direct trade

The sourcing of flowers by flora providers is currently performed by one out of the seven participated flora providers. A remark has to be made that this is partly true, since growers also deliver flowers direct to this flora provider. All other six companies have agreed with the growers that the growers transport the direct traded flowers to the flora providers either by themselves or by outsourcing the logistics to LSPs. However, occasionally the other six flora providers source flowers from growers themselves when volumes are low and delivery time is limited.

Logistics between auction locations

For the logistics between the auction locations more flora providers outsource their logistics. Four flora providers outsource these logistics to one or multiple LSPs. These LSPs are often not local LSPs because most LSPs who offer these shuttle services are operating on a nationwide network. The other three flora providers do not outsource logistics, one takes care of it himself and the other two have no outsourced logistics since flora providers F and G do not buy from other auction locations. Figure 12 illustrates the current sourcing strategies of the growers and flora providers in case flowers are transported between auction locations of Aalsmeer, Naaldwijk and Rijnsburg.



*both small flora providers have no sourcing strategy due to lack of remote buying

Figure 12 Transportation routes in flower chain with current sourcing strategies

As shown in figure 12, from the seven flora providers, three outsource to a single LSP who are part of the bigger LSPs in the sector. One flora provider outsources partly the logistics between auction locations to multiple LSPs, the smaller local LSPs, and partly performs the logistics himself. Another flora provider performs the logistics totally in-house. Both small flora providers have no sourcing strategy since the flora providers buy their flowers by clock trade at their own auction location. Of the growers, two out of the three outsource their logistics to a single local LSP. The third grower has chosen to insource his logistics and occasionally outsources.

Reasons to outsource logistics

The reasons the growers and flora providers gave in the interviews are combined since the actors both outsource and because in the current situation growers are responsible for the transport and in de future detail scenario it is assumed that this will shift to the flora providers.

The advantages of outsourcing given by the flora providers and growers are presented in table 32. These advantages are; the reduction in transport costs, higher flexibility, ability to focus on core competences and making use of the knowledge and experience of LSP. These advantages were also found in literature as advantages of outsourcing. The transport costs are reduced since LSPs can combine truckloads of different companies which makes the use of truck more efficient. When a truck is loaded with more volume the costs of transport can be divided among the different flora providers. When outsourcing to one of the bigger LSPs, flora providers can make use of the frequent network of trucks between auction locations and growers. The flora providers are then more flexible in their planning of processes. Companies can focus more on their core competences by outsourcing logistics due to fact that a LSP has the knowledge and experience of transport in-house.

One interviewee explained that small volumes are expensive to transport yourself, but LSPs will combine it and therefore are cheaper. The truck is used with more volume and therefore the logistics costs per trolley are lower. Another argument for outsourcing was that LSPs are focused on only transport and as flora provider/grower you should make use of it since you have a lot of other processes to care about.

The other advantages, as a better competitive position for outsourcing to a 3PL and a better service performance, were stated in literature however not mentioned by the interviewees. Though, the service performance is related to the focus on own core competences. Besides advantages the interviewees mentioned other reasons for outsourcing, see table 33. These other reasons are that outsourcing is easier than to in-house logistics since that requires meeting laws and regulation in order to ride with your own trucks. These rules and laws about maintenance and environment made it too expensive according to a flora provider. The distance of transportation is for growers a major reason for outsourcing the logistics to the auctions and flora providers. The costs for insourcing are mainly based on the investment in trucks, maintenance of these trucks and fuel. The delivery time will also increase with longer distances which will turn out in high transport costs and it would take them too much time. The third reason, convenience, was mentioned by a grower who explained that it is good to know that an experienced company is taking care of your logistics since as grower you do not have to worry about it.

Table 32 Advantages of outsourcing logistics

Advantages	# Flora provider (n=4)	# Growers (n=3)
Reduction in transport costs	3	1
High flexibility (frequency of trucks)	3	2
Focus on core competences	2	2
Knowledge and experience of LSP	2	1

Table 33 Other reasons for outsourcing logistics

Other reasons for outsourcing	# Flora provider (n=4)	# Growers (n=3)
In-house logistics became too difficult	1	
Geographical scope	1	2
Convenience		1

The flora providers and growers who outsourced logistics found it difficult to name any disadvantages of outsourcing and therefore no conclusions can be drawn. However, grower A mentioned a disadvantage which is that he sometimes has to wait for the logistics provider while the flowers are not stored in the right conditions at his nursery. Another disadvantage which was stated by multiple flora providers and growers concerned the control of the logistics processes. The processes refer to the ability to control the planning and not knowing how the products are transported either direct or via a hub. Only the outsourcing firm, in this case the flora provider or grower, knows how the flowers will be transported and at what time the flowers will arrive.

5.4.3 Sourcing strategies

In the previous section the number of companies who chose for each sourcing strategy were discussed. This section explains why the flora providers and growers have chosen this specific strategy.

Single sourcing

Single outsourcing of logistics is chosen by the companies because it gives them certainty about the fact that their products are in good hands. Trust and confidence in the other company is important to them (n=3/7 and n=1/3). Besides this the ease of working together with the same company is a reason (n=1/7). However, this strategy does make the flora providers vulnerable since the companies dependent on one 3PL. Another main reason is that these companies have a constant flow of products to transport and it would take too much of their time to make new arrangements with other LSPs (n=2/7).

In literature single sourcing was discussed by advantages and disadvantages. The advantages of a good buyer/supplier cooperation and good communication were stated in literature and the interviews confirmed this. Trust towards the LSP and reliability of good delivery performance result in good relationships and are reasons to use single sourcing according to the interviewees. According to one grower is the product quality of transported flowers better with outsourcing to a single LSP who is trustworthy due to the fact that the performance of LSP is good and reliable. The other advantages of total reduced costs and decreased logistics costs were not named by the companies who outsource to a single LSP but was named by grower F, who stated that single outsourcing leads to lower fixed costs. The advantage of low lead time is not applicable in flower sector because most LSPs have a frequent network of trucks riding during the day. In general flora providers work together with the larger LSPs and growers work together with smaller/local LSPs. Therefore this reason is not applicable to this research.

The disadvantages of single sourcing named in literature were that disruptions cause major difficulties and that the buyer has no bargaining power. These disadvantages were not confirmed by the interviews but that does not mean that the disadvantages are not applicable to this research since the empirical study was performed in a small sample of firms.

Concluding, the advantages and disadvantages of single sourcing in literature are applicable to the flower sector when deciding on which sourcing strategy is suitable to a flora provider or grower. However, the main reason for flora providers to choose single sourcing is the reliability and trust in the LSP and other reasons or advantages are inferior according to the interviewed companies.

Multiple sourcing

Outsourcing to multiple LSPs is done by only one interviewed company. However, the others mentioned after questioning that the flora providers and growers do use sometimes other LSPs but their main strategy is single sourcing. The reason of not choosing one company to work with but working together with different companies is according to flora provider E the ability of choosing the company with lowest outsourcing costs and the flexibility of outsourcing to different companies. The region of where the flowers need to be picked up play a role too. Flora provider E has chosen for multiple LSPs because he likes to work with a small, family business and these are often locally active (who operate at one auction location). Therefore, the flora provider has to outsource his transport to more than one LSP when trading from different regions in the Netherlands. The reason for multiple sourcing in this case is based on the kind of LSP and his geographical scope. This conclusion however cannot be generalized due to the fact that it is based on only one company's strategy.

The stated reasons in literature of high flexibility due to more suppliers, bargaining power of buyer, large pool of 3PLs to choose from and low risks were not the reasons for flora provider E to choose the multiple sourcing strategy. The owner did mention he prefers to find a good deal within the large pool of local LSPs and a good deal can be obtained by making use of his bargaining power. These advantages are applicable but not the main reason of choosing this strategy.

The flora provider did not mention disadvantages of multiple sourcing. However, other companies who did not use this strategy, but single sourcing, thought that the disadvantage of no close relationship, no trust between each other and that it costs a lot of time to make agreements with different LSPs. The literature stated that a short term contract is another disadvantage of multiple outsourcing.

Concluding, multiple sourcing is a strategy that will be chosen if a company wants to be flexible in the outsourcing of logistics. The flora provider prefers to work on a short term with a LSP and is aiming for low logistics costs.

Local sourcing

When companies choose local sourcing the growers and flora providers do this next to the choice of single or multiple outsourcing their logistics. From the participating companies in this study, one flora provider and two growers choose for outsourcing their logistics to local active LSPs. Their reasons for this were that these companies are often a small, family business who tend to be more flexible towards their customers. According to the three companies it is easier to make changes and agreements on the planning of the outsourced logistics then with bigger nationwide companies who have a strict time scheduled network, thus more flexible with local sourcing. Another advantage is that the feeling of working together with these businesses is better. A remark of a grower was that there is more trust and you know who is handling your products. He prefers people who have the knowledge of the flowers which leads to higher product quality after transportation. Literature stated too that local sourcing has the advantage of higher product quality but then due to shorter lead times. Shorter lead times are not special for local active LSPs in the flower sector because of the frequent trucks of the bigger LSPs these LSPs can also offer short lead times.

The disadvantages of making use of local LSPs are according to the literature that these companies have less experience because the local LSPs are most of time small companies. The opposite was argued by a grower and flora provider who both stated that the local LSPs often have employees who

have more knowledge of the products and handling of it than the bigger LSPs. The other disadvantages given in literature were not mentioned by the interviewees. It cannot be confirmed that local sourcing LSPs do less investments and are less efficient due to their geographical boundaries instead a LSP explained that local LSPs know their region better and can therefore take other routes which might be shorter.

Concluding, local sourcing in the flower chain can be applied when a company prefers to work with a small, family logistics provider. The geographical boundaries of the company should not be a problem. Therefore, a flora provider should purchase his flowers from only one region or should choose for multiple local sourcing.

Insourcing

By insourcing logistics the flora provider and grower believe to be more flexible with their time. The companies can make their own planning of distribution (grower) or collection (flora provider). Therefore, the actors believe to provide quicker deliveries to their customers if needed since the companies have the availability of own trucks. Another advantage of insourcing is according to them being independent. When outsourcing growers have to wait for the trucks to arrive and when the outsourced company is too late this could lower the product quality since the flowers are not stored in the right conditions at the nursery.

5.4.3 Logistics performance

When deciding on a sourcing strategy flora providers tend to include the logistics performance of a LSP in the decision making process. Since in the current flower chain growers take care of the logistics towards the flora provider the growers are included in this analysis of logistics performance. In the previous section the reasons for a certain sourcing strategy were discussed. This resulted often in reasons based on indicators of the logistics performance factors. Therefore, the logistics performance factors do effect the choice of the sourcing strategy by flora providers (and growers).

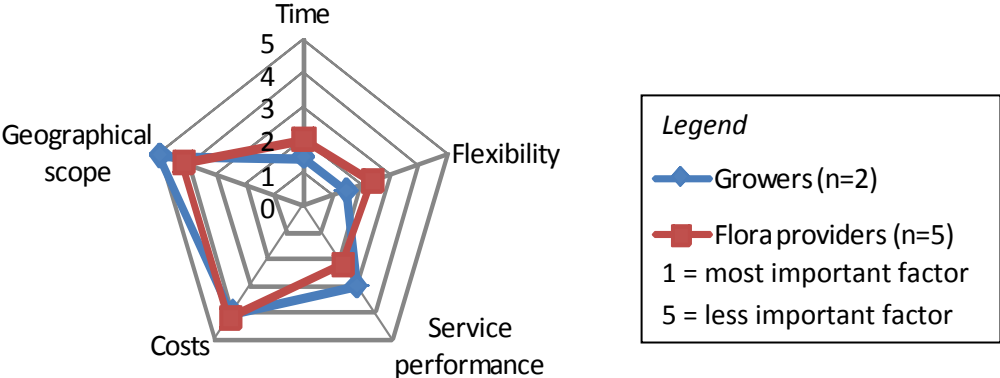


Figure 13. Logistics performance factors ranked from high (1) to low (5).

The ranking of the five factors of logistics performance is illustrated in figure 13. The growers and flora providers who currently sell or purchase more the 10% direct are included. The two growers, who sell most of their flowers by direct trade, find time and flexibility in their logistics performance very important which can be seen in figure 13. The time refers to the delivery time and flexibility is based on the planning of transport and flexible volumes that are transported. With direct trade it is important that growers can deliver the flowers within a short time period to their customers. Therefore, growers believe that flexibility is important in their logistics. The transport costs are

shown on scale four which means that the cost factor is less important since the service performance to their customers is more important. The service performance of their logistics are affected by the trust and reliability of the LSP. Geographical scope is not important to the growers when the logistics performance is assessed since the growers are active with direct trade in different regions. Figure 13 shows that geographical factor is also not important to the flora providers.

Furthermore, the five flora providers who purchase by direct trade ranked on average service performance as most important factor for logistics performance. The flora providers need to sell the flowers to detail outlets and therefore are concerned about the quality of the transport and trust of the LSP/grower. The trust refers mainly to the agreements that are made with a LSP or grower about the delivery times at flora provider. When flowers are delivered too late the provider is not able to process them the same day. The factor time is therefore ranked as second and flexibility as third. Flexibility concerned the ability to offer frequent transport during the day and flexible transport planning. Costs referred to the transport costs of outsourcing logistics and this fourth ranked factor indicates that flora providers are not aiming for the lowest costs price for transport. The last factor geographical scope referred to the operating area of a LSP and was ranked as last since most LSPs to which the flora providers outsource have a nationwide network.

Table 34. Logistics performance factors and indicators

Factor	Indicator
Service performance	Trust, reliability and product quality
Time	Delivery time
Flexibility	Volume changes (variability), frequency of trucks, planning
Costs	Transport costs
Geographical scope	Operating nationwide or regional

The indicators that were identified in the interviews are a bit different than the ones who were identified from the literature. Table 34 presents an overview of the indicators that can be concluded from the interviews and literature study. According to literature the indicators of service performance are reliability, variability, and product quality. Indicators retrieved from the interviews were reliability, trust and product quality. Reliability refers to the ability of trusting the other company. For example the agreements that are made related to the time of delivery or flower conditions during transport which both can affect the product quality. Variability (volume changes) and availability (frequency of trucks) were more related to flexibility according to the interviewees. The frequency of trucks passing by on a day and ability to outsource different volumes are according to the flora providers indicators that relate to flexibility and not to service performance. The time factor was indicated by lead time which is confirmed by the results of the study. The flora providers spoke about the time it takes from order to delivery. Costs referred according to literature to transport-, inventory- and information costs. However the interviewees considered only transport costs since that is included in the direct trade price by growers. The inventory costs are not applicable since the growers and flora providers do not outsource stock and information costs are for the LSP. The indicators of flexibility can be concluded on route planning (location), frequency of trucks (availability) and volume changes (flexible volumes). The last factor, geographical scope, has the indicator of operating area which can be either nationwide or regional for the flora provider and grower.

5.4.4 Future sourcing strategies

This section presents the possible future sourcing strategies of the collection of flowers in the detail scenario. In literature and from the interviews was found that currently growers take in general care of the direct transport to their flora providers. From the interviews with growers and flora providers can be concluded that the sector is aware of the direct trade increase and the changing market. The percentages of all participating companies, growers and flora providers, are increased in the past five years for direct trading. However, the growers and flora providers do not act on the increase of direct trade with their logistics and collection between grower and flora provider. The participating companies do not see a (logistics) problem. The frequent and small batch sizes that are assumed in the detail scenario will not affect the organisation of their incoming logistics. However, flora providers will have to deal with a lot of trucks at their docks during the day.

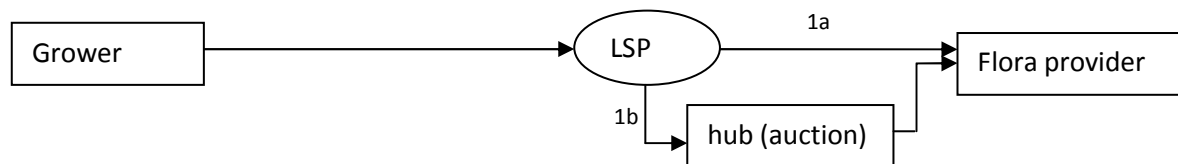
From the seven interviewed flora providers, five companies prefer to keep using the current logistics channels at the auction. As mentioned before only one flora provider and one LSP thought about a different collection of the flowers then today. The views of the growers, flora providers and LSPs resulted in different cases to organise the logistics in the future detail scenario. Each case led to a different sourcing strategy for the flora provider in the detail scenario. The different cases are discussed below.

Case 1: Growers organise the logistics and can outsource the transport to LSPs.

For this case was not specialised if the growers would outsource to (local) single or multiple LSPs.

1a: Growers organise the transport and can outsource to LSPs who transport the flowers direct to the dock of a flora provider.

1b: Growers organise the transport and can outsource to LSPs who transport the flowers to the auction which functions as a hub for LSPs. From there the flowers from different suppliers are cross docked and further distributed to the flora providers.



<i>Harvest and order preparation</i>	<i>Collection, transportation(cross docking)</i>	<i>Receives flowers</i>
8.00-12.00	12.00-14.00	before 14.00

Figure 15 Flow of goods and time line in case 1 of the detail scenario

In case one the growers arrange the transport to the flora providers either by direct transport to the dock (1a) or by transport to the auction which will then operate as hub (1b). The time line of case one starts in the morning when the flowers are harvested and transported by LSPs during the day in order to deliver the flowers in the afternoon to the flora providers. Case one is actually the same as the direct trade currently is organised. The flora provider does not have to source logistics from 3PLs or himself since the collection and transportation is arranged by the growers. Table 35 presents an overview of the positive and negative factors related to the logistics performance of the logistics in case one in which the flora providers have no sourcing strategy for the collection of the direct trade.

The sourcing strategy that results from this case is that the flora provider outsources the logistics to the growers.

Table 35 Logistics performance factor of the incoming logistics to flora provider assessed for case 1

Factor	
Costs	+, lower then when organised by flora providers
Time	-, delivery time is dependent on grower
Service performance	-, dependent on outsourcing choice of grower
Flexibility	-, no input on growers distribution planning
Geographical scope	+/-, not applicable

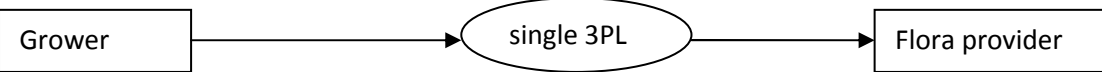
As table 35 presents, the transport costs will be reduced due to outsourcing to the growers. The costs will be paid by the growers but are included in the direct trade price for flora providers as currently is done. Therefore, the flora providers still pay for the transport although the flora providers do not have to take care of the organisation. The interviewees explained that the costs for this case of the detail scenario, where growers organise the transport, will be lower for the flora provider compared to sourcing the flowers themselves. Flora providers could never collect a full truck which would make it inefficient for them. The transport costs of the truck will be too high compared to the sales price of the volume that is collected. Although the flora provider is dependent on the delivery of the grower the flora provider can make agreements on the delivery time with the grower as is also done at the moment by companies. If the grower will deliver the flowers on time depends on the reliability of the service performance. However, the service performance of the logistics depends on the choice of outsourcing by growers to LSPs. Flora providers have no influence on it. In this case the flora providers will have a high number of trucks at their docks when the growers will be delivering the flowers all between the same time span, between 12.00 and 14.00 a clock. The five flora providers who suggested case one for the detail scenario did not see a problem in the unloading of the trucks by this. Especially, this 'problem' will not be noticed when the growers could make use of the auction as cross dock centre. The three growers who preferred this case did therefore mention that it is of high value for them that the growers or the outsourced LSP can unload the different batches all at once in order to save time. Each time a truck has to dock at a flora provider it takes time but if the truck can be sooner returned to the nursery it can be used again. Case 1b has therefore the preference by most companies. The auction will be a cross dock centre where growers or outsourced LSPs can deliver their flowers to. These flowers will then be further distributed to the flora providers by the logistics network of the auction. The last factor geographical scope was not applicable to this case since growers will always deliver the flora provider independent on their location.

The flora providers did not specify if the growers should deliver the transport or that the growers should outsource the transport to LSPs. This was not done because the flora providers only mind if the flowers will be delivered on time and not how or by who. However, the growers did specify their view which is discussed below.

Grower A specified that LSPs should cooperate. The LSPs should bundle their services and logistics networks in one ICT system to which growers can sign up to. When this is possible growers have the ability to outsource at any moment of time by a cooperated ICT system between the LSPs and growers. Grower B explained that he prefers to believe growers will be able to perform the logistics without outsourcing to a LSP. Only when the distances are too far away from the nursery growers will outsource to a LSP. Grower C specified that he as grower will outsource to a single LSP. The

choice for single outsourcing is based on the fact that the grower prefers a family logistics provider who the grower knows and takes good care of their flowers.

Case 2: Flora providers source the flowers from the growers by outsourcing the logistics services to a single LSP.



<i>Harvest and order preparation</i>	<i>Collection and transportation</i>	<i>Receives flowers</i>
8.00-12.00	12.00-14.00	before 14.00

Figure 16 Flow of goods and time line in case 2 of the detail scenario

This case assumes that the flora providers will take over the role of arranging transport from the growers to the flora provider in the detail scenario. Flora providers will organise the sourcing of the flowers which is purchased direct from the growers with the help of a single LSP. The flora providers will work with one specific LSP who can customise the logistics services to the flora provider. The LSP will then collect the flowers from the different growers and delivers them to the flora provider.

The sourcing strategy that results from this case is that flora providers will source their logistics from one single LSP.

Table 36 Logistics performance factors assessed for case 2

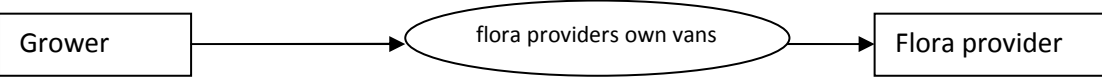
Factor	
Costs	+, outsourcing cheaper than insourcing
Time	+, decreased peak hours in deliveries
Service performance	+, not dependent on grower
Flexibility	-/+, dependent on one LSP but high frequency of trucks
Geographical scope	+, most LSPs operate nationwide

Table 36 presents a short overview on the advantages and disadvantages of the logistics performance factors for this sourcing strategy. The time line for this scenario starts the same as the other cases. The flowers will be harvested in the morning but these flowers will then be collected by the LSP in order to deliver the flowers in the afternoon at the flora provider. Since the LSP can cross dock the flowers for different flora providers at his location, the LSP can make the collection efficient by collecting flowers for multiple flora providers at different growers. In the end the flowers are cross docked at the hub. The costs of outsourcing will have a fixed price which is the advantage of outsourcing to a single LSP since the costs are paid by the flora provider. However, the costs could be higher than when the growers will take care of the transport but lower when logistics are in-housed. The flora provider has more power when the collection of flowers is organised by themselves and not by the grower which makes them less dependent than in case 1. In this case of the detail scenario the flora providers determine the times trucks will arrive and the number of trucks at their docks will be lower than in case 1. Peak hours can then be reduced when the flora provider is in charge of the organisation. Furthermore, the high number of trucks that a LSP has in his network will make the flora provider flexible, a late order could still be collected. The operating area of the LSPs who will be chosen by the flora providers will be nationwide with a single sourcing strategy in order to purchase from different regions. However, most large LSPs operate nationwide in the flower chain.

The auction will not play a logistics role in the above described case 2. The auction will only play a financial role, who guarantees the financial transactions between grower and flora provider.

The single sourcing strategy was argued by one flora provider (B). The interviewee explained that the company has already discussed the ability of cooperation with a single LSP for the collection of flowers from the growers. The flora provider believes that the company can get advantages out of organising the logistics as described in table 36. The advantages the flora provider stated are that he can decide on the time that the flowers are delivered since the flora provider gives the order to the LSP. The lack on logistics knowledge made the flora provider choose for outsourcing of logistics and single sourcing was chosen because of trust issues, low fixed transport costs and the high frequency of trucks. Furthermore, it has to be mentioned that this flora provider already outsources his logistics to a single LSP at the moment. Therefore, the flora provider is sticking to his old way of working just as the companies who choose case 1 where flora providers do not need a sourcing strategy since the logistics is arranged by the growers.

Case 3: The flora providers do not outsource the logistics but organise the logistics themselves with use of small vans.



<i>Harvest and order preparation</i>	<i>Collection and transportation</i>	<i>Receives flowers</i>
8.00-14.00	12.00-16.00	before 16.00

Figure 17 Flow of goods and time line in case 3 of the detail scenario

In this case of the detail scenario the flora provider takes care of the sourcing of flowers but does not outsource to a LSP. The flora provider will organise the logistics with his own small vans. The flora provider will source the small volumes in his small vans from the growers in order to be efficient in the logistics. A normal truck can transport 25 trolleys, which is too big compared to the volume that is collected and transported. Therefore smaller vans are lower in transport costs. Case three offers the flora provider more hours to receive orders from their customers and the provider can order also in the afternoon at the grower. The advantages and disadvantages related to the logistics performance of this sourcing strategy are presented in table 37.

The sourcing strategy that results from this case is that flora providers will source their logistics in-house by own small vans.

Table 37 Logistics performance factors assessed for case 3

Factor	
Costs	-, less efficient strategy than outsourcing
Time	+, more hours to collect and transport
Service performance	+, not dependent on a LSP
Flexibility	+, own planning and longer order time
Geographical scope	-, long distances cost too much

As shown in table 37 the transport costs will in this case be higher than when a flora provider would outsource. The number of trucks or in this case vans that will come to the flora provider will be high but there will be no peak in delivery since the flowers are ordered and collected throughout the day. Due to the longer order time at the grower and collection time in the time factor has a positive effect on the logistics performance. Since the vans are in own property the flora provider can choose to collect the products the whole day long as growers provide them flowers, which is an advantage to the flexibility of the planning and delivery times. The main reason for the flora provider who choose this sourcing strategy is that it enables the flora provider to serve the detail outlets with a delivery that is ordered not only in the morning but also in the afternoon. By performing the sourcing himself the flora provider will be more flexible in the collection since the company is not tight to a time like when the sourcing is outsourced to a LSP. The availability of own vans make the transport more flexible and the flora provider can serve the customer more hours a day when direct trade with growers is also possible in the afternoon. However, long distances between a flora provider and grower will have a negative impact on the logistics performance since the transport costs will be high and efficiency of low. Therefore, this sourcing strategy applies best to a flora provider that collects the flowers from growers that are located nearby.

In this case the auction will have the same function as in scenario 2. The auction will function in a financial role, who guarantees that the financial transactions between grower and flora provider are made.

A remark to this sourcing strategy is that it was suggested by a medium sized flora provider (D) who currently sources part of the direct trade by small vans. The company prefers to maintains their current strategy. The underpinning of this strategy was to be independent of a LSP and to be more flexible in the planning and collection of flowers in order to receive the products on time for further handling. Furthermore, knowing how the products are transported and through which routes was another reason (track & trace). The small vans were also suggested by grower A for the collection of flowers by flora providers.

Conclusion

Overall, the interviewed companies did not agree with the suggested detail scenario from this research wherein flora providers would organise the sourcing of flowers themselves. The different actors in the chain like to remain the current role division of who organises the logistics between grower and flora provider with the direct trade. As long as no major problem arises with the logistics the participated companies do not see the point of investing in reorganising the logistics network for the increase in frequent but smaller volumes ordered by direct trade. Therefore, the majority of the interviewed companies wants that the flora provider does not have to source logistics from 3PLs or himself since the collection and transportation is arranged by the growers.

Three sourcing strategies for the collection and transportation of flowers by flora providers can be concluded from this empirical research:

- Flora providers outsource their logistics to the growers
- Flora providers source their logistics from one single LSP
- Flora providers source their logistics in-house by their own small vans

The companies who chose for the strategy in which the flora provider organise the transport either by a single LSP or their own vans have currently a higher direct trade percentages. These flora provider have a 60% and 50% direct trade percentage compared 5-30% of the other flora providers. This could be the reason of why these flora providers have another point of view on the detail scenario since the other companies do not yet realise the disadvantages of growers arranging the transport.

Of the three LSPs which were interviewed two LSPs agree with case 1b which was also suggested by the flora providers and growers. Growers should outsource the transport to a LSP who will collect and cross docks at hub (auction) to flora provider. The other flora provider agrees with case 2, were a flora provider outsources his logistics to a single LSP. These two companies are both the ones who had thought about the problem and might therefore have a different view than the other companies which heard the 'problem' of more frequent transport but smaller volumes for the first time.

Furthermore, from the three described cases in this section can be concluded that the growers, flora providers and LSPs have a short term view. Before the interviews, eleven of the thirteen companies did not consider the development of more direct trade as a possible logistics problem. Although, the companies were stimulated to think about possible changes in the chain, the companies remained their view on the sourcing strategy. The logistics does not have to be organised in a different way in the detail scenario since the actors in the flower chain prefer the current way of working. The actors explained to wait for investing in new sourcing strategies until problems arise with their incoming logistics.

Local sourcing was not named in one of the cases. At the moment, growers outsource their distribution partly to local LSPs and flora providers do not outsource to local LSPs. This could be an explanation of why the option of local sourcing is not included in one of the scenarios. Flora providers need to source from different regions and prefer to have the convenience of outsourcing to one LSP (case 2).

Insourcing the logistics by flora provider is not a realistic scenario since the destinations to the suppliers, the growers, are too spread out across the country. Although the growers are concentrated in some regions, sourcing the whole assortment will not be possible from one region. Owning trucks and organising itself will costs too much time and money for the flora provider. To find out which scenarios are most realistic and applicable to the future scenario where 60% of flowers is traded direct between grower and flora provider, and batches are small and frequently ordered, an expert interview with a employee of the auction was held. The next section provides the analysis of this interview.

5.4.5 Analysis of interview with expert from Flora Holland

The expert interview gathered data about the direct trade increase in the flower sector and the future scenarios that were suggested by the growers, flora providers and LSPs.

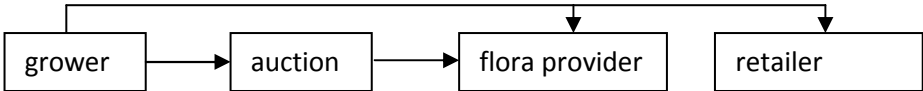
According to the expert direct trade is most often used for the main crops e.g. Tulips, Chrysanthemums, Roses and Gerberas (which are all produced in large volumes). The smaller production volumes of crops (e.g. season flowers) are mainly sold by clock trade. An explanation for this difference is that the main crops are sold to retailers who prefer direct trade, since the retailers want to reassure a quantity of the same flowers for a good price. Overall, 70% of flowers are clock

traded and 30% are direct traded. The participating growers' direct trade percentages meet with the explanation of the expert. Grower B and C produce large volumes and currently trade respectively 90% and 60% direct and grower A produces a seasonal flower with small volume who currently trades <10% direct.

The increase in direct trade is according to the expert (and auction) due to the scale optimisation of companies in the chain, there are less small growers in the Netherlands. Price agreements like fixed sales prices are another reason for growers and flora providers. An advantage of direct trade for a flora provider is that it is possible to order all day long, seven days a week. Therefore it is not limited to the morning hours as with clock trade. The shorter supply chain, caused by the value added activities growers perform like packaging and labelling result in skipping the flora providers in the chain. The expert mentioned that this short chain is attractive for retailers who prefer speed in the process, a quick delivery.

The influence of direct trade on the logistics processes therefore are the ongoing flow of goods that are transported. The auction used to be a place where flowers were collected during the night till 4.00 a.m. for clock trade. Currently the auction collects and stores less flowers. The expert thinks that the building of the auction will become smaller in the future since the peak hours for storing the clock trade flowers will decrease in volume. Instead, the expert expects that the ongoing logistics of direct trade will increase. At the auction locations was already noticed that between peak hours the logistics is not stopped as was in the past. The logistics flow of goods are constantly coming and are further distributed to the flora providers. However, it has to be mentioned that the volumes of direct trade which come to the auction during the day are smaller than the volumes that were traded at the clock. An explanation for this is that the large volumes are directly transported outside the auction to the flora providers or retailers. This has to do with the price the auction counts for the distribution service for each trolley. Figure 18 illustrates the different transport routes that are currently possible for direct trade.

Figure 18 Current transport routes direct trade



Detail scenario

The expert believes that the growers will be arranging the transport to their customers in the future with more direct trade. He based this on the time span for the transport and distribution in the current and future chain. The example that was given is that on a normal day the auction FloraHolland distributes 10.000 trolleys, which come from about 534 trucks which are on average for 75% loaded. These 10.000 trolleys each are traded at the clock. Which means that before 4.00 a.m. these trolleys are collected and stored at the marketplace of the auction and are then between 6.00-11.00 a.m. traded at the clock. These 10.000 trolleys are traded in smaller batches and about 50.000 transactions come out of it and have to be distributed within 5 hours to the customers, see figure 19.

Figure 19 Time span for clock trade

Transport to auction	Store at auction	Clock trade	Distribution	Delivery
from 7.00 p.m.-04.00 a.m. between 1-25 trolleys	till auctioning 10.000 trolleys	6.00-11.00 a.m. 10.000 trolleys	6.00-10.00 a.m. 50.000 transactions	before 12.00 a.m.

The same amount of flowers, 50.000 transactions, are direct traded in the detail scenario. However, the logistics process of collection and delivery will start later compared to the clock trade. The collection starts after the trade is settled and not before. The expert thinks that it is not possible to distribute the same number of orders in the same time span as with clock trade, see figure 20. He believes the information exchange between growers, flora providers and transport companies is not efficient enough. The companies will have to share a lot of information based on volumes, harvest- and delivery time in order to make an efficient logistics plan. This is difficult since there is no central hub to cross dock the orders in the detail scenario. It is possible that the time span works but then flora providers have to be located at the same location so that the grower can make one distribution route of deliveries. When the customers of the grower are spread over different locations this is not possible.

Figure 20 Time span for direct trade

Direct trade	Transportation to flora provider	Delivery
till 10.00 a.m.	12.00 a.m.	before 2.00 p.m.

Concluding, the future detail scenario, where flora providers source the flowers, is only possible when the information exchange about trade volumes, harvest- and delivery times is shared between grower, flora providers and LSPs. The expert believes the information exchange in the cloud (online) is not yet of a good level, since it is currently not shared. Therefore the organisation of the transport by the flora provider will cost too much time. The sourcing strategies by flora providers depend also on the commercial strategy and cost leadership model of the company. If a flora provider advertises with 'same day delivered', he will have to choose for transport that is not always optimal due to the fact that the delivery time is more important than transport costs. However, when flora provider advertises with 'lowest prices', it can be that due to lowest costs transport can take some time. Therefore, the sourcing strategy where flora providers source the flowers from the growers by outsourcing the logistics services to a single LSP is realistic but will not be the main strategy to organise the transport between grower and flora provider. The same applies to the sourcing strategy where the flora providers do not outsource the logistics but organise the logistics themselves with use of small vans. This strategy will be chosen when a flora provider has a commercial strategy in which the demand of the customers is most important. The company should always provide a solution and/or products to the customers problem or demand.

Case 2 has the difficulty of the information exchange between grower, flora provider and logistics provider. Before this can work in reality it has to be figures out how the information shared between the actors is shared and how the LSP could collect all flowers for the flora provider within a reasonable time span after ordering. Outsourcing the collection and transport to a LSP can only work efficiently by knowing the right information otherwise the collection of flowers will costs too much and flora providers cannot pay the LSP anymore. Due to the lack of an shared ICT platform or system this sourcing strategy is not yet possible and therefore less attractive for companies because it will require a whole new logistics model. The sourcing strategy with in-house logistics services will be used when companies believe it would make them more flexible. The flora providers believe that when collecting flowers themselves the transport is quicker and handling can be done sooner. The flora providers see it as a service to their customers to provide a quick service. The higher costs that come with it compared to outsourcing are not important.

The strategy wherein the growers arrange the transport is according to the expert a better option than the above named scenarios. He believes a number of sourcing strategies will be used based on this idea. Growers decide on their distribution strategy for outsourcing by multiple reasons according to the expert. The reasons the expert named are described below:

- Owning a truck is only efficient if the grower has to transport large volumes every time.
- Small volumes will be outsourced to a LSP, since it costs too much for a grower to drive with an almost empty truck which is not efficient. It is possible that growers own small vans to transport flowers on short distances to an auction were the grower further outsources to a LSP.
- Growers in the area of Naaldwijk will make use of the LSPs network to Aalsmeer and Rijnsburg. This is based on the fact that they have frequent transport and are located at the main auction locations were buyers of growers are located.
- Growers prefer to have the organisation in own hands and find outsourcing of their distribution to flora providers not flexible although it will be more efficient and will reduce the transport costs. The expert calls this emotional aspect, it is the same as people who drive in their own car instead of using the (cheaper) public transport. People know it is more expensive but other advantages are more important.

The organisation of the transport between grower and flora provider for direct trade are according to the expert depended on a few variables. These variables are the product the grower is selling (volume), emotional aspect (grower prefers to be independent), transport costs and location of customer.

Conclusion

In the future the transport will be organised by different kind of strategies for the transportation between grower and flora provider. Each grower and flora provider will have a different distribution or sourcing strategy that is most efficient for the company regarding the business strategy. The choice for which strategy is chosen for transport will be based on the product (bulk or limited produced), transport costs, location of growers and flora providers and emotional aspect. The flora providers will have different sourcing methods: collecting flowers themselves or transportation arranged by growers.

In the past the auction was the only cross dock and distribution centre but in the future with more direct trade all LSPs companies can take up this role. The expert believes the auction will remain as hub but the logistics function of it will decrease because the auction will become one of many companies who can offer direct transport.

The reasoning of the expert corresponds with the data from the other interviewed companies. The scenario were growers will be arranging the transport is seen as most likely in the future with more direct trade. The main reason for this is that it is based on the current model of transport in the flower sector. All companies know how it works and do not see an advantage of shifting the responsibility. The scenario of flora providers sourcing the flowers with or without help of LSPs is a scenario that is too futuristic to the companies. It is currently not yet possible because the information between companies is not shared.

5.5 Theoretical propositions from framework

This section discusses the propositions in order to assess the theoretical framework that was stated in figure 10. From the within-case and cross-case analysis conclusions can be drawn on the propositions.

The first proposition (P1) was defined as: *The more logistics services are outsourced by a flora provider, the higher the logistics performance of a 3PL will be.*

From this research can be concluded that the participated flora providers assess the 3PLs (LSPs) by their logistics performance and not specifically by the services that the 3PLs offer. As stated in the cross-case analysis, the flora providers currently outsource only basic logistics services. The value added services e.g. breaking bulk, order preparation and quality control check are mainly offered to foreign flora providers by the 3PLs (LSPs), Dutch flora providers do not outsource these activities. Therefore, P1 is difficult to assess since all flora providers outsourced the same kind of logistics services. However, the flora providers who outsourced on a long term to the same 3PL explained to have a good logistics performance. This could be caused by the customization of the 3PL to the demands of the flora provider, which is easier on a longer term. Though P1, was *not confirmed* by the case study.

The second proposition (P2) was stated as the following: *P2: When a small amount of services are outsourced to a 3PL the sourcing strategy will be multiple sourcing. When more logistics services are outsourced to a 3PL by a flora provider the sourcing strategy will be single sourcing.*

As stated before, the flora providers in this research outsourced more or less the same logistics services. The flora providers choose their sourcing strategy by determining the logistics performance of a 3PL. Therefore, proposition two is *not confirmed* by the results of the data analysis. However, from the empirical analysis can be concluded that flora providers chose single sourcing when outsourcing on a regular basis. Flora providers who occasionally outsource chose multiple outsourcing. The choice between single or multiple sourcing together with local sourcing is not affected by the number of logistics services that are outsourced to a 3PL since most 3PLs can offer the same services. The only difference between the 3PLs in the sector is that the 3PLs have a different operating scope, some only operate in a specific region around one auction location others operate nationwide.

The third proposition described the relation between each sourcing strategy and the most valued factor(s) of logistics performance. The propositions were formulated as:

P3a: Flora providers who value the indicators that relate to service performance are more likely to choose a single sourcing strategy.

P3b: Flora providers who value the indicators that relate to costs and flexibility are more likely to choose a multiple sourcing strategy.

P3c: Flora providers who value the indicators that relate to geographical scope are more likely to choose a local sourcing strategy next to single or multiple sourcing a 3PL.

As stated earlier in this report, the advantages and disadvantages of logistics performance are based on the factors of service performance, flexibility, costs, time and geographical scope. From the analysis follows that the flora providers assess their sourcing strategy by advantages that follow from a sourcing strategy. The advantages that the participating interviewees named could be related to

one or more of the factors of logistics performance. The flora providers who prefer indicators as trust and reliability in outsourcing to a 3PL chose single sourcing. The flora provider who chose multiple sourcing based the decision on the ability to outsource to a company with low costs since it will be a short term relationship. The flora provider preferred to be flexible and did not want to have a contract or long term relationship. The local sourcing strategy was not an option for the flora providers in the detail scenario since the flora providers prefer to be able to purchase from growers in different regions and a local 3PL does not operate nationwide. Furthermore, local sourcing would lead to outsourcing to multiple 3PLs which is not preferred. Therefore, *3a and 3b are confirmed* but *3c was not confirmed* in this research.

6. Conclusion and discussion

This chapter consists of the conclusion (6.1) and discussion (6.2) of the research. The conclusion is made by providing an answer to the main research question. In order to answer the main research question the sub research questions are answered first, second the main research question is answered. The final section (6.3) of this chapter provides the discussion and recommendation for further research and to the VGB and DaVinc³i project.

6.1 Conclusion

First, each sub research question is answered in this section. Second, the final research question will be answered. The first sub research question which is answered is:

SRQ 1. *Which roles are present in the current flower supply chain in the Netherlands?*

In the literature study research was done on the activities the different actors in the flower sector perform. The different actors that were identified are growers, auction, flora providers and logistics service providers. For each actor the role in the supply chain was identified by the activities that are performed by them.

The growers are at the beginning of the chain and are the actor who produce the flowers. A lot of flower producers are located in the Western part of the Netherlands. The main role or activity of the growers is to produce their flowers. Another activity that the growers do is the organization of the transport to the auction locations or the customer (flora provider). This basically means that the growers take care of their own distribution. Other activities besides these two main ones are related to the changing market, a more demand driven market. Growers used to grow, harvest, and put flowers in containers for auctioning. Currently, growers still produce the flowers and harvest them but are doing other activities as well like marketing of their products for the direct sales channels. The role of the growers can therefore be identified as grower, transporter and sales marketer.

The auction currently performs the role as marketplace and distribution place in the supply chain. The auction offers a place where supply (from growers) and demand (by flora provider, florists etc.) can meet. This is currently their main activity, other activities the auction FloraHolland provides are their logistics network at the auction locations, warehouses, information regarding buying trends and prices and ability to do quality controls on products.

Flora providers are the customers of the growers and their role is to distribute the flowers further down the supply chain to e.g. florists, retailers and/or garden centers in the Netherlands and foreign countries. Currently perform the flora providers the activities of breaking bulk, making small batches from larger batches, packaging of flowers, bouquets making and organizing transport for distribution.

The transport in the flower supply chain is often outsourced to logistics service providers, the transport between grower and auction/flora provider and between auction locations. The role of these companies is to organize the transport between the different actors in the flower chain. Other services LSPs provide were not found in literature.

The different roles of the actors in the flower supply chain are described earlier. However, the outcomes of the literature study have to be complemented with the results from the empirical study to avoid discussion on the changing roles of the actors. Due to the changing market, the responsibility of the organization of transport between growers and flora providers is shifting. The interviews provided an insight in how the current roles in the flower supply chain are organized and how this would be organized in the detail scenario. However, the growers and flora providers who are currently active in direct trading explained to keep performing the same activities as these companies already provide. Compared to the past or clock trade transactions the growers offer more services to their customers due to the direct trading. In the past the growers did not offer services as packaging, customized order assembling and direct deliveries to their customers. Due to direct trade growers perform more handling activities that used to be done by flora providers. However, it has to be mentioned that this is most often done for the retail market and not for the detail market according to the growers and flora providers. The auction is noticing that their role as marketplace is decreasing due to less logistics activities in the auction locations. Furthermore, flora providers do not think their activities will change with more direct trading, only the purchasing part will be different all other activities will stay the same. The role of the LSPs was described right, LSPs mainly perform transport, other services offered to Dutch flora providers are the incoming control and quality control. However, the detail scenario will impact their activities. The LSPs will do more cross docking due to the increase in more direct trade.

SRQ2. What are the main differences between the single sourcing, multiple sourcing and local sourcing strategies in the Dutch flower supply chain?

The sourcing strategies that were set at the start of the research were: single sourcing, multiple sourcing and local sourcing. These strategies for outsourcing logistics activities are often mentioned in literature. In this research the strategies were chosen to indicate the sourcing strategies flora providers can choose from when outsourcing logistics services to a 3PL for the collection of flowers from growers. It was assumed that due to the detail scenario, flora providers would take over the transportation role of the growers. When this would happen flora providers would have to (re)consider their sourcing strategy since most flora providers are not yet active in organising the collection of the flowers. The collection is most of the time arranged for them, by the growers and the auction. When outsourcing the logistics activities a flora provider has to choose between outsourcing to one 3PL (single sourcing) or to multiple 3PLs (multiple sourcing). Next to this choice in sourcing strategy the flora provider has to consider using local 3PLs or not (local sourcing).

According to literature, single sourcing has a service performance which is based on high product quality, good communication and cooperation between the outsourcing company and 3PL and a high reliability. The lead times are assumed to be low and costs are decreased compared to multiple sourcing. Single sourcing logistics services leads to low fixed costs due to a longer relationship with the 3PL.

The multiple sourcing strategy was according to literature low in costs caused by collaboration in order sharing, high in reliability on delivery time, and high in flexibility due to the ability of multiple suppliers. When outsourcing to multiple 3PLs the risk of delay by disruptions will be lowered and the firm can choose from a large pool of 3PLs.

In the case of multiple sourcing is the cost aspect of outsourcing of higher value than with single sourcing. The flora providers are not bond to one LSP and can easy change of outsourcing company who offer the lowest price. Due to the high changeability of the outsourcing firm this strategy is more flexible than single sourcing. Therefore, the reliability (trust) in the multiple sourcing strategy is lower because the relationship is only for a short time and not a long relation can be build on trust. Another argument for multiple sourcing is when the outsourcing firm prefers to work with local (family) businesses. These local businesses often are operating in a limited region and not nationwide. Therefore, when flora providers source from different regions the flora providers will have to work with multiple LSPs.

From the participating firms outsource multiple flora providers their transport between the auction locations to one single LSP. The reasons of this strategy were that outsourcing to one company has the advantage of convenience and building a relationship. The trust towards the performance of the LSP is higher due to the familiarity of their processes compared to multiple sourcing.

As mentioned before, local sourcing strategy is chosen next to the choice of single or multiple sourcing. However, from the empirical research followed that flora providers do not often use local sourcing. The growers only use local outsourcing for their distribution to auction location. This is due to the fact that the local 3PLs are operating around one auction location.

SRQ3. What are the key services a 3PL can provide?

The literature review discussed the key services of 3PLs in section 3.6. From the literature could be concluded that 3PLs are active in providing different kind of services to firms. The services were categorized in transportation, warehousing, inventory management, other value added services, financial services and information systems. The activities that are applicable to the flower sector are for transportation activities the following: forwarding, (de)consolidation, and contract delivery. The warehousing service relates to the location of 3PLs at the auction(s) and/or trade parc(s) were the 3PLs store, receive, assemble the flowers and return the containers and trolleys to the auction. Inventory management activities related to forecasting, location analysis, layout design, tracking and tracing. The value added service included the quality control, merchandising, assembling and handling of flowers. The financial services related the administrations of financial transactions and information systems the design of schedule and routing.

Although, the literature stated that 3PLs can provide all kind of services, the 3PLs (LSPs) in the flower chain provide not all of these services. The 3PLs in flower chain provide the transportation service like transport between auction, transport between grower and flora provider and cross docking. The value added services of breaking bulk and control check on quality at incoming and at the flora provider. The activities of packaging and order preparation are performed mainly for foreign flora providers just as inventory management.

From the literature review was concluded that when more services are outsourced to a 3PL, this 3PL could customise to their customers and in the end even integrate in the company. In the detail scenario was assumed that flora providers would outsource to 3PLs in order to source their flowers from the growers. The outsourcing could lead to higher degree of customization by 3PL(s). However, the 3PLs in the flower chain will not integrated in the businesses of the flora providers since the 3PLs work not by contract and offer their services after the demand of the flora providers (or growers).

SRQ 4. *What are the effects of different sourcing strategies on services that can be provided from a 3PL perspective in the detail evolution scenario?*

3PLs can provide multiple services as explained in the answer of the previous sub research question. The different sourcing strategies flora providers can choose from are the single sourcing and multiple sourcing strategy in combination of cooperation with local 3PL(s). From this research can be concluded that the services 3PLs provide are according to the participating LSPs based on the demand of the flora providers. However, the services that are demanded by the flora providers in the flower chain are mainly based on the basic logistics services as transportation and collection of flowers, independent if logistics is single sourced or multiple sourced. Services as warehousing or value added activities are not outsourced by Dutch flora providers. Although single sourcing often requires a relationship with the 3PL, the services provided by a 3PL will not be that different compared to the multiple sourcing strategy.

A single sourcing strategy can result in more customised logistics services to a flora provider than when multiple sourcing strategy is chosen. This is due to the long relationship that the flora provider will work with the 3PL. The 3PLs, to which is single sourced in the detail scenario, can design a specific logistics sourcing network for the flora provider. The information of which growers and orders need to be picked up will be shared in an information system in order to provide the customised logistics. With multiple sourcing is the information sharing less since the information of orders are not shared random to every 3PL due to confidential information. With single sourcing is it possible, as one flora provider suggested, that the 3PL will know the information of collection points and volumes that need to be transported upfront instead of sharing the information afterwards. When information is shared after the direct trade is made and flowers are ready for transport the design of a routing schedule for the 3PL will cost too much time to deliver within a time span of six hours as currently is done with clock trade. As the expert of the auction mentioned, the time that is needed to collect and deliver the flowers to the flora providers will cost too much time if information is shared at the end of the trading process. When the design of a routing schedule is integrated in the business of the flora provider it would take less time, single sourcing makes this possible.

The flora provider who choose for the single sourcing strategy in the detail scenario did this because the company preferred to cooperate with a single 3PL. The 3PL would be not only the supplier of their incoming logistics from the grower but the 3PL would be part of the flora providers organisation. Together with the 3PL the flora provider would design a logistics system in order to source their flowers from the different growers efficient and according to their requirements.

If a flora provider would choose to use local sourcing, it will limit the services the flora provider can outsource since most local 3PLs only provide transportation services and no other services. Therefore the local 3PLs are not existing in the flower chain, however local transport companies do exist.

SRQ 5. *What will the effect of different sourcing strategies be on services that can be provided from a flora provider perspective in the detail evolution scenario?*

Currently, most flora providers source the flowers that are purchased by direct trade at their dock, where the flowers are delivered by the growers or the flowers are sourced by the auction which distribute it to the flora providers on the 'electronic automatic system' (EHB system). In both cases the flora provider does not need to organise the sourcing of the flowers, it is taken care of by other

actors in the chain. However, the flora providers do pay for the transport of the flowers by growers and the auction which is included in the direct trade price of the flowers. The main services a flora provider performs when the logistics between the growers and the flora provider is arranged by the growers are breaking bulk, adding value to the flowers by bouquets making and packaging of the flowers and distribution to the detail outlets.

When flora providers take care of the logistics between grower and flora provider, the sourcing of the flowers from the growers. The flora provider can outsource or in-house the logistics services. With outsourcing the flora providers can choose between (local) single and (local) multiple sourcing logistics from 3PLs. The services flora providers then provide are almost the same as discussed in the case wherein the flora providers do not source the flowers themselves. The previous named services plus the logistics services of arranging transport for the collection are performed by the flora provider whether the providers use single or multiple sourcing. The services that the flora providers provide to their customers, like bouquets making, packaging, distribution, is not affected by the sourcing strategy.

To finalise this section the answer on the main research question is provided.

What are possible sourcing strategies for flora providers in the detail scenario of the Dutch flower chain?

At the start of the research the strategy for single and multiple sourcing in combination of a local sourcing strategy was suggested as possible strategies for flora providers in the detail scenario. From the research can be concluded that although all strategies are according to literature possible in the future flower chain, the participating companies in general had another view on the future detail scenario. From the thirteen interviewed companies three growers, five flora providers, two 3PLs and the expert from the auction explained to disagree with the scenario in which flora providers would organise the sourcing themselves. The main reason for the disagreement was that the current logistics system, wherein the growers are responsible for the transport to the flora providers with or without the help of the auction logistics network, is working well. Although the companies are aware of the increase in direct trade in the flower chain and the decrease in volumes ordered by the detail outlets, the logistics in the flower chain would not become a problem according to these companies. Almost all participated flora providers and growers believe that the collection of flowers by growers should be part of their service and that it would not benefit them when flora providers would source the flowers themselves. The expert explained that in the future detail scenario the collection and transport of flowers, from growers to flora providers, will take more time to organise than the current time line of direct trade. Furthermore, the information exchange between the parties is currently not efficient enough to organise the sourcing in the same time span as clock trade. Due to a lack of shared ICT system between the growers, 3PLs and flora providers for the logistics and the lack of a (central) hub to cross dock the flowers in the detail scenario.

Ten interviewed companies and the expert explained that the growers should organise the direct trade transport with the help of 3PLs in the future detail scenario. Their view on the logistics was that growers should organise the direct trade transport and outsource to LSPs. A distinction was made between logistics directly delivered at the dock of the flora provider or delivered at the (auction) hub. The advantage of delivering the flowers at a hub is that the truck of 3PL has to dock only once which saves time. The different orders will be distributed to the different flora providers by electronic cars or small vans of the 3PL.

Concluding, the research showed that most interviewed companies (n=10/13) prefer that the growers should arrange the logistics to the flora provider. Therefore, the flora providers will have the sourcing strategy of outsourcing the logistics to the growers in the future detail scenario. The majority of the interviewees chose this sourcing strategy since the companies do not want to invest in a new logistics network while the current network is operating well without logistics problems for them. Even though, the growers and flora providers are aware of the increase in direct trade.

The sourcing strategy of outsourcing to growers can refer to the following two cases:

- Growers organise the direct transport and outsource to LSPs who transport the flowers direct to the dock of flora provider.
- Growers organise the direct transport and outsource to LSPs who transport the flowers to the auction which functions as a hub for LSPs. From there the flowers are cross docked and further distributed to the flora providers.

In order to answer the main research question, three sourcing strategies are applicable for flora providers in the future detail scenario according to this research. These sourcing strategies are:

- Flora providers outsource the logistics services to growers
- Flora providers source their logistics from one single LSP
- Flora providers source their logistics in-house by their own small vans.

As the expert explained the flora providers will all use different sourcing strategies in the future detail scenario based on their different business strategies. Therefore, it is possible that growers will organise the transport for a part of direct traded volumes in the Netherlands and flora providers will collect another part. Some companies value customer service more than others and therefore will use the sourcing strategy, in which the flora providers perform the sourcing themselves with use of small vans, in order to be flexible in their planning and routes. Other flora providers will prefer cost leadership and will outsource the collection of flowers from growers. However, both flora providers value being responsible for the logistics between grower and flora provider (emotional value). The different sourcing strategies for the detail scenario are based on the product and volume of transport, the business strategy of the flora provider, logistics performance of 3PLs service and emotional value of the sourcing strategy.

Local sourcing is not used in one of the two sourcing strategies by flora providers. However, growers will be using the strategy when sourcing logistics from transport companies.

Furthermore, a discussion point has to be mentioned on these results since the participating companies who were currently less active in trading direct (<50%) preferred the strategies in which growers organise the logistics between grower and flora provider in the future detail scenario. The flora providers who trade currently more than 50% direct have another view on the detail scenario and agreed with the scenarios in which flora providers will source the flowers from growers with or without outsourcing to a 3PL.

6.2 Discussion

Finally, in this section, the relevance and limitations of the research are discussed. Concerns about validity and reliability can be found in section 4.5.

6.2.1 Relevance of research

From the information of the DaVinc³i project and VGB followed that the direct trade percentages between growers and flora providers are increasing in the flower sector. This was confirmed by all interviewed growers and flora providers who had a direct trade increase over the past five years. Therefore, the relevance of the research is confirmed. However, the problem that was given in the detail scenario about the outsourcing strategy to 3PLs and the sourcing strategy was less relevant. Most participating companies had the view that the current network of logistics would remain in the detail scenario, when more direct trade is purchased and frequent transport between grower and flora provider would occur due to smaller batch sizes.

6.2.2 Limitations

Although most discussion points are already mentioned in this chapter and in section 4.5 some limitations still have to be noticed. In the empirical research a small sample of growers, flora providers and LSPs was used due to time limitation since interviewing is a time consuming research method. However, interviewing is the best method to gather information about the background and business strategies of the companies in the flower chain.

Furthermore, the second limitation is about the awareness of the detail scenario. Although the participants received the questions upfront by e-mail with an introduction to the topic, the interviewees found it difficult to relate to the future detail scenario of the flower chain, which made it difficult for them to get a good understanding of the future logistics problem(s). It would have been more beneficial if all interviewees had been introduced to the detail scenario and shift in organisation of logistics between grower and flora providers before the interview. The interviewees who were familiar with the DaVinc³i project and/or research of Hubways (n=9/13) in the flower chain had a better understanding of the future scenario.

The cooperation of 3PLs with a flora provider was not in detail discussed in this research since the flora providers did not work on a contractual base with 3PLs. The cooperation of LSPs in flora providers is not that easy in the flower sector due to the attitude of the competitive companies in the chain. Flora providers and growers are in general reluctant to share confidential information with 3PLs.

Finally, concerning the future detail scenario that was assumed for the flower chain, it may be discussed if the problem of which sourcing strategy should be used is the dominant problem in this detail scenario. From the case studies can be argued that the topic of who will organise the transport and how the auction will play a logistics role in it is more critical to the actors in the flower chain.

6.3 Recommendations and further research

Based on the results of this research, some general recommendations can be given to the VGB and the DaVinc³i project. The recommendations stated in this section relate to a qualitative research, a virtual information platform for growers, flora providers and 3PLs, time constraints for ordering at the grower and hubs in the detail scenario.

As this research project had an explorative character in which sourcing strategies for flora providers were developed for the future detail scenario, the most central recommendation for further research is to test the insights in sourcing strategies, on a larger scale. The first recommendation is based on the outcome of the research which is different than was assumed upfront, ten of the thirteen

interviewed companies preferred that flora providers would not have to source the flowers themselves. Therefore, the first recommendation is to perform a qualitative research study conducted by a large scale survey among flora providers in the Netherlands. Due to the small sample in this research no conclusions could be drawn on the relation between the direct trade percentage of the flora providers and the kind of future sourcing strategy that the companies prefer. However, when more companies will be questioned by a survey an answer could be provided.

The advise VGB can offer to their members, the exporting flora providers, is that in the future detail scenario the role of transportation could only be performed by them if the flora providers will cooperate with growers and 3PLs to make one virtual information system for the design of a logistics network. The system is needed to organise the collection and transport within the same day as the trade is made. The actors will have to share information on volumes of the direct trades, harvest- and delivery times and amount of trucks. Since cooperation with a 3PL is needed in the detail scenario, multiple sourcing will not be an option for the sourcing strategy in which flora providers will organise the transport. Without a virtual information system between the growers, flora providers and 3PLs it will not be possible to collect the flowers within the same time span as currently is done.

Furthermore, the third recommendation is about the time period of ordering a direct trade in the detail scenario. As previously mentioned the time between ordering a direct trade and receipt of the order is short. When ordering flowers in the morning, flora providers have only a few hours to collect and transport them before the flowers need to be received in order to handle and distribute the same flowers to their customers. With clock trade, the collection of flowers is started in the night before the clock trade and stocked at the auction. Therefore, the time between the order at the grower and time of receiving the order at the flora provider is longer than with direct trade. In order to source the flowers from the growers flora providers will have to order earlier than currently is done. When the order is made before the flowers are harvested, information about e.g. the volume, destination and delivery times could already be shared among the actors in the chain in order to organise the collection and transport to the flora provider. In this case the flowers are ordered on the forecast of the growers. After the harvest flowers can be sourced directly by the flora provider or 3PL since the organisation of the sourcing was performed upfront. Therefore, new time constraints for ordering direct trade should be used in the detail scenario in order to optimise the logistics sourcing process of the direct trade.

Finally, the last recommendation is to add hubs in the design of the detail scenario. Due to the short period for the collection and transport of the flowers in the detail scenario hubs will come handy. Since the auction is no longer part of the physical supply chain other places will have to be designed to cross dock the different orders from growers and flora providers.

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