



Netherlands Enterprise Agency

Green Opportunities with an Orange Touch in Colombia

*Business leads in the horticultural sector
Ideavelop & Verbos Business Development*

*>> Sustainable. Agricultural. Innovative.
International.*



Green Opportunities with an Orange Touch in Colombia

Business leads in the horticultural sector

Commissioned by: Netherlands Enterprise Agency,

Transition Facility Colombia

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Preface

In April 2014, Netherlands Enterprise Agency requested Idevelop and Verbos Business Development to carry out a market survey on the opportunities for the Dutch horticultural sector in Colombia as part of the so-called 'Transition Facility'. The Transition Facility is a program focused on improving cooperation between selected sectors in the Netherlands and three upcoming markets (Colombia, South Africa and Vietnam). Horticulture is one of these priority sectors.

It often turns out that the bad image of Colombia withholds Dutch companies to investigate the opportunities in Colombia. The Dutch companies often do not know what opportunities there are or Colombia is not even selected as a potential interesting (export) market. This hurdle can be overcome by mapping market opportunities in the Horticultural Sector in Colombia.

The beneficiaries of this market entry study are representatives of Dutch industry and trade, for example importers, exporters, manufacturers, consultants and investors. The study is written for people who see, or want to identify, opportunities for doing business in Colombia. For them, the market entry study is an introduction to a subsector in Colombia and a guidance tool that will inform them on business leads, market and business constraints and possible partners. Furthermore the report provides a Dutch entrepreneur or organisation with reliable starting-points to enlighten the practical execution of his plans to enter the foreign market.

The study is divided in 5 Chapters: An introduction to Colombia, the horticultural sector in Colombia, the horticultural sector in the Netherlands, strategies based on the first three sectors and in Chapter 5 possible business leads based on the strategies.

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Executive summary

General information about Colombia can be found in **Chapter 1**. The country has made great progress over the last decade. GDP per capita has doubled. The security situation has improved significantly. FDI has increased rapidly (almost 17 billion USD in 2013) putting Colombia in the top 20 FDI receiving countries worldwide. Colombia is the only South-American country with ports on both the Atlantic and Pacific oceans. It has by far the highest score on the Investment Protection Index of all countries in the region. All in all Colombia has become the third most business-friendly and leading reforming country in Latin America.

Chapter 2 describes the current situation of the horticultural sector (ornamentals and vegetables) in the country and concentrates on greenhouse production. The production of cut flowers started some 45 years ago and is mainly export oriented. The sector is reasonably well organized, structured and documented, mainly because of the establishment of Asocolflores, the sector's branch organization which was a private initiative.

Vegetable production is upcoming, but often of low quality and low volumes and destined for the local market. Institutional organisation in this sector is weak from a private point of view, since most producers are small (<2 ha) and cooperation between companies has proven to be difficult. The fruit and vegetable sector however has closer ties to public institutions and food production and safety is high on the agenda of the Ministry of Agriculture. Branch organization Asohofrucol has developed an ambitious 10 year plan to develop the sector further with the final goal of exporting fresh produce.

The table below shows the current status of Colombia (first 10 aspects) and its horticultural sector (last 7 aspects). The table is a first indicator for companies who are interested in initiating imports, export activities or investments in Colombia.

General aspects		Veg.	Orn.	Horticultural aspects		Veg.	Orn.
1.	Political aspects	3	4	11.	Climate & natural resources	4	4
2.	Social aspects	3	4	12.	Horticultural sector organization	2	4
3.	Safety	4	4	13.	Phytosanitary service	2	3
4.	Economic aspects	4	4	14.	Horticultural supplies	3	4
5.	Fiscal aspects	2	3	15.	Labour (unskilled)	3	2
6.	Investment capital	3	3	16.	Labour (management)	3	4
7.	Infrastructure (local)	1	3	17.	Subsidies	2	2
8.	Infrastructure (export)	1	3				
9.	Communication	3	4				
10.	Trade agreements	4	4				

Description:

1 = Bad	2 = Weak	3 = Average	4 = Good	5 = Excellent
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Chapter 3 explains the current status of the Dutch horticultural sector. Its strengths, but also its current challenges are mentioned. The Netherlands is recognized as a leading player in global horticulture and Dutch horticultural companies are well known for their products, knowledge and experience. Many Dutch companies, organisations and knowledge institutes work abroad and are active in developed and developing markets. 'Go local' is becoming the trend for these international companies. Different markets are asking for different and adjustable technologies that increase profits for farmers and improve their social, ecological and financial situation.

A couple of important strengths that are mentioned are lessons learned from cooperation within the supply chain with a number of stakeholders (including government). Exchanging knowledge between farmers and knowledge institutes. Continues innovation regarding seed, equipment, knowledge, production methods, logistics, and trade, sustainability issues (a.o. food security, lowering carbon- & water footprint, social concerns, measuring & communicating sustainability).

As a result of the first 3 chapters a number of strategies are described in **chapter 4**. These are developed to increase the competitiveness of the Colombian horticultural sector and how Dutch organisations can contribute to achieve that.

Colombian floricultural companies can increase productivity by applying knowledge and/or technology. Efficiency can be improved in different levels of the supply chain. On a production level high labour costs makes investments in mechanisation more feasible. Integrated Pest Management makes a more sustainable production possible, and internationally sustainable growing practices will become a farmer's 'license to produce'. On a post-harvest level, mechanisation should definitely be considered. Suppliers (distributors, agents) could be more pro-active in adding value to their products.

Dutch companies could provide training courses and cooperate more closely in exchanging knowledge and experience to further develop the market.

Concentrating on local market demand, increasingly interesting because of the growing middle class, could be another strategy to develop cut flower sales and introduce new products like high value flowering pot plants (orchids, anthurium).

In the field of logistics, there is a tendency to increase and further develop sea freight since the relative success of transporting Chrysanthemum. Geographically, Colombia is well positioned towards major markets in Asia and Europe with harbours on both the Pacific and the Atlantic coast. On the other hand, sea freight might turn out to be a threat as the very competitive air freight rates from Colombia to North America contribute to the strong position that market (80% of all Colombian flowers is exported to North America).

In **vegetables** some strategies are similar to the floriculture. However food security and healthy food is becoming more important. Therefore increasing yields need to go hand in hand with safe - and healthy production which directly benefits the consumer. From a broader perspective attention should be paid for climate friendly farming methods using less water, decrease carbon emissions and improve biodiversity on the farm.

For the upcoming years, the focus should lie on production and sales in the growing domestic market. More market orientation and thus market intelligence will be required to produce what the market is currently asking for. At the moment, domestic consumption of vegetables is relatively low and offers ample room for growth. Awareness of the health benefits of food is increasing and can be supported by a multi stakeholder approach aiming at locally produced food.

To reduce post-harvest losses a closed cool chain is a precondition for successful growth of the sector. The government has started to carry out ambitious projects to improve the national infrastructure, so it will become worthwhile for companies active in the vegetable supply chain to also invest in refrigerated solutions from seed to shelf.

The strategies described above, focus on company level improvements. The public sector should have a wider focus on protected horticulture and cooperation between universities, research centres and the private sector should be improved. The government should create an enabling environment for those active in the flower and vegetable sector and make sure that greenhouse production gets the attention that it requires. This can be done by defining the right policies to facilitate producers to produce more sustainably and guarantee access to financial instruments that stimulate improvements in greenhouse production. Such strategies can be supported by financial instruments, knowledge and experience from the Netherlands.

Chapter 5 presents practical business leads which could contribute to the strategies mentioned above. It is clear that more cooperation is feasible between Colombia and the Netherlands. A concrete example would be the establishment of a training centre for the floricultural sector where growers can be trained in a practical, real life environment and get to know Dutch technology.

Heating and mechanization of sorting, bunching and sleeving is becoming more feasible in Colombia as well as hydroponic production (both in flowers and vegetables). Dutch exporters are clearly advised to join forces. The market in Colombia requires time and investment to mature so no fast returns can be expected. Nevertheless investing now to build trust, relations and a local network can be done together.

In vegetables adding value to the product can be done by improving packaging and labelling for the growing retail market. Also the vegetable processing industry is growing and ready-to-eat food solutions are in demand.

Cooperatives with small vegetable growers are a relatively young phenomenon. Growers can work together via the cooperative and share the benefits. NGO's are also interested to support with the establishment of such structures while even some financial institution are willing to finance those cooperatives to lift the small farmers out of poverty. Various Dutch suppliers in horticulture already work with similar structures.

The Dutch and Colombian government are already collaborating in other sector programs in for example water and biomass. Combining forces and link those to the horticultural sector will increase the efficiency and effectiveness of this collaboration. Promote 'climate smart agriculture' and focus on creating synergy between existing programs.

Dutch universities can help to develop specialized horticultural curricula for various universities in Colombia. An important focus should be how to bring up to date knowledge to the private sector. In other countries, Dutch universities in cooperation with horticultural companies offer executive management training courses, during which local managers are trained in the Netherlands. Such leads can easily be incorporated when establishing a training centre. Various financial support programs might be available via the Dutch and/or Colombian government.

The government should create an enabling environment for the private sector to be able to operate smoothly. Existing cooperation can be extended and improved. An example is the cooperation between ICA and NVWA. Improvement can be reached concerning import procedures of seed. Another area would be regulation around trial seed. The Dutch government has great knowledge and experience to offer the Colombian government. The same applies for allowing and even stimulating biological crop protection.

The overall conclusion is that the Colombian market is becoming more interesting for a wider range of Dutch companies. Not because the market is growing rapidly on a production level, on the contrary. Colombia faces a great number of challenges to redefine its horticultural sector and Dutch companies can play a leading role in guiding that process.

One has to keep in mind that investments done in Colombia are traditionally based on a return of investment of 2 or 3 years. This implies that well adapted products and solutions are required to improve productivity and to increase the efficiency of local farms. To be successful in Colombia requires a long term approach and local presence. On the other hand, local producers will have to embrace foreign (Dutch) suppliers of knowledge and technology to remain competitive in the international market. We will both have to get to know each other.

Dutch companies are recommended to start visiting Colombia to understand how this market works. Joining a trade mission could be a logical first step.

Introduction

Demographics show growth in Colombia in many aspects. Politically, Economically and socially the country has also made great progress over the last decade. Colombia is currently the second largest flower producer and exporter in the world, only preceded by the Netherlands. Greenhouse vegetable production however is in its initial stages and focused on the domestic market. Both sectors are in different stages of maturity but are both in development. Especially in vegetables it is expected that the coming 5 years production will increase considerably offering opportunities for Dutch suppliers.

This market survey is not meant to be an academic piece of work but a practical approach concentrating on these opportunities in greenhouse production, especially cut flowers and greenhouse vegetables.

The report starts with a general introduction to Colombia, Chapter 2 describes the current situation regarding cut flowers and greenhouse vegetables. It also gives more information on government policies and CSR. The next chapter focuses on the horticultural sector in the Netherlands and concentrates on the strengths and advantages Dutch horticultural companies when entering the Colombian market.

The analysis in Chapter 4 is the basis for various strategies and is followed by practical business leads in the concluding Chapter 5.

These strategies and business leads are the final result of the previous chapters combined with trends in the international horticultural world. These chapters are meant to be discussed and criticized and cannot be regarded as blue prints for future projects. The authors of this report hope to achieve that these strategies and leads can work as a trigger for companies, institutes and government representatives to develop new ideas and activities in a country that, after a long difficult period, certainly deserves more international attention from especially the Dutch horticultural sector.

If you are interested in doing business in Colombia and already know about the country as such, we suggest you to start reading Chapter 2 to get a general idea of the status and situation of protected horticulture in Colombia. When you want to know more about specific opportunities for your product or service, we suggest you to start reading Chapters 4 and 5 where you will find an overview of the opportunities and future scenarios

1. Country description

1.1 Introduction

Colombia has made great progress over the last decade. GDP per capita has doubled. The security situation and perception have improved significantly, going hand in hand with skyrocketing FDI to almost 17 billion USD in 2013, placing Colombia among the top 20 FDI countries. 55% of its 46 million inhabitants is younger than 30 years old. Unemployment has been decreasing steadily over to 8.5% in 2013. The middle class consists of 25% of the population and is growing. Inflation rate is stable. It is the only South-American country with ports on both the Atlantic and Pacific oceans. It has by far the highest score on the Investment Protection Index of all countries in the region. All in all Colombia has become the third most business-friendly and leading reforming country in Latin America.



Figure 1. Country map Colombia

1.2 General facts about the country

1.2.1 Colombia

Official name: Republic of Colombia (República de Colombia). 'Colombia' is derived from the last name of Christopher Columbus, the discoverer of the new world.

Capital: Bogotá, Capital District (D.C.)

Time: GMT -5: no daylight saving time: 6 hours earlier during Dutch winter time, 7 hours earlier during Dutch summer time.

1.2.2 Geography

Location: Colombia is located in the upper north west of South America. It has two coastlines, one along the Caribbean Sea between Panama and Venezuela (1760km), and along the Pacific Ocean between Panama and Ecuador (1448km).

Borders: Colombia has borders with five countries: Panama (225km), Venezuela (2050km), Brazil (1644km), Peru (1800km) and Ecuador (590km).

Area: 1,138,910 km²

Altitude: The highest peak is Pico Cristobal Colon with an elevation of 5,775 m. The capital Bogotá has an altitude of 2,625 m. The variety of altitudes influences the country's geography, ecology and climate.

1.2.3 History

Discovery – 19th Century: The Spanish 'conquistadores' first arrived in 1499 in the Guajira Peninsula. Santa Martha was founded in 1525 followed by Cartagena in 1533, today the biggest port of Colombia on the Caribbean coast. The Spanish then moved inland, christening all they conquered and founded the capital of Santa Fe, later known as Santa Fe de Bogota, in 1538. In the meantime the number of indigenous people decreased significantly due to the conquest and foreign diseases brought in by the Spanish. The Spanish crown began to sell land to governors, conquerors and their descendants which created large farms and mines, after which African slaves were brought in. In 1717 the Viceroyalty of New Granada was created, with Bogota as the capital of what is now known as Panama, Colombia, Venezuela and Ecuador. With that, Bogotá, although more backward, became one of the principal administrative centres of the Spanish possessions in the New World, along with Lima and Mexico City.

Simón Bolívar became the first President of Colombia. Colombia had the first constitutional government in South America, and the Liberal and Conservative parties, founded in 1848 and 1849 respectively, are the oldest political parties in the Americas. Slavery was abolished in Colombia in 1851. Panama eventually separated from Colombia under pressure of the United States in 1903.

20th Century: In the beginning of the 20th century, Colombia achieved some degree of political stability, which was interrupted by a bloody conflict that took place between the late 1940's and the early 1950's, a period known as La Violencia ("The Violence"). Its

cause was mainly mounting tensions between the two leading political parties, which subsequently ignited after the assassination of the Liberal presidential candidate Jorge Eliécer Gaitán on 9 April 1948. The ensuing riots in Bogotá, known as El Bogotazo, spread throughout the country and claimed the lives of at least 180,000 Colombians. Since the 1960's, the country has suffered from an asymmetric low-intensity armed conflict between the government forces, left-wing guerrilla groups and right-wing paramilitaries. The conflict escalated in the 1990's. The conflict in Colombia takes place mainly in remote rural areas or marginalized sectors with very difficult access.

The United States has been heavily involved in the conflict since its beginnings, when in the early 1960's the U.S. government encouraged the Colombian military to attack leftist militias in rural Colombia. This was part of the U.S. fight against communism.

21st Century: During the presidency of Álvaro Uribe, the government applied more military pressure on the FARC and other outlawed groups. After this offensive, many security indicators improved. Since 2002 the violence decreased significantly, with some paramilitary groups demobilizing as part of a controversial peace process and the guerrillas lost control of much of the territory they had once dominated. Colombia also achieved a great decrease in cocaine production.

In February 2008, millions of Colombians demonstrated against the FARC. 26,648 FARC and ELN fighters have decided to demobilize since 2002. During these years the military forces of the Republic of Colombia managed to be strengthened.

The peace process in Colombia refers to the dialogue between the Colombian government and guerrilla of FARC-EP with the aim to find a political solution to the armed conflict. The Colombian government and rebel groups meet in Cuba. As of November 2013, the talks have represented breakthroughs, but until this day no final solution or outcome has been reached. The parties are now concentrating on 4-5 major themes to be negotiated.

1.2.4 Political aspects

Form of state: presidential representative democratic republic

Constitution: President of Colombia is both head of state and head of government in a multi-party system

Executive power:

Head of state: President Juan Manuel Santos Calderon (since 7 August 2010);

Cabinet: cabinet appointed by the president

Elections: president and vice-president elected by popular vote for a four-year term (eligible for a second term); last election held on May 2014 with a runoff on June 15, 2014 in which Santos was re-elected)

Main political parties:

Largest parties: Partido Social de Unidad Nacional, Partido Conservador Colombiano, Partido Liberal Colombiano.

Other parties: Partido de Integración Nacional, Cambio Radical, Polo Democrático Alternativo, Partido Verde Colombiano, Movimiento Independiente de Renovación Absoluta

Political stability: Political stability has steadily been improving

ever since 2003, as shown by the Political Stability index value (-2.5 weak; 2.5 strong) for Colombia: during 1996-2012 the average value was -1.77 points. There was a minimum of -2.38 points in 2003 and a maximum of -1.25 points in 2011.

Legislative power: Legislative power is vested in both the government and the two chambers of congress, the Senate and the House of Representatives of Colombia.

Legislative branch: Bicameral Congress (or Congreso) consists of the Senate (or Senado) (102 seats; members elected by popular vote to serve four-year terms) and the Chamber of Representatives or Camara de Representantes (166 seats; members elected by popular vote to serve four-year terms)

Effectiveness: World Wide Governance Indicator score: 0.01 (rank 57) (2012)

Corruption: Corruption Perceptions Index Score: 36 (rank 94 from clean to corrupt)

Political Parties perception of corruption score: 4.3 (5 being extremely corrupt)

According to the World Economic Forum's Global Competitiveness Index (2011-2012), corruption is the biggest problem for doing business in Colombia. The Colombian Attorney General estimates that corrupt activity drains US \$2.1 billion per year from the country's economy. In 2012, Transparency International (TI) ranked Colombia 94 out of 176 countries on its Corruption Perceptions Index, a step back from 2011 when it ranked 80 out of 183.

Since taking office, President Santos has demonstrated his commitment to prosecute corrupt officials and tackling fraud and bribery in the use and contracting of public funds. On July 17, 2011 President Santos signed the Anti-Corruption Statute, a comprehensive policy that gives the GOC new tools to crackdown on corruption and stiffer penalties for those found guilty. The Statute seeks to create more transparency and accountability in the contracting of public works projects and prohibits campaign contributors from receiving government contracts during their candidate's term in office. President Santos signed on December 9, 2011 a decree to create a Transparency Secretariat within the Office of the President and he reiterated the GOC's commitment to ratifying the OECD Anti-Bribery Convention. Santos has also uncovered multiple high-profile scandals involving the public sector since taking office, and numerous officials have been dismissed, taken to court, or put in jail.

1.2.5 Social aspects

Population:

Number:	45,745,783 (July 2013 est.)
Density:	42.43/km ² (2011)
Growth:	1.1% (2013 est.)
Official language:	Spanish
Religion: 90%	Roman Catholic
0-14 years: 25.3%	(male 5,998,645/female 5,720,229)
15-24 years: 18%	(male 4,243,251/female 4,099,299)
25-54 years: 41.6%	(male 9,515,723/female 9,720,894)
55-64 years: 6.7%	(male 1,796,050/female 2,051,948)
65 years and over: 6.5%	(male 1,293,258/female 1,806,000) (2014 est.)

Development:

Human Development Index (HDI): 0.791 (rank 91, 2013)
 Multidimensional Poverty Index (MPI): 0.022 (rank 91, 2012)

Working Population:

Labour Force: 23.75 million (2013)
 Unemployment rate: 8.5% (2013)
 Composition: agriculture 17%, industry 21%, services 62%

Immigration / Emigration:

Flow of national and foreign
 travellers in and out of the country: 1.034.594 (2013)
 Nationals: 725.895
 Foreigners: 308.699

1.2.6 Safety

Colombia has long been plagued by internal conflicts and related violence. A breakthrough was made due to Plan Colombia in 2000, a collaboration between the US and Colombia to strengthen the Colombian government to establish peace, law and order. Whereas in 2000 the government was barely in control of one third of its territory, by 2008 it controlled 90%. Homicides were reduced by half, kidnappings by over 85%, and the use of highways was increased by 60% showing confidence of its people regarding safety. Although Colombia's security situation has thus improved tremendously considering where it was before 2000, indiscriminate attacks and kidnappings still occur. In 2013, several kidnapping incidents took place that included foreign tourists and energy contractors. In general, the more remote the area, the greater the potential safety threat. In the major horticultural regions of Bogota/Sabana/Cundinamarca as well as Medellin/Rio Negro no specific threats are to be taken into account. In general properties are gated and guarded by private security employees.

Assault reports rate (per 100,000 people): 63.4 (rank 53) (2011)

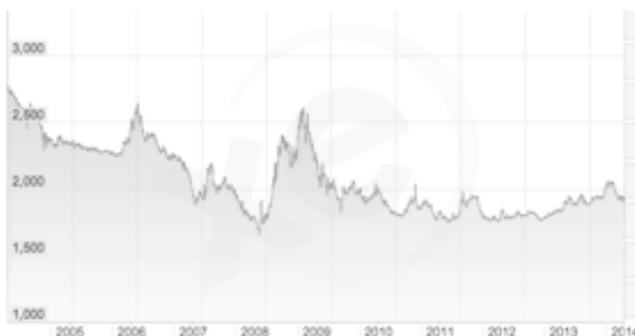
Intentional homicides rate (per 100,000 people): 33.2 (2011)

1.2.7 Economic aspects

Currency

COP = Peso, currency symbol is \$,
 exchange rate per August 2014: 1 USD is 1880 COP.

Figure 2. Currency development COL Peso to USD.



Source: www.XE.com

Developments

The Colombian peso was revaluated after the world economic crisis in 2009, causing a lot of problems for Colombian exporters. The Peso is still very strong against the USD. The revaluation of the Peso in 2009 in combination with the financial crisis in the US, is considered by virtually all horticultural exporters as the major setback of the past 5 years.

Ease of doing business indicator: 45 (world rank)

The period 2001-2007 showed a steady economic growth of 4.5%. After that economic growth slowed down and stopped in 2010 and 2011. In 2012 it grew with 4% again.

Foreign investment

FDI has been growing steadily over time and extraordinary over the last few years. It reached \$16.822 billion in 2013.

Top investing countries:

United States: \$11.1 billion United Kingdom: \$5.1 billion
 Panama: \$6.2 billion Anguilla: \$3.5 billion
 Spain: \$5.7 billion Virgin Islands: \$3 billion

Table 1. Direct trade between the Netherlands and Colombia

Year	From COL to NL	From NL to COL
2010	€ 785.558.000	€ 312.626.000
2011	€ 1.145.547.000	€ 325.047.000
2012	€ 1.370.418.000	€ 327.941.000
2013	€ 1.336.294.000	€ 461.371.000

Source: CBS Statline

Free Trade Agreements (FTA's)

Colombia has FTA's with the US and Europe, the latter being effective since August 1, 2013.

Other FTAs with: Mexico, El Salvador, Guatemala, Honduras, Chile, Canada, United States, Cuba, Nicaragua, Andean community, CARICOM (Caribbean community), MERCOSUR (Brazil, Argentina, Uruguay, Paraguay), EFTA (Switzerland, Iceland, Norway, Liechtenstein), Venezuela and Peru.

Currently, the Netherlands and Colombia are negotiating an agreement for the avoidance of double taxation and the prevention of tax evasion.

Free Trade Zones

According to Proexport there are more than 100 Free Trade Zones in Colombia (both permanent and special permanent), divided over the Caribbean, Andes and Pacific regions. Companies in these zones are benefiting from the FTAs, are not subject to local market sale restrictions, pay an income tax of 15% and customs tax doesn't apply (VAT, Tariffs).

1.2.8 Fiscal aspects

Taxes are national or regional: national taxes apply to all the inhabitants of the national territory with the same tariff, whereas regional taxes have tariffs within a range determined by national law, which regions cannot surpass. Colombia offers certain advantages to foreign investors on taxes and incentives.

1.2.9.2 Subsidies and financial support

Funding can be obtained from various sources. Please find an overview of private investment initiatives below. In chapter 2 an extensive list of support programs applicable to horticulture available in Colombia as well as the Netherlands can be found.

Table 2. Tax composition

Taxes	Definition	Tariff
Income and capital gains tax	Income tax is a national tax levied on profits and gains derived from day-to-day operations (ordinary income). The capital gains tax applies over the extraordinary income.	Income tax: 25% Capital gains: 10%
Income Tax for Equality (CREE)	CREE is a National tax designed as a contribution of companies to the benefit of employees, employment generation and social investments. The CREE applies over profits and gains obtained by companies which are likely to enrich them. This tax replaced certain wage-based social contributions.	9% for 2013-2015, 8% as from 2016
Sales tax (VAT)	VAT is an indirect national tax on supplied services and on sales and imports of physical goods.	Three tariffs: 0%, 5% or 16%.
Consumption tax	Indirect tax levied on telecommunications, food vehicles, and beverages.	4%, 8% and 16%
Tax on financial transactions	The tax is accrued on every transaction aimed at withdrawing resources from checking, deposit or savings accounts, and cashier checks.	0.4% of the value of the operation.
Industry and Commerce Tax	The industry and commerce tax is a local tax that is imposed on revenue generated from industrial, commercial or service activities carried out in the corresponding municipality	Between 0,2% and 1,4%.
Property tax	This tax is levied annually on the ownership, usufruct or possession of real estate property. It is collected by the municipality where the property is located.	Between 0,3% and 3,3%.

Source: investincolombia.com.co

1.2.9 Financial aspects and subsidies

1.2.9.1 Top 12 most important financial institutions

There are three financial institutions that are relevant for this market study. Firstly, the Banco Agrario which is the main bank for the agricultural sector. Secondly, Finagro is a fund managed by intermediaries that provides loans for companies to increase their productivity in the agricultural sector. Maximum credit is \$ 62,524,000. Thirdly, Bancoldex is a fund managed by intermediaries to support exporting companies.

Please see a complete overview below:

- | | | |
|----|----------------------|--|
| 1 | Banco Agrario | www.bancoagrario.gov.co |
| 2 | Bancoldex | www.bancoldex.com |
| 3 | Finagro | www.finagro.com.co |
| 4 | Citibank Colombia | www.citibank.com.co |
| 5 | Banco de Occidente | www.bancodeoccidente.com.co |
| 6 | Bancolombia | www.grupobancolombia.com |
| 7 | Banco Popular | www.bancopopular.com.co |
| 8 | Banco de Bogota | www.bancodebogota.com |
| 9 | Banco GNB Sudamerica | www.bnamericas.com |
| 10 | Davivienda | www.davivienda.com |
| 11 | Helm Bank | www.grupohelm.com |
| 12 | HSBC Colombia | www.hsbc.com.co |

Funds:

Emprendedor-Grupo Bancolombia:
www.grupobancolombia.com/emprendedor

Fondo Inversor-MiPymes:
www.mipymes.gov.co

Fondo Capital de Riesgo Coomeva:
<http://redcoo.coomeva.com.co/>

Innpulsa Colombia:
www.innpulsacolombia.com/es/ofertas

More information about the so-called 'Angel' funding can also be found on the website of the Ministry of Commerce, Industry and Tourism: www.mipymes.gov.co. The next funds are explained in more detail: Ángeles de los Andes Inverángeles Red de Inversionistas Ángeles – Bavaria. Colciencias is the administrative department of Science, Technology and Innovation. They work on the improvement of various sectors and support companies with training programs and subsidies. More information can be found on www.colciencias.gov.co

1.2.10 Infrastructure and communication

Roads transport:

Roads are relatively good in Colombia, however due to the abundance of hills and mountains, road transport is expensive. Bogota, Medellin and Cali are between 7-8 hours drives away from each other. Cartagena, the port to the Atlantic, is 12 hours from Medellin and about 19-20 from Cali and Bogota.

Airports:

The main international airport is in Bogota. There are daily flights to Amsterdam via Panama or other stops. Domestic flights are abundant between cities covering 168 airports.

Harbours:

Colombia is the only South American country with harbours on both the Caribbean and Pacific coasts: Barranquilla, Buenaventura, Cartagena, Muelles El Bosque, Puerto Bolivar, Santa Marta, Turbo.

Telephone:

Mobile cellular subscriptions (per 100 people): 103 (2012)
Country code for international calls: 57
Service providers: Telecom, Claro, Movistar.

Internet:

Internet users: 22.538 million (2011).
Internet users (per 100 people): 49 (2012)
Service providers: Movistar and Claro.
Broadband cable providers: Telecom/Telefónica, Empresa de Telecomunicaciones de Bogotá, Empresas Públicas de Medellín, Coldecon, Telmex Colombia S.A.

Electricity:

Access to electricity: 97.4% (2010)
Electric power consumption (kWh per capita): 1,123
Average residential tariff (\$US): 0.0979 per kWh (2005)
Average industrial tariff (\$US): 0.0975 per kWh (2005)
Hydropower generation: 65%
Thermal generation: 35%
Electricity in Colombia runs at 110 volts. Electric outlets accept U.S.-type plugs.

Both internet and electricity are readily available at more remote (farm) locations, but come at a price.

1.2.1.1 Labour

Availability of labour

In 2013 the CIA fact book estimated the Colombia workforce to consist of 23,750,000 people. 17.9% is employed in agriculture, 20,0% in industry and 62,0% in services. Labour force participation rate was 70,2%. Unemployment was 11,8% in 2013. Youth unemployment was 23,0% in 2013. 9,307,000 people work in the informal sector. The efficiency of the labour market is 4.16 (/10), higher than Mexico and Argentina. This indicator includes cooperation in labour-

employer relations, flexibility of wage determination, hiring and firing practices, redundancy costs, pay and productivity, reliance on professional management, brain drain, and women in labour force (Global Competitiveness Report 2013-2014).

Minimum wages

In 2012, the minimum wage was 315,18 US\$ per month. Annual increases are negotiated between employer's guilds and trade unions under governmental supervision, and depend on inflation, productivity increases, workers and employers' needs and general characteristics of the economy among others (International Labour Office Geneva, 2013). In addition to the minimum wage, now-wage costs have to be paid by the employer, which are 51,97% (2012)

Table 3. Minimum wage and non-wage costs

NWC and WC	% of CMMW	COP	US\$ ¹¹
Minimum Wage	-	566 700	315,01
Transport Subsidy ¹²	-	67 800	37,68
Health Contribution	8.5%	48 170	26,77
Pension Contribution	12%	68 004	37,80
Risk Administration	0.522%	2 958	1,64
Worker Welfare Programs - Payroll taxes	4%	22 668	12,60
Early Childhood Programs - Payroll taxes	3%	17 001	9,45
Job Training - Payroll contributions	2%	11 334	6,30
Compulsory Savings ¹³ - Social benefits	8.33%	52 854 ¹⁴	29,37
Interest Payments	1.119%	6 342	3,52
Bonus	8.33%	52 854 ¹⁵	29,37
Vacations	4.17%	23 631	13,13
TOTAL NWC¹⁶	51.97%	305 816	169,99

Source: International Labour Office Geneva, 2013

Labour unions

Pursuant to Colombian Labour Law, any group of 25 or more workers, regardless of whether they are employees of the same company or not, may constitute a labour union. Employees of companies with fewer than 25 employees may affiliate themselves with other labour unions. About 51 percent of Colombia's labour force belongs to the informal sector (October 2012 data). About 4 percent of the country's labour force is unionized. The largest and most influential unions are composed mostly of public employees, particularly of the state-owned oil company and the state-run education sector. The Constitution protects the right to constitute labour unions, and union members have a special legal protection that prevents them from being fired for forming unions. Some union officials are allowed to dedicate some or all of their working hours to union business. Strikes, when held in accordance with the law, are recognized as legal instruments to obtain better working conditions. Strikes in sectors considered essential public services are illegal.

Foreign companies and employees

Foreign companies operating in Colombia must follow the same hiring rules as national companies, regardless of the origin of the employer and the place of execution of the contract. Colombian companies may hire foreign employees after certifying compliance with the legal national-foreign employee ratio, (pursuant to

Colombian Labour Law, in companies with more than 10 employees, Colombian nationals must occupy at least 80 percent of all managerial level positions and 90 percent of non-managerial positions), which will allow the employee to obtain a Temporary Work Visa. Foreign employees have the same rights as Colombian employees. Part-time formal sector employees with an indefinite term contract or a defined term contract receive prorated social benefits (e.g., pension, health, unemployment). Companies/individuals that provide services-provision contracts do not have to pay social benefits to part-time employees, except for domestic employees, which have a special regime given the vulnerability of their condition.

1.2.12 Education

Bilingualism

In 2004, the Ministry of Education launched the 'National Bilingual Program' with the aim to give all students in the country the opportunity to become bilingual in English and Spanish as part of the vision of increased productivity in a globalized world. According to a report of the Banco de la Republica in 2013 however, only 6% of university students had a decent level of English and teaching of the language has been inadequate across all schooling. English levels are a topic of heavy debate to the degree that decent English schooling should not be restricted to those students whose parents can afford expensive private schools or universities in the US or UK, but available to all students in the country.

Level of education

About 90% of the population enrolls in primary education, 76% in secondary education, and 43% in tertiary education. The Colombian education system is ranked 72 (of 122) in the world. Public spending on education is 4.5% of GDP. Adult literacy is 93.6%. 25.3% of the labour force has tertiary education.

Agricultural education

The foremost and most widely regarded institution for agricultural research and education is the Universidad Nacional de Colombia in Bogota (www.agronomia.unal.edu.co/web). Secondly, the Military University of New Granada offers an education program for Horticultural Technology that focuses on production of flowers, fruits, vegetables, aromatic and medicinal plants. (www.unimilitar.edu.co/web/guest/programas-academicos/facultad-ciencias-basicas/pregrados/tecnologia-horticultura).

Other universities worth mentioning are Universidad de los Andes Colombia, Pontificia Universidad Javeriana, Universidad de Antioquia, Universidad del Rosario, Universidad del Valle, Universidad de la Sabana, Universidad del Norte, Universidad Industrial de Santander and Universidad EAFIT.

To improve knowledge and competitiveness on the work floor the public institute SENA (Servicio Nacional de Aprendizaje) offers workers free courses to improve their abilities. The institute also offers opportunities for further study if workers/employees live up to certain conditions. More information can be found on: www.sena.edu.co.

1.3 Business climate in Colombia

The economic and political stability and prosperity of recent years combined with a booming domestic market have turned Colombia into an interesting destination for internationally operating companies. Regarding the country's business climate and mentality, politeness, proper behaviour, good manners and courtesy are valued. Generally, interaction between people is more formal and less direct than in the Netherlands.

Colombians want to know you personally before they do business with you. You must develop a relationship with your counterparts before they will consider you trustworthy. Always allow your Colombian counterparts to bring up the subject of business. Be aware that this may take a while. Meetings may be slow, with quiet, deliberate discussions also non-business issues like family, health and sport may enter the conversations. Rushing any decision making process however is seen as disrespectful. Third-party contacts are vital to business success. It is recommended to hire a local distributor, representative, salesperson and/or lawyer.

The armed conflict has severely influenced the process of doing international business with Colombia. Many smaller companies lack experience in dealing with foreign parties/investors. Colombian entrepreneurs can be described as proud, but stubborn as well, they want to maintain control over their business operations and do not trust foreign partners with making quick decisions without being involved themselves.

Price is important when taking investment decisions and this combined with a short-term view (no long-term planning), leads to the fact that the cheaper alternative is often more attractive. Politics and bureaucracy play quite a role in the business and decision making process. This is generally not different in other Latin American countries. The government bureaucratic way of working dates back to the Spanish colonial period and elaborate paperwork was seen as a way to minimize corruption (although often the opposite proved true). Within larger companies the decision making process can be elaborate and slow.

Colombian entrepreneurs active in the same sector usually don't share information easily, too often they are seen as competitors. This is also true between branch organization and ministries. Information is not often shared, a missed opportunity when it comes to best practices etc.

1.4 Trade promotion and assistance

When it is decided to become active in Colombia, there are various public institutions that cater to the needs of foreign entrepreneurs and can help them to get started in Colombia. A more elaborate explanation on the responsibilities and activities of the various organizations is listed below:

Proexport (www.proexport.com.co)

Proexport is associated to the Ministry of Trade, Industry and Tourism and is in charge of promoting exports, international tourism and foreign investment in Colombia. Proexport works from national as well as international branch offices (US, Europe, Asia and Latin America) and offers support and assistance to clients via

services and instruments facilitating their internationalization strategy so they can make the utmost of the business opportunities Colombia has to offer.

Chambers of Commerce

There are 57 Chambers of Commerce in Colombia grouped under the Colombia Confederation of Chambers of Commerce or 'Confecamaras'. Their purpose is to serve as advocates and enhance the overall interests of the business community of Colombia and to keep the commercial register, the non-profit organizations register, and the proposers form (RUP) vested upon the chambers by law.

In Bogota there's also 'Invest in Bogota', a separate investment promotion agency for Bogota, a public private partnership initiated by the Bogota Chamber of Commerce and the City Government. The office supports investors exploring opportunities in and around Bogota. More information can be found on: en.investinbogota.org

INVIMA: Instituto Nacional de Vigilancia de Medicamentos y Alimentos

The National Institute of Food and Drug Monitoring (INVIMA) is a governmental entity exercising functions of inspection, monitoring and control of food, drugs, medical devices and other products subject to sanitary surveillance. Its mission is to protect and promote the health of the population through risk management associated with these products. See also: www.invima.gov.co

DIAN: Dirección de Impuestos y Aduanas Nacionales de Colombia

The special national administrative tax and customs agency (DIAN) is mainly responsible for the administration of taxes and customs and facilitation of foreign trade operations in terms of fairness, transparency and legality. See also for more information: www.dian.gov.co.

DANE: Departamento Administrativo Nacional de Estadística

The National Administrative Department of Statistics (DANE) is the Colombian Administrative Department responsible for the planning, implementation, analysis and diffusion of the official statistics of Colombia. More information on: www.dane.gov.co.

Fedesarrollo: Fundación para la Educación Superior y el Desarrollo

The Foundation for Higher Education and Development (FEDESARROLLO) is a private non-profit organisation which purpose is to contribute to the design, monitoring and improvement of public policy. FEDESARROLLO encourages, directly or indirectly, the economic and social development through studies, publications and discussions in different areas of public policy. The studies are funded by the private sector, the public sector, multilateral agencies and local and international foundations.

See also: www.fedesarrollo.org.co.

Fenalco: Federación Nacional de Comerciantes.

FENALCO is that national federation of tradesmen. It aims to promote trade and solidarity, efficiency and modernization of its members. FENALCO Promotes the intellectual, economic and social development of all people linked to the Guild, and is a forum for discussion of the problems of the country. More details can be found on: www.fenalco.com.co.

Holland House Colombia

In 2013 the 'Holland House' opened its door, a public private cooperation between various Dutch ministries, the Dutch embassy in Bogota and the Colombian/Dutch business community, established with co-funding from the so-called Transition Facility program. Companies interested in doing business in Colombia can work with the Holland House in realizing their international market/sales strategy and become a member of this institute as well. Read more via: www.hollandhouse-colombia.com

Embassy of the Kingdom of the Netherlands in Colombia

Last but not least it is important to mention that the Economic Department of the Embassy of the Kingdom of the Netherlands offers its services to Dutch companies and can help to find business partners and market information. Via the embassy companies can participate in trade missions and fairs, but also seminars and network events. In the cities of Medellin and Cali, the Dutch government is represented by Honorary Consuls.

More information: <http://colombia.nlabassade.org/>

2. Horticultural production and trade in Colombia

2.1 Introduction

General

Various factors have influenced the position of Colombian exports of horticultural products. The exchange rate of the Peso against the dollar has definitely caused the greatest impact in recent years. In the domestic market, times are changing. Economic progress and a growing middle class give way to new opportunities for the production of high quality fresh food and vegetables, but also to luxury products as flowering pot plants.

This chapter describes the current situation of the sub sectors **ornamentals** (cut flowers and pot plants) as well as **vegetables**. Mutual interest and opportunities for cooperation between Dutch and Colombian companies lie in the field of **protected production** hence the **focus** of this study.

Dutch companies with an interest in open field production (for instance vegetables, fruit, tropical flowers and foliage) can be found in breeding / propagation (fruits and vegetables) and on wholesale level. Such companies usually operate internationally or even globally and are (assumed to be) well aware of the actual developments in the Colombian market.

Ornamentals

The production of cut flowers has started some 45 years ago and is mainly export oriented. The sector is reasonably well organized, structured and documented, mainly because of setting up Asocolores, the sector's branch organization which was a private initiative. Pot plant production is oriented at sales to the local market and is not very well organised. Neither on a production level nor on a distribution – sales level. The economic development of Colombia in the past 10 years, has spurred more professionalism in this (sub) sector.

Vegetables and fruit

Vegetable production is upcoming, but often of low quality and low volumes and destined for the local market. Institutional organisation in this sector is weak from a private point of view, since most producers are small (<2 ha) and cooperation between companies has proven to be difficult. The fruit and vegetable sector however has closer ties to public institutions and food production and safety is high on the agenda of the Ministry of Agriculture. Branch organization Asohofrucol has developed an ambitious 10 year plan to develop the sector further with the final goal of exporting fresh produce from Colombia. However, statistical information on producers is difficult to obtain and often not up to date.

Breeding and propagation

Propagation material (seeds and cuttings) is virtually only produced in Colombia for local consumption. There is hardly any export of propagation material and many growers, especially in the ornamental sector, produce their own propagation material. Various international (mainly Dutch) breeders of cut flowers are present in Colombia, producing their starting material ('grandmother plants') for local cutting producers.

The data presented in this chapter were collected by way of desk as well as field research and include information on production and trade. It is also explained how the different sub sectors are organized and what relevant government policies are applicable. Field research consisted of extensive standard interviews with public and private representatives in Colombia and the Netherlands.

At the end of this chapter, table 17 indicates the current status Colombia's horticultural sector by summarizing scores on 17 key aspects which Dutch (horticultural) companies consider of great importance in their decision to initiate imports, export activities or investments in Colombia.

2.2 Ornamentals

2.2.1 Basic facts

Colombia's geographical location, close to the equator, in combination with the presence of enormous 'altiplanos', flat highlands at more than 2.000 metres above sea level, have made the country a climatological paradise to produce cut flowers. Abundant light levels combined with very favourable temperatures make cut flower production possible with very limited investments.

Recent history and actual situation

And that is exactly how the sector was established. Colombia's excellent climate and favourable geographical location led some 45 years ago to the establishment of a 'blooming' sector; the production and export of cut flowers. The flower sector has grown rapidly in the 80's and the 90's which led to the construction of more and more low-tech greenhouses. It was of no priority to increase productivity because land was available and affordable. For labour, the exact same conditions applied. Besides, the North American market was increasing and local nor foreign competition appeared.

In that same period, Colombia faced severe internal problems. Sectors which did not require high investments were flourishing, because it was just too risky to invest in long term pay back projects. That reality has set the trend for flower production in Colombia; investments focused on short term profits and the use of labour was preferred above mechanisation.

During the first years of the crisis, 2008 and 2009, Colombia has suffered substantially as a result of diminishing demand from the North American market. Export figures dropped and as a result, numerous Colombian companies had to close down or were taken over by bigger flower producers. Especially the Medellin region was

hit hard, but also the production acreage in the altiplanos around Bogota diminished with some 500 hectares.

Since 2010, exports to Northern America have increased again and nowadays Colombia is still a monopolist on the US market. Domestically however, the Colombian economy has made great progress creating all kinds of new opportunities for companies and for the Colombian work force. Land became scarce and expensive (up to around \$100 / m² for horticultural properties) and so has labour. In addition, many Colombians prefer other jobs than working in greenhouses.

Colombia has 1.225 registered flower producers (ICA) of which 40% export their products. In total, the sector covers some 6.800 hectares of protected cultivation. Only some 3-4% of all flowers produced in Colombia are sold to the domestic market. These figures indicate that there is a rather large number of very small growers which produce for the local market (60% of all producers is responsible for less than 3 – 4% of the total sales).

Revaluation of the Peso

Except for these developments, Colombia had to face a new phenomenon. As a result of the incredible development of the country on all kind of levels (not just the economy), the Peso started to reevaluate against the major foreign currencies but especially against the US dollar. Considering that some 55% of the average costs to produce flowers in Colombia are labour costs, the impact of this revaluation has been huge.

As a result, many small and medium sized companies are suffering or have already ceased to exist. Many of them were taken over by others making the big companies more powerful. In fact, less than 10 companies nowadays dominate the market and it is likely that this trend will continue.

Labour

The monthly minimum wage for production workers in horticulture, including all taxes, is currently some \$ 547 per month. In Latin America, only Argentina, Paraguay, Uruguay and Costa Rica have higher minimum wages. Competing countries like Ecuador (\$ 400) and Kenya (\$ 80) have substantial lower labour costs.

The flower sector generates 130.000 legitimate jobs, according to the national statistics agency DANE (2012). According to Asocolflores, the flower sector generates 120.000 direct jobs and 70.000 indirect jobs. Most workers are female (65%) and about 200.000 families are dependent on floriculture representing about a million people. Floriculture is therefore important when it comes to social welfare, stability and security around many townships of Bogota and Medellin.

However, it is likely that this situation will change in the near future. Companies will be forced to reduce costs of labour to reduce their production costs, but also to make them less vulnerable for monetary fluctuations.

2.2.2 Production

2.2.2.1 Greenhouses

Typical Colombian greenhouses are the so-called 'saw-tooth' type greenhouses made of wood and covered by plastic. Such greenhouses functioned perfectly until recently due to a market that accepted the quality that was being produced in these greenhouses but also because there was no real desire (or need) by the growers themselves to increase their productivity.

Nowadays, all interviewed growers say that an increase of productivity and improvement of the efficiency are on top of their priority list. On a production level this means that lots of factors will have to be reconsidered. To start with the greenhouses themselves. Traditional greenhouses can not be ventilated besides the natural ventilation present. Heating is therefore virtually impossible because the greenhouse cannot be closed. In other words, climate control is out of the question making growers dependent on actual weather conditions.

Although the leading growers are aware of the fact that (major) investments in knowledge and technology are required to improve their competitiveness, most SME's have not come to that conclusion yet. Investment in modern greenhouses and technology are still rather limited, although some pilot projects are being implemented at larger companies, among others hydroponic production.

The crisis has made almost all growers aware of the fact that something needs to be done. Most growers try to increase, with low investments, their production output by putting more emphasis on cultivation techniques.

Compared to other flower producers like Kenya, Ethiopia, Ecuador and Israel, countries with similar climatological conditions, Colombia is lagging behind with its greenhouses. It is fair to say that Colombian growers will have to improve the structure of their greenhouses in order to maintain their position as the second largest flower producer in the world. More sophisticated greenhouses will also enable growers to produce in a more environmentally friendly way. This is still regarded as 'added value' in 2014, but sustainability will be a growers 'license to produce' in the near future.

2.2.2.2 Inside the greenhouse

The average Colombian greenhouse is the sawtooth type greenhouse which has fixed ventilation on one side of the roof (the saw tooth, having its opening on the opposite side of where the wind usually comes from) and is made of wood. Some growers use steel for their greenhouses and a limited acreage of cut flower production could be considered as medium tech multispan greenhouses.

Growers that do invest in better greenhouses, enable themselves to have more control on, amongst others, the climate in their greenhouses. Heating becomes an option, but also ventilation (higher greenhouses, automatic vents) and, if required, CO₂ dosage is possible. All these improvements increase not just the

productivity, but above all the quality and thus, the uniformity of the flowers. In practice, heated greenhouses are still seldomly found. The first attempts to improve the climate in greenhouses focuses more on technical improvements that require less investments such as fans.

Hydroponic production slowly becomes feasible in crops like roses, carnation, alstroemeria and most of all gerberas. Some 75% of the 50 hectares of Gerbera production is now produced using hydroponic systems, mainly because of infection pressure and higher yields. This does not imply that the other mentioned crops follow this example with the same speed. According to some of the rose growers, the lack of control on the climate inside the greenhouse and the lack of knowledge on how to manage hydroponic systems, reduces the (financial) output of investments in such systems.

Once again, such comments prove that flower production in greenhouses needs an integrated approach. Each production aspect influences other production issues and only the optimal combination of all these aspects can create optimal results. As an example; it hardly makes sense to invest in substrates when the irrigation system in the greenhouse is not capable of dealing with that substrate.

Finally, crop protection is becoming a major issue in Colombian floriculture. Although great initiatives are being executed such as the 'Florverde' certificate (see explanation about Asocolflores and Ceniflores, paragraph 2.3.4) the sector is known for its excessive use of pesticides. If flower producers do not take responsibility on the middle long term, it will probably be the market itself forcing growers to change their working methods, in combination with tougher (international) restrictions on the use of certain pesticides. A good example of this kind of market pressure is the Spanish vegetable production around 1997 when European retailers did not accept the (ab)use of pesticides, herbicides and fungicides anymore, forcing growers to make a tremendous shift in very little time towards Integrated Pest Management. On the short term major threats will be; resistance of plagues and diseases towards existing chemicals and more national and international restrictions towards the use of chemicals. Vegetables cannot be compared to flowers, but sustainability is definitely becoming the name of the game in each subsector of horticulture.

2.2.2.3 Post-harvest

Investing in post-harvest equipment (such as sorting and grading machines) is probably the easiest way for Colombian flower exporters to reduce labour costs and in the mean time, improve uniformity of their flower bunches and bouquets. An additional advantage of such investments is the reduction of dependence on the exchange rate of the Peso vs. the USD.

Costs and quality

The most labour intensive process on a flower farm, is the post harvest. Colombia is known for the fact that a rather large

percentage of its flowers is being exported as mixed bouquets. Making such bouquets manually requires lots of labour. But also regular flower bunches need to be sorted, bundled, sleeved and packed. If such processes are done manually, many people are involved implying that the flowers go through many different hands. This manual handling definitely influences (diminishes) the quality of the final product and is another reason (besides reduction of labour costs) to focus more on mechanisation.

On the other hand, the fact that most flower producers make their flower bunches manually, creates great flexibility. Any kind of bunch, any kind of label and any type of sleeve can be used. This is probably the major strong point of manual post harvest methods and the greatest restraint not to invest in mechanisation. Having said that, the final quality and uniformity of a bunch produced by a packing and sorting machine is known to be better than man made bunches. Each person is different and with many people involved, it is clear that the accuracy of a machine cannot be met by (wo)men.

Remarks

Botrytis is an upcoming problem in Colombian floriculture. One single infected flower can destroy a bunch. In other words, the keeping quality of each bunch depends on the weakest flower in it. When making mixed bouquets in Colombia, this fact implies an additional risk. Hygienic preconditions should be of very high standards to avoid any contamination with Botrytis. For some growers, these risks have become quite big forcing them to look for alternative solutions. Such a solution might be to make the final mixed bouquets much closer to the final consumer. In other words, in the US itself. This comment should not be considered a trend. Yet.

2.2.2.4 Production regions

Colombia is known as the world's second largest producer of cut flowers after the Netherlands. Roses are by far the most important crop followed by Carnation, Chrysanthemum, Hortensia, Alstroemeria and Gerbera. Production takes place, predominantly, in Bogota (79%) and Medellin (17%). Some 95% of all flowers produced are being exported.

See table 4. Production per department in hectares

Some 5.000 hectares is in the hands of companies with a surface of over 20 hectares. More than half of this surface (some 3.000 hectares) is owned by the 6 biggest companies in Colombia.

In the major production regions, Bogota (Sabana and Cundinamarca) and Medellin (Antioquia), prices of land are skyrocketing. Prices of around \$ 100 per square meter are no exception anymore. This means that various companies prefer to choose eggs for their money or in other words, they capitalize their investments by selling their properties to either the real estate sector or other, mainly industrial, sectors.

Table 4. Production per department in hectares

Year	2003	2005	2007	2009	2011	2013
Sabana y Cundinamarca (Bogota)	5.271	5.910	6.820	7.210	5.756	4.970
Antioquia	744	834	963	1.018	1.547	1.602
Boyaca	51	63	72	77	62	70
Risarala	42	36	40	43	259	50
Others	52	56	65	68	279	91
Total	6.160	6.899	7.960	8.416	7.903	6.783

Source: Asocolflores

Colombia has, climate wise, not really an alternative for the Altiplano of Bogota, making it unlikely that flower production will shift to other parts of the country. Besides, logistics, sales and supplies are all concentrated in Bogota and to a lesser extent Medellin, making it more difficult to move production facilities. Taking all this into consideration makes it likely that acreage wise, flower production in Colombia will decrease in the near future, but productivity will increase. Less land will be needed to produce the same (or even more).

2.2.2.5 Varieties

Colombia is traditionally exceptionally strong in the production of Rose and Carnation, but also Chrysanthemum. In the field of Rose production, many other countries compete with Colombia, among others Kenya, Ecuador and Ethiopia. Ecuador, a neighbouring country, is the biggest competitor of Colombia although Ecuador concentrates on the top segment of the market and sells to niche (high value) markets like Russia.

As a producer of Carnation, Colombia can be regarded as the leading producer worldwide. The same can be said about Chrysanthemum, although Colombia goes pretty much hand in hand with the Netherlands. Hortensia was more recently developed into a major crop and it is likely that this expansion will continue. Japan has great demand for Hortensia and also for Calla. Other crops, important for Dutch breeders, are Alstroemeria and Gerbera.

The only major flower crops that increased in production in the past 5 years, have been Chrysanthemum and Hortensia. Hortensia is still regarded 'new' to Colombia and is gaining market share, Chrysanthemum grew due to the recent opportunities to enter the European market by means of sea freight. This tendency has definitely improved the average quality of Chrysanthemums being produced in Colombia and has also forced growers to diversify their variety range. This development might pave new roads for other cut flower varieties in the near future.

Although it is too early to draw conclusions, it seems that the acreage of various crops will decrease in 2014 due to diminishing demand in the North American market.

Table 5. Production per type of flower in hectares

Type of flower	Acreage (ha)
Roses	2.465
Carnations	1.146
Chrysanthemums	716
Hortensia	639
Alstroemeria	306
Others	1.511
Total	6.783

Source: Asocolflores

Compared to other major flower producers like Ecuador, Kenya, Ethiopia and Israel, Colombia is not a frontrunner in selling the latest varieties to their markets. An important reason is the fact that most of the Colombian production is absorbed by the United States. And the other way around, most flowers sold in the North American market, are Colombian flowers. Because of this lack of competition, there is no trigger like in for instance the European market to constantly supply the latest varieties to clients and consumers. As a result, Colombia faces problems to enter new markets because in many cases, they simply cannot compete on a variety level with their major competitors. In addition, the UPOV treaty 1991 has not been signed yet making it more difficult for foreign breeders to secure (the payment of royalties on) their varieties.

UPOV legislation and protection

In 1996 Colombia became a member state of the UPOV convention ('Union Internationale pour la Protection des Obtentions Vegetales') by signing the UPOV 1978 treaty. UPOV 1978 provides limited protection of varieties to breeders. The Colombian government has been trying to adhere to the UPOV 1991 Convention for several years, but is still facing strong political resistance from sectors opposing the broadening of the IP standards in socially sensible areas such as pharmaceuticals and agriculture. The government intends to proceed with this process under the Free Trade Agreement with the EU.

On a positive note, Colombia has managed to implement the '91 Act minimum standards by providing breeders with (1) provisional protection between filing and granting; (2) effective protection over Essentially Derived Varieties (EDVs); (3) experimental use exception; (4) farmer's privilege restricted to less than five hectares in addition to filing a report with the Instituto Colombiano Agropecuario (ICA), and a marketing prohibition of the harvest material; and (5) a 25-year term of protection for vines, forest and fruit trees, and a 20-year term for other species.

Finally, to facilitate the enforcement of the protection of plant varieties in the country, the Colombian Congress passed Bill 1564 in 2012, providing the ICA with jurisdiction over infringement of Plant Breeders Rights (PBR). This allows the ICA to maintain judicial control over the country's PBR system. The challenge is now in the hands of the ICA.

When looking at the statistics of the application some 44% of the total originate from the Netherlands and 47% of the grants belong to rose varieties, followed by 14%, Chrysanthemum, 11% carnation, 11% Alstroemeria and only 17% for other varieties.

2.2.2.6 Main flower producers in Colombia

As stated before, Colombia can be regarded as a monopolist in the North American market. This implies that the main competitors in this market are fellow Colombian producers. And that fact explains the hesitation amongst the main Colombian producers and exporters of flowers to collaborate.

Nowadays, there are some 10 leading producers, each managing between 20 and 800 hectares of cut flower production for export. Most of these companies have their own sales offices and channels in Miami and other parts of the US and thus have direct access to their final market. Some of them have also moved their bouquet department to the US (see comments in paragraph 2.3.2.3 post-harvest).

Domestic production of cut flowers in the US is not very strong and therefore flowers from Colombia have become a dominating factor in the market. This has been strengthened by the implementation of the FTA between Colombia and the US, which has been favourable to the Colombian cut flower exporters. Colombian flower exports are exempt of taxes, while neighbouring Ecuador still pays duties.

A leading example of a successful exporter to Europe is Grupo Capiro, who exports large quantities of Chrysanthemum to the European market, often using maritime transport. Even Australia has become accessible for them by means of sea freight. The Dutch company Intergreen (part of the Dutch Flower Group) is their main partner. Selling Chrysanthemums to Europe has forced Colombian flower exporters to improve the final quality of their products. This has led to the ability to sell flowers of higher quality to more traditional markets making them more competitive.

See: [Table 6. Main flowers producers – exporters in Colombia](#)

2.2.2.7 Dutch breeders and propagators active in Colombia

The Netherlands is the major supplier of new varieties and cuttings for most of the top 10 cut flower varieties such as Rose, Chrysanthemum, Alstroemeria, Carnation and Gerbera. Because of that, all major Dutch companies either have their own facilities in Colombia or work with local distributors.

See: [Table 7. Dutch breeders and propagators in Colombia](#)

2.2.2.8 Production trends

Nowadays, the sector is dominated by some 10 producers - exporters as explained in the previous paragraph. A second group of some 15 – 20 companies produces on plots between 20 and 100 hectares. Most of the growers in this second group sell to specialty markets. Either geographically or as a result of their product range and/or quality level. Companies which measure between 20 and 100 hectares and which do not fit into the profile of this second group as described, will either have to create more critical volume or they will have to specialise. It is likely that the tendency that big companies, the companies selling to commodity markets, will only get bigger and bigger. Therefore it is expected that within the next couple of years, there will only be some **5 - 6 major players** left in Colombia. Each one of them will have its own sales offices in the USA, first of all in Miami.

The vast majority of flower producers is much smaller than 20 hectares and most of them are facing fierce economic problems. This situation has already led to a **shake out of many small producers**. It is unlikely that this situation will change unless they start collaborating with other producers and in the meantime, make great efforts to reduce costs and increase productivity.

Climate changes are increasing the presence of plagues (due to more rain) and fungi. In 2011 a harsh winter lead both to the redundancy of many producers as well of even more fungi due to increased humidity leading to phytosanitary problems, lower production and quality.

These negative tendencies have led to the realization that efficiency needs to be increased by way of **investing in technology and knowledge** in order to reduce costs.

Table 6. Main flowers producers – exporters in Colombia

Company name	Product and location	Hectares	Website
Grupo Chia	Rose, Carnation, Chrysanthemum, Alstroemeria, a.o. – Bogota	800	www.grchia.com
The Elite Flower Group	Rose, Carnation, Chrysanthemum, Alstroemeria, Gerbera a.o. - Bogota	240	www.eliteflower.com
Ipanema - Passion Growers	Rose, Carnation, Chrysanthemum, Alstroemeria, a.o. - Bogota		www.passiongrowers.com
Flores Funza	Rose - Bogota	>200	www.floresfunza.com
Sunshine Bouquets	Rose, Carnation, Chrysanthemum, Alstroemeria, a.o. - Bogota		www.sunshinebouquetcompany.com
Esmeralda Farms	Chrysanthemum - Medellin	25	www.esmeraldafarms.com
Jardines Los Andes	Rose, Carnation, Chrysanthemum, Alstroemeria, a.o. - Medellin	50	www.grupoandes.com
Flores La Sabana	Gypsophila, Alstroemeria, Gerbera, Rose - Bogota		
Hosa	Rose, Carnation, Lily - Bogota		www.hosa.com
Grupo Capiro	Chrysanthemum - Medellin	54	www.capiro.co

Table 7. Dutch breeders and propagators in Colombia

Organization	Type	Website
DNA Green Group	Wide range of cut flowers and pot plants	www.agribiocolombia.com
Dekker Chrysanten	Chrysanthemum	www.dekkerchrysanten.nl
Deliflor	Chrysanthemum	www.deliflor.nl
Royal van Zanten	Chrysanthemum, Tulip, Alstroemeria, Lily, Limonium, and pot plants a.o.	www.royalvanzanten.com
Hilverda Kooij	Carnation, Limonium, Alstroemeria and pot plants	www.hilverdakooij.nl
Konst Alstroemeria	Alstroemeria, Zantedeschia	www.konstalstroemeria.nl
Florist	Gerbera	www.floristholland.nl
TerraNigra	Rose and Gerbera	www.terrannigra.com
Schreurs	Rose and Gerbera	www.schreurs.nl
De Ruiters New Roses	Roses	www.deruiters.com
Olij Rozen	Roses	www.olijrozen.nl
Bot Flowerbulbs	Lily, Gladiolus, Iris bulbs	www.botflowerbulbs.nl
F. Stoop	Lily, Gladiolus bulbs	www.stoopflowerbulb.nl
Anthura	Anthurium and Phalaenopsis	www.anthura.com
Rijnplant	Anthurium	www.rijnplant.nl

This is spurred by young Colombian agronomists who have been trained in Europe and have a more open attitude towards integrated investments.

Innovation aimed at the increase of productivity is another trend which will have to secure the future of the floricultural sector in Colombia. Leading producers are conducting experiments with substrates and hydroponic production. On average, these experiments have led to an increase of production of some 20%.

On a national level, Colombia's **domestic market** (middle class) is growing, offering new opportunities, not only for the sales of cut flowers via direct sales to chains as Homecentre and Exito, but also for the production of tropical pot plants like Anthurium and Orchid/Phalaenopsis.

2.2.3 Trade

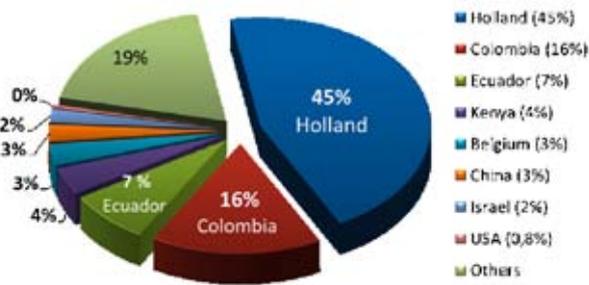
2.2.3.1 Global import and export

Worldwide flower exporters

Colombia's flower sector has a long standing tradition and has been exporting its products from the very first beginning, at the end of the 1960's. Asocolflores was already established in 1973 indicating that there was an evident need to be organised in order to explore new (export) markets. On a global scale, Colombia is the second exporter of flowers visualized in figure 3.

The Netherlands still is responsible for the majority of flower exports worldwide. The total (growers) value of cut flower production worldwide amounts to 8,5 billion USD.

Figure 3. Main flower exporting countries worldwide in 2011



Source: AIPH

Worldwide flower importers

The main importers of flowers are Germany and the U.K. With regards to import values of cut flowers, both countries are still larger players than the US, which can be seen as a sign of maturity of European markets compared to Northern America. Flower consumption in the US and Canada is still low compared to most European countries. Most of the flowers imported by the Netherlands are being re-exported.

Figure 4. Main flower importing countries worldwide in 2011

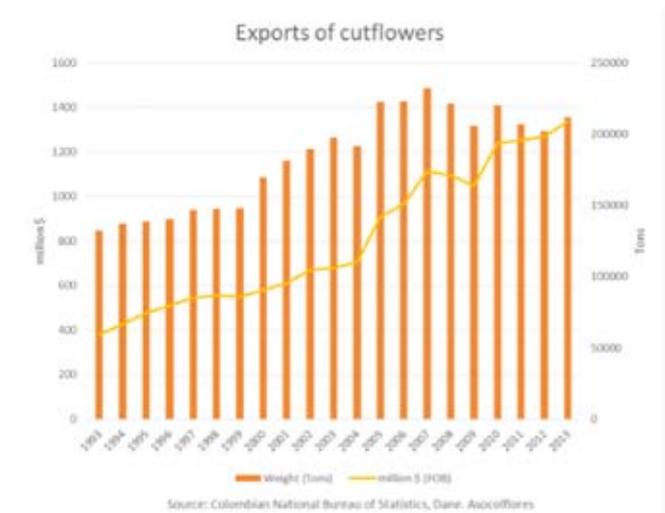


Source: AIPH

2.2.3.2 Colombian flower exports

In 2013, Colombia exported some 212.000 tons of flowers accounting for over 15% of the world export market in terms of volume. Flower export value amounted to more than 1.3 billion USD (only preceded by coffee exports).

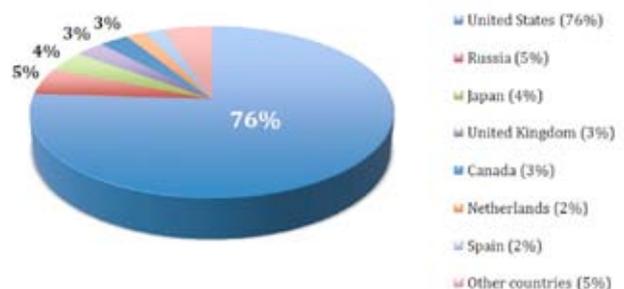
Figure 5. Export of flowers 1993-2013



Source: Colombian National Bureau of Statistics (DANE)

Obviously, the major export market for Colombia is the United States. Together with Canada, Northern America absorbs some 80% of the flower exports followed by Europe with some 15%.

Figure 6. Export of flowers from Colombia to the world in 2012 (Asocolflores)



Source: Asocolflores

2.2.3.3 Logistics

Traditionally, cut flowers are being exported by means of air freight. Due to the perishability of almost all flowers, a well-controlled (climate wise) and organized logistic chain has always been a precondition to guarantee quality flowers to the final consumer. Therefore, sea freight has not been an option for decades. Not only because of the time it takes to go from one harbour to the other, but also because internal logistics in Colombia are far from perfect. Distances are long, roads are often in rather poor conditions and because of these facts, and costs of (internal) transport are rather

high. It is a well-known fact that transport from the farm (wherever in Colombia) to the harbour is more expensive than the sea freight from Cartagena to destinations in Europe. Even internal transport between the farms is problematic. It is expensive and most trucks are not cooled.

North America-general

About 80% of all Colombian flowers is exported to North America. Besides, a similar percentage of all flowers being sold in North America is Colombian. This situation leads to great mutual dependence. The result is that the North American market is far less competitive than the leading markets Europe and Japan. Competition in the North American market is basically the same as competition between Colombian flower producers. Having said that, changes in the market are becoming evident. The North American market is more demanding than it used to be with a need for newer varieties and for more sustainability. The world is getting smaller and North American retailers are aware that there is room to improve the quality level of the flowers to sell to their customers.

Miami is the main gateway to the US, handling around 85% of all flowers exported to the country. Due to the immense volumes of flowers exported from Colombia to the US, freight tariffs are attractive compared to other Latin American countries. On peak days such like Valentine's Day or Mother's Day, some 30 – 40 cargo planes leave on a daily bases to the United States. The Colombian flower sector absorbs 75% of all air cargo leaving the country.

North America-sea freight

Colombia still dominates the North American market, but other countries are showing more interest. Sea freight starts opening doors for a number of Latin American countries. If air freight remains the dominating means of transport for flowers, Colombia will maintain its competitive advantage over its (Latin American but also African) competitors, but as soon as sea freight really becomes attractive as means of transport for a range of flowers, Colombia will face more competition. This is only emphasized by the troubled and expensive over land infrastructure in Colombia, that makes sea freight relatively expensive compared

to countries with better (cheaper) domestic infrastructure. This last aspect will change substantially if domestic infrastructure in Colombia is improved. The current government is working to implement large scale public private partnerships that should improve roads, harbours and waterways.

Europe

Europe represents a rather small percentage of Colombian exports. Only a few Colombian producers are competitive in the European market where competition with the Dutch producers, but also with African, Israeli, Spanish and Ecuadorian producers (Eastern Europe) is fierce. Logistic costs to Europe, the strong local currency and the extreme high quality standards as well as strong demand for a wide range of varieties in the European market put pressure on the competitiveness of Colombian flowers.

Europe – sea freight

On a logistic level, there is a growing tendency to export, predominantly to the United Kingdom, by means of sea freight. Such markets are mainly served by specialised Colombian flower exporters. Worldwide, the exports of flowers over sea still cover only some 2% of total exports, representing a value of 24 million USD or 1.200 containers of 40 ft. However, this development is significant and was unthinkable some 10 years ago. This development is also opening new doors in markets like Japan and Australia.

Dutch importers / wholesalers of flowers and foliage active in Colombia

Most major Dutch flower importers are active in Colombia although on a limited scale. Maritime transport shows a positive development towards the European imports of Chrysanthemums. Other cut flowers are facing severe competition in Europe from predominantly African competitors and, in the East European market, from Ecuador.

Table 8. Dutch importers / wholesalers of flowers and foliage active in Colombia

Organization	Type	Website
Floraholland	Flower auction	www.floraholland.nl
Superflora (DFG)	Flowers	www.superflora.nl
Intergreen (DFG)	Flowers	www.intergreen.nl
FleuraMetz	Flowers	www.fleurametz.com
Westland Bloemen Export	Flowers and foliage	www.wbe.nl
Van Vliet Flower Group	Flowers	www.jvanvliet.com
Adomex	Foliage	www.adomex.nl
OZ Import	Flowers and foliage	www.ozimport.nl

2.2.3.4 Cut flower export procedures

Since 2004 exporting from and importing to Colombia has been significantly more efficient with the implementation of VUCE or Ventanilla Unica de Comercio Exterior. VUCE is a digital information platform that facilitates the handling of all necessary paperwork regarding import and export procedures via one single channel. VUCE guarantees technological and legal security during the process via integration of the digital signature and payments can be done online.

VUCE consists in practice of four different modules that help speed up exports and imports:

- Imports (facilitates digital processing of registrations and licenses)
- Exports (facilitates the digital authorization preceding the export by the relevant authorities in charge of the products to be exported)
- Single Form of Foreign Trade (which integrates the registration of producers of national goods, certifications of national production and administration of export quota)
- System of Simultaneous Inspection (automates and integrates the different information channels from the various departments involved in in- and exports (DIAN, ICA, INVIMA and Antinarcotics Police. Currently, cut flowers exported in containers are simultaneously inspected by the various government institutes making the inspection process a lot quicker and easier and enhances traceability in case of problems with the shipment).

More information can be found via: www.vuce.gov.co

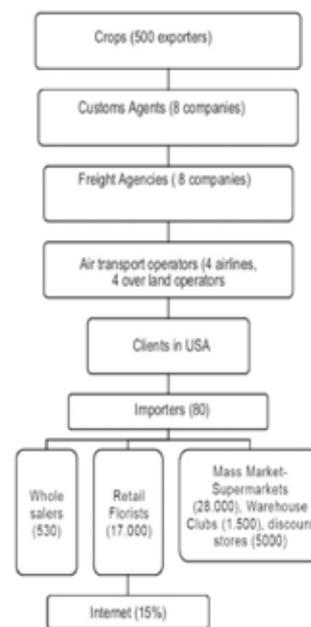
VUCE is an umbrella platform covering and integrating information from no less than 21 government bodies and was set up by the Ministry of Commerce, Industry and Tourism. The relevant bodies for export such as ICA and DIAN have their own digital information systems, which are called Sisap and MUISCA (Modelo Unico Ingresos Servicios Control Automatizado) respectively. These systems all strive to facilitate better control, coverage, traceability and the reduction of (human) errors in the export process.

Although the internet, mobile phones and messenger services such as MSN Messenger and nowadays Whatsapp, have made the exchange of information between the various public and private parties a lot easier, improvements can still be made, also in the field of technical maintenance of these online platforms. The integration of electronic systems, especially those managed by the different government entities, is not easy. However, some 90% of all exports are now realized via Sisap and VUCE handles on average some 14.000 requests per month.

The figures below illustrate the actual export process with its various steps, players and the paperwork involved.

Figure 7. Actors in the export chain of cut flowers from Colombia to the United States

ACTORS IN THE EXPORT CHAIN OF CUT FLOWERS FROM COLOMBIA TO THE UNITED STATES



Source: Intercambio de información en las cadenas de suministro internacionales

Author: Andrea C. Gonzalez Cardenas/Asocolflores

Twelve documents in total are needed to export a shipment of cut flowers. An overview of these documents as well as the entity that needs to provide them and the institution who is demanding them is presented below:

2.2.4 Floricultural sector organization and trade promotion

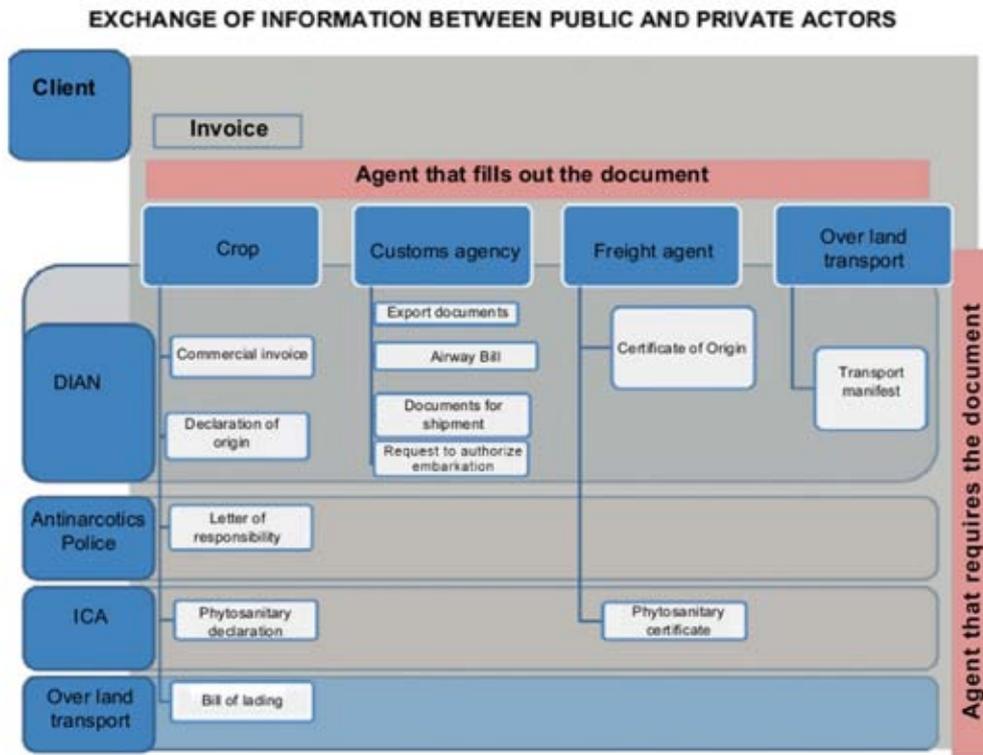
The main public body that is responsible for the institutional developments in horticulture is the Ministry of Agriculture and Rural Development. Besides, the Colombian Agricultural and Livestock Institute (ICA) is playing an important role when it comes to import and export ICA aims to contribute to sustainable development of the agricultural, livestock, fishery and aquaculture sector. It does so by means of prevention, surveillance and control of sanitary, biological and chemical risks for animal and plant species. Both scientific and applied research is executed. The overall objective is to protect people, animal and plant health and ensure trade relations, see also www.ica.gov.co.

Colombia's flower sector has always been proactive in organizing itself privately. More than 40 years ago the sector's branch organization Asocolflores was established and this organisation has undertaken numerous initiatives concerning sector organization and regulation as well as in the field of specific research as trade promotion. A more extensive description can be found below.

Asocolflores (www.asocolflores.org)

The sector itself (various entrepreneurs) founded the organization in 1973 as a trade association to promote flower exports and defend and maintain access to international markets. The US has always

Figure 8. Exchange of information between public and private actors



Source: Intercambio de información en las cadenas de suministro internacionales Author: Andrea C. Gonzalez Cardenas

been a main export market and Asocolflores to this end maintains its own representative office in Washington.

The organization has some 200 members. In Colombia itself it works to develop the Colombian floricultural sector via research, technology and training. At the same time it also advocates environmental management practices (IPM) and initiates environmental and social welfare programs. Asocolflores also works with foreign partners/donors, notably USAID. A recent partnership was formed with the Dutch Floriculture Sustainable Initiative (FSI), working towards more sustainability in the flower sector (see also www.fsi2020.com).

The branch organization also established its own research institute in 2004: Ceniflores. For now it mainly operates as a 'virtual platform', exchanging knowledge and coordinating research projects with third parties such as universities in Colombia and abroad. Its goal is to contribute to the international competitiveness of the sector as a whole. A new priority is the diversification of flower exports by focusing also on the export of tropical flowers. See also www.ceniflores.org.co

Asocolflores for long has been working independent from the Colombian government (Ministry of Agriculture and Rural Development) focusing on its members and export of their products. In recent years, cooperation has been strengthened and intensified. By way of its programs, but also its promotional

campaigns the organization has been playing an important role in promoting Colombia's horticultural sector.

Regarding their promotional role, Asocolflores was the initiator of the professional trade fair ProFlora. Since 1991 this event has steadily grown into a leading cut flower trade fair worldwide and its organization alternates between Colombia and Ecuador. In 2013, the Bogota edition attracted 1500 buyers from 40 countries, the 2014 edition is being organized in Ecuador at the beginning of October. See also, www.proflora.org.co

Other institutions worth mentioning with regards to the organization of the floricultural sector are:

Fedecolflores

This organization represents the interests of the exotic flowers and foliage producers in Colombia.

Anallex (www.anallex.org)

Anallex is the national association of external trade and assists and supports external commercial activities.

2.2.5 Government policies

As mentioned above, the floricultural sector has been organized in a rather early stage (some 40 years ago) on a private basis. The sector for long didn't maintain close contacts with the national government.

Opposite to food production, floriculture so far has not been a priority of government policy. This also means that no specific, comprehensive subsidy program has been designed for the flower sector. There has been merely sporadic and erratic support in various fields, lacking continuity and consistency. However, measures were taken to protect exporters from the harming effects of the revaluation of the Colombian Peso.

Over the years, branch organisation Asocolflores itself has initiated various private projects for its members financed by member contributions. They also sought cooperation with international organizations such as USAID and ILO. Asocolflores is currently working on the approval of a so-called 'Fiscal', a compulsory 1% sales contribution of all flower growers (members as well as non-members). This 'Fiscal' needs to be incorporated into a national law and the funds that will be contributed afterwards can be used to the benefit of the whole sector. Asocolflores hopes to expand its research centre Ceniflores and give it more mandate in executing projects independently.

Despite the success of Colombian flowers abroad and the opportunities for employment among others at home, there is no neither national nor regional government policy towards floriculture, let alone greenhouse horticulture (everything produced in greenhouses). This is a missed opportunity that will probably become more evident in the next few years when producers, starting with the larger flower growers, are 'forced' to invest in their greenhouses and technology to maintain their leading export position.

Closer cooperation with relevant government bodies and institutes, not only in the field of regulation (ICA) but especially sustainable development and innovation (such as Colsciencias) would build a stronger Colombian horticultural sector. When production in greenhouses could be put on the government agenda one could think in developing strategies and training courses aimed at horticulture as a whole and work on exchanging knowledge and technology relevant to both flower and vegetable producers.

2.3 Vegetables

2.3.1 Basic facts

Contrary to the production of cut flowers, vegetable production has so far been a local affair with hardly any export. Production is up and coming, since producers are slowly recognizing the opportunities Colombia's excellent climate offers and the fact that the local market (middle class) is growing rapidly and consumers are better informed and more aware of what they eat.

For long Colombia focused on fruit production and therefore there has been little attention towards protected cultivation. An updated national registration system on vegetable statistics does not really exist and it has been very difficult to obtain reliable quantitative data. Besides, the definition of "protected horticulture" is not very clear in systems like Sisnap (www.ica.gov.co). Statistical

information in this report regarding vegetable production and sales is therefore also based on information from a.o. personal interviews and sometimes estimates are provided instead of exact figures.

Recent history and actual situation

The general perception of growing vegetables has changed significantly all over the world. It once started as a small scale activity mainly in order to feed families and small groups of people. Nowadays the sector is being connected to many issues of pollution like contamination of ground water with highly toxic pesticides, high concentrations of phosphorus in soil due to over-fertilization and perceived as a major contributor to global warming due to the carbon emissions. In addition, vegetable production is also increasingly mentioned in the debate about the use of scarce resources (regions with water shortages and the effects of production on rainforest preservation), but also when discussing issues such as the affordability and accessibility of food.

In Colombia the vegetable industry was mainly set up for local consumption. In 1915, agronomic engineering started the establishment of the Escuela Superior de Agricultura de Bogota, resulting in graduation of the first agronomic engineers of the country in 1920. Two years later however, the school was shut down again. Basically all knowledge was based on European agriculture and experiences in European colonies.

Over the next decades vegetable growers will have to manage scarcity of land and water, soil quality, sustainability, succession, changing supply chains and many more issues. There is no doubt that growing vegetables has become much more than putting a seed into the ground. It is a complex business but growers are learning more and are challenged to contribute to health, job creation and sustainable growth for themselves and for their country.

Due to Colombia's economic situation and the armed conflict, the government has had other priorities to focus on than agriculture. Only since recently, fruit & vegetable production is back on the political agenda. An ambitious National Development Plan for Horticulture 2012-2022 was developed together with a business plan that intends to develop the production for export of five fruit crops (pineapple, avocado, strawberry, mango and papaya) and two vegetable crops that are in high demand in international markets (onions, peppers). In addition, in December 2013 the so-called Productive Transformation Program (PTP) was launched, seeking to turn the country in a world class exporter of fruit & vegetables.

Labour

The vegetable sector generated 167.000 direct jobs in 2011, a growth of 6.4 percent from 2005. According to the table below it is clear that the growth of jobs is mainly found in fruit production. It is expected that due to the plans of the Colombian government to double production for seven specific crops until 2020, the jobs created in agriculture will increase significantly.

Table 9. Direct employment in agriculture Colombia

Direct employment in agriculture Colombia (x 1.000)							
Total number of employees	2005	2006	2007	2008	2009	2010	2011
Hortalizas	157	172	172	177	171	174	167
Frutales	293	310	329	327	342	360	366
Hortalizas y Frutales	450	482	501	504	513	534	533
Total jobs in Agriculture	2.237	2.249	2.302	2.338	2.347	2.421	2.439

(source : MADR. Dirección de Política Sectorial-Grupo Sistemas de Información)

Source: MADR

Indirectly, the sector offered 409.000 jobs in 2011 over 390.000 jobs in 2005, a growth of 4.9%. This number will also increase, since the expansion plans aim at export which requires extra indirect employment to make this growth possible.

An example from the fruit production given by Marisol Vargas, representative of Asohofrucol, is avocados. According to the Program of Productive Transformation (PTP) the goal is to turn Colombia into one of the world's top eight avocado exporters by 2030. On the path to do this the goal is to have 8.000 hectares of the Hass variety planted by 2020, generating 10.000 direct jobs.

with empty greenhouses, because no one knows how to use them properly. Regarding tomato production especially, it is estimated that only 10-15 ha medium tech greenhouses have been built in Colombia, achieving a maximum of 10-15 kg tomatoes/m².

A widely accepted perception is that technology from the Netherlands is too high-tech and too expensive. Often that has to do with lack of knowledge, but also with a short term view on return on investment and quick profits. Changing market requirements, the wish to increase productivity and further improvement of efficiency asks for more comprehensive, but affordable solutions.

Table 10. Indirect employment in agriculture Colombia

Indirect employment in agriculture Colombia (x 1.000)							
Total number of employees	2005	2006	2007	2008	2009	2010	2011
Hortalizas	390	431	428	429	419	435	409
Frutales	735	774	827	817	854	880	894
Hortalizas y Frutales	1.125	1.205	1.255	1.246	1.273	1.315	1.303
Total jobs in Agriculture	4.422	4.454	4.520	4.594	4.642	4.741	4.784

(source : MADR. Dirección de Política Sectorial-Grupo Sistemas de Información)

Source: MADR

2.3.2 Production

2.3.2.1 Greenhouses

The wooden 'saw tooth' type greenhouses can also be found in vegetable production. But most crops are still grown in the open soil or minimally protected by plastic tunnel greenhouses (for example; low tech greenhouses now produce around 5-8 kg/m²). Favourable climatological circumstances did not urge investments and innovation in technology, but now, with a growing demand of the local market and government programs aiming at export, producing quality is becoming a relevant and important issue and thus investments in greenhouses could and should be a logical result.

This brings along a need for knowledge and training in how to make optimal use of modern greenhouses and how crop production can be improved (quantity and quality). Today, little is known at private sector level about the potential of increasing profits when growing in greenhouses. Some universities experiment since the early 1990's with greenhouses but this knowledge was never spread amongst the private sector and there are examples of demonstration projects

2.3.2.2 Inside the greenhouse

More often than not, vegetable crops in Colombia are still produced in the open field. Irrigation will be the first step towards production improvement. Ventilation, better greenhouses and hydroponic production are the next steps. The interviewed company representatives believe that Dutch technology is very good, even excellent, but often too expensive for Colombia. Over the years, the innovative Dutch companies have adapted their technology to local circumstances. Most products are easy to simplify or modify to fit Colombian needs. 'Seeing is believing' is a phrase that is especially true when it comes to improving horticultural techniques. Semillas Saenz is a Colombian seed distributor who together with foreign partners (among others Dutch seed producer Rijk Zwaan and coco substrate producer Van der Knaap) took the initiative to set up a demonstration nursery in which they show modern greenhouse technology to their clients. In the longer term vegetable growers will be trained to use these installations in order to learn how to improve their own production. Plastic greenhouses and fairly simple irrigation systems and hydroponic installations will show a significant increase in production and thus turn over.

The 'open' construction of most greenhouses in Colombia affects pest development and control. Some greenhouses are very simple structures with hardly any possibilities for climate management, the growers are often only part time involved in production and have other primary professions; the result is poor pest management and no interest in knowledge intensive biological control programs. Other greenhouses are more high tech and a better quality, but still little attention is paid to biological pest and disease control. It is expected that demand will grow and that with a proper education and a growing availability of natural enemies, biological pest control is a realistic opportunity.

It is a misunderstanding that Integrated Pest Management only makes sense when climate can be optimally controlled. There are many examples of successful pest control in mid-tech greenhouses in different parts of the world (e.g., East Africa). The reduction of the use of pesticides is an important method to create investment capacity, to increase product quality and food safety in order to make certification possible, still the tool to get better access to export markets.

Water from boreholes is often used for irrigation purposes. The water from the Bogota River is too contaminated to use in agriculture and / or horticulture. As a matter of fact it is one of the world's most polluted rivers. Rainwater is also used. In summer periods the supply of good quality water is limited, and the irrigation to the crop falls short. Two options for improvement are apparent: (1) create water reservoirs to store excess rain water, (2) re-use irrigation water. For both options well-developed technologies are available. In water usage various solutions are possible. A nice example is recirculation of nutrients. One can think of a recirculation system with UV disinfection. Recirculation considerably reduces water and fertilizer use.

A more sustainable use of water is advocated by the Colombian government but no legislation is supporting these aims with regards to the horticultural sector. The solutions mentioned above go with relatively high investment costs, the government can stimulate the implementation of these sustainable techniques by supplying funds.

2.3.2.3 Post-harvest

The golden rule of post-harvest management is "Quality cannot be improved after harvest, but only maintained."

There are two main functions of post-harvest management:

- To maintain the good quality of the harvested produce for the market/final consumer
- To reduce the level of losses in weight and quality after harvest

Various Colombian vegetable farmers estimate that in production post harvest losses can go up to some 70%. This is often caused by improper harvesting, poor handling of the produce between greenhouse and market place; inappropriate or lack of packaging material; poor transportation and distribution systems and/or lack

of adequate storage facilities. Only very few vegetable farmers have their own cooling facilities, where some more advanced processing companies (sliced cabbage) who make packages directly for retail outlets do have proper cold stores.

Similar to the flower industry, investing in post-harvest equipment (such as sorting, grading and simple packaging machines) is probably the easiest way for Colombian vegetable farmers to reduce labour costs and in the mean time, improve uniformity and extend the shelf life of their crops. Proper packaging also adds value and can reduce post harvest losses with 15 to 20 percent.

Costs and quality

In vegetable farming, the post-harvest process is usually very labour intensive. As explained earlier, labour costs are increasing in Colombia and investments in post-harvest equipment should be considered.

In Colombia farmers do try to cooperate but often, due to distrust between farmers, no real collection and distribution systems are in place. So not many consolidation and packing houses have been established for consistent handling of the produce which is resulting in losses in the supply chain.

On a positive note however, in Cundinamarca over 12 producer organizations and associations collectively gather and store fresh produce.

Proper packaging is important to protect the produce against rough handling during loading and transport. It also helps to move the produce as an efficient unit that is easy to handle and that can also be marketed as a unit. Not many farmers use packaging as a communication tool towards the buyer by way of a label combined with a trade mark or trade name which promotes the product. Smart packaging improves the produce presentation and can also set standards for more efficiency in the market place.

Improper transportation methods result in 10 to 20 percent post-harvest losses in fresh produce. Not many minimum requirements are used to maintain quality and reduce losses. Very often vehicles are overloaded and while the load must be stable and well ventilated. During transportation, the produce must be protected against sun, rain and dust by covering it with a light coloured tarpaulin or storing it in a refrigerated truck.

Excessive speeding, sudden stops and jerk starts must be avoided, as they will cause squeezing and bruising of the product. Poor roads, uneven surfaces, pot holes, winding corners are all greatly increasing mechanical damage. Loading and unloading of produce is not always done with care where packed produce is often thrown from the vehicle.

Palletizing packaged produce guarantees that quality produce arrives in the marketplace in good condition, but this method is still not widely used. Proper post-harvest management practices will therefore result in reduction of food loss and maintenance of quality and higher profits for farmers.

2.3.2.4 Production regions

Bogota is the main consumption centre of Colombia and **Cundinamarca is Bogota's main food supplier**. Bogota's consumption level is explained not only by its population (10 million) and income level (US\$ 11.918) but also by its growing institutional market (private companies, schools, restaurants, hotels and hospitals). Due to the availability of land in different **thermal soils**, a wide variety of vegetables can be grown in areas with temperatures ranging from 12°C to 27°C.

Some of the most important products harvested in Cundinamarca are vegetables such as **lettuce** varieties, carrots, broccoli, beans and peas (**French beans, sweat peas, snow peas**) and asparagus.

Bogota and Cundinamarca have several programs to strengthen the **agricultural chain**, and focus on research, logistics, supply and technology. Various incentives are given to companies who create jobs and set up companies. Examples are:

- 5 years income tax benefits;
- 3 year cost benefits on annual registration fees
- 3 year cost benefits on payroll contributions
- Tax exemptions (VAT and/or ICA) on exports
- Special credit lines with second tier banks
- Subsidies up to 30% for certain agricultural projects

On the website <http://en.investinbogota.org/> more specific information can be found about Bogota and Cundinamarca's incentives.

In addition, the support services to the industry (input suppliers, labs, logistics operators and certifying entities) have their headquarters in **Bogota**.

fruit. Since vegetable production is a very local and regional activity, production takes place where the consumption is and Bogota is the main consumption centre in the country.

The region is also considered by many international companies as the main distribution centre for the Andean and Central American regions.

FAO reports show that Colombia produces 7.5 million tons of fruit (748,604 Ha) per year, against 1.739 million ton (107,694 hectares) vegetables per year. As mentioned in the introduction, this study concentrates merely on crops grown in **greenhouses**. Despite the fact that Colombia produces about 5 times more fruit than vegetables, almost all of the fruit is produced in the open field. Vegetables are more often found to be grown in greenhouses.

Production of vegetables has risen from 2215k tons in 2005 to 3861k tons in 2010, showing a 1.6% growth over five years (see table#). Economic value of production rose from 2.172.803,7 million pesos in 2005 to 2.672.657,7 million pesos in 2010, showing a 23% increase (see table 11).

Unfortunately more recent figures have not been available.

When taking a closer look at yield per Ha (overall vegetable production), a yield of 15.8ton/ha was realized in 2010, a growth of 8.6% over 5 years from 2005. According to Asohofrucol, this proves that government's attempts to promote technological assistance and transfer have not been adequate.

Figure 9. Vegetables harvested area, by department (2012)



Source: National Administrative Department of Statistics (DANE)

Cundinamarca is by far Colombia's largest vegetable production area and accounts for 42% of the national production, equivalent to about 400 thousand tons of vegetables and 300 thousand tons of

Table 11. National production of vegetables (incl. potatoes)

Year	Production (Thousands of tons)	Value (Millions of Col. Peso)
2005	3316	2.172.803,7
2006	3788	2.427.648,8
2007	4509	2.430.047,7
2008	4152	2.446.647,5
2009	4080	2.539.036,3
2010	3861	2.672.657,7
2011*	3789	

Source: Plan Nacional de Fomento Hortifruticola 2012-2022

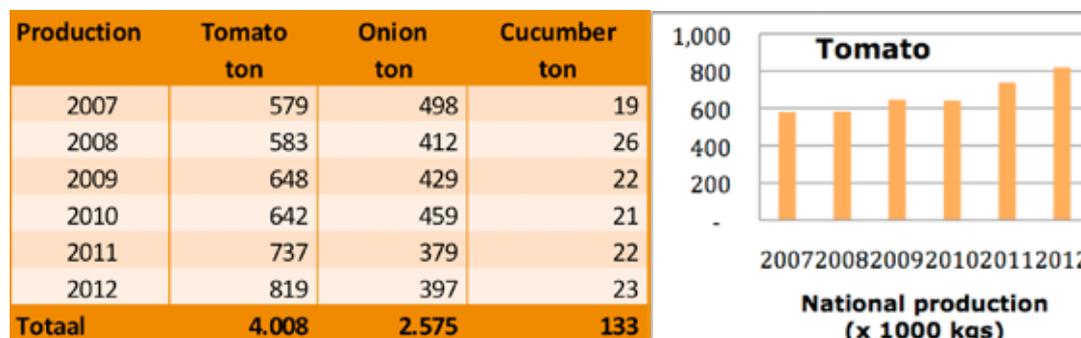
2.3.2.5 Varieties and plant material

Varieties

Obviously many crops are grown in Colombia. However, tomato production and onion production are leading subsectors. Unfortunately there are no actual figures available on the percentage that is produced in greenhouses.

The figures below, received via Asohofrucol, illustrate produced tonnages per year. Onion production has gone down over the years and will get a lot of renewed attention within the PTP program. Production of cucumbers is relatively stable over the years whereas the tomato production has increased over 40% since 2007.

Figure 10. Produced tonnages per year: tomato, onion and cucumber (2007-2012)



Source: Ministerio de Agricultura y Desarrollo Rural (2013)

Tomatoes are by far the main vegetable crop produced in Colombia. The production of tomato comes in a number of varieties. The largest being the so-called 'chonto' a typical variety in Colombia mostly used in pastas and sauces (processing) which is grown in the open field. There are also some large producers of 'tomate de arbol', a sort of tree tomato. Mentioned varieties are both produced in the open field and therefore not included in this study.

Tomatoes on the Vine (TOV) and cherry are also being produced, often in greenhouses, making up about 20% of the total production.

Leading producing regions are Boyacá, Antioquia, Norte de Santander and Cundinamarca (close to Bogotá). Average yields in the specific regions decreased slightly from 40,67 ton/Ha in 2011 to 39,87 ton/Ha in 2012. In 2012, 12.388 Ha were dedicated to tomato production, with a total production amounting to 581.980 tons. Currently, only about 27% of all tomatoes are produced in greenhouses.

Plant material

Importing seeds from foreign (Dutch) companies is on the rise. Various seed suppliers are entering the market and try to build a position. Expectations are that the market will grow further and a few well known distributors in Colombia are Eurosemillas and Semillas Saenz. These companies have many years of experience in importing seed and are very engaged in further development of the market. At the same time they are highly involved in improving the 'enabling environment' for companies to operate in by lobbying at government level (ICA) to make import procedures easier.

2.3.2.6 Main vegetable producers in Colombia

Vegetable producers are often small (<2 ha) and there's many of them. Other than cut flower producers, which are large scale companies dominating a singular export market (the US), these small producers are selling their produce locally and in a growing market. Cooperation over competition should therefore be the key word, thus improving the quality as well as the quantity of the produced vegetables.

The vegetable farmers as mentioned in the table below grow their product outside the open field as well as in greenhouses. Exact figures on open field and greenhouse production are not available.

Table 12. Area, production and yield of tomatoes per department, 2012

Tomatoes	2011			2012		
	area Ha	Production tonnage	Yield ton/Ha	area Ha	Production tonnage	Yield ton/Ha
Antioquia	1.153	64.810	56,21	1.187	66.560	56,07
boyacá	1.294	112.155	86,67	1.332	115.183	86,47
Caldas	1.108	61.483	55,49	1.140	63.143	55,39
cundinamarca	1.451	45.145	31,11	1.493	46.364	31,05
Huila	1.137	22.838	20,09	1.376	23.455	17,05
Norte de Santander	2.639	105.400	39,94	2.716	108.246	39,85
Santander	1.265	33.327	26,35	1.302	34.227	26,29
Valle del Cauca	1.693	31.919	18,85	1.742	32.781	18,82
Totals	11.740	477.077	40,64	12.288	489.959	39,87

Source: HHCO Tomato statistics report

Organization	Type	No. Ha
Horti Fresco	Lettuce, radish, onions, carrots	39,8
Eurosemillas	Tomatoes, peppers	3,8
Anolaima Guangata	Vegetables	9,3
San Gregado	Vegetables	16,0
Agrícola la Palma	Tomatoes, Cherry tomatoes, peppers	38,4
El Vallano	Grapes, peppers	8,0
La Carmelita	Tomatoes	4,0
Organicos gica	Tomatoes	-
Agrícola JR	Tomatoes	-
Lusitania	Tomatoes	-
Camsal	Tomatoes	-
Cibre	Tomatoes	-
La Traviesa SAS	Tomatoes	-

Source: www.ica.gov.co

2.3.2.7 Dutch breeders and seed suppliers active in Colombia

Vegetable seed production has grown into a multibillion dollar business, with worldwide production facilities and locations. While most seed is produced by large specialist growers, large amounts are still produced by small growers that produce seeds of only a few crops. These larger companies supply seed to commercial resellers as well as wholesalers. The resellers and wholesalers sell to vegetable and fruit growers, and to companies who package seed into packets and sell them on to the amateur gardener as well. Urban farming is a growing market in itself but beyond the scope of this study.

Most seed companies produce a catalogue – generally published during early winter for seed to be sown the following spring. They have extensive research facilities to produce plants with better genetic materials that result in improved uniformity and farmers appeal. These improved qualities might include disease resistance, higher yields or new colours. These improvements are often closely guarded to protect them from being utilized by other producers, thus plant cultivars are often sold under their own names and by international laws protected from being grown for seed production by others.

Since the Colombian market for vegetable production is growing, more seed will likely to be sold the coming years, especially when it will be easier to import because of less strict procedures concerning the Certificate of Origin (see also paragraph 2.4.3.3). Most seed producers look to establish long term partnerships with local distributors.

A selection of Dutch seed suppliers active in Colombia are mentioned below.

2.3.2.8 Production trends

Vegetables are highly vulnerable when it comes to the propagation of **diseases** and **pests**. Colombia has an extremely high usage rate of chemical pesticides and the country lacks strict phytosanitary protocols or guidelines on how to use these products properly. On the sales side, multinationals like Bayer and Syngenta often use aggressive sales techniques towards producers and there is little room for alternative measures.

With a population of 46 million inhabitants, Colombia does not produce enough vegetables to supply domestic and overseas markets. However, thanks to government incentives and promotional campaigns, the farmers' mind-set is changing and they are motivated to see their production as a **business**. The agricultural sector is becoming aware of the importance of being active at a higher level. Colombia's Ministry of Agriculture and other authorities are promoting the training of growers and technicians on **global quality and safety standards**.

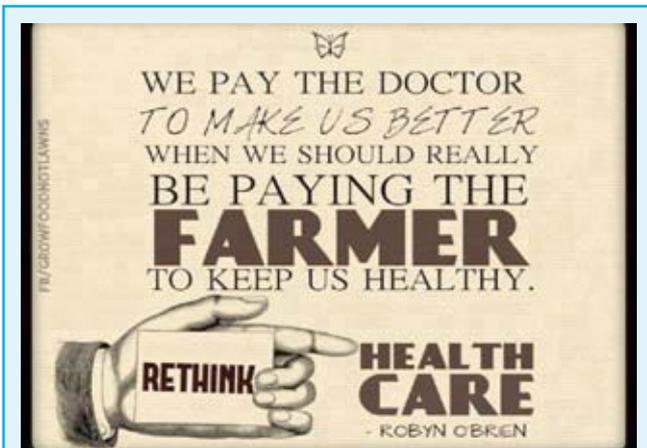
To be able to adhere to global quality and safety standards generally asks for **improved production methods and better technologies**. Production in greenhouses offers the opportunity to increase production significantly while maintaining full control over the climate in the greenhouse. However, local producers seem unwillingly to invest in new technology. Their vision on return on investments is relatively short as well, expecting to break even in 2-3 years.

When looking at vegetable production as such, potential can be found in **increasing vegetable production areas**. Between 2005 and 2011 the cultivated area for the major horticultural products has been growing at a rate of 2.4%, which is higher than the average growth rate of 1.6% for this period. During these 5 years the cultivated area increased from 802.000 to 940.000 hectares. As to their representation in the total agricultural area, fruits and vegetables are gaining ground, increasing from 19% in 2005 to 22.2% in 2011.

A selection of Dutch seed suppliers active in Colombia are mentioned below:

Organization	Type	Website
Rijk Zwaan	Tomatoes, melons,	www.rijkzwaan.com
Enza Zaden	Various	www.enzazaden.com
BeJo Seeds	Carrots, onions, tomatoes, peppers	www.bejo.nl
Eminent	Tomatoes, peppers, specialties	www.eminentseeds.nl
Bakker Brothers	Various	www.bakkerbrothers.nl
Nunhems Seeds	Various	www.nunhems.nl

Climate change is having an increasing effect on production. According to the Intergovernmental Panel on Climate change (IPCC) the variability and progression of climate change would cause farmers and their crops to face adverse situations in the coming years. Especially in tropical regions the situation can worsen significantly. In the case of Colombia, growers and particularly small producers will struggle with changing patterns, extreme weather conditions and increased risk of fire hazards, floods and plagues. This could have dramatic consequences for the vegetable sector.



Colombia's middle class is demanding **healthier fresh products**. To satisfy this relatively new demand, production methods must improve. There is a growing awareness of how food can influence the health of people and can lower the cost related to illness and diseases. Obesity is a growing problem and needs to be addressed. This trend paves the way for more conscious and sustainable food production and creates opportunities and a need for **Integrated Pest Management and biological crop control**. Methods that are also used in important export markets such as the US and Europe.

Safety standards become more and more important in a market that is evolving and wants to export. Retail chains are demanding ever cleaner and safer products and stricter food protocols (such as Maximum Residue Levels, MRL's) will become standard. Certifications like Global Gap, HACCP and BRC will certainly become standard market requirements.

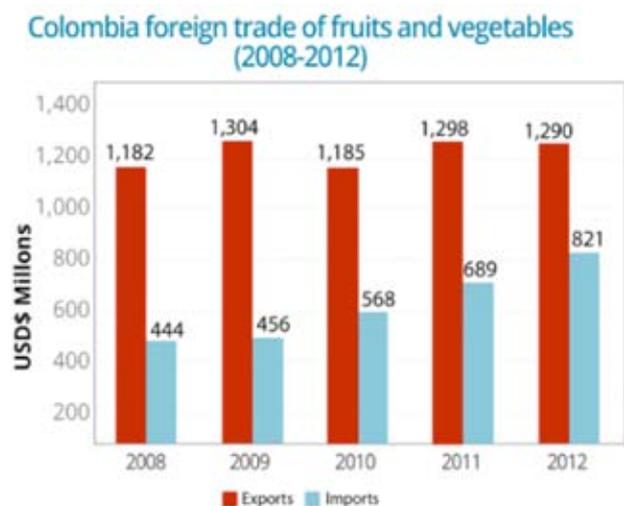
2.3.3 Trade

2.3.3.1 General

Colombia is the only country in South America with access to both, the Atlantic and the Pacific Ocean. Colombia's fruit & vegetables exports used to be more than double the size of imports when looking at the figure below. While export remained the same, imports doubled between 2008 and 2012.

Important to know is that **only fruit is exported** from Colombia and research showed that hardly any vegetables are exported and only sold on the local market. Branch organization Asohofrucol did not record any export of important crops like tomatoes, onions and cucumbers in the period from 2008-2012.

Figure 11. Colombia foreign trade of fruits and vegetables (2008-2012)



Source: National Administrative Department of Statistics (DANE)

Onion imports show a very volatile course from 72.613 tons in 2008, peaking in 2011 with 129.000 tons but going down to 83.711 tons in 2013. Production however decreased slightly from 412 tons in 2008 to 397 tons in 2012. It is incredible that so many onions consumed in Colombia are imported and it is therefore perfectly understandable that the government is promoting production of this crop via the PTP program.

For an important product like **tomatoes**, imports decreased from 3.700 tons in 2008 to 1.456 tons in 2013. Production however, increased from 582 tons in 2008 to 819 tons in 2012. The conclusion would be that consumption of tomatoes went down over that period.

Since **peppers** (hot peppers, paprika) are also part of the PTP program and are often produced in greenhouses, the product was included in this market research. Unfortunately no data is available on these crops. Nevertheless this is a very interesting growth opportunity for Colombian growers and a lot of knowledge is available within the Dutch horticultural industry that certainly can benefit Colombian growers. As a matter of fact, the Netherlands is a leading producer of (hot) peppers, but also a major supplier of productive varieties that are suitable for many different climates.

2.3.3.2 Sales and logistics

Vegetables are mostly sold to consumers via local farmer's markets. Since farmers usually do not have storage nor cooling facilities the product is sold to so called 'middlemen' who organize collection and distribution. To give an example: only 10% of tomatoes are sold via supermarkets whereas in general 30% of all fruit and vegetables is sold via the supermarket. Since the middle class is getting more spending power and increasingly purchasing vegetables at local supermarkets, this distribution channel is growing steadily. Colombia's domestic demand and household consumption have

grown steadily since 2007. The large young population living in urban areas has developed new tastes and preferences becoming more health-conscious and selective. The growing percentage of women in the workforce has increased the number of fast food restaurants and the demand for new value-added products. Economic research and current consumer trends indicate that buying decisions are primarily made based on quality, price and after-sales service.

Different formats of sales outlets can be identified:

- a. Big scale commerce (Hypermarkets, large supermarkets)
- b. Small supermarkets (self-service supermarkets - “superetes”)
- c. Traditional supermarkets (small and medium sized stores)
- d. Street formats
- e. Category specialists (Frutiver and Surtifruber)

A few examples of large players in retail:

- Exito (> 130 hypermarkets), Carulla (> 80 supermarkets) and Surtimax (> 55 discounters) are all owned by Casino from France
- Cencosud (Jumbo, Metro (before: Carrefour), from Chile
- Olimpica, from Colombia

Parties like Makro and Alkosto (Cash & Carry) are also active in Colombia. An interesting, general development is that more foreign retailers are investing in Colombia or exploring opportunities to invest. This implies that international production and quality standards will be demanded and thus production standards, also for the local market, need to improve.

Dutch importers/wholesalers of fruit and vegetables in Colombia

Import of vegetables from Colombia is (still) minimal. Normally vegetables have a lower value than fruit, so export from Colombia is more difficult. Since many years however, a large and growing variety of fruit is exported to different parts of the world. Dutch companies importing from Colombia are amongst others:

Organization	Website
Nature's Pride	www.naturespride.nl
Jaguar	www.jaguarthefreshcompany.nl
Eosta	www.eosta.nl
Total Produce	www.totalproduce.com
FSK	www.fskgroentenenfruit.com
Yex	www.yex.nl
Staay Food Group	www.staay.nl

Since hot peppers are on the list of the Colombian government to be promoted, this might be a product that can be exported to Europe and / or other parts of the world in due course. Hot peppers (Chili peppers, Jalapeno and alike) are high value crops which are now also imported from other continents. Africa for example exports different varieties to Europe during certain periods in the year.

Infrastructure

Despite the FTA between Colombia and the EU, exporting from Colombia will remain difficult due to a very weak local infrastructure which makes market access very difficult.

According to the National Association of Foreign Trade (Analdex) and the World Bank, costs in Colombia for transporting a container from a domestic production facility to a domestic port are 2.255 USD on average and takes 14 days. Import costs are 2.830 USD. In comparison: Chili can reach the same markets in 15 days at 980 USD per container, Peru (also having trade agreements) can supply in 12 days for 1.450 USD per container, the same as Mexico.

Currently, Colombia is actively working on improving domestic infrastructure and by 2020 the country will have 12.000 kilometres of arterial roads connecting cities and ports. Of this new network 3500 kilometres will be dual carriageways, allowing 40-tonne trucks to double their average speed.

2.3.3.3 Import procedures of seeds and plant material

As explained in more detail already in paragraph 2.2.3., VUCE or Ventanilla Unica de Comercio Exterior. VUCE is a digital information platform that facilitates the handling of all necessary paperwork regarding import and export procedures via one single channel. Since vegetables are hardly exported from Colombia, the platform is mostly used to facilitate the import procedures regarding seeds and other plant material from abroad. Via the VUCE website importers can register themselves and sign up to the system. They also use the Single Form of Foreign Trade, simplifying the necessary paperwork and facilitating a smooth digital process.

The ICA is the most important government body to take into account and to work with when dealing with the paperwork of importing seeds and/other plant material. As mentioned before, the ICA works with SISAP, an electronic system via which the necessary paperwork is dealt with.

Via the ICA website, www.ica.gov.co, relevant information can be found on procedures and the departments in charge can be contacted directly.

Regarding **import procedures** and the working methods of the ICA, Colombian importers / distributors and Dutch exporters are not always positive.

Currently 2 main certificates are needed for export to Colombia from the Netherlands:

1. Certificate of Origin, this is a commercial certificate that states the product and its origin.
2. Phytosanitary certificate, this certificate declares the health of the seeds related to the import requirements established by ICA.

Regarding the phytosanitary certificate (PC) there are 2 types:

- a. Export certificate, used for products with origin in the Netherlands and European Union.

On this certificate additional declarations can be stated based on field inspections and laboratory tests performed within Europe;

b. Re-exportation certificate, used for products with origin outside the European Union. On this certificate a referral is made to the PC from the country of origin, where the absence of many diseases is declared. Additional declarations can be stated on the document based on field inspections and laboratory tests performed in the Netherlands stating the absence of diseases.

Another issue is that Columbian distributors need an **import permit** for every single delivery, which costs time, effort, money and the process often take more than 1,5 months. Some countries do not have import permits at all because the documentation (as mentioned above) sufficiently covers the risks involved.

In Colombia, **Trial Seed Regulation** is not working at all or is non-existent. The current process is as explained in the figure on the next page.

Normally when a country requires variety registration a trial seed regulation exists so first or parallel variety trials can be done to decide whether a variety is interesting enough to apply for registration. Referring to the table above it takes 2 full years from first step until commercial sales is possible.

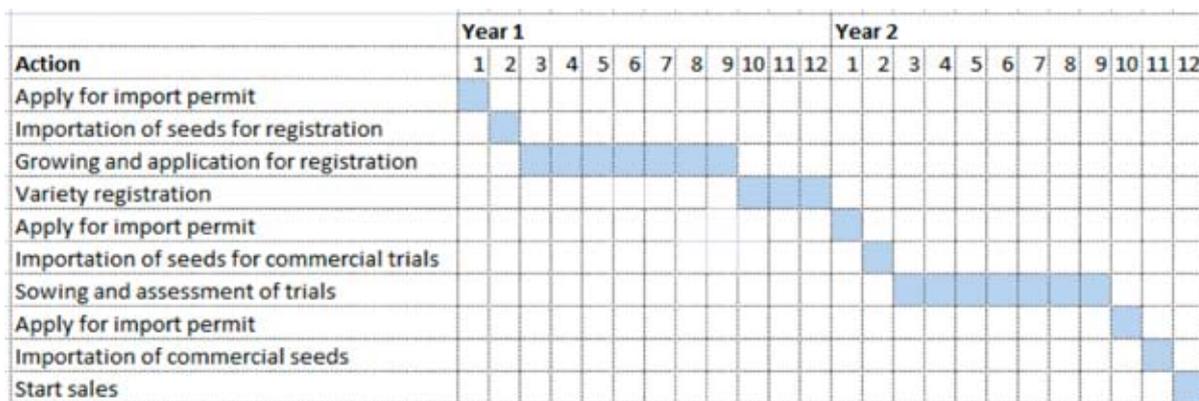
Currently, the ICA and the Netherlands Food and Consumer Product Safety Authority (www.nvwa.nl) are negotiating on these issues and looking for solutions.

The sector also has established its own research institute.

Asohofrucol (Association Hortifrutícola Colombia) receives 1% of their members' sales. This compulsory contribution is collected in a fund managed by the Association. They make the decisions concerning partnerships and project implementations: in 2006 they implemented over \$ 2,664 million in 18 projects with national and regional impact. Currently they are working on a new paprika project together with an international marketing bureau, which is of interest and importance for the export market involved. For more information visit www.asohofrucol.com.co.

Corpoica (Colombian Corporation of Agricultural Research) is the entity directed to research and development of scientific knowledge and technological innovation and transfer in agriculture. Corpoica is developing the National Plan for research, innovation, training, transfer and technological development to improve competitiveness and sustainability of vegetables. For more information go to: www.corpoica.org.co.

Whereas the Proflora trade fair in floriculture has become one of the major annual trade events in the world, the Agrofuturo Expo is Colombia's major promotional event in agriculture, organized in September every year, but hasn't reached the same international importance. However, to get a good overview of what Colombia's agricultural sector has to offer, the Agrofuturo is certainly the event to attend. It is facilitating the integration between producers,



2.3.4 Vegetable sector organization and trade promotion

The fruit and vegetable sector's main public body in charge of institutional developments is again the Ministry of Agriculture and Rural Development. When looking at vegetables, its production is so far destined for a growing local market and thus ICA plays a major roles concerning import of plant materials such as seeds, access to new varieties and biological pest control.

Various producer groups (such as banana and coffee producers) have organized themselves in associations and committees. The main association for fruit and vegetable producers is Asohofrucol. Together with the Ministry of Agriculture and Rural Development they are involved in the implementation of the so-called 'Plan Nacional de Fomento Hortifrutícola 2012-2022', an ambitious ten year plan to further develop the sector (see also the next paragraph).

landowners, investors and businesses in the agricultural production chain, around a common goal: transfer of knowledge and business development. See also: www.agrofuturocolombia.com.

2.4.5 Government policies

Between 2000 and 2011, the National Horticultural Development Fund (FNFH) has invested 62 billion pesos in funding research projects, technology transfer, marketing, export support, information systems and training for producers of fruits and vegetables in different regions of the country through 275 projects which have been prioritized by the National Board of the Development Fund Hortifrutícola (Table 12).

Table 12. Co-financed Projects with FNFH 2000-2011

Project #	Program		Invested by FNFH	%
2	AE	Export Support	\$ 241.702.000	0,39%
17	SI	Information Systems	\$ 3.154.599.646	5,09%
119	IV	Research	\$ 15.273.721.048	24,62%
28	CA	Training	\$ 3.346.683.108	5,40%
28	CO	Merchandise	\$ 3.344.867.389	5,39%
81	TR	Technology transfer	\$ 36.670.678.796	59,12%
		Total	\$ 62.032.251.987	100,00%

Despite the investments made to improve the level of income and living conditions of producers, horticulture continues to present a number of problems that hinder its development:

- Fragmented and geographically dispersed production
- Low sustainability and competitiveness
- No group or associative marketing
- Low generation of knowledge and technology regarding the production of fruit and vegetables to tropical conditions
- Excessive use of chemical pesticides
- Lack of a refrigerated supply chain and knowledge of marketing and (international) sales
- Few and expensive agricultural credit systems generally due to a lack of planning and long-term vision.

Similarly, the lack of producer organizations with the ability to solve and circumvent the market failures that affect individual small, medium and large farmers (in terms of funding, provision of inputs, support systems, technology and marketing) is considered another obstacle to growth in the vegetable sector (PFNH). Added to this is the fact that the largest percentage of the production is sold in informal markets, against which the producer has no bargaining power and is subject to the prices charged by middlemen.

To address these problems, Asohofrucol proposed the National Development Plan of Vegetables 2012-2022 (Plan Nacional de Fomento Hortifrutícola 2012-2022), an ambitious ten-year plan which, based on a comprehensive sector analysis, presents a large number of improvements and future scenarios for the industry. The goal is to make vegetable production in Colombia internationally competitive. The National Development Plan focuses on three products that were chosen due to their scores on worldwide popularity and competitiveness in Colombia: 1. Tomatoes 2. Onions 3. Paprika and pepper.

The National Development Plan describes solutions such as a better organization of the sector by encouraging partnerships between companies and sub-sectors and a larger, more controlling role for Asohofrucol. Cooperation in Colombia, including in floriculture, is very difficult as producers regard one another easily as competitors limiting the sharing of information on improving production and use of technology. The National Development Plan also aims towards reducing the use of chemical agents by improving the plant material, tighter controls and spray instructions (training of producers). A refrigerated supply and transportation improvement

has to be realized in order to make exports to markets such as the U.S., Canada and Europe possible. Improvement of phytosanitary aspects such as plant health checks and the availability of laboratories for tests, etc. are also included.

As a sub-sector within the agricultural sector, the production of fruit and vegetables is also part of the Productivity Transformation Program, a public-private partnership under the responsibility of the Ministry of Commerce, Industry and Tourism which concentrates on the further development of 'leading sectors' where exports play an important role. Among others, emphasis is put on improving supply channels, training and knowledge exchange and (international) regulations. These aspects are in line with the National Development Plan.

2.4 Horticultural supplies and services

It is clear that the cut flower sector is much further developed than both the ornamental plant and the vegetable sector. Roughly some 98% of all cut flowers is exported while a similar percentage of greenhouse vegetables and ornamental plants is produced for the local market. And thus, the cut flower sector shows a greater need for products and services from a horticultural supplier like the Netherlands. Many Dutch suppliers however provide their products and services to both ornamental and vegetable producers. Gradually, the current suppliers that are already active in Colombia are exploring opportunities in the vegetable market. The Colombian floricultural market can be characterized as relatively small in terms of number of medium sized/larger companies, but large in terms of acreage and production volume. In the vegetable sector many small producers are active and only a limited number of companies will be interesting for Dutch suppliers (capacity to invest, ability to innovate, etc.)

Quite some Dutch companies have been present in Colombia for many years. Actual presence in Colombia of Dutch companies is predominantly found in the subsectors of breeding and propagation (seeds, cuttings and new varieties) and logistics and sales. These groups have already been described in the paragraphs 2.3 and 2.4, other (potential) suppliers will be described in this paragraph.

Dutch suppliers of technical goods

The major issues in Colombia are improving the productivity per square meter and increasing the efficiency. It leaves no doubt that serious investments will have to be done to reach these goals. Colombia has very few suppliers of technical goods that can play a role in reaching these objectives and obviously, this creates opportunities for Dutch suppliers. Some of the suppliers of technical goods which are already active in Colombia are mentioned in the table below.

See: [Table 13. Dutch suppliers in Colombia of technical goods](#)

Dutch suppliers of operational goods

Most of the operational products available in the Colombian market are considered to be commodities. Dutch suppliers of commodities are scarce and therefore, only a few of them are actively present in Colombia. The companies mentioned below are just some of the companies which are trying to enter the market, but none of them can be considered to have a well-established position in the Colombian market yet, except for Chrysal.

See: [Table 14. Dutch suppliers in Colombia of operational goods](#)

Table 13. Dutch suppliers in Colombia of technical goods

Organization	Type	Website
Priva	Climate and fertigation systems	www.priva.nl
Formflex Metazet	Cultivation systems	www.formflex.nl
Dalsem Greenhouses	Turnkey greenhouses	www.dalsem.nl
Verkade Climate	Heating	www.verkadeklimaat.nl
SERCOM	Climate and water systems	www.sercom.nl
Bercomex	Postharvest equipment	www.bercomex.nl
Potveer	Floricultural machines	www.potveer.com

Table 14. Dutch suppliers in Colombia of operational goods

Organization	Type	Website
Van der Knaap Group	Cocopeat substrates	www.vanderknaap.info
Koppert Biological Systems	Biological crop protection	www.koppert.com
Chrysal	Flower care products	www.chrysal.com
MDK Flowers & Greens	Tropicals and leaf products	www.mdk.nl

Table 15. Dutch suppliers in Colombia of services

Organization	Type	Website
Wageningen UR	University / various services	www.wur.nl
GreenQ/DLV	Crop consultancy	www.greenq.nl , www.dlvplant.nl
Ideavelop	Business development	www.ideavelop.biz
Verbos Business Development	Sustainability services and BD	www.verbos.nl
Headventure	Marketing & business	www.headventure.nl
Q-Point	Quality systems	www.q-point-bv.nl

Table 16. Dutch suppliers in Colombia of logistical services

Organization	Type	Website
KLM	Air freight	www.klm.com
Martinair	Air freight	www.martinair.com
A. van Dongen & Heerschap	Sea freight	www.avandongenheerschap.nl

Dutch suppliers of services

Services from the Netherlands are from a quality point of view very good, but for Colombian producers usually too expensive. Due to the short term approach of doing business in Colombia, investing in advisors that have to be flown in from the Netherlands is considered to be 'a bridge too far'. Breeders and propagators solve this problem by means of their distributors and by frequent visits of their sales people and technical advisors to Colombia. This makes technical assistance accessible to a wider range of growers and thus, affordable.

See: [Table 15. Dutch suppliers in Colombia of services](#)

Logistics providers, predominantly airlines, have been active in Colombia for years. Now sea freight is getting more interesting as a means of transport to reach new markets, opportunities for service providers in this field will certainly increase.

See: [Table 16. Dutch suppliers in Colombia of logistical services](#)

2.5 Summary horticultural sector Colombia

The current status and situation of Colombia's horticultural sector (protected production) is summarized in table 17 below. The table has been divided in a vegetable part and an ornamental part based on the results of the executed desk and field research. Regarding some aspects, the results are quite different and further explanation is provided below the overview. It is also an indication of the fact that some of the aspects are less relevant or problematic for vegetables compared to ornamentals and the other way around. It also indicates that both sectors can be regarded as fully separate ones. In general there is little exchange among companies in the same subsector (too often regarded as direct competitors) and hardly any contact between producers active in the different subsectors (ornamentals and vegetables). This is a missed

opportunity since a lot of producers are dealing with the same problems when producing in greenhouses. Representative branch organisations and relevant government institutes are also confining themselves to one subsector and there's hardly any exchange of information between the ornamental and vegetable sector. As a result, no strategic plan for the development of protected cultivation in Colombia exists. When referring to serious constraints for Dutch companies to become active in the Colombian horticultural sector, field research led to the following conclusions (and already mentioned in this chapter);

- Import/export procedures and cooperation with the ICA
- Revaluation of the Colombian Peso

Please note that the selection of 17 key aspects and its parameters should be regarded as a compromise between the readability of the report on one hand and the level of detail of the information given in this report on the other. More information on the first 10 general aspects can be found in Chapter 1.

See: [Table 17. Evaluation of the 17 key aspects – Colombia](#)

1. **Political aspects (3 - 4).** Colombian politics have dramatically improved in the past 10 years. President Uribe and his successor Santos have made great progress in coming to terms with the FARC although no peace treaty has been signed yet. Fact is that security has improved a lot and this has spurred national and international investment. Colombia has become a place to be visited. By investors and even by tourists. That fact can be considered to be a tremendous step forward for a troubled country in the 80's and 90's of the last century.
2. **Social aspects (3 - 4).** Along with great political improvement, social circumstances have advanced likewise. Education, health care and social security have improved and (minimum) wages are increasing.

Table 17. Evaluation of the 17 key aspects – Colombia (vegetables or veg. and ornamentals or orn.)

General aspects		Veg.	Orn.	Horticultural aspects		Veg.	Orn.
1.	Political aspects	3	4	11.	Climate & natural resources	4	4
2.	Social aspects	3	4	12.	Horticultural sector organization	2	4
3.	Safety	4	4	13.	Phytosanitary service	2	3
4.	Economic aspects	4	4	14.	Horticultural supplies	3	4
5.	Fiscal aspects	2	3	15.	Labour (unskilled)	3	2
6.	Investment capital	3	3	16.	Labour (management)	3	4
7.	Infrastructure (local)	1	2	17.	Subsidies	2	2
8.	Infrastructure (export)	1	3				
9.	Communication	3	4				
10.	Trade agreements	4	4				

Description:

1 = Bad	2 = Weak	3 = Average	4 = Good	5 = Excellent
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3. **Safety (4 - 4).** Criminal activity is still a problem in rural areas where the FARC maintains conflicts with government forces. However, the situation is much better than it used to be and investors do no longer have to regard security as the main reason not to invest in Colombia.
4. **Economic aspects (4 - 4).** Foreign investment, (legal) security and a country image that has switched from very troubled to challenging and inspiring, has had great economic impact. Almost all interviewed people consider the economy to be 'good'.
5. **Fiscal aspects (2 - 3).** Colombia has a fairly good fiscal system although thoughts and opinions on this are quite diverse.
6. **Investment capital (3 - 3).** The access to capital is acceptable, but long term investments are, like in most other Latin American countries, hard to accomplish. Colombia is a country where entrepreneurs traditionally concentrate on projects and investments that have a very short ROI. Simply because it used to be too risky to invest in long term projects. Although this situation seems to be slightly changing, it is definitely a limiting factor for many companies that need to invest in efficiency (reduction of labour) and productivity.
7. **Infrastructure (local, 1 - 2).** A difference in opinion can be detected here between the vegetable sector and the ornamental sector for obvious reasons. Growers from ornamental plants are located in Rio Negro – Medellin or in Sabana or Cundinamarca near Bogota. Both regions have good access to international airports and therefore, the national road system is no major worry. In case sea freight will become more important in 'the world of flowers', (the cost of) internal transport will definitely become an obstacle. In fact, for vegetable growers it already is since they are merely producing for the local market.
8. **Infrastructure (export, 1 - 3).** The biggest difference in opinion between the two subsectors exists when it comes to logistics for export. Ornamentals use air cargo and virtually all produced flowers are exported by plane. Volumes are enormous and rates are therefore very competitive. This can be considered as a good comparative advantage if one considers the air freight rates of other Latin American countries to North America. Greenhouse vegetable producers however, export hardly anything and have to deal with sea freight and expensive internal freight which is no cheaper than other Latin American competitors. For them, it is considered to be the weakest aspect (combined with local logistics) in their development towards becoming exporters.
9. **Communication (3 - 4).** Communication is considered to be good although the big flower exporters are more positive than the small sized vegetable growers. On average, no major complaints about communication.
10. **Trade agreements (4 - 4).** Since the political situation in Colombia has stabilized, numerous FTA's have been signed with many countries. For the ornamental sector the treaty with the United States was of major importance to maintain and strengthen their position as number 1 fresh flower provider. Most interviewed persons are satisfied, although it was mentioned frequently that Colombia could benefit more from signed agreements.
11. **Climate and natural resources (4 - 5).** All sorts of climates can be found in Colombia, land is available and various flat highlands make production in greenhouses feasible. However, costs of land have become extremely high. In many cases, even higher than in the Netherlands. On average, the quality and availability of water is good although everyone seems to be worried about the substantial climate change that is taking place in Colombia. Nevertheless, only Colombia and Ecuador have 'altiplanos' well over 2000 meters ASL facilitating the production of many cut flowers.
12. **Horticultural sector organization (2 - 4).** The organisation of the sector is another matter that shows a great difference of opinion between entrepreneurs in vegetables and ornamentals. Although quite some major companies are no member of Asocolflores (and Ceniflores), the ornamental sector is considered to be quite well organised, and this was mostly initiated by the flower growers themselves. Asohofrucol, the branch organisation for fruit and vegetable producers has compiled a strategic plan for the vegetable sector and has stronger ties to the national government. However, the private sector at times seems to doubt its mandate.
13. **Phytopsanitary service (2 - 3).** The ICA, responsible for phytosanitary measures in Colombia, stands for the great gap between the private sector and the public sector. Representatives from ICA are positive on the way imports and registrations of products are currently organised and have many documents available to prove their efficiency. On the other hand, both the vegetable and the ornamental sector consider all kind of import restrictions and registrations procedures amongst the major restraints to further develop their activities.
14. **Horticultural supplies (3 - 4).** It can be concluded that all basic supplies are available in Colombia against acceptable prices. However, it must be said that most distributors or agents of foreign products usually sell mainstream commodities. The sales of the newest innovations and technical assistance to use these and other products that need further training are usually not the main interest of these distributors/agents. The necessary technical assistance on new products therefore is provided by the original producer or by (agronomists of) the local (flower) producer. Many vegetable growers have no such agronomists and thus, no access to such information. There is a strong, continuous lobby from the distributors of chemicals and that lobby definitely does not help developments in the field of sustainability. In addition, the government does not play a proactive role to change the situation. One of the leading flower producers said that the slogan 'Colombia, land of flowers' should be changed into 'Colombia, land of chemicals'.
15. **Labour (unskilled, 3 - 2).** The rate of the Peso against the USD combined with the great increase in salaries has made Colombian flower exports quite vulnerable. Some 55% of production costs (on average) are considered to be labour costs

making it nowadays not only attractive, but a precondition to invest in efficiency measures to remain competitive in the international market. For the vegetable sector, this topic is of less importance as virtually all produce goes to the local market and no major competition is present from foreign suppliers (greenhouse vegetables).

Besides, labour is less available due to fierce competition with other sectors, especially in regions where flowers are produced. People prefer cleaner jobs than working in horticulture.

16. **Labour (management, 3 - 4).** No real complaints on a management level although each manager that enters any type of company producing in greenhouses, needs to be trained from scratch. Agronomy courses on university level are rather well, but very general. Protected production is not a specialized topic. Agronomists working on flower farms are usually trained on the farm itself, but also by visiting suppliers and sometimes abroad.

Technical assistance provided towards vegetable producers is usually of a low level and not aimed at improving production by implementing new technologies (greenhouses, irrigation systems etc.). Vegetable producers are often not aware that simple improvements (which are often not expensive) can improve their yields considerably and thus make them more into 'entrepreneurs' and 'managers' that just growers of crops. Improving management in the vegetable sector has a lot to do with changing their mentality as well.

17. **Subsidies (2 - 2).** On multiple levels subsidies are available for companies active in horticulture (also see Chapter 2) and members of Asocolflores also receive support towards their operations in various ways. Accessibility of these funds is not always clear or easy, but the government is gradually paying more attention to the sector and it is expected that this situation will change.

2.6 Corporate social responsibility

Colombia has a long tradition of corporate social responsibility across many industries. Beneficiaries of CSR programs include students, children, populations vulnerable to Colombia's armed conflict, victims of violence, and the environment. Often programs are supported by foreign donors such as USAID.

Larger companies, in particular, structure their CSR programs in line with generally accepted international CSR principles. On several occasions, companies in Colombia have been recognized on an international level, including by the US State Department, for their CSR commitments.

The OECD Guidelines for Multinational Enterprises offer a framework for companies to deal with societal issues like child labour, adverse environmental impact and corruption and provide guidance for (multinational) companies on framing their CSR-policy. The good news is that in July 2014 representatives of the agricultural committee of the OECD met with the Minister of Agriculture and Rural Development, Rubén Darío Lizarralde, in Colombia to evaluate the progress of the efforts the country is

making to join the OECD. This compliance process takes usually more than a year but Colombia is on track. Joining this intergovernmental body will contribute to the competitiveness and development of the commercial sector of Colombia.

2.6.1. Risks

With the production of flowers and vegetables both social and environmental risks are involved:

Environmental risks

Extensive agricultural land use and the conversion of natural resources in tropical products can cause erosion, leaching, land fertility reduction, primary materials, species, fragmentation of animal habitats and loss of biodiversity.

Besides, the variability and progression of climate change is already leading to increased uncertainties for farmers and their crops, especially of fire hazards, floods and plagues.

The most pressing issue at this moment however is the abundant use of chemical pesticides as well as nitrates and phosphates. As flowers and vegetables are grown outside or in very low-tech greenhouses, plagues and diseases bear good chances to do harm. The general response of producers is to use a lot of pesticides. In the countryside, small farmers are often subject to the aggressive sales tactics of representatives from chemical companies and they are not well informed on the risks excessive use is bringing along. Over time, some diseases become resistant to certain pesticides which leads even more extensive usage of stronger pesticides. This is an alarming situation that also could be positively influenced by adapting more technology and training farmers in becoming more aware of the risks of pesticide use. At the same time, more attention for integrated pest management programs at the farms and the use of biological pest control measures would provide farmers with better and healthier alternatives.

Social risks

Flower and vegetable production are an important source of direct and indirect jobs. However as both industries are highly labour intensive, there will always be risks of exploitation of overworking and underpaid labourers. Working conditions are sometimes tough and productivity demands can be very high. Adapting more technology and mechanization could positively contribute to a safer and more comfortable working environment for personnel. At the same time, the floricultural industry offers much needed social stability as well in the form of steady jobs in areas harmed by the armed conflict. Funded in part by USAID branch organization Asocolflores for a number of years managed the so-called 'School of Floriculture' where farmers received practical education related to the flower industry and after a period of 9 months a steady job was offered at a flower farm.

Still, basic labour rights including the right to freedom of association and collective bargaining, are often violated and the country is considered to be "partly free" according to the Freedom House Country List. This means that there is an oppressive regime,

with regard to political rights and civil liberties. Human rights abuses persisted during the year 2012, with land rights advocates frequently targeted and paramilitary “successor groups” continuing to expand. The issue of ‘land grabbing’ is less evident in horticulture and is more relevant in fruit production.

Market risks

The power of the growing number of supermarket chains is increasing and they demand high environmental and social standards, but are often not willing to pay much more for these higher standards. This development puts profit margins in the agricultural (vegetables and fruit for the local market) sector under even more pressure. Supply chains become more transparency meaning that measuring will become increasingly important (tell what you do and do what you tell).

2.6.2. Sector initiatives

The branch organization Asohofrucol of fruits and vegetable producers recognizes the environmental problems related to its sector and has published an Environmental Guide to more sustainable production. In this report, environmental problems are addressed and recommendations are given how to produce in an environmentally friendlier manner.

In floriculture, Asocolflores of flower producers recognizes both social and environmental problems and has started different initiatives to improve the situation. Examples are specific training courses, peace conflict sessions and the provision of day-care centres. The CSR programs that Asocolflores initiates for its members are not compulsory but generally all members participate. Recently the organization is also offering these programs to non-members active in the Eje Cafetal that work in the production of tropical flowers.

Since 1996 the organization has been working with the ‘Finca Florverde’ program. A comprehensive program and a “strategic tool” to promote sustainable floriculture with social responsibility at both company level and throughout the sector. Its implementation ensures compliance with strict international social and environmental standards from planting to postharvest. Within the Finca Florverde program companies can opt to become certified producers and receive the Florverde certificate, now aligned with Global GAP and Rainforest Alliance standards. More information can be found on www.florverde.org.

In the fruit & vegetable sector there are various standards, initiatives and guidelines available to support companies with their strategy on Corporate Social Responsibility. Some of them are very practical tools which can be implemented easily. Others are more comprehensive. A few relevant initiatives for Colombia are mentioned below:

Ethical Trading Initiative (ETI)

ETI is an alliance of companies, trade unions and voluntary organisations that work in partnership to improve the working lives of people across the globe who make or grow consumer goods - everything from tea to T-shirts, from flowers to footballs. Increasingly companies are applying it to goods not for resale, from office equipment to construction materials and to logistics operations. Members must report annually on the implementation of the ETI Code. See also www.ethicaltrade.org

SIFAV2020

The Dutch Sustainability Initiative Fruit and Vegetables (SIFAV), aims to make imports of fruit and vegetables from Africa, Asia and South America 100% sustainable in 2020. Dutch retailers, traders and civil society organizations have signed a covenant committing to 100% sustainable sourcing. In January 2014, 30% of companies’ total import (in volumes) will be sustainable, in January 2015 50% and 100% in January 2020. The program is approaching international retailers, traders and brands to join SIFAV. Colombia is one of their focus countries, see also www.sifav.com.

Business Social Compliance Initiative (BSCI)

The Business Social Compliance Initiative is a leading business-driven initiative for companies committed to improving working conditions in their global supply chain. Target constituents of BSCI are producers and exporters who are based in risk countries and supply their products to at least one BSCI participant. BSCI is the official partner of the SIFAV2020. Go also to: www.bsci-intl.org.

IFOAM

Organic farming is growing in Colombia. The International Federation of Organic Agriculture Movements (IFOAM) is an umbrella organization of 750 organizations and institutions in more than 100 countries. IFOAM aims to disseminate information and knowledge about organic farming and to promote their application. The Principles of Organic Agriculture consist of health, ecology, fairness and care. IFOAM established accreditation criteria for certification programs based on these principles. The Organic Guarantee System (OGS) unites the global organic farming with a common system of standards, authentication methods and market identity. More information can be found on www.ifoam.org.

3. Horticultural production and trade in the Netherlands

3.1 Introduction

The Dutch horticultural sector (production of both vegetables and ornamentals in glass greenhouses) is of substantial importance to the Dutch economy. Within this horticultural cluster some 30.000 companies (13.500 primary producers and 16.500 others) are active and together they create 300.000 direct and indirect jobs. About 80% of the companies are family owned and considered to be small or medium sized Enterprises (SME's).

The total production acreage is 9.960 ha that together creates a production value of 7,9 billion Euro and the export value was 16,5 billion euro in 2012. The Netherlands is the second biggest exporter of agricultural produce in the world and the horticultural sector contributes substantially to this position.

In the last decade, the importance of international trade increased significantly for many Dutch horticultural players. The economic crisis, but also improved logistics and the increasing international need for knowledge and technology accelerated this process. The Netherlands truly acts as a 'one stop shop' and main gateway to Europe when it comes to the import and re-export of horticultural products. The integrated systems of logistics and proximity of production locations, but also one of the largest consumer markets, Europe, have reached an extremely high level of productivity and efficiency and can be regarded as the major competitive advantage the sector has over its international competitors.

On a production level, investments in the Netherlands are decreasing and / or are being postponed, forcing Dutch suppliers of knowledge and technology to expand their business to (new) export markets.

This chapter elaborates on the current situation of the sub sector **ornamentals** and **vegetables** (produced in greenhouses) in the Netherlands and therefore follows a similar set up as the previous chapter about Colombia.

3.2 Ornamentals

3.2.1 Sector organization

The Dutch ornamental sector is well organised. The majority of the ornamental producers are relatively small with an obvious need to cooperate and organize themselves in order to survive. This cultural behaviour is deeply rooted in the sector and started more than 100 years ago with the establishment of cooperatives like the auctions (FloraHolland) and financial institutes (Rabobank, Interpolis) who are still present in the market. Study clubs for each crop (small groups of producers) are another typical phenomena of Dutch horticulture. In fact, this cultural and historical background

probably marks the main difference between the way that the two biggest producers of cut flowers in the world, The Netherlands and Colombia, are organised.

The Dutch sector created branch organisations for producers, such as LTO, Plantum (breeders) and VGB and HBAG (traders). These branch organisations represent the interests of their members (producers, breeders and traders) towards the government, develop quality standards and set market requirements (intellectual property protection, phytosanitary quality standards and certification). It needs to be emphasised that in recent years however this strong collective cooperation has been diminishing and sector fragmentation is becoming visible. Umbrella organisations (Flora Holland and Flower Council of Holland for instance) are merged or discontinued (Productschap Tuinbouw). Another interesting development in the Netherlands of the past 10 years is that the former Ministry of Agriculture merged with Ministry of Economic Affairs. The agricultural sector is simply regarded as part of our economy, just like any other sector that contributes to it.

The aim of such changes is to maintain a sound transfer of knowledge which is secured and strengthened via the close cooperation between producers and traders on the one hand and research/educational institutes and extension organisations on the other.

This 'Golden Triangle' approach is especially visible in the setup of so-called 'Greenports', horticultural 'hotspots', where various players in the horticultural chain are located and work together. A well-known example of a Greenport is the Westland area, also called the 'Garden of Europe' due to its high concentration of horticultural production and trading companies.

3.2.2 Production

The ornamental sector can be divided in three sub sectors: the production and trade of: 1. plant material (seeds, cuttings etc.), 2. cut flowers and cut foliage and 3. pot and bedding plants. In the Netherlands, the total production surface of ornamentals amounts to almost 3.900 ha. Due to economic recession and worldwide financial crisis, this production surface declined with 17% over the last 5 years. At the beginning of 2014 there were 2.970 primary production companies active in the ornamental sector (production in glass greenhouses). The sector provides a total of around 125.000 direct jobs, a number that has been fairly stable in recent years.

3.2.2.1 Propagation material

Seeds and cuttings

The Netherlands is the world's largest exporter of ornamental seeds and cuttings with a value of 2,5 billion Euro. Companies in this sector are engaged in breeding, propagation, production and trade of seeds, cuttings, bulbs, tubers and young plants. About 10.000 people are working in this industry. Dutch breeders and propagators of ornamentals (100 companies in total) together represented an export value of 390 million Euro in 2012.

The Dutch leading position in this sector was obtained via constant product and process innovation. Dutch breeders and propagators supply growers with new varieties, high quality plant materials, high quality knowledge and extensive after sales services. These companies are knowledge intensive and invest on average 15% of their turnover on Research and Development.

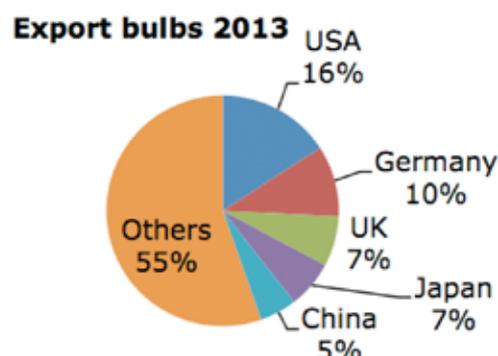
See: [Table 18. Main Dutch breeders – propagators](#)

Flower bulbs

The production and trade (export) of flower bulbs takes a special position within the sub sector propagation materials. Dutch flower bulbs dominate the world market. The Dutch production value of bulbs is 575 million Euro and the export value accounts for 695 million Euro.

The US, Germany, UK, Japan and China are the most important destination countries. The most important species are Tulip, Lily, Gladiolus, Hyacinth and Calla. The Dutch domination has its roots in high quality, varied assortment, good availability, extensive knowhow and efficient logistics. Several large Dutch bulb suppliers also have bulb production fields in the southern hemisphere e.g. Chile, South Africa and New Zealand to supply high quality bulbs year-round.

Figure 12. Exports of flower bulbs



Source: LTO/LEI/CBS

See: [Table 19. Main Dutch breeders – propagators](#)

3.2.2.2 Cut flowers and cut foliage

In recent years, the number of production companies is declining strongly, due to high costs of energy and labour. Quite some Dutch production companies have been reaching their 'productivity ceiling'. There has been little room to increase their yields per

Table 18. Main Dutch breeders – propagators (seeds and cuttings)

Organization	Type	Website
DNA Green Group	Cut flowers, pot plants, bedding plants	www.dnagreengroup.com
Beekenkamp group	Pot plants, chrysanthemum	www.beekenkamp.nl
Anthuria	Anthurium, orchids	www.anthuria.nl
HilverdaKooij/ Florist	Cut flowers, pot plants	www.hilverdakooij.nl www.florist.nl
Royal Van Zanten	Cut flowers, pot plants	www.royalvanzanten.com
Florensis	Pot plants, bedding plants	www.florensis.nl
Olij Innovation	Roses	www.olijrozen.nl
Floricultura	Orchids	www.floricultura.nl
Schoneveld	Pot plants	www.schoneveld.nl
Schreurs	Cut flowers	www.schreurs.nl

Table 19. Main Dutch breeders – propagators (flower bulbs)

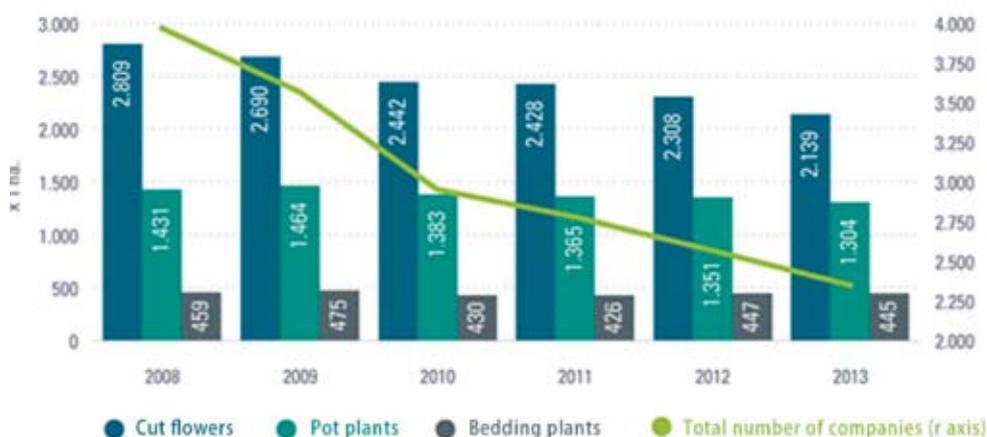
Organization	Type	Website
Mak Breeding bv	Lilies	www.makbreeding.nl
Gebr. Vletter & de Haan	Lilies	www.lilybreeding.com
Paauw Lilies	Lilies	www.paauwlilies.nl
Pater Bloembollen bv	Lilies and tulips	www.paterbloembollen.nl
Sande bv	Calla	www.sandegroup.nl
Jan de Wit & zn	Lilies, Tulips	www.jandewitenzonen.com
Van den Bos Flowerbulbs	Lilies, Tulips	www.vandenbos.nl
Onings bv	Lilies, Tulips	www.onings.com
Leek Tulips	Tulips	www.leektulips.nl
Jan Langedijk Bloembollen bv	Lilies, Tulips	www.langedijk.nl

square meter nor to reduce costs. In the cut flower sector the fierce competition from Africa and South America is another important factor. As a result, companies are fewer but larger. The average surface of ornamental companies doubled the last decade. This tendency is illustrated in the table below.

3.2.2.3 Pot and bedding plants

The production value of the most important pot plant species are: Phalaenopsis (415 million Euro), Kalanchoe (54 million Euro), Anthurium (52 million Euro), potted Rose (45 million Euro), potted Chrysanthemum (31 million Euro), Dracaena (30 million Euro).

Figure 13. Surface of Dutch ornamentals



Source: LEI/CBS

Regarding production volumes; the most important cut flower species grown in the Netherlands are Chrysanthemum (510 ha), Rose (460 ha) and Gerbera (180 ha). The production value of the most popular (widely produced) varieties is divided as follows; Rose 304 million Euro, Chrysanthemum 222 million Euro, Tulip 204 million Euro, Lily 117 million Euro and Gerbera 101 million Euro. Cut flowers are traditionally sold through the clock system at the auction although an increasing percentage is sold directly to the wholesaler, with or without using the auctions as an intermediate.

Most species in the top 10 are flowering pot plants. The production of Phalaenopsis proved to be especially strong in the last decade and now represents more than 50% of the total production value. Phalaenopsis can be regarded as a matured subsector. The Phalaenopsis thanks its popularity to its durable qualities as flowering pot plant, its favourable price and its adaptability for planned production in high volumes. Bedding plants are considered a separate subsector and are sold from February (violets) until springtime (other species). Producers of bedding plants usually combine this with the production of for instance Poinsettia. The intermediate office at the auctions traditionally sold a large percentage of pot plants compared to clock sales.

Table 20. Main cut flower producers

Organization	Type	Website
Worldwide Satter	Chrysanthemum, roses, orchids	www.satterroses.nl
LMC	Chrysanthemum	www.leen-middelburg.nl
Kreling Chrysanten	Chrysanthemum	www.krelingchrysant.nl
Van den Berg Roses	Roses	www.vandenbergroses.com
Marjoland	Roses	www.marjoland.com
Zuurbier & Co	Roses	www.zuurbier.com
Holstein Flowers	Gerbera	www.holsteinflowers.nl
LG Flowers	Gerbera	www.lansbergen.com
Germaco	Lily	www.germaco.nl
Paauw	Lily	www.paauwlilies.nl
Tesselaar Alstroemeria	Alstroemeria	www.tesselaar.eu

Table 21. Selection of growers of pot and bedding plants

Organization	Type	Website
Vreugdenhil en Klugt Combinatie	Bedding plants	www.klugt-delier.nl
Perkgoed partners	Bedding plants	www.perkgoedpartners.nl
SO natural	Phalaenopsis	www.sonatural.nl
Maarel Orchids	Phalaenopsis	www.maarelorchids.nl
Sion	Phalaenopsis	www.sion.eu
Ter Laak Orchids	Phalaenopsis	www.orchidee.nl
Optiflor	Phalaenopsis	www.optiflor.nl
SV.CO	Flowering pot plants	www.svco.nl
Bunnik Plants	Various pot plants	www.bunnikplants.nl
Stolk Brothers	Anthurium	www.stolkbrothers.nl
Vireo	Foliage pot plants	www.vireoplantsales.com
Ammerlaan TGI	Green plants	www.ammerlaan-tgi.nl
Sjaloom	Green plants	www.sjaloombv.nl
D.C. van Geest	Various pot plants	www.geestpotplanten.nl

3.2.3 Trade

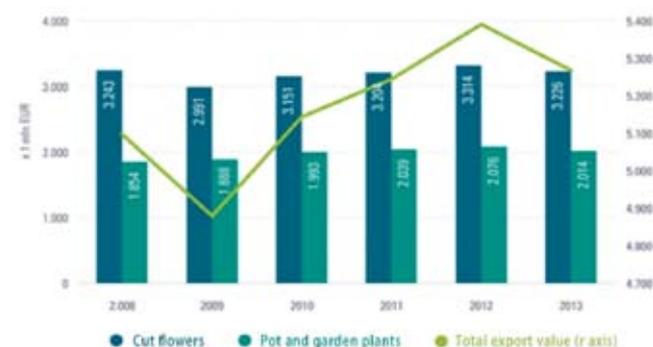
The worldwide consumption of ornamentals is about 35 billion Euro with Europe being responsible for about 45%. Dutch wholesalers are responsible for 60% of the world trade in flowers and plants making them market leaders in Europe. There are 700 wholesalers of ornamentals active in the sector, but this number is declining due to economies of scale. About 32 exporters have a turnover of more than 40 million Euro. They represent 50% of the whole sale market. The largest wholesaler (Dutch Flower Group) has a turnover of over 1 billion Euro.

Historically, the Dutch flower auctions are the world largest market places for flowers and plants. The FloraHolland auction is the largest player in the field with an annual turnover of over 4 billion Euro. The vigorous horticultural sector has turned the Netherlands into the focal point of the global ornamental trade, due to an intricate distribution network, efficient logistics, extensive assortment, innovative production and high technology and specialised service companies.

International competition is increasing and the leading role of Dutch traders and distributors is under pressure. More and more products are sold directly in the global market without any involvement of Dutch parties. This means that the traditional ‘traders’ need to turn into ‘service providers’, focusing on providing added value to their clients instead of only selling pot plants or cut flowers. To this end, Dutch companies are forced to set up (own) offices in the major horticultural production countries. The Netherlands as such is losing (part of) its dominant logistical position forcing traders to have their own strategic – geographical offices around the world.

The Dutch export value of ornamental products (cut flowers and potted plants) was 5,27 billion Euro in 2013 (divided in 3,2 billion Euro for cut flowers and 2,1 billion Euro for potted plants). This value increased almost 10% in the last five years. The Dutch import value of cut flowers amounted to 800 million Euro in 2012.

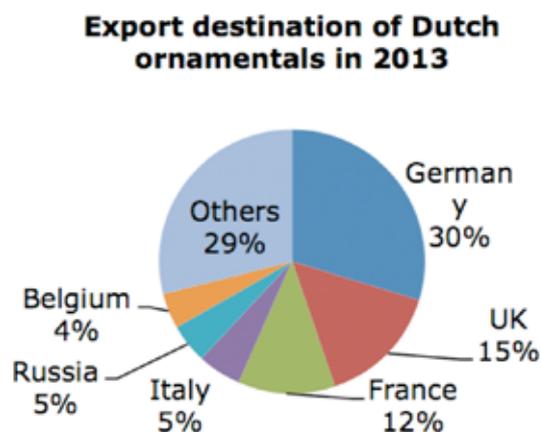
Figure 14. Export value of Dutch ornamentals, flowers and plants



Source: HBAG

When looking at export destinations (figure below), Dutch ornamentals are mainly exported to neighbour Germany, followed by the UK and France. Eastern Europe is also increasingly popular as export destination.

Figure 15. Export of Dutch ornamentals



Source: HBAG

of food, unfortunately there is a tendency of decreasing consumption in the Netherlands and in Europe. At the same time global consumption is increasing, due to the growth of the world population and one of the biggest challenges we face is how to feed 9 billion people in a sustainable way.

There are many parallels between the subsectors ornamentals and vegetables. In vegetables the Dutch **production sector** created branch organisations for producers, such as the Dutch Producers Association (DPA). DPA represents its member's interests on a national and international level.

The **trade & distribution sector** is represented by branch organisation Frugi Venta which concentrates issues concerning import and export of fruit & vegetables and the constant improvement of sector logistics.

Where production and trade were historically two different individual parties in the chain trying to benefit from each other, they nowadays work much more together as partners with a focus

Table 22. Selection of the leading trade companies in the ornamental sector

Organization	Type	Website
Dutch Flower Group	Bedding plants	www.dfg.nl
Royal Lemkes Group	Bedding plants	www.lemkes.nl
Fleurametz	Phalaenopsis	www.fleurametz.com
Waterdrinker Aalsmeer	Phalaenopsis	www.waterdrinker.nl
Van Vliet Flower Group	Phalaenopsis	www.jvanvliet.com
Noviflora	Phalaenopsis	www.noviflora.nl
Westland Bloemen Export	Phalaenopsis	www.wbe.nl
Vida Verde	Flowering pot plants	www.vida-verde.com
De Gooijer International	Various pot plants	www.dgi.nl
Wesselman	Anthurium	www.wesselmanflowers.nl
Adomex	Foliage pot plants	www.adomex.nl
Heemskerk	Green plants	www.heemskerkflowers.com
Van der Plas Groep	Green plants	www.wvdplas.nl

3.3 Vegetables

3.3.1 Sector organization

The Netherlands is the world's second largest exporter of agricultural products, after the United States. Together with the United States and France, the Netherlands is one of the world's three leading producers of vegetables and fruit. It supplies a quarter of the vegetables that are exported from Europe. The agri-business is one of the driving forces behind the Dutch economy.

The Dutch fruit & vegetables supply chain is relatively traditional, but global. Innovation is needed to increase the consumption, but also see the food sector/the farmer as the pharmacy of the world being able to significantly reduce illness and avoid health problems. Because even though more attention is paid to the health function

on the final consumer. Per 2014 both associations merged and the new organisation, 'GroentenFruit Huis' or in English, 'Fresh Produce Centre' addresses the following main topics:

- Food & health
- Food safety & food quality
- Market affairs & statistics
- Logistics & ICT

When it comes to **suppliers of knowledge and technology**, it has been clear that the Netherlands has become too small and these companies are now selling their products and services worldwide. The Dutch government is actively promoting cooperation initiatives between such parties by way of financial support and the set-up of public private partnerships.

A few examples of internationally operating clusters are Greenport Holland International and NethWork which are promoting sustainable horticulture and support local growers / investors with knowledge, experience, network, goods and service.

Top Sectors

Maintaining an internationally competitive business environment requires permanent effort. This is why the Dutch government in 2010 launched a new enterprise policy consisting of two different tracks; the first track serves as an “economic agenda” that strengthens innovation frameworks, reduces regulations, improves access to finance and ensures a better match between the education system and the labour market. The second track acknowledges the government’s role in building multi-actor systems that can deliver an above average contribution to economic growth and prosperity. The Dutch government has identified 9 Top Sectors:

- Agri & Food
- Horticulture and propagation materials
- High Tech industry
- Energy
- Logistics
- Creative industry
- Life sciences & health
- Chemical industry
- Water

One aspect important for and within all Top Sectors is **sustainability**. The different Top Sectors are always looking for synergies between them, the so-called ‘crossovers’, making each sector more sustainable. The transition to a bio based economy is an important theme to stimulate innovation and economic growth. In chapter 4 and 5 specific opportunities for cooperation between the Netherlands and Colombia are described.

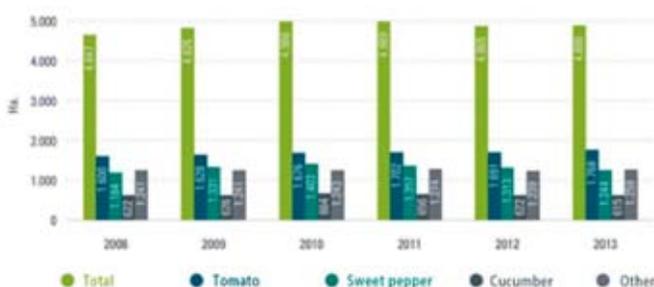
3.3.2 Production

The figure below shows that the total surface of Dutch vegetable production was 4.886 ha in 2013. This figure has remained about the same over the last few years. About 75% of the total surface is covered by tomato, pepper and cucumber which are the main products cultivated in the Netherlands. Tomato production grew in the past 5 years, the production of peppers declined and the cucumber output remained stable.

In 2013, 1.030 production companies were active in the Netherlands. This number is declining fast since the start of the economic crisis in 2008. Five years ago there were still 1.874 Dutch vegetable producers.

The lower number of companies in combination with a steady total surface of the vegetable sector indicates a rapid increase in scale. This trend is mainly caused by the take-over of greenhouse growers that went bankrupt. The average surface of the vegetable companies is increasing fast and doubled the past decade to 3,21 ha/company in 2013. About 300 companies produce in greenhouses of 5 ha or more. On a product level there is little variation in the total production area. Sometimes growers switch crops when they expect better results the year after.

Figure 16. Development of surface of Dutch vegetable production in Ha



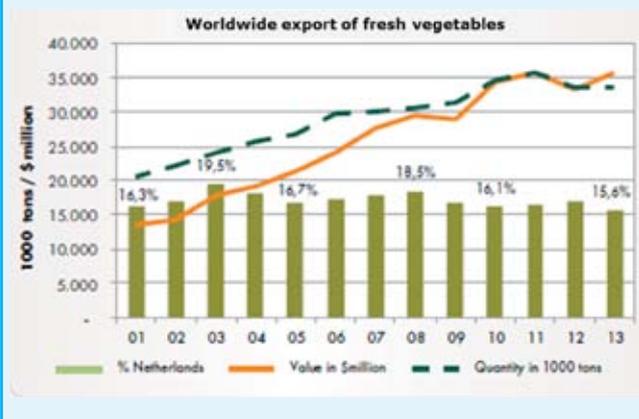
Source: CBS/LEI

3.3.3 Trade

The Netherlands is – globally - the most important country for fresh vegetables export (including re-export) followed by Spain and Mexico.

Half of the world vegetable production takes place in China. These vegetables are mainly produced for the local market and some for export to countries in the region such as Indonesia, Vietnam, Thailand, Japan and Russia.

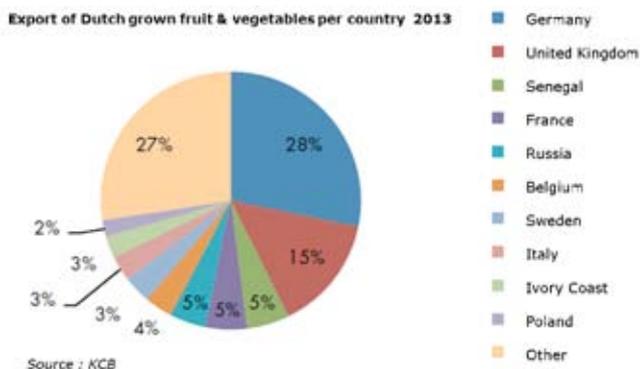
Colombia’s middle class is demanding **healthier fresh products**. To satisfy this relatively new demand, production methods must improve. There is a growing awareness of how food can influence the health of people and can lower the cost related to illness and diseases. Obesity is a growing problem and needs to be addressed. This trend paves the way for more conscious and sustainable food production and creates opportunities and a need for **Integrated Pest Management and biological crop control**. Methods that are also used in important export markets such as the US and Europe.



When looking at the main export destinations of Dutch fruit & vegetables, neighbours Germany and the UK are the biggest markets. Besides Europe, Russia is a main destination and growing, but a difficult market due to geopolitical trade barriers.

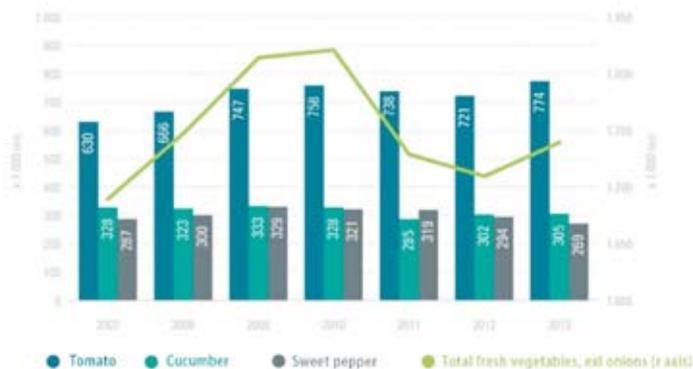
In 2013, a total of 2.9 million tons of fresh Dutch fruit & vegetables were exported to hundred and thirty countries. The 4 largest products exported in 2013 were onion, tomato, pepper and cucumber.

Onion and tomato exports account for 60% of the total volume in 2013, an increase of 2% compared to the previous year.



The figure below shows a small increase (1,%) in 2013 of export of vegetables (in tonnages) from the Netherlands. The total amount exported was 1,7 million ton during that year (excl. onions).

Figure 17. Development of Dutch export volume x 1000 tonnes.



Pricing and sales

Prices of vegetables in the Netherlands are not rising and show a lot of fluctuation throughout the years. Fierce competition comes from Spain and the upcoming local production in Europe. At the same time, energy costs (about 30% of total costs) as well as labour and land prices are increasing. It is clear that the Dutch vegetable sector is facing significant challenges and the growers are combating these developments increasing their production surface (economies of scale) and improving quality and productivity year round.

Companies are also forced to look at foreign markets and are increasingly establishing branch companies abroad.

The situation in the Netherlands during 2014 it is far from positive for Dutch growers. A warm pre-season resulted in earlier yield during the time that Spain and other Mediterranean countries were still supplying. The market was overloaded and prices were very low. Many growers are losing money and a lot of them already are

carrying high financial burdens. By the end of the year it is expected that quite a few growers will go bankrupt.

Overall it can be concluded that there is a structural oversupply, while demand is not increasing. Supply should be reduced or growers have to innovate and find other crops in niche markets where still is space to manoeuvre.

The difficulty is that the Dutch growers hardly have the financial means to invest in innovation or other crops. Here financial institutes/banks could support and 'protect' their investments and the Dutch government could also provide some support. Either way something needs to happen to turn around the current situation in the Netherlands regarding bulk production of the larger crops.

Market trends

The main **market trends** in the saturated **European market** are a decentralised supply, growing local production, higher demands of buyers and economies of scale. Dutch vegetable growers can distinguish themselves with the sustainable production of fresh produce that tastes better and can be stored longer. In addition they are exploring new markets beyond Europe, which is not always easy due to trade barriers and currency fluctuations.

In order to better serve the final consumer, **vertical cooperation** between the different partners in the vegetable chain is growing. Growers are producing 'on demand' and supply specialty products for specific channels and markets and work closely together with wholesalers and retailers on a fixed price basis.

Vegetable growers are mainly focused on **cost price reduction** and **technological improvements** (assimilation lighting) in their greenhouses. Most investments take place in relation to energy savings like Cogenerated Heating Power (CHP), energy screens, Heat and Cold storage, diffusion sunlight, geothermal energy and new growing techniques.

The supply chain is becoming **shorter**. Growers have started to sell directly to the market (forward integration) and the vegetable auctions have disappeared. Direct sales to retail is also common practice nowadays, putting the position of trading companies under pressure. Traders used to have a collection and distribution role and added value in dealing with the complex logistics and growing demands of customers. However, various trading companies also producers (backward integration), resulting in a situation where growers and traders became both supplier and customers but also competitors.

A selection of well-known producers/traders of fresh vegetables can be found on the next page:

Table 23. Selection of leading trading & production companies in the fruit & vegetable sector

Organization	Type	Website
Nature's Pride	Trader	www.naturespride.nl
Prominent	Producer	www.prominent-tomatoes.nl
Jaguar	Trader	www.jaguarthefreshcompany.nl
Koppert Cress	Producer	www.koppertcress.com
Eosta	Trader	www.eosta.nl
Total Produce	Trader/producer	www.totalproduce.com
FSK	Trader	www.fskgroentenenfruit.com
Best Fresh Group	Trader / producer	www.yex.nl
Staay Food Group	Trader / producer	www.staay.nl
Greenery	Trader / producer	www.thegreenery.com

3.4 Horticultural supplies and services

The Netherlands as horticultural producer has quite some disadvantages. Its climate, high (labour) costs and lack of available and affordable land are serious problems. Nevertheless, the country is known as the worldwide leader in virtually all issues related to horticulture. Collaboration on all levels is an important reason for the success of Dutch horticulture and that collaboration has led to an impressive accumulation of knowledge and technology.

3.4.1 Technology

The investment environment of the Dutch horticultural sector has always been rather aggressive. Many Dutch horticultural producers have a low solvency, because every Euro earned was traditionally re-invested in new innovations, modern greenhouses, growing techniques and / or equipment.

That situation has changed during the past 5 years. The worldwide crisis has led to losses for growers worldwide. However, the Dutch production sector seems to suffer more than average. Investments are being cancelled or postponed and banks are reluctant in approving loans which would have been provided without hesitation less than 10 years ago.

Before the crisis, the average construction of greenhouses reached approximately 1.000 hectares per year. That figure has dropped to some 100 hectares nowadays. As a result, not only sales of (glass) greenhouses are lagging behind, but virtually all equipment and knowledge related to the setup of such projects.

Before the crisis, the Netherlands had to maintain its international (leading) position by a never lasting quest to innovate and to improve efficiency. By doing that, Dutch producers were able to deal with their climatological and cost related disadvantages.

This quest has led to the establishment of ultra-modern greenhouses using the latest growing techniques, fertilisation units, re-useable substrates, energy saving heating equipment, (biological) crop protection and post-harvest machinery. Another striking difference between (traditional) Dutch horticulture and horticulture in many other countries is the Dutch focus on a

high capital investments with a long term horizon (> 10 years). However, official statistics (LEI/CBS) show a sharp decline in investments by horticultural companies from 230.000 Euro in 2007, to 181.000 Euro in 2011 and 48.000 Euro in 2013

Internationalisation and competition

Dutch suppliers are looking for new opportunities in order to survive. Rapid scaling by mergers, extensive automation, intensive cooperation between suppliers and among chain partners and a strong focus on international markets are the various methods companies have been using to battle the crisis. 'Going abroad' is the name of the game nowadays.

When these suppliers indeed go abroad, in this case Colombia, they usually are confronted with two important issues:

- Dutch suppliers work at an extremely high level, generating solutions to problems that sometimes ask for a different approach in countries like Colombia. One should be aware of these differences and being capable to implement solutions that cater to local circumstances.

- In Latin America the Netherlands as horticultural provider has an excellent, yet expensive reputation. Especially hardware suppliers (greenhouses, climate control systems etc.) face stiff competition from Spain and Israel. Because of the focus on short term ROI, price is often the decisive factor in building new greenhouse projects. Spanish and Israeli suppliers often offer inferior quality products against lower prices. In addition, they have been working in the Latin American market for quite some time and have gained experience and trust with their clients. Besides, no language barrier for Spanish suppliers exists, and historically they have strong ties with the region.

Table 24. Selection of suppliers of technical goods

Organization	Type	Website
Priva	Climate and fertigation control	www.priva.nl
Van der Heide Greenhouses & Solar	Plastic greenhouses, solar systems	www.foliekassen.com
Luiten Greenhouses	Screening and greenhouses	www.luiten-greenhouses.com
AWETA	Post-harvest equipment	www.aweta.nl
JAVO	Potting machines	www.javo.eu
Celtic Cooling	Cold stores	www.celtic.nl
Formflex-Metazet	Growing systems – internal transport	www.formflex.nl
Hordijk Groep	Packing materials	www.hordijk.nl
Certhon Groep	Turnkey greenhouse projects	www.certhon.nl
Dalsem Groep	Turnkey greenhouse projects	www.dalsem.nl
Hortimax	Climate control	www.hortimax.nl
Hoogendoorn	Climate control	www.hoogendoorn.nl
KUBO	Turnkey greenhouse projects	www.kubo.nl
Buitendijk Slaman	Internal transport systems	www.buitendijk-slaman.nl
Flier	Horticultural machines	www.fliersystems.com
Greefa	Post-harvest equipment	www.greefa.nl
Genap	Geosynthetic applications	www.genap.nl
Bosman Van Zaal	Internal transport systems	www.vanzaal.com
Verkade Climate	Heating installations	www.verkadeklimaat.nl
Flamingo – van der Meer	Used equipment	www.hortimat.com
Berg Hortimotive	Horticultural machines	www.berghortimotive.nl

Table 25. Selection of suppliers of operational goods

Organization	Type	Website
Van der Knaap Groep	Coco substrates	www.vanderknaap.info
Koppert Biological Systems	Biological crop protection and pollination	www.koppert.com
Modiform	Plastic pots and trays	www.modiform.com
Van der Windt Group	Packaging materials	www.vanderwindt.com
Chrysal	Flower care products	www.chrysal.com
Jiffy	Substrates and plant plugs	www.jiffygroup.nl
Bas van Buuren	Substrates	www.bvb-substrates.nl
Bato Trading	General supplies	www.bato.nl
Horticoop	General supplies	www.horticoop.nl
Desch Plantpak	Pots and trays	www.desch-plantpak.nl
Grodan	Rockwool substrates	www.grodan.com
Dillewijn Group	Packaging materials	www.dillewijn.nl
Royal Brinkman	General supplies	www.brinkman.nl

3.4.2 Knowledge exchange and education

Although the Dutch horticultural sector is facing the biggest setback in its history, the knowledge level of the Dutch is still undisputed. Collaboration between growers, throughout the chain, public – private and excellent horticultural universities are responsible for this leading position of the Dutch.

3.4.2.1 Universities and related research institutes

1. Wageningen UR (www.wur.nl)

Wageningen University and Research Centre is an internationally renowned university and research centre. The WUR mission is to 'explore the potential of nature to improve the quality of life', thus working and researching in the domain of healthy food and living environments.

The WUR carries out application-oriented and field-based research. These research projects are commissioned by the government, commercial businesses and non-profit organisations and often executed by various institutes coordinated by WUR.

WUR also manages a large international network via its international account managers. Mr. Peter Zuurbier is responsible for Latin America. For the horticultural sector, the following associate research institutes, linked to WUR, are particularly relevant:

Wageningen UR – Applied Plant Research (PPO)

Applied Plant Research conducts research through co-innovations with partners from the different agricultural sectors, sciences, industry and government. Together with its clients PPO analyses questions regarding farm and crop management and translates these into applied research and development programs.

LEI Wageningen UR

LEI is a leading social-economic research institute which acts as an independent, strategic partner for governmental organisations and companies. LEI specializes in developing data, models and knowledge to assist its customers in strategic policy and decision-making.

Wageningen UR Greenhouse Horticulture

WUR Greenhouse Horticulture is dedicated to innovating for and with the greenhouse horticulture sector. In collaboration with business and scientific communities and the government, they analyse issues relating to operational management and cultivation of greenhouse crops and translate them into application-oriented research and innovation procedures.

2. HAS Hogeschool (www.hashogeschool.nl)

HAS Hogeschool is an Agricultural University of Applied Sciences and specializes in offering hands on courses and trainee ships educating students to become professionals with practical experience once they graduate.

HAS Kennistransfer (HAS Knowledge Transfer) is a separate department offering (short) tailor made courses for companies and professionals. Besides, in relation to their final thesis, 4th year students of the HAS Hogeschool can work on specific business cases for private companies. They are supervised by an experienced HAS tutor.

3.4.2.2 Private suppliers of knowledge and services

The Netherlands traditionally has a rather transparent knowledge structure in which companies and individuals are willing to share information with each other. Probably the main reason that this treasure of Dutch horticulture has faced quite some challenges in recent years, is the fact that many family owned businesses cease to exist or merge into bigger holding structures.

Nevertheless, collaboration is part of the Dutch DNA. Many companies organize knowledge exchange by themselves. Courses are organised for (inter)national growers, demo nurseries are established in and outside of the Netherlands, joint training centres are founded, etc. In some cases it is for instance a seed supplier or a technical supplier who takes the initiative to setup such knowledge exchange centres, in other cases it is a group of companies who take responsibility. A good example of such a group of companies is to be found in the Westland area:

Demokwekerij Westland

Demokwekerij Westland is a demonstration nursery in the heart of the Westland area which focusses on applied technology in horticulture. The demonstration nursery creates the greenhouse of tomorrow by concentrating on 3 pillars:

Demonstration: in the 5000 m² greenhouse more than 25 companies show their latest technologies and innovations.

Research: 41 compartments are available for research and small scale testing.

Table 26. Knowledge and service providers

Organization	Type	Website
Groen Agro Control	Laboratory	www.agrocontrol.nl
BLGG	Laboratory	www.blgg.nl
Agro Advies Buro	Project implementation	www.agroadviesburo.nl
VEK Adviesgroep	Project implementation	www.vek.nl
DLV-Green Q	Crop consultancy	www.greenq.nl
Flynth	Accountancy and financial advice	www.flynth.nl
Triple Consultancy	Financial services	www.tripleconsultancy.nl
Alfa	Accountancy and financial advice	www.alfa.nl
Verbos Business Development	Sustainability services and BD	www.verbos.nl
Ideavelop	Business development	www.ideavelop.biz
Headventure	Marketing and business	www.headventure.nl

Knowledge exchange: the nursery is the linking pin between business, education and government and facilitates further development of knowledge and innovation within Dutch and international horticulture.

On a company level, a large range of consultancy companies exists in the Netherlands covering fields such as cultivation, crop protection, business development, marketing, certification, project development, environmental studies, etc. Some of these companies are specialized in Latin America such as the authors of this sector study, Verbo Business Development and Ideavelop. A short list of providers of knowledge and services from the Netherlands:

See: [Table 26. Knowledge and service providers](#)

3.4.3 Measuring Sustainability

The market is increasingly asking for transparency in the supply chain. Consumers are more and more interested in how products are produced and under what conditions these products are grown.

With that, a demand for systematic approaches to assess sustainability was created. Systematic sustainability reporting helps organizations to measure the impacts they cause or experience, set goals, and manage change. A sustainability report is the main method to communicate sustainability performances and impacts – whether positive or negative.

Since a couple of years various initiatives for making assessments have been developed in Europa and/or the Netherlands. Some methodologies are designed solely for single issues while others are more comprehensive. The ones mentioned below are also known/ being implemented in Colombia.

Global Reporting Initiative (GRI)

GRI is a leading organization in the sustainability field. GRI promotes the use of sustainability reporting as a way for organizations to become more sustainable and contribute to sustainable development. GRI has developed indicators, but offers no ranking system. They provide tools and guidelines for sustainability reporting. See also: www.globalreporting.org

FAO - Sustainability Assessment of Food and Agricultural systems (SAFA)

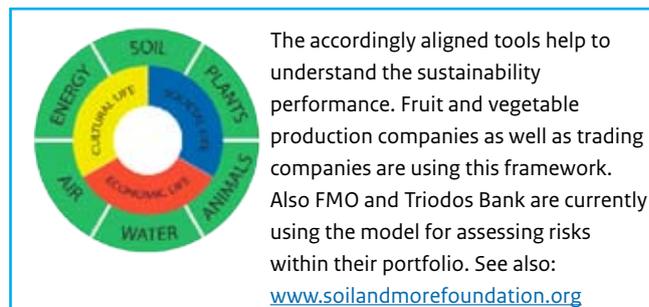
The SAFA looks into four dimensions of sustainability for agriculture; the results are displayed in a polygon of 21 themes. On the webpage there are also other tools that use this approach or combine it with own developments. More information: www.fao.org/nr/sustainability/sustainability-assessments-safa/en/

MPS

In the Flower industry MPS is a well-known administration and certification system. MPS works on a better image for the entire international horticulture sector. MPS achieves this by making sustainability and quality demonstrable and by showing improvements. Read more on www.my-mps.com

Sustainability Flower

The Sustainability Flower represents a pragmatic and scalable approach to create transparency and cooperation based on partnerships.



Response-Inducing Sustainability Evaluation (RISE)

RISE is an indicator- and interview-based method for assessing the sustainability of farm operations across the economic, social and environmental dimension. From information collected on the farm during a 3- to 4-hour interview, scores of 50 parameters are calculated. These scores, which range from 0 (worst) to 100 (best), are condensed into ten indicator scores and visualized as a radar chart. Results are thoroughly discussed with farmers and should support the continuing improvement of farm sustainability, ideally in the context of extension, development, training or quality management programs. The sustainability of agricultural production is measured and communicated in the context of agricultural extension, education and supply chain management. Read more on: <http://www.hafl.bfh.ch/>

The Cool Farm Tool (CFT)

The Cool Farm Tool is designed to help growers understand and measure their carbon footprint. By using the tool, the grower gains insight into the impact of the various operations on the environment, and it therefore helps the grower to optimize the management decisions to be made on-farm. The benefits can be measured both in terms of sustainability and productivity. The CFT is an online, farm-level greenhouse gas emissions calculator based on empirical research from a broad range of published data sets. The tool identifies hotspots and makes it easy for farmers to test alternative management scenarios and identifies those that will have a positive impact on the total net greenhouse gas emissions. Unlike many other agricultural greenhouse gas calculators, the CFT includes calculations of soil carbon sequestration, which is a key feature of agriculture that has both mitigation and adaptation benefits.

See also: <http://www.coolfarmtool.org/CoolFarmTool>

Water Footprinting Network (WFN)

WFN promotes the transition towards sustainable, fair and efficient use of fresh water resources worldwide by:

- advancing the concept of the 'water footprint', a spatially and temporally explicit indicator of direct and indirect water use of consumers and producers;
- increasing the water footprint awareness of communities, government bodies and businesses and their understanding of how consumption of goods and services and production chains relate to water use and impacts on fresh-water systems;
- encouraging forms of water governance that reduce the negative ecological and social impacts of the water footprints of communities, countries and businesses.

The Water Footprint Assessment (WFA) Tool is a free online web application assisting users in water footprint quantification, sustainability assessment and response formulation. It can be used by companies, governments, NGOs, investors, consultants, researchers or anyone else interested in the Water Footprint. Read more via www.waterfootprint.org

4. Strategies

4.1 Introduction

Colombia is the second largest producer and exporter of cut flowers in the world. Besides, the country has been making strong economic progress the last 10 years and its middle class is growing fast. That development has led to increased prices for virtually everything and besides in addition, a rather strong exchange rate to foreign currency of its Peso. Obviously, this has affected the labour intensive horticultural sector. Producers of cut flowers are obliged to increase their productivity and efficiency to stay competitive in foreign markets. At the same time, the developments in the domestic market give way to opportunities in high quality vegetable production due to the increasing consumer demand. The public sector (both education and government) will need to adjust their policies in order to support producers to meet international standards. Horticulture will have to 'mature' on a public level.

Colombia needs knowledge and technology to prepare its horticultural sector for a new era.

The Netherlands has a long standing tradition of being the major horticultural producer and exporter in the world. But the horticultural sector, due to the financial crisis, is under severe pressure and suppliers as well as producers are looking to upcoming markets abroad to increase their sales, exchange their knowledge and spread financial risks.

Dutch horticultural companies are looking for opportunities in new markets.

This chapter analyses what strategies should be developed to increase the competitiveness of Colombian producers at home as well as abroad, how the Colombian horticultural sector can be improved and how Dutch suppliers of technology, knowledge and services can contribute. The resulting strategies will be described in the next paragraph.

In line with the more extensive information given on the Netherlands and Colombia in the previous chapters, the subsectors of ornamentals and vegetables are divided in three fields:

- Production
- Suppliers
- Distribution and trade

Strategies for the public sector, consisting of Knowledge and education and Government, are applicable to both ornamentals and vegetables and are the concluding paragraphs of this chapter.

4.2 Strategies for Colombian floriculture

4.2.1 Production

• Increase of productivity

On top of the priority list of virtually every grower of cut flowers in Colombia, is the need to increase their productivity per square meter. Due to the staggering land prices and the need to invest in better and more professional facilities, the need to have much more (financial) output per square meter is evident. The productivity can be increased by means of applying technology and / or knowledge.

Technology (technical)

Greenhouse production starts with the greenhouse itself. Traditional Colombian greenhouses hardly create any span of control on the climate inside the greenhouse and thus, any other issues related to the increase of productivity. Each aspect of greenhouse production is connected with another and therefore, each solution can only create optimal results if other aspects are taken into consideration as well. This means that Colombian growers would make a great start increasing their productivity by improving their greenhouses. More options to ventilate, for screening, heating, and maybe even cooling would have great impact on the climate in the greenhouse, but would also facilitate the application of (future) necessities such as hydroponic production and Integrated Pest Management.

Dutch suppliers can play a major role in improving greenhouses by providing their technology. They are used to sell their products and services to customers who demand optimal performance in every possible way; product quality, after sales, technical assistance, etc. This aspect prepares Dutch suppliers for entering virtually any other market as long as their products and services are adapted to local circumstances. Just one example; although it might be true that even Colombian growers will produce in glasshouses one day, that scenario is far from today's reality. Plastic is the name of the horticultural game in Colombia today. The first step in Colombia is to go from traditional 'saw tooth' greenhouses to multispan greenhouses with (automatic) top and lateral vents and maybe even insect netting in these vents. Few Dutch suppliers have such greenhouses in their product range but the ones who do, supply very good ones.

Most Dutch suppliers can supply competitive and well-adapted solutions for irrigation and fertilization equipment, climate control, hydroponic systems, water treatment, heating systems, internal transport, PAD registration systems, sorting and packing machines, cooling facilities, (solar) energy systems, etc. Nevertheless, quite some of these investments require a long term approach and do not provide ROI's of 2 – 3 years. Practically, this means that Dutch suppliers and Colombian producers will have to get to know each other in order to gain mutual confidence (first step) and to learn from each other (second step). Dutch suppliers thus will have to travel frequently to Colombia (that is exactly what breeders and propagators do) and / or to work with a pro-active agent or distributor who knows his way around and understands Dutch (horti)culture.

Technology (operational)

Operational goods can be divided in storable and non-storable goods. Most of them (plastic cover, plastic pots, chemicals, fertilizers, substrates, packing materials, etc.) can be imported by means of sea freight, non-storable goods such as biological crop protection and pollination should be flown in.

Storable goods are easily available in Colombia and are affordable. However, there is no culture amongst the distributors of such products to be frontrunners with innovations or with technical assistance. Practically, this means that most innovations come from foreign suppliers directly or being picked up at international trade fairs or during visits to flower producers abroad.

An increasing (latent) market for so called specialties can be detected; products which fulfil demands which did not exist before. Good examples of such products are (coco)peat and other substrates as well as biological crop protection. All such products need to obtain import permits and need to be registered being novelties to the market. It would be a great opportunity for Colombia to improve communication between the private and the public sector to facilitate such innovations as their applications will increase productivity and improve final product quality as well as the position of Colombian produce in the international market.

Knowledge / Technical Assistance

Knowledge is the key to virtually everything. If one wants to invest in technology to increase its productivity, knowledge is required to make the right decisions, but also to make optimal use of the investments. In the meantime, knowledge is what is lacking on many levels in Colombian horticulture. Investments have traditionally been focussed on short term planning and increasing productivity has only recently gained importance. Colombia has always fulfilled market demands, but has no image of being a trendsetter, neither on a production level nor on a sales and marketing level. Although it should be stated that some leading flower producers in Colombia really make a difference and an organization like Asocolflores has not many competitors, the sector as such is rather conservative.

Two of the main reasons for this are the troubled history of Colombia as a country and thus, the short term business mentality and secondly, the US being their major market, a market which is lagging substantially behind other markets such as Europe and Japan.

So it should be easy. Knowledge has been crucial in the development of Dutch horticulture and that same knowledge is what is required in Colombia. But it isn't that simple. Colombian entrepreneurs are not used to pay for advice. It usually comes with the product. Breeders and propagators supply (technical) services to growers how to get most out of their seeds, cutting or varieties. There are virtually no foreign (production) advisors active in Colombia on a contract basis. The price of such advice is simply considered too high.

It is unlikely that Dutch consultants (cultivation, crop protection, etc.) will touch base in Colombia. More feasible will be to set up systems to 'train the consultant'. Local consultants which are trained in the Netherlands or Dutch trainers organizing 'train the trainer' courses in Colombia. Another opportunity would be the setup of a training centre for floriculture in Colombia, see also Chapter 5.

Other types of services such as lab tests (soil, water and leaf samples) are easier to implement, as such services do not require an actual presence of consultants in Colombia.

• Improve efficiency

Labour costs make up more than 50% of the total costs in horticultural production in Colombia. This is significantly higher than in other competitive countries. Two major reasons for this have been detected. First of all, minimum wages and benefits are much higher than in African countries, Ecuador or Mexico. Secondly, the Peso has become very strong against the dollar making operational costs relatively more expensive. Besides productivity issues, efficiency is on top of the priority list for all major growers in Colombia.

Improving the efficiency can be attributed to production and/or post-harvest related measurements.

Efficiency on a production level

In many greenhouses, the internal transport of flowers can easily be improved by using belts to get the flowers out of the bays and trolleys to transport them to the central collection point. Of course such solutions are quite different for each crop, but in virtually all cases relatively cheap solutions will reduce labour input and improve quality, as less hands will touch the flowers. Nowadays, many flower producers harvest manually and carry the flowers (in big quantities) on their shoulders out of the bays of the greenhouse.

Many of the actual greenhouses are not equipped for such solutions, as the construction offers no options for hanging the belts. Another reason to improve the actual greenhouses.

Efficiency on a post-harvest level

The 'easiest' way to save money by improving the efficiency, is probably the mechanisation of post-harvest processes. Most companies are sorting, bunching and packing their flowers manually and have no equipment in their packing halls to transport flowers automatically. Although this way of working enables them to supply virtually any desired kind of bouquet, it definitely is expensive.

Mechanisation of sorting and bunching does not necessarily mean that all bouquets should be prepared in an automated way. There will always be the option of serving specific niche markets with hand-made bouquets.

• **More market oriented production (focus on novelties)**

Colombian flower producers usually work with a limited range of varieties that does not include the newest novelties. There are different reasons for this. One of them is the fact that the North American market is less demanding than other major markets such as Europe and Japan. Considering that Colombia is a virtual monopolist in North America implies that North American consumers are just not aware that certain varieties exist.

Another reason is that new varieties are still not well protected under UPOV regulations in Colombia. This makes breeding companies reluctant in supplying their latest innovations to Colombian growers. Last but not least, the general Colombian business mentality is focused on short term profits, making it less obvious to invest in expensive novelties.

Summing up all these aspects makes clear that there are several problems to be solved, before this situation will substantially change. However, it should be mentioned that the floricultural world is changing rapidly and that it can be expected that other (upcoming) flower producing countries will start knocking on the North American door. In that case, innovation on a variety level will become more evident.

An example that goes with this strategy can be found in the Chrysanthemum sector where the development of the British market has forced Colombian growers to renew their variety range. This opened new doors to enter new international markets.

• **IPM (Integrated Pest Management)**

IPM in horticulture symbolises a shift from traditional production to a more sustainable approach. On a production level, Colombia definitely should not be regarded as a trendsetter, but growers and their spokesmen (Asocolflores / Ceniflores) are very much aware of the necessity of sustainable production. It was proven in various countries that IPM systems in crops like roses and gerberas are not only feasible, but actually show better results on the control of plagues and diseases (compared to conventional control methods). In addition, the reduction of chemical applications makes crops more healthy and thus, more productive.

When implementing IPM, various factors are crucial in order to be successful. As many predators and parasites are not locally produced, they need to be imported by means of air freight. KLM reopens their direct flights from Amsterdam to Bogota and Cali in March 2015 and that will be a big step forward. Besides, import and registration procedures need to be optimal to guarantee a quick and smooth entry of the products into the country. This step should still be considered critical as the formal responsible entity for such processes, ICA, is not fully equipped yet (according to the private sector) to fulfil their role as arbitrator defining whether a certain natural enemy to plagues or diseases should be allowed or denied into Colombia. Close collaboration with Dutch authorities is strongly recommended to facilitate such processes.

4.2.2 Suppliers

Most Colombian suppliers of knowledge and technology are distributors or agents. The number of Colombian producers of (horticultural) equipment that can be qualified as medium / high tech, is rather limited. Therefore, most knowledge and technology is directly or indirectly imported.

• **Increase suppliers' knowledge level / add more value**

Colombian distributors and agents are usually only supplying commodities / products that the market requires. Not just production companies in Colombia are focusing on short term profits, supply companies show a similar way of working preferring commodities over specialties.

Due to increasing costs for virtually everything in Colombia, margins for suppliers in Colombia are under serious pressure and often they are simply not aware of latest developments in other flower producing countries.

Professionalization of a production company can go hand in hand with sustainable partnerships that create more access to knowledge and technology. Colombian suppliers can look for these partnerships with their clients (setting up trial facilities, more technical assistance, joint visits to foreign suppliers and competitive production companies) or with their suppliers.

Dutch companies are recommended to play a proactive role and become part of this opportunity.

They (as well as foreign suppliers) often neglect the Colombian market or simply face too many cultural barriers they cannot cope with. To become successful in a market like Colombia, a local partner is a precondition.

Recommended strategies can be:

Collaboration. A good example of a specialized collaboration can already be found between some Dutch Chrysanthemum breeders (Fides, Van Zanten, Dekker) and some of their Colombian clients. They have formed a joint 'study group' in order to solve production problems and enhance knowledge and all of them contribute financially to this initiative.

Clustering. A group of Dutch suppliers can make the difference in close collaboration with local distributors. Examples of such Dutch clusters already active in neighbouring markets are KasTec (focus on Brazil, www.kastecestufas.com.br) and NethWork (focus on Central America, www.nethwork.info).

4.2.3 Distribution and trade:

• Sea freight

To markets which are hardly accessible by air due to high freight rates, sea freight is a great opportunity to reduce (transport) costs and Colombia is geographically well positioned with harbours on both the Pacific and on the Atlantic coasts.

Sea freight is picking up quite rapidly for flowers like Hypericum, Gypsophilla and Chrysanthemum. Only the latter can be regarded as a major crop in Colombia so transport developments have concentrated so far on the export of Chrysanthemums. In order to expand these opportunities via sea freight, domestic infrastructure and the cool chain need to be improved.

However, Dutch traders and logistic service providers are already taking advantage of these opportunities and Chrysanthemums are exported from Colombia to Europe (predominantly the U.K.) via Dutch wholesalers. These far away markets, in line with (technical) developments in sea freight, can be explored further.

• Development of the domestic market

Colombia presents itself as 'The Land of Flowers' when referring to cut flower production, but in the country itself there is hardly any tradition of buying flowers or plants for own use or as gifts. This seems a generally accepted fact. Nevertheless, the middle class in Colombia increases rapidly, more people have money to spend on 'exclusive' products such as flowers, but also flowering pot plants. In addition, the world is getting smaller and Colombians travel more and more. This brings them to countries where consumption of flowers and plants is more common.

In other words, there is no real reason why the local market could not be developed much more. Governmental organisations and Asocolflores, although their focus is export, could play an important role in this.

4.3. Strategies in Colombian vegetable production

Between the subsectors ornamentals and vegetables are many similarities, both in strengths and in opportunities and as a result in strategies. To avoid repetition, we refer briefly to the strategies as written in 4.2 while any vegetable specific opportunities are mentioned in this sub chapter.

4.3.1 Production

• Increase of productivity, improve efficiency and sustainable farming

For increasing productivity we can refer to 4.2.1. Colombian flower producers have a longer track record with technological improvement and innovation, mainly to their international business environment and experience, but in general many of the issues mentioned in flowers also apply to vegetable farmers.

In vegetables large steps can be made to increase yields per square meter. Reducing post-harvest losses on site can be achieved by proper handling during harvest and apply appropriate packaging material so the product cannot be damaged further down the supply chain. Adequate cooling facilities at farm level are the first step in the – preferable – cooled supply chain.

• Improve healthy and safe production

To produce healthy vegetables, healthy production methods are required. Besides opportunities like Integrated Pest Management and biological crop control it is increasingly important to implement systems at an organisational level and work according to safety standards and good agricultural practices. Certifications like Global Gap and HACCP or even ISO standards could improve the product as such.

Extra attention should be paid to water quality. There is a wide spread distrust regarding the health aspect of vegetables which finds partly its origin in the water quality in Colombia. The sector is still suffering from a negative attitude towards fresh vegetables and has to improve its reputation drastically. This starts with clean and safe production methods in general and clean irrigation water in specific. Once that is in place, the perception in the market (trust) towards the vegetables can change.

• Improve sustainable (Climate Smart) production

Agriculture directly contributes to carbon emissions and about one-third of these emissions have an indirect impact on land-use change and land degradation. Some have called for the redesign of the whole food system to achieve sustainability and climate mitigation. Fortunately, even modest shifts in agricultural practices can reduce net emissions. Despite that many proposed measures are already resulting in lower carbon emissions, it is worthwhile to mention this topic as a specific strategy. Agriculture holds enormous potential for mitigating climate change. Dutch consultancy firms possess extensive knowledge on how to make vegetable production more sustainable. Not only at larger commercial farms, but also for smaller farms with less available resources. Dutch consultants have also a lot of experience with linking and creating synergies with other sectors like water and biomass.

• More market oriented production

In the Colombian vegetable market there is only a limited number of varieties available. At the same time it is expected that the domestic market will constantly grow the coming years and Colombian consumers will start appreciating different varieties and products. The Dutch seed companies have an interesting range of varieties available of which some are tastier, more colourful, healthier and / or provide higher yields. Once better protection of varieties under UPOV regulations in Colombia is guaranteed, it will open up a myriad of opportunities for vegetable farmers to expand their assortment within their own speciality.

4.3.2. Suppliers

• Increase suppliers' knowledge level / add more value

In this chapter the limited number of Colombian suppliers in horticulture and the level of knowledge and technology has already been mentioned. Most knowledge and technology comes from abroad.

Dutch companies have a long history in setting up long term mutually beneficial partnerships. However this always require investment from all parties involved. Investment in time, money and effort to build a trust worthy relation where knowledge exchange will become a natural flow.

4.3.3 Distribution and trade

• Improve local infrastructure

Infrastructure in vegetables means infrastructure in Colombia itself with emphasis on specific regions. The vegetable market is mainly organised as a regional business. It means among others that the farmers themselves should invest in their own infrastructure or the part where they are responsible for, while the government should invest in Colombia's local and regional infrastructure; improving road systems, bridges, tunnels, harbours, waterways etc.

In the coming years, a lot of money will be invested in construction via amongst others public private partnerships. Although this is not directly an opportunity for suppliers in horticulture, it is interesting for companies active in this field, both in consulting services and in construction work. These developments help to pave the road for a flourishing horticultural sector.

• Improve the cool chain on all levels

In flowers there is some experience nowadays with a cooled supply chain, because of exports via air and sea freight. This is only possible if all physical steps in the process from seed to shelf are aligned. In vegetables not many producers have their own cooled storage nor cooled packaging facilities. In the relatively new, but upcoming vegetable processing industry companies do setup their own refrigerated facilities.

However, to set up a closed cool chain from seed to shelf asks for knowledge and experience that goes beyond the own company and is in reality a value chain approach involving all players that deal with the product. In chapter 5 a business lead is mentioned in the flower section that is also applicable to vegetable producers.

• Develop the domestic market and promote locally produced vegetables

Large volumes of vegetables are still imported while increased local production can serve the domestic market. Asohofrucol – as representative of thousands of fruit and vegetable farmers can play an important role promoting vegetables on the local market. Unfortunately it looks like the focus is mainly on fruit and export markets and little effort (and budget allocation) is made to develop the domestic market. It is however a large stimulus for vegetable farmers when joint promotions are held, focus on the function of healthy food and raising awareness on a consumer level.

4.4 Strategies for the public sector

4.4.1 Knowledge and education

• More focus on protected horticulture

No university in Colombia offers a degree in 'protected cultivation'. On a statistical level, no real division is made between crops grown in greenhouses or outdoors. Although some Colombian universities have been involved in research regarding growing vegetables in greenhouses, this always has been a relatively small field.

These examples indicate that the public sector and universities do not consider production in greenhouses (horticulture) to be a mature subsector and therefore no specific policies nor courses have been developed. In light of issues like sustainable production, limited resources and food security, greenhouse production is obviously gaining importance.

Interviewees from the private sector mentioned that however the general level of their agronomists was fine, they lacked practical experience in greenhouse management and planning and especially the larger companies have developed special programs to practically train their own managers.

To bridge the existing gap between the needs of horticultural companies (these needs are even more pressing in the vegetable industry, where companies are usually smaller and lack resources to train their own management personnel) and what knowledge institutes are currently offering, cooperation with Dutch knowledge providers can be sought. Dutch universities of applied science, such as HAS Hogeschool and Van Hall Larenstein have experience in cooperation with foreign universities and can help implementing new courses or adjust curricula, but also assist in setting up internship programs with both local greenhouse producers as well as companies in the Netherlands (with a vested interest in Colombia).

• More collaboration between universities, research centres and the private sector

Many Colombian producers do not know what is being researched at the various sectoral knowledge institutes or universities, let alone that they know how to benefit from the research done. To better cater to the needs of the private sector, and thus the development of the horticultural sector in general, universities and research centres could proactively seek cooperation with greenhouse producers in order to develop internships, thesis opportunities and training courses together. In the Netherlands practical problems (virus control, efficiency in the greenhouse etc.) are often subject of a senior student research report or thesis. These students are advised by experienced teachers/professors in order to guarantee professional results. These options are also accessible to companies who don't have big budgets to invest in commercial knowledge and technology and it would be an excellent opportunity to strengthen exchange of knowledge ideas between the public and private sector in Colombia. In this way the private sector can work on developing its own 'talent' base, this is especially important for producers that work in rural areas where job creation and knowledge transfer is of the utmost importance and contributes to (regional) social stability.

4.4.2 Government

• Regard ‘protected horticulture’ or greenhouse production as mature sub sector

Greenhouse production is of significant importance within the development of Colombia’s horticultural sector. Cut flowers are a major export product and the government has developed an ambitious plan to develop various vegetable crops into high quality export products over the next 10 years.

However, there is no national development policy defined for floriculture and the mentioned ambitious development plan for vegetables does not identify the need for better technology and more knowledge as a key issue for further development of (export oriented) vegetable production. Also digitalized systems such as Sisnap do not offer clear definitions for greenhouse production.

Greenhouse producers (cut flowers, pot plants, vegetables) often deal with the same production problems (plant material, virus/diseases, technology to apply) and the Colombian government, by recognizing greenhouse production as a mature sub sector, could respond better to the needs of these producers.

These needs lie for instance in developing better policies regarding IPM and the use of biological crop control. The government could play a (much) more proactive role to stimulate the private sector to switch from traditional production methods towards IPM.

It should even be recommended that the government defines its own stimulation programs (technical assistance, no taxes, maybe even subsidies on the purchase of biologicals) to push flower and vegetable growers to change their habits.

They also lie in facilitating the import of high quality plant material in order to improve the quality of the final product and could also lie in facilitating more cooperation between greenhouse producers, also between vegetable and cut flower producers, in order to create a valid basis for knowledge exchange in order to proactively push the greenhouse horticulture forward.

Financial instruments to be used for further sector development should be easily accessible and usable, both by smaller and larger private companies.

Sector Opportunity	Cut flowers	Ornamental plants	Greenhouse vegetables
Exporters of services			
1. Certification	X		X
2. Residue labs	X		X
3. Crop laboratories	X		X
4. Crop consultancy	X	X	X
5. Capacity building	X		X
6. (Int.) market information, communication	X		X
7. Corporate Social Responsibility, Climate Smart Agriculture	X		X

Exporters of technical products			
8. Greenhouses	X	X	X
9. Cultivation equipment	X	X	X
10. Post-harvest equipment	X		
11. Crop management software	X		

Exporters of operational products			
12. Crop protection	X	X	X
13. Propagation material	X	X	X
14. Peat moss / substrates	X	X	X
15. Trays / pots	X	X	X
16. Packing materials	X		X
17. General supplies	X	X	X

Trade			
18. Importers	X		X

The opportunities mentioned in the private sector (education and government) are all aimed at strengthening cooperation and knowledge exchange and transfer between three actors; private companies, educational institutes and government departments. This enhanced cooperation in time could lead to Colombia's own 'Golden Triangle' in which the developments in the horticultural sector are stimulated from various angles and make it a competitive part (export oriented, but also focused on the domestic market, especially vegetables) of the nation's economy.

4.5 Business opportunities for Dutch companies in Colombia

The strategies described in this chapter refer to a number of fields where opportunities for Dutch horticultural companies can be found, a concise summary can be found below.

Various concrete business leads, in other words, how opportunities can be turned into business, are elaborated in chapter 5.

5. Business leads

5.1 Introduction

Based on the outcome of the previous chapter, it is clear that more cooperation is feasible between the two leading flower producers in the world, the Netherlands and Colombia. In fact, both countries seem to be complementary in many different fields. If one would add up the (horticultural) strong points of both countries, a virtual perfect situation for flower production would be the obvious result.

For decades, the Netherlands has been playing an important role in vegetable production and export worldwide. In Colombia the focus on greenhouse vegetable production is fairly new and expected to last, when taking into account the ambitious government plans. It is clear that the vegetable sector stands at the beginning of a new phase where synergy can be created between Colombian producers and Dutch suppliers.

But it isn't that easy. Cultural and horticultural gaps make many Dutch companies reluctant to enter the Colombian market. On the other hand, the Dutch are strong leaders in horticulture and this fact combined with specific Dutch cultural aspects, often leads to an image of being too straightforward and too arrogant.

We need to get to know each other. Understand each other. Respect each other. The floricultural future of both countries would definitely benefit when this process would be implemented with much more speed, commitment and dedication.

This chapter will present practical business leads which could contribute to this goal. Hopefully it marks the start of fruitful activities for everyone involved in this sector from both countries. Please note that the leads mentioned below derived from desk and field research interviews executed by Ideavelop and Verbos Business Development.

Various (financial) support programs from the Dutch as well as the Colombian government can be of assistance when it comes to realisation of the leads below. These are included in the text when applicable. Additional information on financial support can be found in Annex 1.

5.2 Business leads ornamentals

5.2.1 Production

5.2.1.1 Training Centre

Colombian horticulture needs to put more emphasis on knowledge transfer. However, knowledge is not usually acquired from (foreign) advisors. You either develop it yourself, train your own personnel, or you obtain it through distributors of products that supply technical assistance along with the products they are selling. A good example of this are breeding companies selling their varieties and, indirectly, 'sell' their technical assistance.

Another issue in Colombia, is the (lack of) exchange of knowledge between production companies. In fact, this is an issue all over Latin America but even more in Colombia due to the fact that little competition exists from other flower producers in their main market, the US. For Colombian growers competition is really coming from their 'neighbours'. Therefore, it is unlikely that a training centre could be realized between Dutch counterparts and one of the main Colombian growers. A second potential partner in Colombia would be a university or research institute. Such efforts were made already, unfortunately without success, due to bureaucracy and lack of dedication.

Advantages Training Centre:

- Colombia needs to upgrade its horticultural sector. New technology and knowledge is becoming a precondition for a flourishing horticultural future;
- Dutch suppliers can explain, by means of trainings, why investments in their (predominantly high tech) products creates more efficiency, higher yields and thus, more profit;
- Costs in The Netherlands have been high for decades and growers are automatically thinking in improving their productivity and increasing their efficiency. Colombia is entering a similar face of development. There is quite some existing knowledge in the Netherlands that can be very useful for Colombian growers.

Disadvantages Training Centre:

- High costs to set it up. Who will pay for it and is willing to take the investment risks?
- Exploitation is difficult and can involve private companies, public parties or both. Who will exploit it?
- The gap between Dutch knowledge and technology might, in some cases, be too big. Are Dutch companies ready for the low – medium tech Colombian market?
- Where should it be established? Bogota or Medellin?
- What kind of greenhouse should form the basis? Glass? Plastic? We hardly sell plastic greenhouses in Holland, but no Colombian grower will invest in glass

Opportunities Training Centre:

- The Dutch government could, via funds of the Transition Facility and horticulture being one of the Top Sectors in Holland, support a Training Centre financially;
- A Training Centre would be a great visual presentation for Dutch suppliers, a place where local growers can be invited and informed on the integrated Dutch approach on horticulture;
- A Training Centre can be the showcase and the platform for Dutch innovation and sustainability. Matchmaking, seminars, trade missions, etc. can all be organized at the Training Centre;
- International (regional) prospects can be invited over to the centre and facilitate sales not only in Colombia, but also neighbouring countries.

Threats Training Centre:

- Will the Training Centre be accessible to all Dutch suppliers, or is a limited and thus more exclusive approach preferred in order to prevent competition between Dutch suppliers. Such decisions will have great influence on the way the Training Centre will be organized and financed;
- What will happen when the Dutch government will not support such initiatives anymore and local entities like Ceniflores are also not capable to support it? The perfect solution would be to make the Centre fully private and self-supporting but this is very unlikely on the short – middle long term;
- Due to the big gap between Dutch and Colombian horticulture, growers might use their gained knowledge and technology to buy from Spanish and Israeli suppliers (medium tech) instead of Dutch providers.

A likely scenario to set up a Training Centre for the floricultural sector in Colombia would be to closely cooperate with Ceniflores – Asocolflores. Based on the assumption that the obligatory remittance on all flowers exported from Colombia will be effectuated by law (see Chapter 2), Ceniflores would be the most obvious counterpart as they would play a leading role in the distribution of such funds. These future funds can be compared to the Dutch ‘PT-remittance’.

From the Dutch side, a number of scenarios could be considered. First of all, a group of Dutch suppliers can take the lead. Examples of such collaboration already exist in Mexico and Guatemala where Priva and Koppert have set up CEICKOR and CCIPPP respectively. A more recent example, is the pilot project from NethWork, established in Guatemala named ‘Journey 2 Sustainability’ (www.journey2sustainability.com). Other alternatives could come from companies or institutes like DLV Plant / GreenQ or Wageningen University.

In terms of funding, opportunities lie in the Transition Facility Program from the Dutch government, but collaboration with Colombian entities is evident. In due course it is deemed important that these initiatives are self-supporting and are not dependent on government subsidies.

5.2.1.2 Mechanization of sorting, bunching and sleeving

Labour has become the major cost of flower production in Colombia. On average some 55% of all costs consist of labour costs. The majority that labour concentrates on post-harvest activities. On top of that, the strong local currency makes it even more challenging to invest in mechanization than before. The most obvious way to reduce labour costs, is the mechanization of the most labour intensive process in the post-harvest stage, sorting, bunching and sleeving. By far the majority of the Colombian exporters of flowers still prepare all their bouquets manually. This has the benefit of being flexible in the market, any type of bouquet can be produced in Colombia (given the availability of the flowers of course). However, handmade bouquets usually do not have the same uniformity (length, tightness of the bouquet, etc.) as machine made bouquets.

Both from a labour as from a quality point of view, it is very recommendable that Colombian flower producers mechanize their post-harvest activities as soon as possible. Dutch suppliers involved in post-harvest activities, especially bunching, sorting and packing, will find a very interesting potential market in Colombia.

5.2.1.3 Heating

Heating of greenhouses is hardly common in Colombian floriculture. An important reason for this is the rather traditional setup of Colombian greenhouses. An investment in heating inside such greenhouses, is simply out of proportions. However, increasing the productivity due to increasing costs, prices for land and pressure from the market, is a precondition.

Heating in greenhouses which do reach minimum demands for such an investment, will have great advantages. Of course it will strongly depend on the crop, but increasing the night temperature and maybe more important, decreasing the humidity in the morning, will lead to higher yields and better quality. It will take time and commitment to convince Colombian growers of this, but the first steps have already been set by Dutch specialists.

5.2.1.4 Hydroponic production

Growing ‘out of the soil’ brings flower production to a next phase. Water and fertilizers can be recirculated, irrigation and fertirrigation can be adjusted to the demands of the specific flower, control of diseases becomes easier to control and yields will therefore increase substantially. Theoretically. In fact, the same parallel can be made to heating in the previous paragraph. In a modern greenhouse, every detail is connected to each other and influences each other. To invest in hydroponics and heating in wooden sawtooth greenhouses, will not give the same results as doing such investments in greenhouses that are adapted to and prepared for such investments.

Nevertheless, Colombian growers will certainly show more interest in hydroponics. A number of floricultural companies have been doing substrate tests in the past year and this trend will continue. That tendency will create opportunities for suppliers of substrates, gutters, irrigation and fertirrigation equipment, etc.

5.2.2 Suppliers

5.2.2.1. General supplies

Investments in ways to improve productivity and to increase efficiency, will automatically create a demand for additional products and services. Installation of equipment, all kind of technical devices, means of internal transport, etc.

The Netherlands has a number of ‘horticultural supermarkets’. Some of them are private, others are cooperatives. No such company exists yet in Colombia, although there are of course suppliers of a wide range of products, usually commodities.

Even in a small country like the Netherlands, such 'supermarkets' are usually located in the main production centres. To establish such a system in Colombia, at least the major production areas (Bogota and Medellin) should be covered.

5.2.2.2 Entering the market by clustering

A group of Dutch suppliers can make the difference in close collaboration with local distributors. Operating individually in a complex market like Colombia. Gaining confidence is the first step in doing business and that can only be realised by being present frequently, either in person and / or by means of a representative. Looking for the right representative, getting to know the market and gaining the confidence of future clients, costs time and money.

Collaborating with other (Dutch) complementary suppliers can turn out to be much more efficient. It creates several benefits:

- Centralized communication and collective promotion
- Enabling the representative / distributors to offer a (complementary) range of products
- Set up joint (training) programs to develop the market
- Joint participation at fairs and other events
- Less travel expenses
- Set up of DEMO facilities

Examples of such Dutch clusters already active in neighbouring markets are KasTec (focus on Brazil, www.kastecstufas.com.br) and NethWork (focus on Central America, www.nethwork.info). Currently, financial support from the Dutch government to establish such clusters is available via the PIB program (see also Annex 1).

5.2.2.3 Horticultural trade mission to Colombia

Colombia is a large potential market in terms of hectares but a rather small market in terms of potential numbers of customers. However, you have to know your way around to get in touch with the people who take the decisions. The cheapest and probably most efficient way to get to know the major producers from Colombia, their farms and their management, is probably by participating in a trade mission. Based on the condition that the organizer of such a mission is well known in the sector, both in Colombia as well as in the Netherlands.

A trade mission should focus on:

- field visits (main focus Bogota area, Sabana and Cundinamarca)
- seminars/workshops on relevant issues such as increasing the productivity and improving the efficiency
- match make activities (in close collaboration with for instance Asocolflores, Asohofrucol and the Dutch Embassy / Holland House)

In the first quarter of 2015, Idevelop intends to organize such a trade mission to Colombia.

Please note that for companies that are starting to export, financial support to participate in trade mission (under certain conditions) is available via the Dutch government, also check www.rvo.nl/subsidies-regelingen/missievouchers-sib

In connection to this lead, it is relevant to mention that Asocolflores is organizing a trade mission to the Netherlands and from 5 till 7 November 2014, 15 Colombian companies will participate in the IFTF in Vijfhuizen.

5.2.3 Distribution and trade

5.2.3.1 Closing the cool chain

Most Colombian flower producers are located near an international airport and flowers from these farm to that airport are transported in cooled conditions. Nevertheless, many flower producers have different farms and transport from one farm to the other is not frequently cooled. On the farms itself, cooling facilities show room for improvement as well (pre-cooling for instance) in the post-harvest phase.

Two more aspects regarding cooling. First of all, it is likely that the importance of sea freight will increase. That means that (cooled) inland freight from the farm to the port will strongly increase. Cooled freight from Bogota and Medellin to the major port is at this moment not a commodity. It is scarce and expensive.

Secondly, tracking and tracing will only gain significance in the near future. What happened to the flower between the first seed and the final supermarket shelf? Who took care of what? How were logistics organized? Was the cool chain maintained during transport? All such questions will be made verifiable in the near future.

The cool chain will have to be 'closed' from the moment the flowers leave the greenhouse until they reach their final destination. This requires knowledge and technology at the production company as such but also between that company and the place where the flowers will be shipped to. Dutch companies have enormous experience in this field and are capable to supply virtually anything that is required to 'close the cool chain'.

5.3 Business leads vegetables

5.3.1 Production

5.3.1.1 Add value to the vegetable supply chain

In a growing consumer market there will be room for new products catered specifically to retail outlets.

The larger farmers serving the growing middle class understand that not only higher quality products are required, but issues like new varieties, packaging, labelling are increasingly important. By adding value to the product and make life easier for their customers. the farmers can also distinguish themselves from others and improve their competitive advantage.

Another upcoming development is vegetables processing. The growing middle class is prepared to pay for convenience. This means that the future investments will be made in handling, sorting, packaging, processing equipment but also knowledge is required for hygiene, sanitation and safety. Even issues like transport, marketing these products are as important in processed food as in fresh produce.

According to a local vegetable processor who is about to invest in expanding his company and operations drastically by sourcing from farmer smallholders, local bank loans and financial government incentives are available for this kind of industry.

5.3.1.2 Establishment of vegetable cooperatives

Food production needs to increase. Given that industrialised countries have little ability to increase either the quantity of land devoted to agricultural production or their own agricultural productivity, growth will need to come from developing countries and emerging economies, where the majority of agricultural land is owned and cultivated by smallholders.

Integrating these farms into value chains not only promises to provide new sources for agricultural products, but will also enable smallholders to purchase better inputs and raise investment levels, thus creating market opportunities for input providers.

From many of the persons that were interviewed we heard that cooperation is key within vegetable farming. To benefit from this kind of cooperation, farmers need to organise themselves. When these small farmers, who are geographically not far from each other, can be organised they can share knowledge, increase purchasing power and invest in joint facilities that could serve the cooperative as a whole. An interesting approach is to cooperate with NGO's active in Colombia who have been supporting small holder farmers for decades and built up extensive experience.

A worldwide tendency is that governments nowadays stimulate trade instead of giving aid. This resulted in the private sector programs where organisations like ICCO, USAID and BOPInc are increasingly interested to work with private sector. Financial institutions like Rabobank Foundation are also involved in private sector cooperation to lift small farmers out of poverty and to facilitate social and ecological improvements. In Africa various initiatives are already up and running where Dutch suppliers play a role to supply seed, equipment and biological control systems adapted to local circumstances. This scenario is feasible in Colombia and leads definitely to opportunities for Dutch suppliers.

5.3.1.3 Sustainable expansion of vegetable farms

There are companies that have been in the vegetable business for 15 years or longer, producing, distributing and commercializing various products. Vegetable production is growing and will continue to grow. In order to live up to ever more demanding markets, domestically and in the future perhaps internationally, sustainable expansion (adhering to specific standards) is needed.

As mentioned for the floricultural sector, increasing labour costs require more technology in order to increase productivity, efficiency (as well as health and safety on the work floor) and reduce labour costs.

In addition, internal logistics at such farms can be improved. Lots of mistakes are made during the distribution process and there is a strong need for standard programs or software that can help them organize and facilitate the supply chain, which will help them standardize and unify all the areas, so that everyone knows what is happening inside the company as well as on the way to the supermarket shelf.

Last but not least, there is the potential for export. Their products are complying with various safety standards and are of great quality, which can be interesting for even European countries. Knowledge is crucial for them, and even more than just having the most advanced technology they need the knowhow to improve every day and do things correctly and employ people that can guide them to the right direction.

The Colombian government is supporting vegetable farmers. Paprika and peppers are specifically mentioned in the countries growth strategy. A recommendation would be to approach these growers with a cluster (see also 5.2.2.2) with a customized proposition which offers a sustainable yet commercially interesting solution to their needs. The focus here is on producers who sell in the local market.

In addition the international market can be explored as well. An idea is to jointly (importer / producer) implement an international supply chain for sustainable pepper production. An initiative like this could be eligible for receiving (financial) support through the Sustainable Trade Initiative, which launched a specific program 'Sustainable Initiative Fruit and Vegetables' (www.sifav.com) to stimulate such ideas.

5.3.1.4 Promote Climate Smart Agriculture and create synergy

To capitalise on the potential of climate mitigation, cooperation has to be sought between organisations like Asohofrucol, the government and the producers themselves. Synergy can be achieved by exchanging experiences and joining efforts with existing and current Dutch-Colombian co-operation activities in other domains, specifically water management, waste management and biomass production and vaporization.

Several cross-over areas for co-operation between the different sectors can be considered. More specifically we should consider strengthening the efforts for bi-lateral business development in relation to sustainable growth and more specifically to the interrelated aspects productivity increase and sustainability improvements.

On the aspect of sustainability improvements there is a clear need for support/(IT-) tools/knowledge on:

- Land use (practices, alternatives and scenarios);
- GHG reductions (less pesticides, fertilizers and improved waste management);
- Social issues/working conditions;
- Use and valorisation of residues and by-products;
- Soil improvement via re-use of biomass;
- Sustainability assessments and certification.

From a sectoral perspective, the ongoing biomass activities can benefit from the agri- horticulture NL-COL experiences on:

- Commodity (quality) certification;
- Commodity trading (market development);
- Handling infrastructure;
- Availability of residual streams as feedstock for other (bio-based) applications. On the other hand, the agri- horticulture can benefit from the biomass activities in the fields of:
- Sustainability measurement & certification (development of capacities, markets and policies);
- Availability and transformation of residual solid and liquid biomass streams to develop good quality compost and/or substrates;
- Availability and transformation of residual solid and liquid biomass streams for energy (e.g heating and electricity) and other Bio Based Economic applications (e.g products and chemicals).

Working on both the productivity and the sustainability improvements tracks is crucial for the Colombian agricultural and horticultural sectors to maintain growth in order to cater to domestic demand as well as to fulfil its ambitions to export. The Netherlands has very much to offer in these fields. At the same time, further action is needed from the Dutch companies and institutions in order to effectively enter the Colombian market and benefit from the existing business opportunities, since there is an increasing interest from several other developed countries.

5.4 Business leads knowledge & education

5.4.1 Set up of university level horticultural curriculum

As described in the previous chapters, horticultural education is not very specialized in Colombia (there are no specific degrees in greenhouse production) and graduate students are usually trained on the farms where they go to work. Besides, there's quite a gap between theoretical knowledge taught at university and practical knowledge needed when producing horticultural crops. Knowledge to Knowledge funds (K2K), allocated via the Transition Facility Program can help bridge this gap by assisting in a three-track program:

- Increase practical knowledge of students by way of offering internships at private companies;
- Stimulate student exchanges between Colombia and the Netherlands;
- Train teachers and work on curriculum adjustments to include more practical training.

Such a program logically also leads to closer ties between educational institutes and the private sector, stimulating exchange of knowledge and experiences.

In order to execute this kind of K2K program, a strategic cooperation between a Dutch knowledge institute/university and a partner institute in Colombia is needed. Various universities cooperate with sectoral branch organisations on different research projects (for example University de los Andes and Asocolflores/ Ceniflores) and could be suitable candidates for such a program.

5.4.2 Organization of Executive Manager Training Courses

Training at production facilities is also an issue. To keep executive managers up to date on new growing techniques and horticultural technology, K2K funds (if applicable in combination with financial assistance from the Colombian government) could be used to set up training courses for management personnel in the Netherlands, but also in Colombia.

In the Netherlands company visits (technical suppliers and producers/greenhouses) can be combined with training sessions at knowledge providers such as Green Q, but also universities such as Wageningen or HAS Hogeschool. In Colombia Dutch suppliers could give on-site lectures on specific problems growers are dealing with and how to solve them. These visits could take place as a 'roadshow' and more suppliers could travel together (see also the scenario about clustering in this chapter), but also assisting 'study groups'; growers of certain varieties that get together and discuss problems they're dealing with. These study groups are a very recent phenomenon in Colombia and the example of Chrysanthemum growers collaborating with breeders was already mentioned in Chapter 2.

K2K funds can be a perfect catalyst to initiate these kind of training courses and to stimulate private sector participation so that in due course exchange of knowledge is being funded by the companies themselves.

Logically, the two scenarios mentioned above can easily be connected to the establishment of a Training Centre as described at the beginning of this chapter.

5.5 Business leads government

5.5.1 Enhanced cooperation between ICA and NVWA

The Ministry of Agriculture's department ICA is responsible for phytosanitary matters and has already been cooperating with its Dutch partner institute NVWA. An ICA delegation visited the Netherlands in July and discussed further cooperation on three main topics:

- Importing lily bulbs from the Netherlands to Colombia and the discontinuation of the Colombian zero tolerance policy against virus (now negotiating a 0,5% tolerance level)

- Negotiating the strict policies on the 'Certificates of Origin'. Since both countries are member of the International Plant Protection Convention (IPPC), thus accepting International Standards for Phytosanitary Measures (ISPM's) they should unconditionally accept each other's phytosanitary documents, including documents related to re-export
- Seeking assistance with implementing the so-called Electronic Certificate (eCert) for priority products identified by the ICA (now entering phase 1 during which a Dutch NVWA expert will visit Colombia to assess the current situation).

The follow up of these issues, notably the Electronic Certificate might be eligible to be executed via the Transition Facility (Government to Government or G2G funding). Both parties have already identified a 5 phase period to implement this new system and both Colombia and the Netherlands are dedicated to work on getting the eCert to Colombia.

Follow up on the flower bulb matter and the Certificate of Origin could lead to interactive training courses in order to adequately executing tests and other necessary checks as well as the purchase of new hardware to improve ICA's facilities and being able to execute the necessary tests in the first place.

A recommendation would be to proactively consult with the private sector regarding specific needs and demands, not only to offer relevant training, but also to stimulate cooperation between the public and private sector in Colombia. Although ICA officials have ensured the editors of this report that everything is well-organized and quite under control, representatives from the private sector seem to have a different opinion. Dutch companies active in Colombia also admitted during interviews that import- and export regulations are a serious constraint when doing business in Colombia.

Additional recommendations concerning vegetable seeds that could be taken into account on this subject are the following:

1. The **import procedure** requires currently an import permit for each and every shipment often taking 1,5 months. To make imports easier, it would be recommended (in order of preference) to:
 - Not ask for an import permit because all risks are covered via existing documentation;
 - Or to ask for 1 import permit per calendar year
 - Or facilitate a faster process, preferably digital (like for example in Peru, where the permit is provided within 10 minutes right after the shipment is submitted online).
2. Implement **trial seed regulation** like is done in many other countries. When a country requires variety registration first, parallel variety trials can be done to decide whether a variety is interesting enough to apply for registration. Now that process takes 2 full years from first step to commercialisation. Advised is to have a trial seed regulation which describes the quantity of seeds per crop allowed to import per variety for variety trials. Dutch companies offer their experience and knowledge to

discuss together with the relevant authorities which quantities are reasonable for a representative trial, also taking into account the extra weight of pelletized seeds.

5.5.2 Allow and stimulate the use of biological crop protection

Clear opportunities for both cut flower as well as vegetable producers lie in the field of sustainable production and more specifically in IPM and the use of biological crop protection. As mentioned in previous chapters, Asocolflores makes a great effort to focus on IPM and other sustainability aspects by means of the 'Florverde' program aimed at export of flowers. On the other hand, governmental entities put emphasis on the supply of healthier fruits and vegetables to the local market. Both initiatives require a proactive approach from both public and private entities. G2G funds could not only help to make the use of biological crop protection feasible by way of facilitating training courses at ICA and assist in setting up a regulatory framework for import, but also enhance the exchange of knowledge between the users in the different subsectors, thus enhancing public private cooperation.

In vegetables healthy production methods are probably even more important than in the flowers.

5.5.3 Cooperation to establish an integrated 'horticulture' policy, aimed at

producers of greenhouse products

Cut flowers and more and more vegetables are produced in greenhouses. As explained in this market study, greenhouse production will improve and increase in order to provide the necessary quality for an increasing demanding market, at home as well as abroad. Greenhouse production demands specialized products to create the controlled environment that the plant needs and it needs trained growers who understand what products they need and what their plants need. Good quality plant material is crucial to a successful production process. In the post-harvest phase, the greenhouse products being perishables need cooled transport and careful handling to maintain its quality and shelf life. To improve and increase greenhouse production, many factors are important and an integrated approach would be desirable. Exchange of knowledge and technology would also be desirable, not only between Colombia and other major players like the Netherlands, but also between greenhouses producers themselves. The 'Golden Triangle', one of the strengths of the Dutch agri- and horticulture, has proven that transfer and exchange of knowledge and experiences can be instrumental in developing a sector. In this regard Dutch experience could be used and translated to the Colombian and Latin American context.

G2G funds could help to prioritize the needs of the public sector and initiate knowledge exchange and transfer by way of round table meetings and interactive workshops. A G2G program could also help to start up a dialogue with the private sector to identify its needs and help in accommodating its demands in line with government policy.

Annex 1.

Financial support and subsidies

Both in Colombia and in the Netherlands financial support is available to further develop the horticultural sector as a whole and individual enterprises in particular. Below the available funds, subsidies and cooperation programs are listed.

1. Financial assistance/subsidies available in Colombia

Finagro

Finagro provides loan funds through financial intermediaries to agricultural projects in order to develop better financial conditions in the agro sector.

The financing of the agricultural sector and rural areas are grouped in lines of credit for working capital, investments and investment standards.

Working capital

Funding for direct costs necessary for the development of agricultural and rural productive activity and required for marketing or processing. These fundable activities are:

1. Agricultural Production: costs incurred to develop crops with growing period less than 2 years and whose direct costs are, among others, associated with planting, fertilization and irrigation supply evacuation and technical assistance.
2. Sustainable agricultural production: plant species of medium and late established yields, animals and fishery, and peasant farm economy.
3. Processing and marketing of primary agricultural goods: costs of acquisition of agricultural goods, aquaculture and fisheries of national origin and related to its distribution or sale.
4. Support services for agricultural production: operating costs required to deliver the service support, production and sale of inputs used for agriculture, aquaculture and fishery.
5. Bono Pledge: funding for national inventories of agricultural goods or their primary transformation product, secured by the pledge, issued by a Bailee (Almacén General de Depósito).

Investments and investing standards

The financed activities are grouped in:

1. Planting and maintenance: establishment and maintenance during unproductive years, also the restoration of plant species of medium or late yield (vegetative cycles more than 2 years), associated with, among others, soil preparation, acquisition of seeds, planting, fertilization, technical assistance and cover crops.
2. Adequacy of land: activities whose purpose is to improve the production of agricultural goods, through the preparation of the physical and chemical state of the soil, endowment of irrigation,

drainage and flood control and adequacy for water resource management, as well as their repair.

3. Purchase of land for agricultural use: finances up to 80% on the value of writing. Rural housing: construction and home improvement, located in premises linked to processes of agricultural and aquaculture production.

Rural Development with Equity Program (DRE)

This special line of credit is meant to modernize the rural agricultural sector and aims at greater competitiveness of rural businesses, strengthen the income of rural producers and work towards the internationalization of the Colombian economy. The program offers various Favourable Financial Conditions (Condiciones Financieras Favorables) with subsidized interest rates, maturities and grace periods.

The program applies to medium or large producers, who are cooperating with small producers, (small producers account for a minimum of 60% of the planted area) and the resources are administered by Finagro.

The ICR - Rural Capitalization Incentive

The ICR is an economic benefit given to a natural or legal person for the realization of new investments aimed at modernization, competitiveness and sustainability of agricultural production. Of all the applications so far, \$162,455 million (78,9%) was used to finance new investments in planting and maintaining late crop yields. Of all the incentives given, 85% were used by small producers.

Technical Assistance Incentive

The Technical Assistance Incentive is an instrument of the Ministry of Agriculture and Rural Development (Ministerio de Agricultura y Desarrollo Rural, MADR) financed by the Rural Development Programme Equity - DRE and administered by Finagro, which intends to co-finance the provision of direct Technical Assistance in rural areas, according to the provisions of Act 607 of 2000. The aim is to contribute to the improvement of agricultural productivity and competitiveness of small and medium sized producers.

The FAG – Agricultural Guarantee Fund

The Agricultural Guarantee Fund was created by Act 21 of 1985. Its objective is to “support the credits granted within the National System of Agricultural Credit, to small users and cooperatives that cannot offer the guarantees required ordinarily by financial intermediaries” (article 28 of Law 16 of 1990).

The percentage of coverage and the fee depends on the type of producer, the producer has a tax burden of 16% government tax (IVA (Value-added tax)) on the fees required to be collected by the FAG. In 2012, the FAG issued 245,000 certificates with a guaranteed value of

\$1.57 trillion pesos corresponding to loan for \$2.08 million. At the end of 2012, there were 682,000 outstanding guarantees endorsing loans worth nearly 5 billion pesos, mostly given to small producers.

Investment Fund Risk Capital

The Investment Fund Risk Capital works as a fund without a legal person and is managed by Finagro. Its main purpose is to support and develop productive initiatives, preferably in areas with limited private investment. Agricultural projects are being given priority. Water Resources Program

This program is managed by Finagro together with the Ministry of Agriculture (Ministerio de Agricultura y Desarrollo Rural) and its aim is to support projects with grants to obtain land.

Its benefit lies in the co-financing of up to 80% for the execution of feasibility studies and other assistance especially when infrastructure is being planned.

2. Financial assistance available in the Netherlands Transition Facility

The Transition facility is intended for Dutch SMEs and Dutch knowledge institutions and is a special facility aimed at 3 upcoming markets; Colombia, Vietnam and South Africa.

The facility consists of different forms of (financial) support, such as subsidies for:

- Contribution to improvements in the investment climate in Colombia
- Knowledge acquisition used for entering the Colombian market
- Conducting export feasibility studies
- Conducting demonstration projects

For more information about the Transition Facility (in Dutch) check:

www.rvo.nl/transitiefaciliteit

(in English: <http://english.rvo.nl/subsidies-programmes/transition-facility-tf>)

Dutch Good Growth Fund

From July 1, 2014 onwards the Dutch government will open the revolving fund the Dutch Good Growth Fund. This fund helps SME's that want to be active in upcoming and developing markets mitigating their financial risks. SME's can propose investments up to 10 million Euro (for which no regular bank loan/guarantee is being granted) in which the fund will help with direct loans and guarantees. Funds can be invested in 66 countries in the world, also in Colombia. The fund's aim is to facilitate investments and exports that are responsible and stimulate economic growth in the target markets. For more information about the Dutch Good Growth Fund (in Dutch), go to:

www.rvo.nl/subsidies-regelingen/dutch-good-growth-fund-dggf

(in English: <http://english.rvo.nl/subsidies-programmes/dutch-good-growth-fund-dggf>)

Demonstration projects, Feasibility study en Knowledge acquisition (DHK)

Subsidy scheme for demonstration projects, feasibility studies and knowledge acquisition. Thanks to the rapid developments, emerging markets are increasingly offering opportunities for Dutch export and investments. Are you an entrepreneur with international ambitions and an interest in emerging markets? You may be eligible for the subsidy scheme for demonstration projects, feasibility studies and knowledge acquisition.

_ Knowledge acquisition: financial support for counselling and assistance of an external professional, aimed at positioning a company in an emerging market.

_ Feasibility study: subsidy for conducting a feasibility study.

_ Demonstration projects: subsidy to introduce specific Dutch expertise to the transitional countries.

For more information: www.rvo.nl/dhk

Fund Emerging Markets

With the Fund Emerging Markets (FOM - 'Fonds Opkomende Markten'), FMO stimulates Dutch enterprises to invest in emerging markets. FOM is a joint initiative of the Dutch Ministry of Foreign Trade and Development Corporation and FMO, the Dutch Development Bank.

FOM provides medium- and long-term loans to companies or joint ventures in emerging markets that are majority owned or controlled by Dutch enterprises. In many cases, no appropriate commercial financing is available to these joint ventures and subsidiaries for the construction or expansion of a production plant or to buy new equipment. Also, tenors are often too short or require excessive security.

FOM offers these joint ventures and subsidiaries the opportunity to strengthen their financial structure, by providing often unsecured or subordinated loans. As a result companies are placed in a better position to attract working capital from local banks.

Important characteristics:

- Open for investments in Colombia (other Latin American markets include Mexico and Panama)
- Applicable for companies with a Dutch interest of at least 51% and a consolidated group turn-over as of approximately EUR 15 million.
- FOM finances between a minimum of EUR 500,000 and a maximum of EUR 10 million. Annually EUR 35 million is available and maturity of FOM funding runs from 3 years up to 12 years.
- Sectors are primarily agriculture and horticulture, transport, logistics, agro-processing and manufacturing.
- All companies applying for FOM finance need to comply with the OECD guidelines for responsible business practice and sustainable development criteria.

More information can be found on:

<http://www.rvo.nl/onderwerpen/internationaal-ondernemen/ondernemen-ontwikkelingslanden/hoer-onderneem-ik/developing-your-business/investeren/fonds-opkomende-markten>

Partners for International Business (PIB)

This program is aimed at clusters of at least 3 companies that together want to enter a foreign market. Knowledge institutes can also be included in these clusters.

Together with the Dutch government the cluster works out a market strategy. Government involvement concentrates on economic diplomacy as well as additional activities such as promotion and matchmaking. Besides there are opportunities to start government-to-government (GzG) and knowledge-to-knowledge (KzK) programs.

PIB is eligible for companies active in the so-called 'Top Sectors' of which horticulture is one. PIB is applicable to 66 countries, of which Colombia is one.

For more information, go to: www.rvo.nl/subsidies-regelingen/partners-international-business-pib

Facility Sustainable Entrepreneurship and Food Safety (FDOV)

This facility is aimed at public-private cooperation in the field of food safety and private sector development in developing countries. Joint initiatives of government parties, companies and NGO's are eligible for this subsidy. The initiatives must concentrate on the following sub themes:

- increase of sustainable food production;
- better access to healthy food;
- more efficient markets;
- improvement of business climate.

In the longer run, these themes contribute to sustainable economic growth, poverty reduction and self-sufficiency.

The applying partnerships consist at least of 1 public institution, 1 company and 1 NGO. Participation of a knowledge institute is recommendable (not compulsory). Of all parties at least one is Dutch and one from the country where the planned initiative will be executed.

For more information, go to: www.rvo.nl/subsidies-regelingen/programma-publieke-private-samenwerking/faciliteit-duurzaam-ondernemen-en-voedselzekerheid

Finance for International Business (FIB)

For Dutch SME's wanting to invest in Colombia who want to minimize their risks, the Dutch government (Ministry of Foreign Affairs) can co-invest on a deal-to-deal basis together with a third financing party. The government will offer a loan for 35% of the total investment needed, the other 65% needs to be financed by a professional investor (with sufficient track record).

The maximum financial support from the government is 875.000

Euro per business per country. In 2014 the total budget available for these loans is 5.870.000 Euro.

More information can be found on: <http://www.rvo.nl/subsidies-regelingen/finance-for-international-business-fib>

Starters International Business (SIB)

You are a starting exporter. International entrepreneurship offers new opportunities, but it involves many issues. The step-by-step plan of Starters International Business (SIB) can help you on the right path.

Specific information, advice and collective promotion help to make your first steps in foreign markets into a success. SIB is intended for SME entrepreneurs:

- _ who have little to no experience with doing business on international markets;
- _ who want to embed international business in their business structure;
- _ who have an organisation and sufficient resources at their disposal;
- _ who want to invest time and money in taking actual steps across the border.

With one of our consultants, you prepare an action plan and make a risk inventory.

For more information, also about the Mission vouchers, go to:

<http://www.rvo.nl/subsidies-regelingen/starters-international-business-sib>

Business Partner Scan

Do you have specific plans to conduct international business and are you looking for a reliable business partner? We can introduce you to possible foreign business partners by means of a business partner scan. We use our international network of embassies, consulates, and Netherlands Business Support Offices (NBSOs) in the scan.

For more information: www.rvo.nl/zakenpartnerscan

Matchmaking Facility Program (MMF)

Colombian small and medium sized businesses with a solid business plan and looking for Dutch partners, knowledge providers or investors, can try to find these via the Matchmaking Facility Program. Application can be done via a digital application form and the embassy in Bogota plays an important role in granting the proposal. Subsequently, the Colombian partner receives a voucher for which a consultant is hired to set up relevant meetings and visits in the Netherlands.

More information can be found on www.rvo.nl/mmf.

PUM Netherlands Senior Experts

This organisation works with senior experts from the Netherlands (retired professionals with at least 30 years of experience in a

business environment) and connects them to entrepreneurs in developing countries and emerging markets, such as Colombia. The senior experts are volunteers and provide short-term, solid consultancy projects on the work floor based on what the local entrepreneur is looking for.

On its website www.pum.nl interested parties can fill out a digital application form. PUM also has 4 local representatives in Colombia, working from Bogota, Medellin, Cali and Barranquilla.

Capacity building and training

Via various programs available via the Ministry of Economic Affairs, such as K2K (Knowledge2Knowledge) and G2G (Government2Government), the Netherlands can offer capacity building and training courses to educational and governmental partners from Colombia. Besides, organizations like NUFFIC and CBI also offer their services in this field to Colombia's public institutions or private entrepreneurs. For more information go to: www.rvo.nl, www.nuffic.nl and www.cbi.nl.

Annex 2.

References

Colombia (desk research)

- Sánchez, Andrés Jabba (2012) El bilingüismo en los bachilleres colombianos, Banco de la Republica, <http://econpapers.repec.org/paper/col000102/009225.htm>
- Encyclopaedia Britannica, 20140527 <http://www.britannica.com/EBchecked/topic/126016/Colombia/25348/Climate>
- “Colombia Crime Stats”, NationMaster. Retrieved from <http://www.nationmaster.com/country-info/profiles/Colombia/Crime>
- Deborah Haroon, F. H. (2013). Global Corruption Barometer 2013. Berlin.
- Doing Business. (2013). Doing Business 2013. Washington: The World Bank.
- Ministerio de Relaciones Exteriores. (2013). Boletín Migratorio. Bogotá: Centro Facilitador de Servicio.
- Transparency International. (2013). Corruption Perceptions Index 2013. Berlin.
- World Trade Organization. (2013). WTO. Retrieved 2014, from <http://stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=CO>
- World Bank. (2012). World databank. World Development Indicators. Retrieved from <http://databank.worldbank.org/data/views/reports/tableview.aspx>
- Lewin & Wills Attorneys at Law. (2012). Colombian Corporate Taxation Overview. Bogotá. Retrieved from http://www.slideshare.net/fiscalito_com/colombia-tax-overview-2012
- KPMG. (2012). Colombia Tax Reform 2012. Amstelveen. Retrieved from <https://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/taxnewsflash/Documents/colombia-feb4-2013-no3.pdf>
- Proexport. (2013). Colombia's Permanent Free Trade Zones Directory. Bogotá. Retrieved from <http://www.investincolombia.com.co/investment-incentives/permanent-free-trade-zone.html>
- Acosta, A. (2012). Los mejores bancos para abrir una cuenta de ahorros. Finanzas Personales. Bogotá. Retrieved from <http://www.finanzaspersonales.com.co/ahorro-e-inversion/articulo/los-mejores-bancos-para-abrir-cuenta-ahorros/44533>
- Empresamia. (2013). empresamia.com. Retrieved from <http://empresamia.com/component/flexicontent/items/item/36-como-puede-financiar-su-emprendimiento-en-colombia>
- Zevallos, E. (2010). Obstáculos al desarrollo de pequeñas y medianas empresas en América Latina. Fundación para el desarrollo sostenible en América Latina. Retrieved from <http://www.esan.edu.pe/paginas/publicaciones/cuadernos/20/Zevallos.pdf>
- Ministerio de Comercio, Industria y Turismo. (2013). Colombia's Free Trade Agreements. Bogotá. Retrieved from <http://www.tlc.gov.co/publicaciones.php?id=5398>
- Proexport. (2013). Horticultural Sector. Bogotá. Retrieved from <http://www.investincolombia.com.co/sectors/agribusiness/horticultural-sector.html>
- Embajada del Reino de los Países Bajos. (2012). Relaciones Comerciales, Colombia-Holanda. Bogotá. Retrieved from <http://colombia.nlembajada.org/servicios/comercio>
- Instituto colombiano de desarrollo rural. (2006). Acuerdo de Competitividad de la Cadena de Hortalizas. Bogotá. Retrieved from http://www.incoder.gov.co/documentos/Estrategia de Desarrollo Rural/Pertiles Territoriales/ADR_VALLE DE TENZA/Documentos de Apoyo/Cadena de Hortalizas acuerdo de competitividad.pdf
- Cardenas, Andrea C. Gonzalez. Intercambio de informacion en las cadenas de suministro internacionales. CEPAL.
- Colombia. (n.d.). In Wikipedia. Retrieved April 1, 2014, from <http://es.wikipedia.org/wiki/Colombia>
- QS World University Rankings. (2013). 2013 QS University Rankings: Latin America. London: QS Quacquarelli Symonds Limited.
- [Legal Guide to Do Business in Colombia 2014.pdf](#)
- Boletín Económico Sectoral, Sector Flores. No. 20 Abril 2013.

Invest in Bogota

<http://en.investinbogota.org>

http://www.theglobaleconomy.com/Colombia/wb_political_stability/

http://csis.org/files/publication/131126_Meacham_Colombia_ExecutiveSummary_Web.pdf

<http://www.colombiainfo.org/>

<http://www.cia.gov/library/publications/the-world-factbook/geos/co.html>

<http://www.dane.gov.co>

The Netherlands (desk research)

Oosten van H.J., Horticultural research in the Netherlands: changes and challenges for 2010
Annual report Frugi Venta 2013

CBS – Central Bureau of Statistics, www.cbs.nl

LEI – Agricultural Economic Institute, www.lei.nl

Dutch Producers Association

CBI, www.cbi.nl

Rijksdienst voor Ondernemend Nederland, <http://www.rvo.nl>

Annex 3.

Interviewed persons public and private entities

The Netherlands

Company name	Representative	Position
HilverdaKooij	Marius Kooij	Export Manager
Schreurs	Cees Rombouts	Sales Manager
Terra Nigra	Gidus Hopmans	Export Manager
Florist Arthur Kramers	Area Export Manager	
Royal Van Zanten	Kees Gram	Sales Manager
Florensis	Marck Strick	Commercial Director
Anthura	Marco Knijnenburg	Area Manager
Fides Heerke de Boer	Production Development	
Rijk Zwaan	Jan Frank Omvlee	Production Development Specialist
Koppert Biological S.	Frank Goedhart	Area Manager
Priva Niels van Rooijen	Account Manager Export	
Benfried	Fred van Velthoven	Commercial Director
Verkade	Ron van Luik	Sales Manager
Sercom	Jan Willem Lut	Sales Manager
Veldex Bas van der Velden	Managing Director	
Bercomex	Isabelle Poesse van Roijen	Area Manager
Brinkman	Bas Brinkman	Owner/Director

Colombia

Grupo Chia	Juan Carlos Gonzalez	General Manager
Jardines de los Andes	Jorge Patino	General Manager
Grupo Capiro	Carlos Manuel Uribe	General Manager
Dekker Chrysanten	Chris de Jong	General Manager
Elite Flower	Richard Deckers	General Manager
Guaqueta Trading	Juan Alejandro Guaqueta	Owner/Director
Perfection	Paul Verswyvel	Owner/Director
Semillas Saenz	Alejandro Saenz	Director Special Projects
Semillas Saenz	Fernando Nieto	Crop manager
Eurosemillas	Javier Gomez	CEO
Nieto & Milevcic	Luis Nieto	Owner/Director
Agricola del Alto	Peter Wubbema	Owner/Director
Hortifresco	Ivan Genaro Arenas Garzo	Owner/Director
PAAC Emilio Garcia	CEO	
Ministerio de Agricultura	Miguel Fadul Ortiz	Director of Agriculture and Forestry Chains
Asohofrucol	Marisol Vargas	PTP Coordinator
Asohofrucol	Alvaro Ernesto Palacio	Director
Corpoica	Roberto Alborno	Director of Strategic Development
Corpoica	Jorge Jaramillo Norena	Manager Innovation Vegetables
Asocolflores	Augusto Solano	President
Asocolflores	Katheryn Mejia	Director of Social Development
Florverde	Ximena Franco-Villegas	Director Florverde Program
Ceniflores	Nidia Patricia Copete	Executive Director



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