

# PRODUCTION AND MARKETS

The future of ornamentals



**AIPH**

## THE INTERNATIONAL VISION PROJECT (IVP)

Methodology, framework and main findings  
on the developments of global demand  
and production of ornamentals.

[www.aiph.org](http://www.aiph.org)

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# AIPH

## I | ABOUT

### THE INTERNATIONAL ASSOCIATION OF HORTICULTURAL PRODUCERS (AIPH)

#### THE WORLD'S CHAMPION FOR THE POWER OF PLANTS

In 1948, amid strained relationships following the end of the Second World War, a group of representatives from the national grower associations of Western Europe came together in Zurich. They were united by an ambition to mend relations between European horticulturists, to rebuild burnt bridges. That vision inspired them to form the Association Internationale des Producteurs de l'Horticulture (AIPH), laying the foundations for an international community that exists to this day.

Since then, things have changed. The world seemed to start spinning faster. We moved from the countryside into the city. We flew to places we never knew existed. We went to the Moon. We started dreaming bigger but sleeping less. We invented the web, the smartphone and social networks. Slowly, sadly, we detached ourselves from the natural world. Our intimate bond with nature, so pivotal to our health and wellbeing, was weakened. We found ourselves living unnatural lives.

That is why AIPH lives and breathes today: to rekindle and maintain an enduring relationship with plants. Serving the diverse needs of growers in a globalised world. Pushing the boundaries of science and sharing cutting edge research. To make clear the value of plants in the urban setting, and to advance the essential role they play in sustaining our planet. To help all of us rediscover an affinity with our surroundings as old as humanity.

Our mission is clearer than ever: to reignite and uphold an appreciation of plants that we believe is a basic human instinct. As an organisation we strive for a world in which humanity, technology and nature exist in healthy and stable equilibrium. By achieving this we will build a balanced and prosperous future for all, sustaining the planet for this generation and the next.

We support and promote the work of our members – the grower organisations around the world who together form our proud AIPH community. Through the expertise and energy they give to horticulture, they embody everything that we stand for.

Globally we act as the central source of industry information. Our statistical yearbook gives an unrivalled view of industry trends and developments, valued by our community and all who take interest in our rapidly moving sector. We bring members together both physically and digitally, and encourage the sharing of new ideas and techniques so that horticulture never stands still.

We advocate fair and robust plant breeders' rights, encouraging innovation and rewarding quality so that growers too can reap the benefits of their work. We promote the most sustainable, ethical and advanced practices in ornamental plant production, celebrating the most progressive growers and sharing pioneering new approaches. This strengthens the ornamental horticulture industry and is an affirmation of our determination to build a more balanced future from the ground up.

We lead global thinking on the successful integration of nature into the built environment. Our Green City initiative promotes the essential role of

plants in creating vibrant urban areas in which people and businesses can thrive. Our environment, human wellbeing, social cohesion and economies are all improved by intelligently designed green space.

Finally, AIPH is responsible for the world's finest horticultural expositions. Upholding the very highest standards, we ensure that approved exhibitions benefit growers and visitors alike by inspiring greater appreciation of ornamental plants. Drawing on experience acquired over generations, we provide organisers with expert guidance to create world class spectacles that live long in the memory. Our great hope is for a world where the essential value of plants is recognised and reflected in every step forward for humanity. AIPH is, and will always be, the world's champion for the power of plants. Our relationship with nature was pivotal in our past. It is fundamental to our future.

#### WE AIM TO PUT FLOWER, PLANT AND LANDSCAPING SERVICES ON A GLOBAL AGENDA, WITH A VISION TO:

- Stimulate increased demand for ornamental trees, plants and flowers worldwide.
- Protect and promote the interests of the industry.
- Be an international hub for industry information and knowledge exchange.
- Lead best practice in ornamentals production.

## 2 | IMPLICATIONS OF CHANGING DEMAND FOR ORNAMENTALS

We have studied the following factors on the supply side, however not all countries have data consistently available

- Climate & natural resources; water, land, energy
- Availability of farm inputs; consumables, fertilisers, chemicals etc.
- Access to finance; attitude of banks and lenders to finance growth
- Government regulations & policy; taxes, subsidies, labour
- Trade barriers; taxes and phytosanitary regulations
- Labour; availability of skilled and unskilled workers and labour cost
- Supply chain and logistics; interconnectedness of the production areas with local and global hubs.
- Natural events; sensitivity and resilience to natural disasters and climate change
- Positioning and differentiation: ability to grow unique crops or varieties to serve specific markets, or only compete in the mainstream.

This research has established that change in demand and production is inevitable. In the next decades a variety of macro factors will cause consumers to live different lives than the generations before them and they will develop different behaviour leading to different purchasing decisions which are likely to impact the market for ornamental horticulture. That change in demand raises the question of whether the ornamentals industry should reconsider the way it positions itself.

It is widely accepted, and taken as fact, that the world is urbanising at an increasing pace, and that we humans have an innate tendency to connect with nature (called biophilia).

The irony of these two factors is that they result in a paradox that may hold the greatest opportunity for growth of the ornamentals industry.

While the world, as a whole, will see a tremendous increase in consumer spending, it is the challenge for the ornamentals industry to capture its fair share of this growth in the following segments:

a) Governments, stimulated by the general public, will develop an increased demand for urban green space which will affect government policies on all levels from national

ministries to city councils and even local neighbourhood action committees. As an example: areas with green space are seeing lower crime rates, increased property values, and lower demands on health services.

b) Consumers themselves will recognise the economic and health and well being benefits of greening their own living space. Examples are; improved life quality, lower levels of illness, anxiety and mental stress, and better performance of children at school.

c) A broad range of the private sector is expected to recognise the economic benefits of green space and integrate flowers and plants into their business models. As an example, the recovery rate of patients in a green surrounding inside a hospital is shorter because of the connection to nature.

When assessing options to capture that demand, it is obvious that the industry will face opportunities and constraints on the supply side and production base.

The main question is if the production side of the current value chain is resilient enough to deal with the changes ahead. For this assessment we have taken the country selection

model as a framework (see page 10).

Each of the four categories in this model has a different stake in the global ornamentals market, but they generally can be divided in two: a net importer or a net exporter:

The importers will see a value chain with economic benefits concentrated in retail, wholesale and services, whereas the exporters see a value chain around growers and farm inputs. The obvious exceptions are the mature domestic producers who, by tradition, have grown to be home to the entire value chain. In this part of the research, we have only covered a select number of producers.

The researchers have taken data from secondary sources and a series of interviews with local players in the respective countries. In general, we present a set of factors that influence the ability of a country to maintain or develop the production volume, combined with the rationale of their trading partners on the demand-side. As an example; while demand of a trading partner may boom, a large number of constraints potentially inhibit the producers from capturing their share.





To illustrate this point, here are two examples of implications:

## WATER & RESOURCES

The scarcity of natural resources is driving many industries towards alternative, more sustainable production systems. The ornamentals industry is in some cases, applauded as an example of sustainability, and in others criticised for use of chemicals, intensive water use, or lengthy supply chains. As in any industry, it eventually comes down to the responsibility taken by individual players who are either pushed by regulations, or an intrinsic drive. In all cases it is clear that in a more transparent world, consumers, retailers and governments will develop a stronger demand for sustainably produced ornamentals. Some producing countries will be able to keep up by introducing more efficient production systems, while others lag behind due to lack of availability of resources, or lack of investment capacity.

## POSITIONING

In past decades a large number of academics have researched the benefits of green on humans. One of the key researchers and a strong advocate of the benefits of green is Prof Dr Charles Hall of Texas A&M University. In an article he presents two lesser known but insightful, economic principles to consider when assessing the opportunities ahead for the ornamentals industry:

1. Expenditures rise to meet income (C. Northcote Parkinson)
2. People afford what they want (Lowell Catlett).

The ornamentals industry's (growers, service providers, and retailers alike) job is to make sure they are providing 2 in such a way that they capture their fair share of 1. Thus, the green industry, positioning itself in a way that its products and services are considered as necessities (not mere luxuries) will be better placed to deal with the changes in buyer motives and will be more likely to keep flowers and plants on the shopping list, even during economic downturns. The value proposition for the green industry in the future must focus on the unique ways in which quality of life is improved for consumers. Much research has validated the emotional and environmental benefits of flowers, plants, and trees. In a nutshell, green industry products and services improve emotional health, boost wellbeing, enhance hospital recovery rates, employee innovation and ideas, strengthen feelings and expression of compassion, decrease worry and anxiety, build stronger communities, mitigate environmental externalities, and improve the economic value of homes— to name just a few of the benefits.

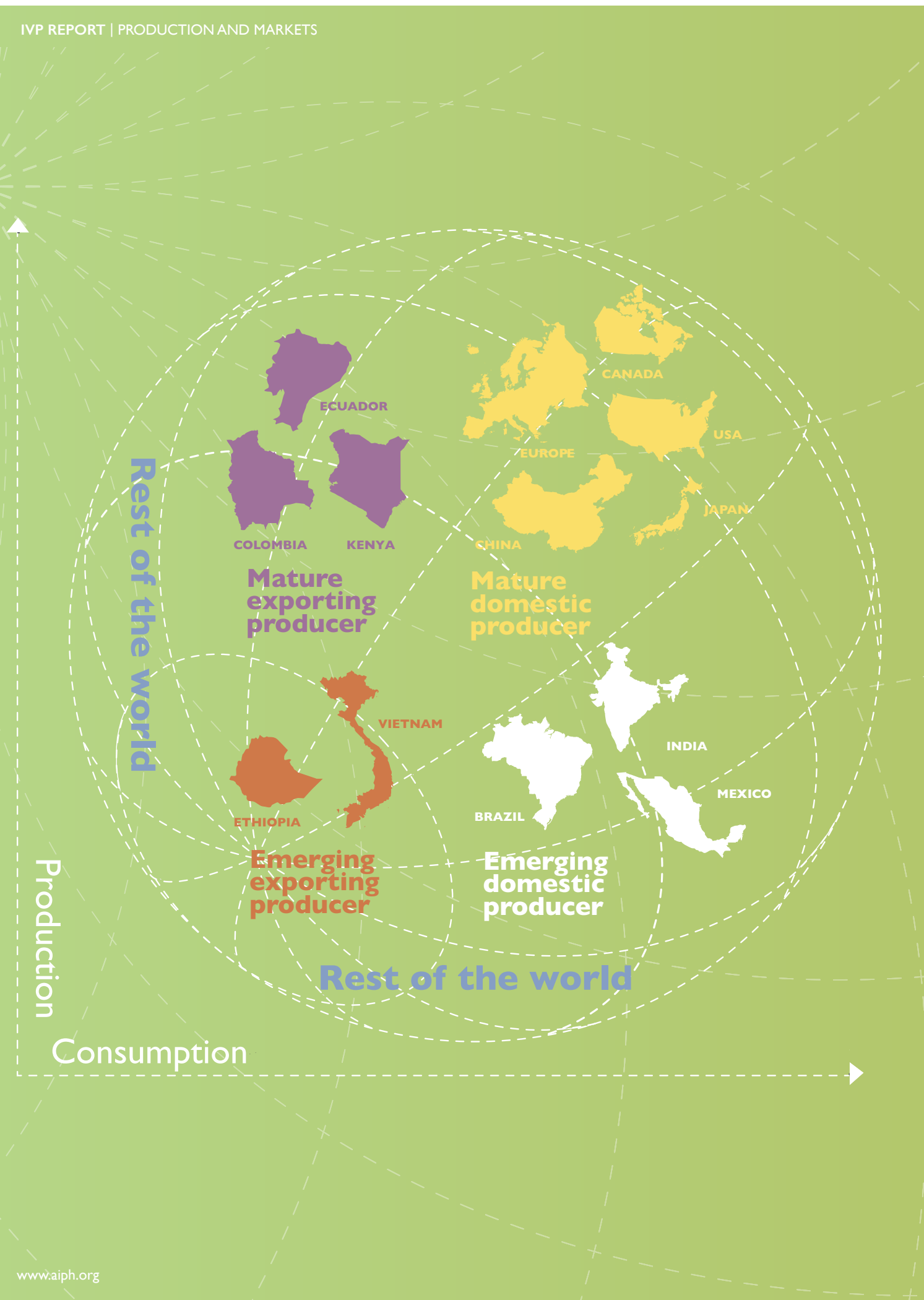
The ornamentals industry cannot over-emphasize the importance of this quality of life message, particularly in focusing its differentiation strategies in the future. That's because of whether one is a

member of the Boomer, Gen X, or Gen Y generations, quality of life is a "higher order" need that is important to them. For example, although the economic downturn has increased anxiety on the part of Baby Boomers about to retire, they are nevertheless proactive in seeking innovative solutions to dealing with age. They view their new stage of life as one of activity and fulfilment rather than idleness.

Gen X is the most "time-starved" generation, often juggling career and family obligations, but they maintain a strong commitment to work-life balance in their lives. Gen Y are just beginning their adult lives with their first homes, first jobs, and most importantly, first independent incomes. They are trying to find the right balance between spending for necessities and spending for entertainment. This generation is concerned not just with function and utility but also with style.

All of these generational attitudes come down to one thing – enhancing the quality of their lives through emotional well-being, ecosystems benefits, and economic paybacks. Research shows that there's no better way to do this than through the daily use and enjoyment of flowers, plants, and trees. All the green industry has to do now is convince consumers of this in a manner that they view their products and services as necessities instead of luxuries. This will, of course, make the industry even more recession resistant in the future..





### 3 | MATURE DOMESTIC PRODUCERS

Based on the identified target groups and the markets they can be found in, we will take a closer look at the dynamics in some of the most prominent markets. This takes us back to the earlier classification of the ornamentals supply and demand markets we used as guidance for analysis (see diagram on opposite page).

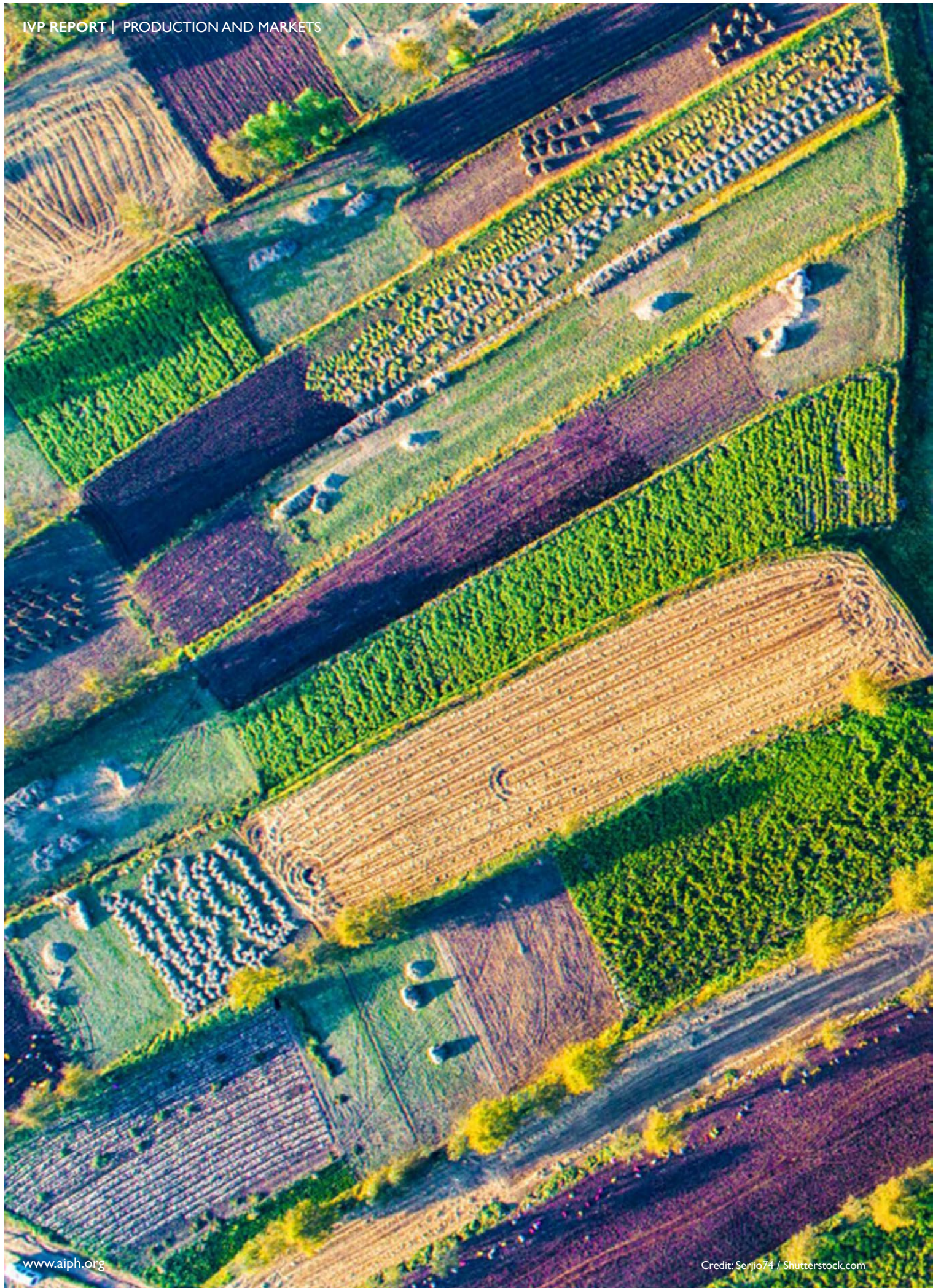
The mature domestic producers are countries which are among the largest in terms of ornamentals production

and consumer demand. In other words, they are highly self-sufficient and satisfy the majority of their demand with their own production. In most cases, external trade is an exception, either to complement demand with specific products or seasonal demand peaks where external trade flows are needed.

Mature domestic producers are markets like North East Asia (China and Japan), North America and Europe which have a strong production base and ornamentals are at the heart of

their society's cultures. They are all found in the current world cores and are the largest consumption markets now and will remain so by 2030. It is in these markets that, during the forecast period, the biggest absolute demand and absolute demand growth is expected.





# CHINA

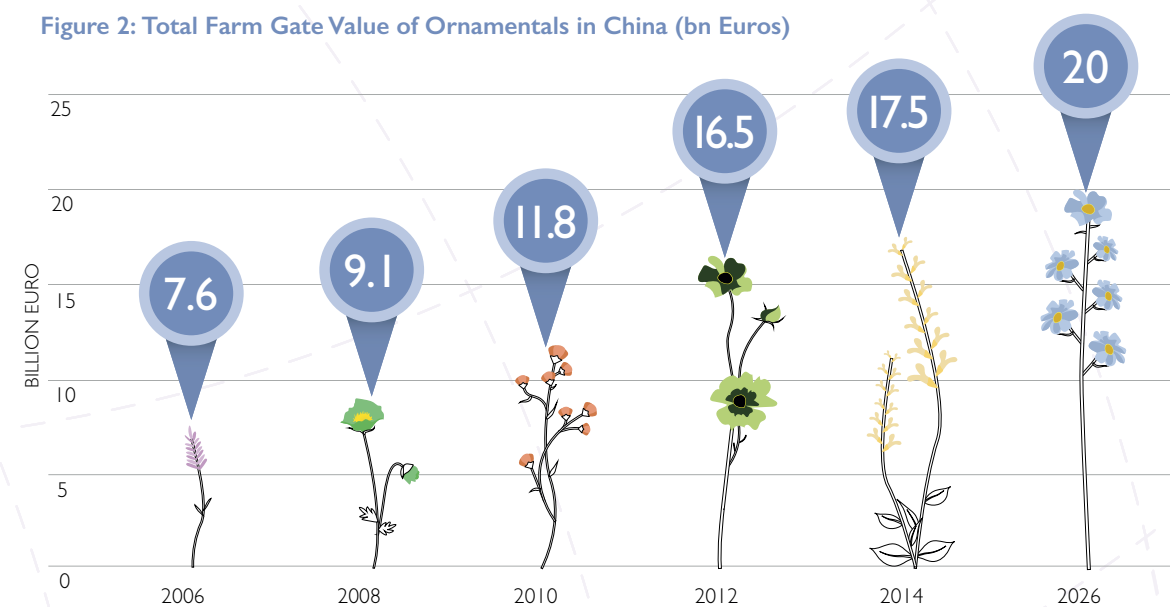
## DOMESTIC PRODUCTION

Over the past ten years, China has seen a sharp increase in demand for ornamental crops. Production is fragmented over a large number of flower growers – 85,406 of which

only 15,127 are medium to large sized farms; the remainder being small holdings. All are feeding into one of the 3,286 regional wholesale markets. Production and trade is not privately organised as it is in other markets. China also has a total of 1,881,153 farmer growers who are small holders that sell direct locally<sup>1</sup>.

The farmgate value increased from around €8 billion in 2006 to nearly €20 billion in 2016. In the same period the production area grew at a slightly lower pace doubling to 1,300,000 hectares in 2016.

Figure 2: Total Farm Gate Value of Ornamentals in China (bn Euros)



Source: Chinese Ministry of Agriculture Statistic Bureau



2 Chinese Ministry of Agriculture Statistic Bureau, 2016

Although the value of imported ornamentals also grew, the impact is relatively low. In 2016, China reported an import value of nearly €200 million. However, when analysed, the lion share of that consists of flower bulbs (sourced from the Netherlands, New Zealand, and Chile) and other starting material, like young plants from the USA and Japan. The share of imported fresh cut flowers is only 10% and originates from the Netherlands, Ecuador and Thailand.

In light of huge domestic trade figures, the export value of cut flowers from China can be almost ignored at just €8 million in 2016. However, China does have stable growth of around 8% in the export trade of pot plants and foliage greens which stood at €350 million in 2016. This is principally the result of regional trade in South East Asia<sup>2</sup>.

## ORNAMENTALS DEMAND IN CHINA

Due to the weight and potential global impact of the middle class in China, we want to gain insight into the value of ornamentals this group could represent. To arrive at such a forecast,

we will need insights on present behaviour. We could not find any consistent information on consumer behaviour for ornamentals demand in China. To fill this information gap, we conducted a series of qualitative interviews among flower retailers in three channels. In September 2016 a total of 153 interviews were conducted, mainly via telephone.

Respondents were randomly selected across the major urban areas covered in this research. The interviews were open conversations, covering a series of topics and have been conducted by native speakers.

## TRADITIONAL FLORISTS

In total, 121 traditional floral retailers (florists) were interviewed. Two categories of questions were asked. One category related to consumer behaviour, and the other focused on how florists see the future for their own businesses.

In terms of consumer behaviour, the reported motivation use is gradually changing from the stereotype of gift giving to a mixture of motivations. Among these, own consumption is gaining popularity among the young upper-middle class. This trend can be observed clearly in tier 1 cities like Shanghai. Less developed cities lag behind. Customers for florists are mainly between the age of 20 and 40. For the young customers, simple arrangements with light-coloured flowers are preferred as gifts.

Sales around events can be ten times higher than sales at other times. The event with the highest flower sales is Valentine's Day, as long as the date does not conflict with the Spring Festival.

In the second category of questions pertaining to their own business, florists revealed that they are gradually expanding their businesses and trying various new channels or platforms for selling and advertising. Retailers are diversifying by offering flower workshops, event design and even developing cross-channel concepts by adding a coffee shop or restaurant to their shop. Also, e-commerce is gaining more attention. WeChat is popular for advertising and keeping contact with regular customers.

Respondents think that problems like poor logistics, low quality and consumer distrust for online platforms will limit further growth of online flower sales.

## ONLINE RETAILERS

Data provided by Alipay, the number one provider of online payments in China, gives an impression of the online shopping behaviour of Chinese consumers<sup>3</sup>. In 2015, the Alipay users of Shanghai had the highest online spending on goods with an average annual spend of €15,000. Zhejiang had an average of €13,000 per person. Such high rates make it relevant to take a close look at the behaviour of buyers towards ornamentals and the underlying supply chain. The large consolidated platforms were reluctant to co-operate in our research, but we found some 20 online retailers active on Taobao that were open to being interviewed. We learnt the following: online orders are generally fulfilled by traditional florists close to the delivery point; these products are sourced from local wholesalers, who in turn buy the flowers mainly from Yunnan Kunming's Dounan Flower Market.

There are some retailers that produce flowers, but due to the fact that they are located in Yunnan Province, we suspect they are forward integrated growers with an online shop. One of the most popular online retailers on this platform is Rose Only. Their popularity cannot only be ascribed to the high-quality product they sell; they have strong marketing with celebrity endorsements and offer unique packaging. Their flowers and arrangements are perceived as luxury gifts, and consumers are willing to pay (extremely) high premiums. Regarding the questions pertaining to the financial information on buying behaviour, nearly all respondents refused to provide information. A few gave vague answers and pointed to the fact that the purchasing power differs per region, income level and seasons. We could identify a bandwidth of €13 to €27 for the average spend and learned

from one respondent that purchases of €500 and more are very common.

## THE EVENT INDUSTRY

Marriage is a major life event, especially in China where the dynamics are unique. Historically, the Chinese have spent big on weddings and currently the average wedding costs a couple around €9,000<sup>4</sup> and is often co-sponsored by parents of both sides. Despite the fact that marriage rates are in decline, the rising middle class finds a wedding the perfect occasion to display their wealth and personal style. To get an understanding of the market value for ornamentals, we interviewed 12 wedding organisations in provinces with the highest number of marriages<sup>5</sup>. Respondents usually cooperate with local retailers or even independent floral designers and wholesalers. The amount spent on wedding arrangements by couples is much higher in Beijing than the average for China. In the capital respondents mention a specific demand for imported flowers like large roses. The population of respondents is too small to provide a representative status and outlook on the value of this segment. However, the insights gained illustrate a picture showing that higher spending is concentrated in large cities and the current generation is spending heavily on pre-wedding photo shoots which are used to announce the wedding. These shoots are often done in sets decorated with flowers. The respondent's bandwidth of average spending varies between €800 and €1500. The highest average spend was €10,000 as reported by one respondent in Beijing.

## CHINA'S SALES CHANNELS FOR ORNAMENTALS

Flowers and plants are still mainly bought through traditional sales channels such as florists, super and hypermarkets, gas stations, nurseries, agri-product markets<sup>6</sup> and flower markets. However, as already outlined, online sales is soaring and flower retailers such as RoseOnly and PandoraFlora are capturing that growth. There are also a large number of flower sellers on Taobao, the largest consumer sales platform<sup>7</sup>. Furthermore, in recent years, e-retailers have experienced an increasing demand for online fresh agricultural food products such as vegetables, fruits, meat and dairy products<sup>8</sup>.

Although fresh food products bought online currently contribute less than 1% to total retail sales, e-commerce operators perceive agricultural products as a highly attractive market. Since there is an increasing demand for fresh products offered online, this might point to opportunities for the online sale of fresh flowers and plants.

Research by Nielsen in 2015 provided more insight into the consumers that are interested in purchasing fresh food products online. The findings showed that young urban consumers of the upper-middle class were the most interested in buying fresh products through online retail channels. Unlike the older generations, young consumers prefer shopping and comparing prices online rather than in traditional stores. The average age of these shoppers for fresh produce was 33, they were mostly highly educated (a bachelor degree or higher) and had a household income with an average of €19,000. Although consumers buy fresh products less frequently online

than through traditional channels, in comparison to traditional channels, consumers overall are spending more money on fresh products online. Furthermore, when comparing the results across city tiers, consumers in tier 1 cities are more likely to purchase fresh products through online channels compared to tier 2 cities<sup>9</sup>. Recently many new entrants have tried to jump into the online market of fresh produce, and many failed. This can largely be ascribed to the lack of standardisation, the high logistical requirements and the perishability of fresh produce. According to HKTDC Research, the average cost for fresh produce sold online in China is twice the average cost for other products due to high storage and transport costs. Despite the challenges that retailers face, the market share of fresh produce sold online is expected to increase by 60% by 2030 and reach a total value of €29.6 billion<sup>10</sup>.

The overall demand for fresh consumer products is growing rapidly and these perishable food products offer an opportunity and a challenge in one. Ornamentals can potentially piggy-back the new network and modalities, but in terms of value it is likely that the perishable food stuffs will have priority over ornamentals. On top of this will be the challenge of maintaining a controlled atmosphere for ornamentals and protection from the hazards of a supply chain alongside food products (e.g. ethylene damage from fruit). Are there any cultural aspects here? Do Chinese want to beautify their homes with flowers, do they have space for this? Is it a given that they would follow the west down this route or could other products fill this gap without the necessary marketing etc?

3 AllChinaTech, 2016

4 Tianyi Li

5 Statista

6 NABSO Kunming, 2010

7 KPMG, 2015

8 HKTDC Research, 2016

9 AC Nielsen, 2015

10 Nielsen

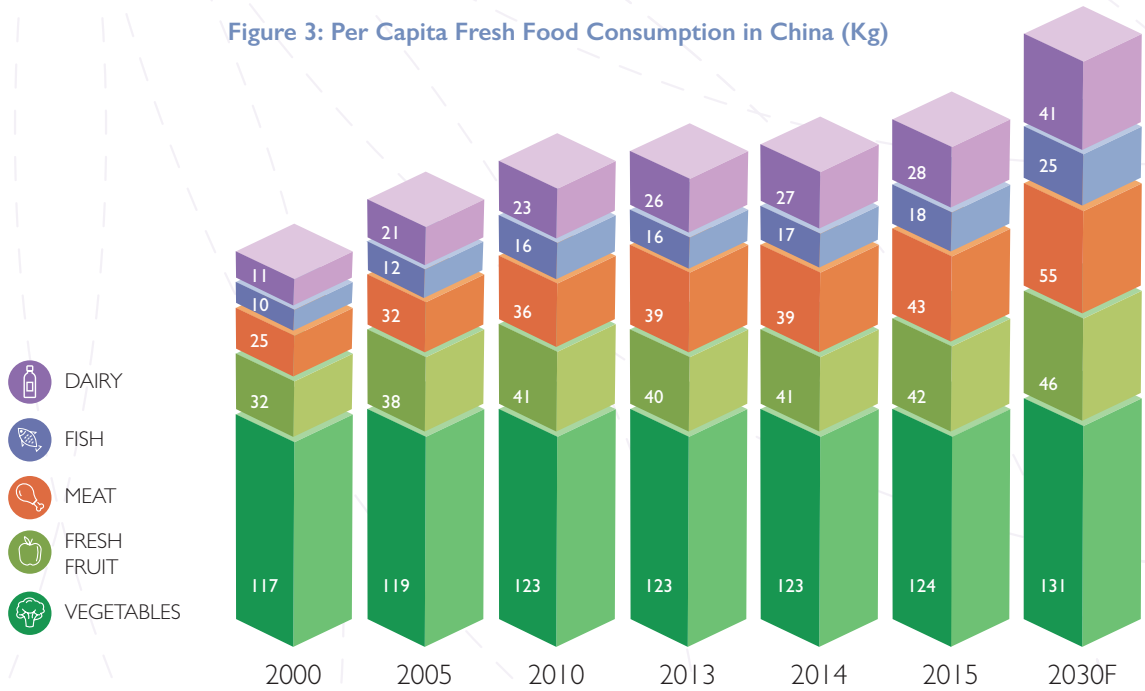
PRIMARY PRODUCTION CHALLENGES TO FEED A GROWING POPULATION

An overwhelming majority of the available arable land is used for producing food in China. The room for China to reduce land used for non-food crop production, in order to produce more food crops is minimal. Volume increase can only be achieved through yield improvement. Meat consumption is expected to increase strongly as income further increases. However, China's capacity to produce more animal products is stretched. More meat and dairy output will require more feed while China's ability to substantially increase its raw feed output is very limited. China has managed to produce a large amount

of food to meet rising demand from Chinese consumers. Looking into the future, China's ability to provide staple cereal foods, (rice and wheat) from domestic sources is promising. The question is whether China can effectively avoid the further decline of available arable land. The demand for land for non-agricultural use is strong, for example for road construction and urban expansion. The other is whether the Chinese government can effectively boost R&D investment, thus improving crop yields and productivity per hectare.

The rising per capita demand for fresh produce is growing steadily. We show this to illustrate a proxy for ornamentals and illustrate a competition for domestic natural resources to grow produce and ornamentals, as well as competition for logistics capacity.

Figure 3: Per Capita Fresh Food Consumption in China (Kg)



Source: China Statistical bureau and own calculation<sup>11</sup>

CHINA'S SUPPLY CHAIN AND LOGISTICS

The urbanisation of China will follow concentrated growth patterns with the rise of a number of large urban areas following the core and periphery structure, or in logistic

terms the hub-and-spoke model. In the coming decades, this will have significant implications on infrastructure investment needed to interconnect these markets. The image below shows the current back bones which may give the impression that the cities where growth is expected are generally

well connected. However, the image does not show capacity, and that is where the challenges will be for not only ornamentals. Despite the national policy arrangements and the execution, demand for logistics capacity seems to outgrow the projected capacity in the various modalities.

Figure 4: National Transport and Logistics Corridors

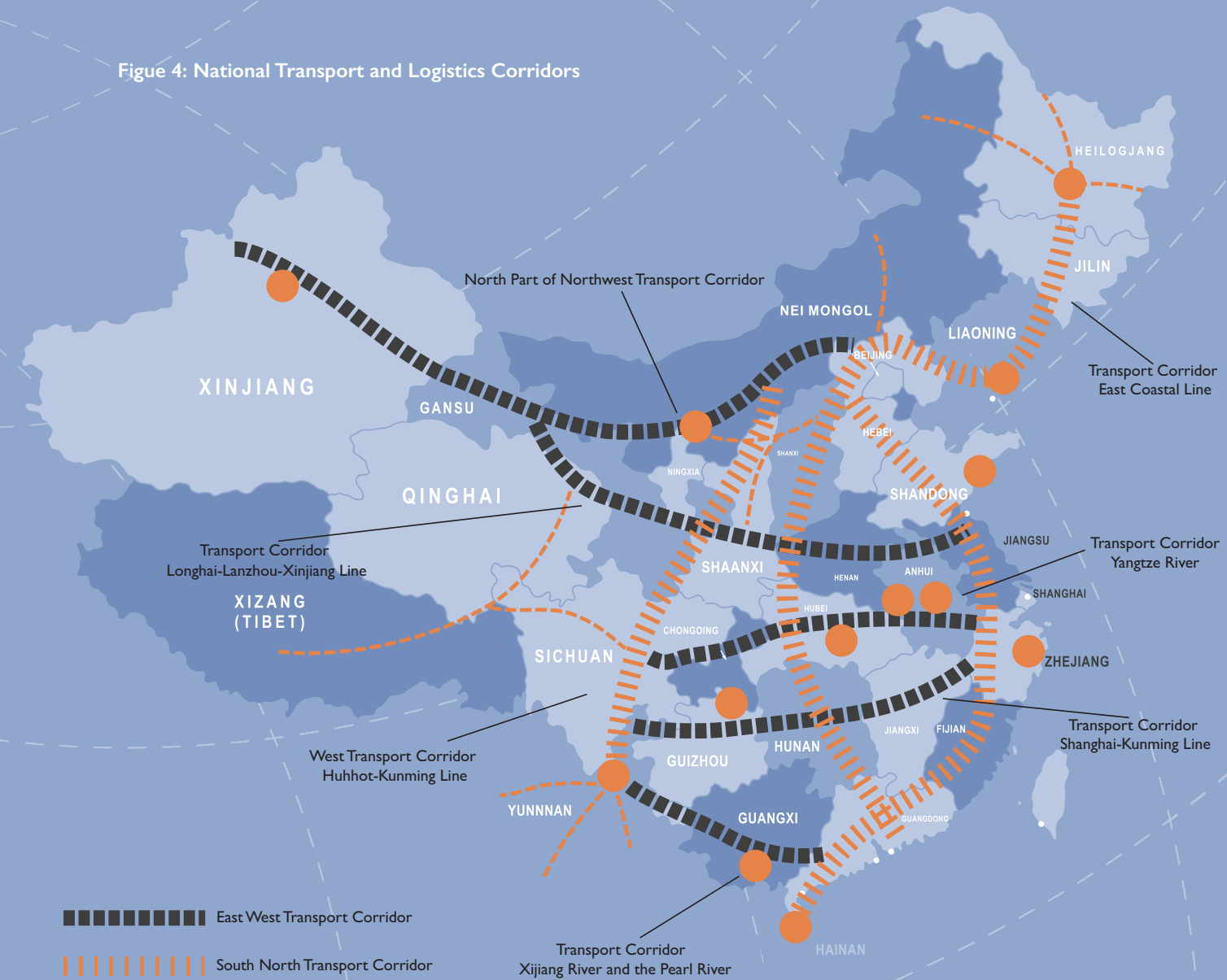
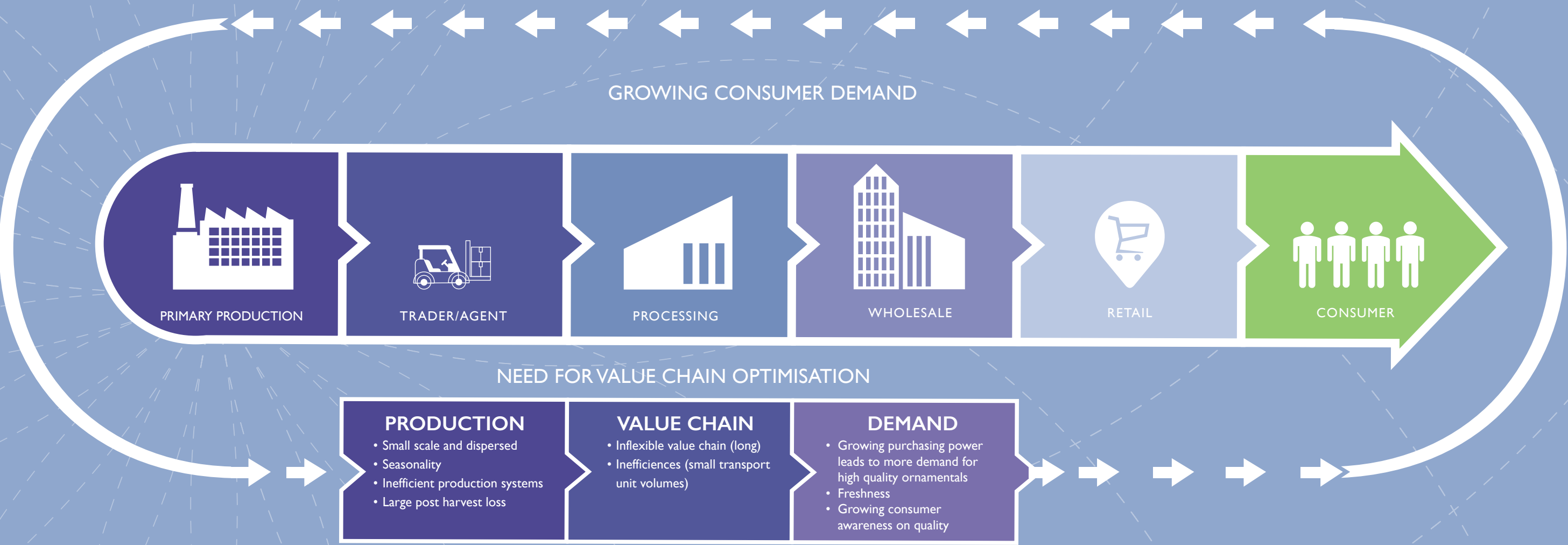




Figure 5: Value Chain bottlenecks and optimisation



In ornamentals, this raises the question of whether the current supply chain and its players are equipped to deal with increasing pressure. They will have to face tremendous volume growth in not only product flow, but increasingly in information flows due to the shift towards online platforms that tend to rely on traditional players for order fulfilment. The value chain will need to optimise.

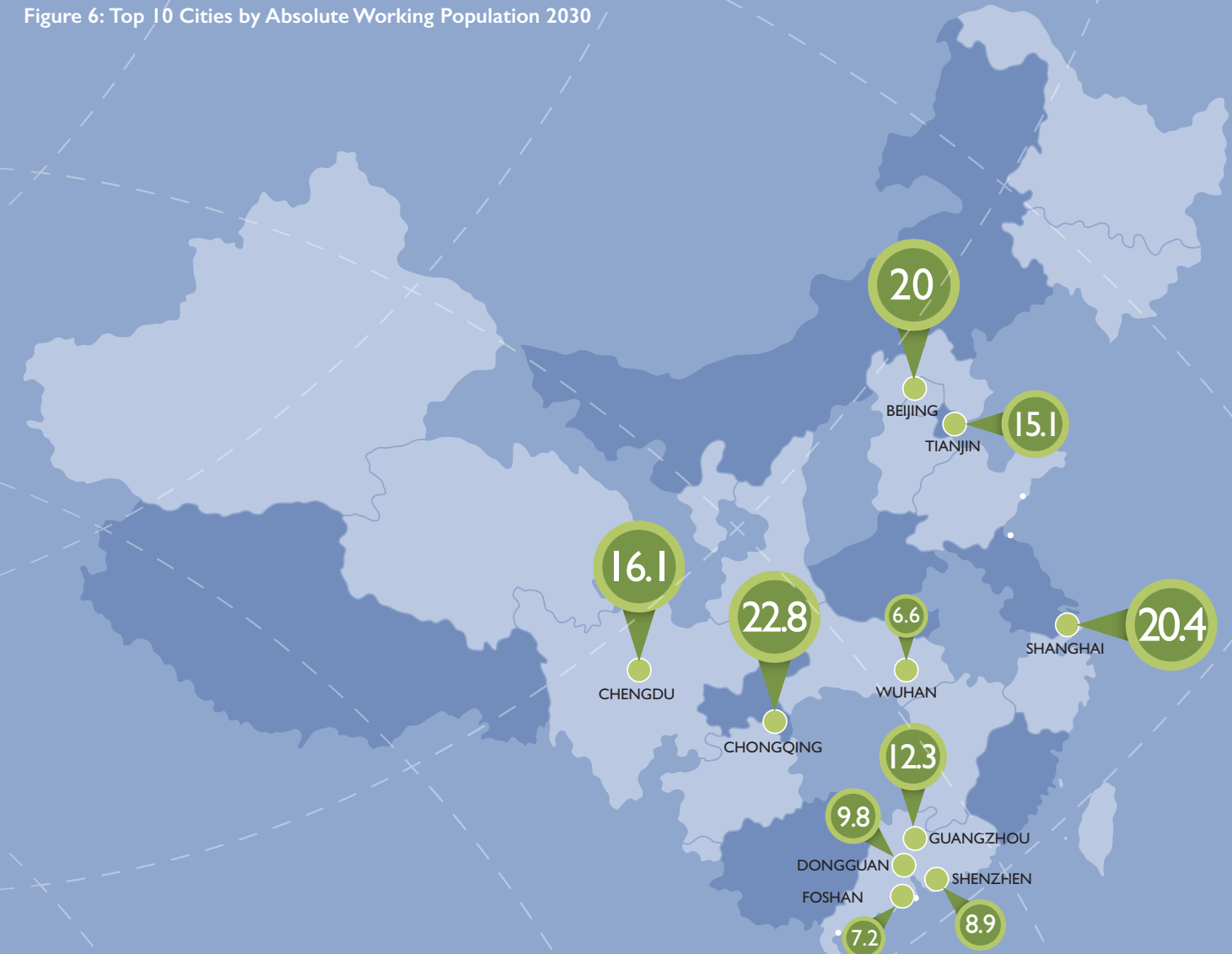
Moreover, China's demand hotspots for ornamentals are not within easy reach of current production centres. We only have production data at a provincial level, but these indicate that there are opportunities for improving logistics, in particular transit time, and improvement of the cold chain. Reduction of waste could be a key to satisfying rising demand whilst preserving input resources. Localising production closer to future demand

is not always feasible, but could be an opportunity for specific propositions such as a hybrid garden centre and nursery operations. China's industry players and various government bodies are working hard to develop solutions and policies to grow domestic production for the growing domestic demand. Meanwhile, the Chinese market offers ample opportunities for foreign growers

and traders to feed that demand. The presented findings on China's current challenges suggest that the economics of a comparison between domestic grown flowers, possibly could be less advantageous than foreign grown imports shipped directly to the demand centres.

# WORKING AGE BY POPULATION BY 2030 (MILLIONS)

Figure 6: Top 10 Cities by Absolute Working Population 2030



<sup>12</sup> Selling prices received by domestic producers for their output. The prices included in the PPI are from the first commercial transaction.

## ECONOMICS

Nearly 80 percent of the Chinese economy pivots around three economic cores: Beijing, the Yangtze River Delta (Shanghai) and the Pearl River Delta (Guangzhou and Hong Kong). However, if we look at where the growth of the working class is to be expected, the smaller cities around the cores of these deltas stand out. Three inland cities also attract attention with their growth of the target group: Chengdu, Chongqing, and Wuhan, mainly caused by large numbers of migrant workers.

## ORNAMENTALS FORECAST CHINA

Previous research often showed a linear growth for the forecast period. We developed a model which allows for a variety of variables and attributed weights. This is summarised in four scenarios:

1 A simple linear extrapolation based on data of the past farm gate value across all ornamentals growers between 2006 and 2016. Data was obtained via the China Flower Association databases of the Chinese Ministry of Agriculture

2 A growth scenario based on compound annual growth of the industry which is at nearly 22%. Based on the same dataset as in scenario 1.

3 A scenario fully based on the average consumer spending increase over the past 20 year period which is at 12.98%

4 A scenario based on a combination of the above plus a weighted average of both the variables that affect production (such as a firm inputs and the producer price index)<sup>12</sup>.

Figure 7: China Ornamentals Farmgate Value Forecast Scenarios (Bn Euro)

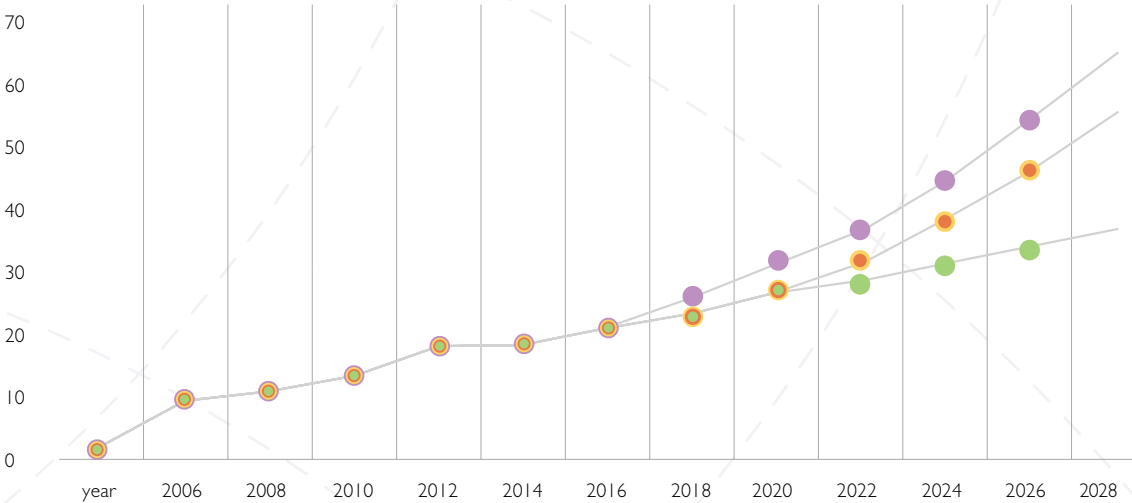
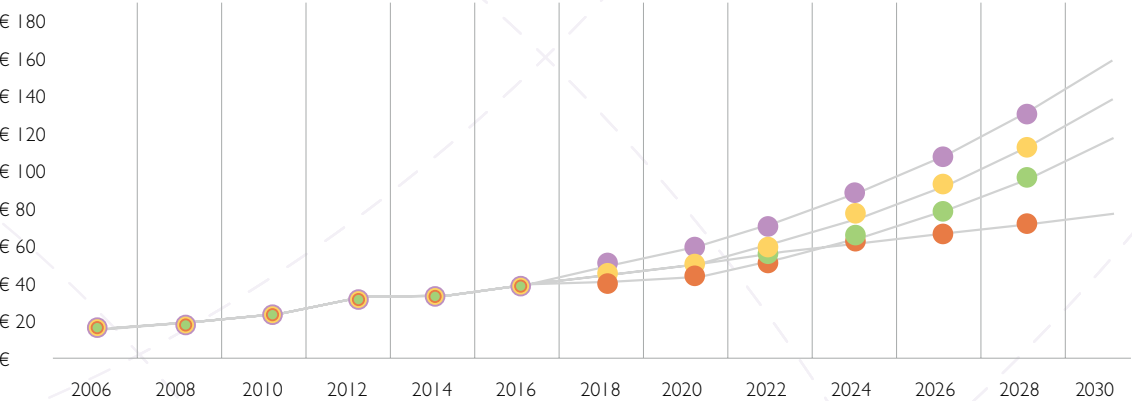


Figure 8: China Ornamentals Retail Value Forecast Scenarios (Bn Euro)



- Simple linear extrapolation
- Scenario on overall retail sales across all categories
- Forecast on past ornamentals production growth
- Scenario on weighted variables of production and demand

To summarise the forecast; we are sure of the demand growth in China; the macro and socio-economic factors are heavily researched and frequently updated by global and national institutions. Although developments in the past show a steady direction of growth, the ornamentals industry remains vulnerable to many external variables. Factors out of the industry's control like natural resources, climatic conditions, government policies, consumer behaviour; etc are at play around the development of this sector.

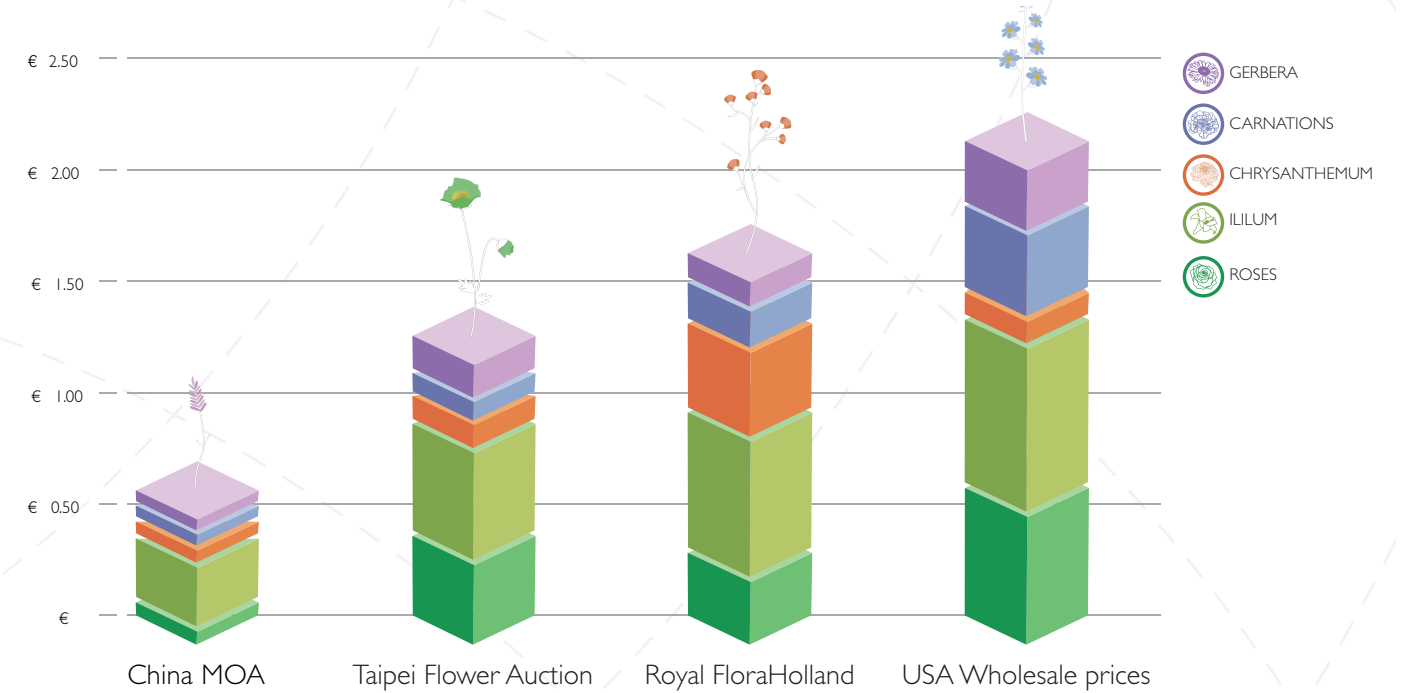
The forecast we have made not include these variables. So, provided that not too many disruptive events occur;

the direction for China's ornamentals industry is clear: by 2030 we expect China to be a super power; if not the leading country in the ornamentals market with a conservative estimate of a retail value in the range of €100 billion<sup>13</sup>. Most of that demand will be met with domestic grown product.

<sup>13</sup> Extrapolated figure of China MOA and MOC reported farm gate values. Extrapolation is based on World Bank long term crude economic growth, and we have adjusted for shifts in socio demographic composition and income development. The figure excludes the service segments and the public spending on city parks



Figure 9: 2016 Basket Value and Unit Price of top 5 Cut Flowers at wholesale level



Source: China MOA (CHINA Ministry of Agriculture), International Statistics – Flowers and Plants 2017 Yearbook (AIPH & Union Fleurs)

The question remains where the supply will come from? Without doubt, China will continue to develop domestic production to be optimally self-sufficient. This will leave a gap between supply and demand due to seasonality, climatic and resource constraints or simply the economics of production. Most of these variables cannot be reliably predicted, so we have taken production economics as a benchmark to assess where supply is likely to come from. We have taken the average 5-year unit values at wholesale level of each of the top 5 cut flowers in a combined basket. This shows a significant difference and illustrates the barriers for global competition with China's domestic production.

In light of the highly competitive advantage on price that local Chinese growers have nowadays, addressing the mainstream demand of China with imported ornamentals will be difficult. Based on the Producer Price Index, Chinese growers are likely to retain that advantage throughout the forecast period. For the higher-value and niche products there will be more opportunity for other countries to export to China.

The supply and demand gap is theoretically two-fold as China could further develop into an exporter of ornamentals. This is an ambition of respondents, however other inhibitors like plant breeder's rights, trade agreements, phytosanitary regulations or logistic interconnectedness are important pre-requisites to enable a strong export position. This is not developing quickly so we do not expect to see a significant increase in export volume in this forecast period.

### SUMMARY ORNAMENTALS IN CHINA'S URBAN CORES

We established that growth is concentrated in the urban working age group and selected the four largest metropolitan clusters for a case study in each area. This is summarised in metro sheets. We use those metro sheets to present the status quo and forecast on a consistent fashion for Metro Clusters or specific cities around the world.

Summarised:<sup>14</sup>

- The four largest urban areas cover 45 cities with a population of larger than 1 million.
- The total population in these four Metro Clusters is 471 million people (34% of total China) this is projected to grow to 573 million in 2030 (39% of total China).
- Their combined total consumer spending in flowers and plants is €1.6 billion in 2017 (40% of total China) which is expected to grow to €57.5 billion in 2030.
- Additionally, the local governments of these four areas spends €4.6 billion per year on city parks and urban greening, for maintenance as well as new installations and replacement. In 2030 we project this to be €9.8 billion per year.

14 Large variety of sources and research calculations





# UNITED STATES

## DOMESTIC PRODUCTION

The contribution to the GDP of the entire constellation of the ornamentals value chain in the USA added up to an economic value of €164.7 billion in 2016. This includes the influx of capital goods, consumables and services which other industries and sectors are tapping into all along the ornamentals value chain<sup>15</sup>.

The farm gate value of all ornamentals grown in the United States is reported at €4.94 billion for the calendar year 2014 in what was the last census of horticultural specialties conducted by the USDA-NASS<sup>16</sup>. The census showed an average annual growth of 3.44% since the previous census in 2009<sup>17</sup>.

US industry association, AmericanHort quotes the more widely used figure of €28 billion in 2016 for the value of the ornamentals and gardening market. Of this, plants account for €5 billion and cut flowers for €2 billion. The majority of the total aggregated

value consists of landscaping, lawn care, chemicals, fertilisers, irrigation equipment and services, accounting for just over €21 billion in 2016.

The difference between the USDA Census data and these figures is partially explained by import flows which accounted for €1,68 billion in 2016. The majority of domestic production consists of pot plants. Cut flowers mainly comprise tulips and Lilium, and the remainder is imported at an annual value of €1,7 billion.

The outlook for the development of domestic production till 2030 is conservatively estimated at just over €6 billion in farm gate value. The growth rate is based on a set of demand driven economic factors, complemented with a producer price correction.

<sup>15</sup> The figure is calculated and annually updated by Texas A&M, Dr. C.R. Hall

<sup>16</sup> US Department of Agricultural Services National Agricultural Statistics Service

<sup>17</sup> USDA Census 2016

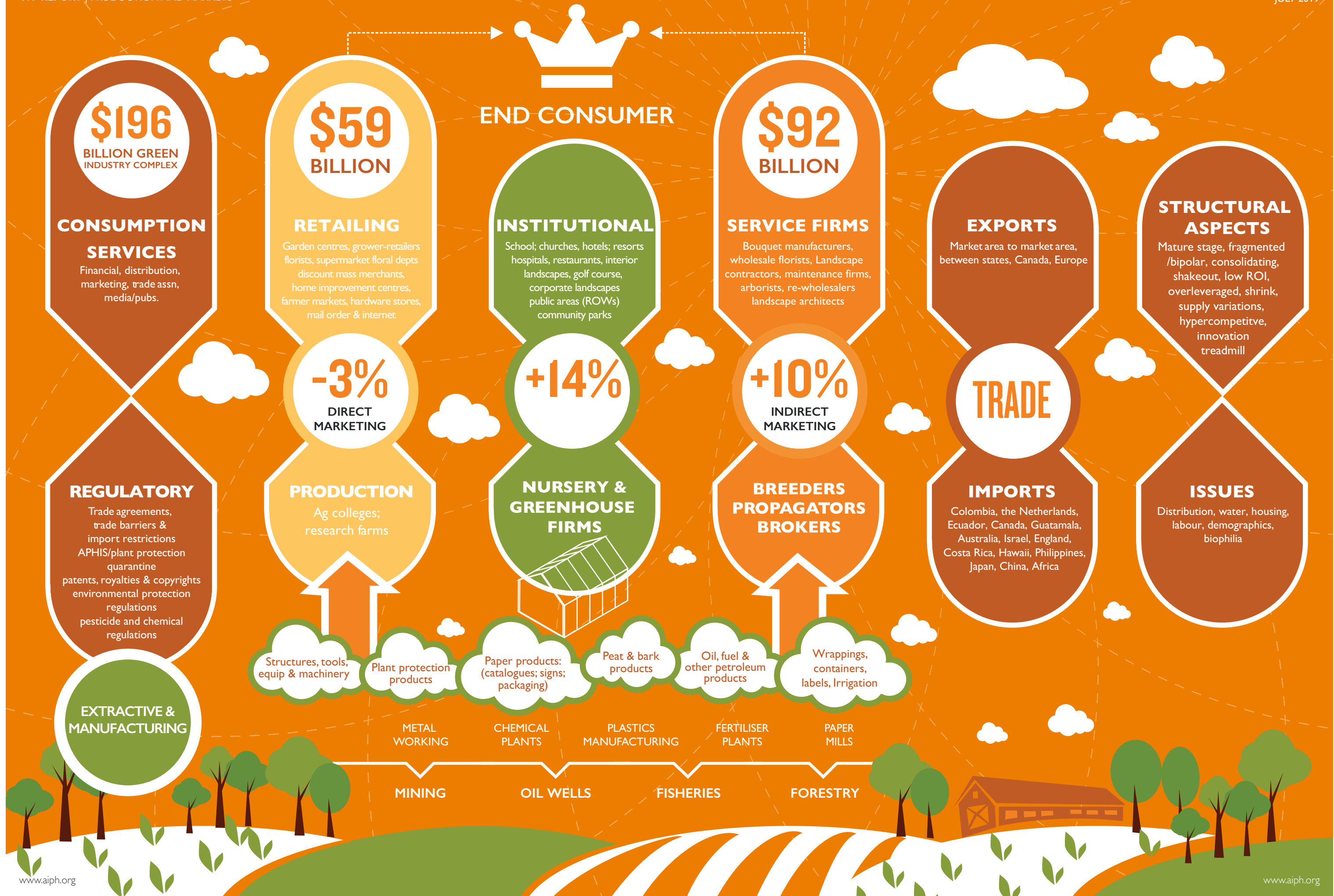
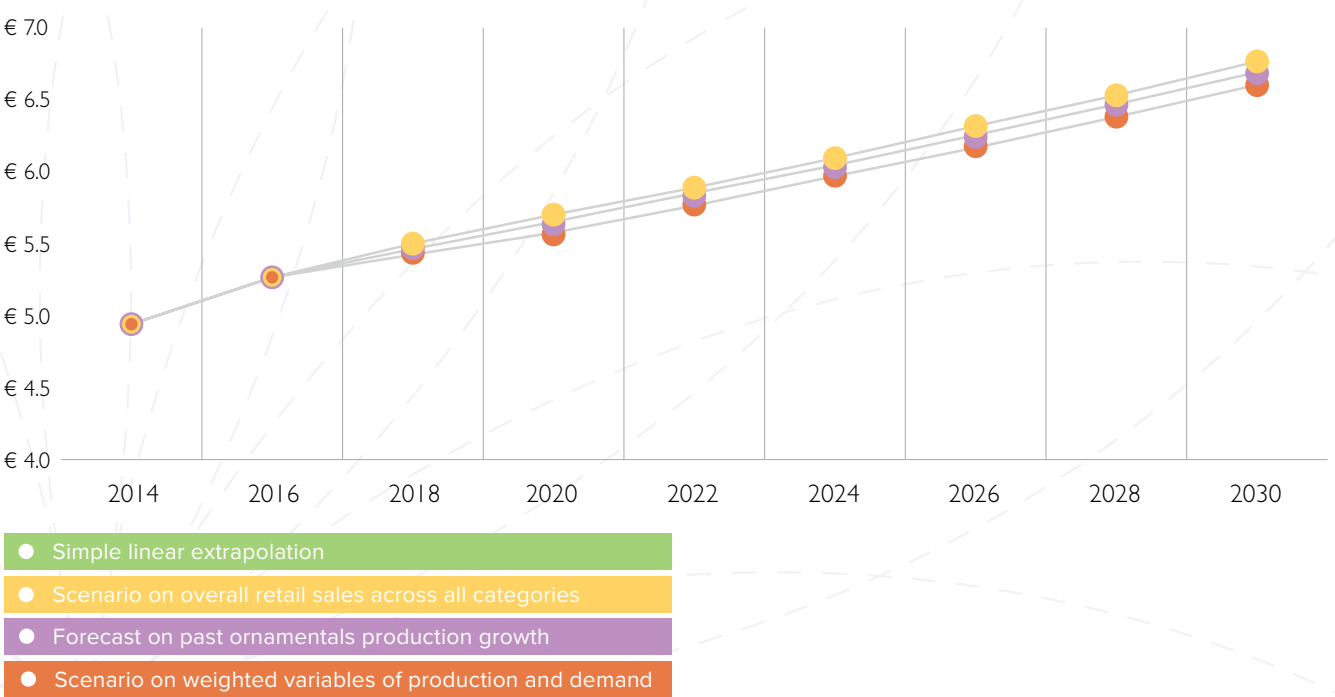




Figure 11: USA domestic production forecast



INHIBITORS OF GROWTH

The United States is seeing, year on year, increasing consumer spending and higher demand volume in ornamentals, yet the two major inhibitors for further growth are not seen at the demand side, but are government policy and industry constraints: labour shortages and logistic challenges is what keeps North American growers awake at present.

WORKFORCE IN HORTICULTURE

The USA is facing major challenges to align the work force with the demand developments. Industry Association AmericanHort indicated that 72% of the entire agriculture and livestock workforce (including horticulture) is foreign documented. It is estimated that over 50% of that foreign workforce is creatively documented, meaning that the individual workers are not allowed to either live, work or both in the Unites States. Labour shortages are the current main concern among growers. The shortage is caused by stricter federal immigration policies and stricter enforcement on illegal workers (heavier

penalties for employers and workers). We have seen numerous cases of growers who cannot expand their operations due to the lack of workers even though they have the money to invest.

Government policies do not currently provide a solution to this. We found an example of two states; Alabama and Arizona which have recently tightened their legislation on restricting foreign workers by making it illegal for anyone to support illegal immigrants. A small gesture like giving a bottle of water to an un-allowed immigrant can result in a severe penalty for the provider of that gesture. The penalties for an employer hiring an illegal worker are high. Research has shown that this policy change has taken away 10% of the workforce of Alabama of which most workers relocated to the adjacent state of Florida. This Alabama policy has not only negatively impacted the GDP and competitive position of the state, but it also strengthened their competitors in Florida and slightly increased Florida's GDP.

LOGISTICS AND ROAD TRANSPORT

Logistics are an issue in itself and an indirect consequence of work force

shortages. It is estimated that the United States alone currently lacks 300,000 to 350,000 truck drivers. An extreme example can be found in the state of Oregon where the entire backbone of logistic road linkages has been lost due to the bankruptcy of the Portland Port. This has exponentially worsened the already substantial challenges for Oregon growers. The state of Oregon is a relatively large producer of cut flowers and foliage of which 80% were sold into other states. Their competitive position is now highly uncertain due to the double challenge of a lack of drivers and a lack of logistic linkages, resulting in an upward cost spiral.

ORNAMENTALS DEMAND FORECAST

The afore-mentioned dynamics for the ornamentals industry are based on ongoing research studies conducted by academics, government institutions and private industry bodies. In general, there is a wide consensus on these figures, despite the fact that large datasets on ornamentals are hard to find, limited in scope and often inconsistent. The common objective of these

approximate datasets is to provide some guidance to players and policy makers. In this research we have made an effort to provide more detail on consumer and public spending on ornamentals. The forecast is based on proxies from available macro datasets combined with industry specific factors for ornamentals. To limit the divergency in the forecast we are applying this on a city level and to specific target groups rather than the country as a whole. This changes the common perceptions of market and segment values. For instance, in the commonly accepted per capita per spending we found a richer understanding and significant higher spending.

In North America, the densely populated areas with the greatest contributions to national GDP are the focal points for this stage of the research:

We have conducted three case studies into the above areas. At this stage we highlight the largest<sup>18</sup> urban area in North America; the North-East Corridor, also known as the Bos+Wash megalopolis. This urban area stretches from Boston, MA south to Washington DC. It is home to 48.7 million inhabitants (15% of the USA) and is responsible for 18% of the national

GDP, on less than 2% of the land area<sup>19</sup>. This metropolitan area is characterised by a higher level of education (22.6% have a bachelor's degree or higher), higher median incomes (8.4% higher)<sup>20</sup> and is generally younger with a median age of 34.2 years compared to the national median of 37.9 years<sup>21</sup>. The region can be considered an economy in itself with its own characteristics for supply and demand dynamics. Such urbanised areas have different socio demographic compositions than the country they sit in. This directly affects the consumer behaviour and their spending on ornamentals. The key findings are categorised as follows:

GENERAL PER CAPITA SPENDING

The per capita spending figure is calculated by the total consumption value divided by the total population. It is an aggregated indication on the annual consumer value per person, across all age groups, income classes, gender, background, and area. We found two reported per capita spending values: One is €83 and is provided by the US department of Commerce, which includes cut-flowers, plants and garden (products and services), the

other is calculated at €28,84 by Royal Flora Holland and only pertains to cut-flowers and pot plants. When we place that second figure of cut-flowers and pot plants in the context of the specific demographic and economic situation and outlook of the area, the calculations reveal new insights that can be relevant to players addressing this, or comparable metropolitan areas. The per capita spending in the Bos-Wash Area is at €49,00, more than double that of the national average. The following factors are at play:

MAJOR LIFE EVENTS; WEDDINGS AND FUNERALS

We have studied two major life events in which flowers are culturally embedded and a service market of mainly traditional florists has grown to serve; weddings and funerals. For instance; New York has a wedding rate of 1,36 that is nearly double that of the average national rate (0.71) and the surrounding cities (0.9). It is likely that the wedding market in New York is an attractive destination market

18 in terms of population and GDP  
19 American Institute for Economic Research  
20 US Bureau for Labour Statistics  
21 US Census Bureau



22 City of New York  
23 Ibis World research  
24 Elite Publishing  
25 US census data  
26 Crains New York  
"grave situation"  
27 GIE Media Lawn  
and Garden

for couples, which is reflected in the high number of wedding planners and wedding venues.

The average budget for weddings in New York is €73,000<sup>22</sup> nearly three times as high as the national average which is budgeted at €26,000<sup>23</sup>. To calculate the wedding market value for ornamentals in this area conservatively, we use the national average budget for flowers and decoration of €1,975<sup>24</sup>. With a total of 438,390 weddings per year in this area, the current market value for flowers and plants is well over €865 million. In the course of the forecast period till 2030, the development of this figure will not be linear. Factors in play are, for instance, an increasing number of unmarried couples, an ageing population, slowing population growth, etc. The conservative forecast for 2030 would be that the wedding rate will grow more in line with the national average and that the annual number of weddings grows linear to the population growth. These two factors taken into account, show a total of 476,297 weddings in 2030 with a total market value for ornamentals of €1.178 billion.

Funerals are an inevitable consequence of life and an industry in itself. The mortality rate of the ageing population in the USA will increase from 63 to 89 per thousand in 2030<sup>25</sup>. In the target area this implies an annual number of just over 300,000 funeral ceremonies, increasing to 550,000 ceremonies in 2030. The average cost of funerals will increase non-linear to other demographic indicators due to a decreasing number of undertakers and scarce space at cemetery sites and more personalised ceremonies such as eco-burials<sup>26</sup>.

Despite the new economic opportunities this ageing population provides, we have calculated the forecast period with a linear cost increase to provide a conservative outlook. This means that the market value for ornamentals in the target area is €73.8 million in 2016 and

estimated at €184.7 million in 2030 in a conservative scenario. This figure excludes the cost of installing and maintaining the cemetery sites.

The two researched major life events combined result in an additional per capita spending of €25.85 in 2016 and are estimated at €35.26 in 2030. This is an additional spending, since the main component is based on service rather than product-cost. As such this service segment is not included in the common industry figures, which are based on a sum of the product's domestic farm-gate value plus total import value which is then increased with standardized margins for players further downstream along the value chain. Moreover, this market is served by the so-called event industry which is not consistently included (or excluded) from the prevailing data.

**GARDENING AND GARDEN CARE MARKET**

At first sight the garden market in this densely populated area would seem small, as space is rare and expensive. However, around the metropolitan cores, the peripheries and semi-peripheries provide a wealth of green space to compensate the lack in the high-rise down-town, and less affluent urban areas.

The available data for this segment show that the market value in the product group of landscaping, chemicals (crop care and fertilisers) and lawn services (maintenance) is extremely concentrated in just 6 nation-wide companies taking 30% of the market value<sup>27</sup>.

A survey by NGMRC also reveals that the highest spending was among Baby Boomers, who traditionally are avid gardeners. Other characteristics of consumer profiles stand out, such as married households, college graduates

and households with annual incomes over \$75,000.

The same report observes an emergence of new gardeners which is the age category of 18 to 34 years. This trend may in part be driven by the quest for health-conscious life styles.

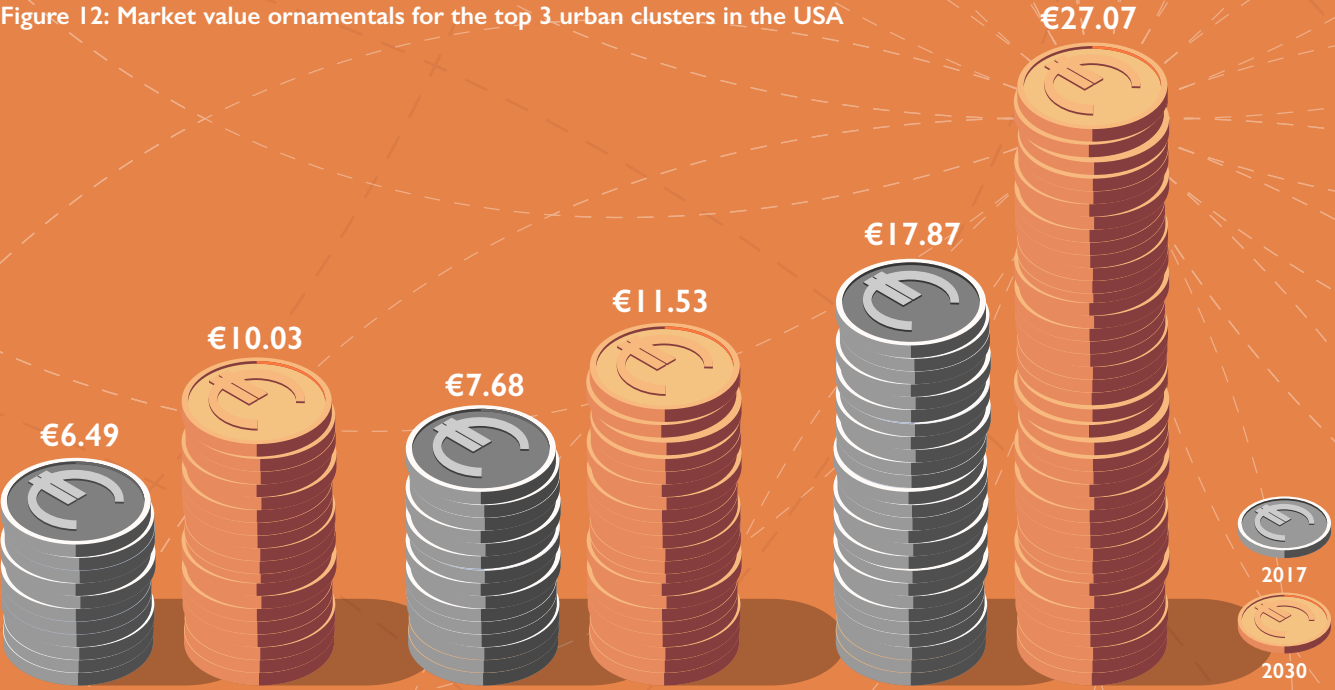
The average spending per household on this category gradually increases as the homeowner ages. The 60-plus age category tends to spend up to €375, while the working age spend averages €319. The national average household spend on gardening is €337 in 2016 and forecasted to grow to €438 in 2030. In the target area we have calculated a total market value for this category of €2.6 billion.

The growth in the forecast period will likely be non-linear to other economic indicators due to trending factors like health consciousness (home-grown) and an ageing population with avid gardeners with time and money to spend. The estimated value of this segment amounts to €4.05 billion in 2030, or €65.44 per capita in the target area.

**PUBLIC SPENDING ON URBAN GREEN SPACE**

The urban greening revolution is on its way worldwide to shape the cities of tomorrow, but established cities are doing their best to keep up the pace by ensuring that their populations all have easy and close access to public parks. Design, build and maintenance costs are typically covered in city budget plans and reliable data are available. We have collected the total and per capita spending of the major core cities in the target area and from there extrapolated to the total Bos-Wash area. The current market value of public spending in urban green spaces is

Figure 12: Market value ornamentals for the top 3 urban clusters in the USA



to €10.2 billion. This comes down to a per capita spending of €121 in 2016 and €165 in 2030, equal to double the highest present day value of €83<sup>29</sup>.

**CONCLUSIONS FOR THE URBANISED NORTH-EAST OF THE UNITED STATES**

- The demand growth till 2030 will be driven by an increase in purchasing power (36%) rather than population growth (9.66%)
- Specific consumer groups show steep increases such as the 60-plus age group and the working class.
- The per capita spending in the studied area is higher than the national averages presented in other research. This is likely due to the demographics and economics of an area specific demand profile, consumer behaviour, a service industry catering to major life events, and relatively high public spending on urban green space.

Further research to enrich and validate these projections is needed, but there is definitely a trend and it seems likely that

such a city approach is a representative case for other densely populated metropolitan areas in North America.

We have calculated the economics of demand for ornamentals for the three largest urban clusters in the USA. Divided over three categories, of which public spending is by far the greatest. The MidWest cluster is home to 4 cities in the top 10 of the highest public spending per capita on urban green spaces. They spend an average of €240 per capita per year. It is also home to the city with the lowest spend; Detroit at €19 per capita.

**CONCLUSION UNITED STATES**

- The market is mature, but huge and with growth in specific segments which brings opportunities for new propositions.
- During the forecast period the ornamentals market for flowers, plants and gardening is expected to grow 54% by 2030 in the USA
- For exporters to the USA, opportunities arise particularly for cut flowers from Colombia and Ecuador who are expected to benefit

most from this demand growth which will be over 54% by 2030.

- Also, Canada is positioned well to take advantage of this, to increase their current export value of €250 million in mainly pot plants.

- The number of working-age people in North America is not growing as fast as either of the other two groups of consumers but they represent a growing value. Cost consciousness and rising inequality need to be factored into companies' strategy for capturing the purchasing power of these consumers. The unique needs of these consumers are creating opportunities.

Looking ahead, if their fortunes improve through wage growth that is higher than expected or through lower debt, it will be interesting to see if their cost-conscious choices endure.

- Even in North America, inhibitors for growth are on the horizon. The challenges growers are facing on logistics and labour cannot be solved overnight and are likely to bring some scarcity and raise retail prices as a consequence.

28 Trust for Public Land, City Park Facts 2017  
29 US department of commerce





## 4 | MATURE EXPORTING PRODUCERS

This category includes mainly the production countries that have developed their logistic backbones in a South-to-North direction and only in the past decade started to actively widen those routes to the east and west.

These countries have been in business for decades already and have well established infrastructure and connections to the main markets.

Latin America is obviously also home to two world players in the field of production of cut flowers: Colombia and Ecuador. Advantages of natural resources, location, altitude, labour force and other economics have propelled the growth of volume and value of cut-flowers grown in these countries.

Producers in Central America have captured their own export markets for foliage greens and are selling in similar trade routes to the developed western world.

Traditionally, export flows mainly from Colombia and Ecuador to North America, and to a lesser extent to Europe and Russia but in total these two countries serve the global market place and their flowers have ended up in every corner of the world, either direct or via re-export through hubs like the Netherlands for example.

### FORECASTING MODEL

In order to get an understanding of the years ahead, we calculated three scenarios to create a forecast. Each scenario is based on a handful of macro and socio economic factors that were explained in the previous chapters. For the three countries studied in this category we used the following factors:

a) Datasets from the respective country's statistical office, AIPH data, and UN Comtrade, were cleaned and prepared after which a simple linear extrapolation is done;

b) We calculated a demand scenario where the majority of production will continue to flow to the current top 5 clients. The growth of the export value is then based on a compound average growth of the demand development in these markets.

c) A scenario of a total global long-term average economic growth rate.



# COLOMBIA

Traditionally the home of the cut flowers for North America, this country is diversifying rapidly. The assortment suits all major demand markets and the logistics network is improving continually. A steady supply of mainstream bulk crops is expected during the forecast period. Differentiated high-grade crops are to generate more demand, hence driving value up and decreasing volume.

Colombia flower export association, Asocolflores expects that future exports of Colombian flowers will be influenced by two distinct tracks: macro-economical drivers like exchange rates which have helped Colombian exports since 2013, and secondly, local farm input or operating costs and the underlying societal and political factors that determine the cost of labour.

Second-generation growers are running their farms based more on theory and marketing rather than agronomic excellence. The main farms have been relying on the same technical agronomists for the last 20-25 years hence technical innovation is currently at a low level, which negatively affects the competitive position.

## RESOURCES

Availability and quality of land as well as water, energy and labour supply are also significant issues that could limit growth but these are hard to predict. We think that just as in other parts of the world a society will debate over where scarce resources are best deployed; in domestic food production, or in external trade and hard currency.

## OCEAN FREIGHT

In order to access demand on other continents, direct air routes need to be developed further. Colombia has obtained a strong position with research and trials for flowers to be shipped via sea freight in climate-controlled reefer containers. This may prove to be a strong competitive advantage in the future as technical and economic solutions for ocean freight are further enhanced. The potential for penetration of Colombian Flowers in European markets is dependent on the entry barriers of breeders depending on how and where they will collect royalties. Currently royalties are differentiated between Europe and Colombia, where royalties for

Colombian growers are lower, with low cost export via ocean freight to, for example, the UK, this then creates a playing field that is not level.

## FORECAST

The Colombian producer association Asocolflores has a positive outlook and is looking forward to a steady growth path. To get an understanding of the years ahead, we calculated three scenarios based on:

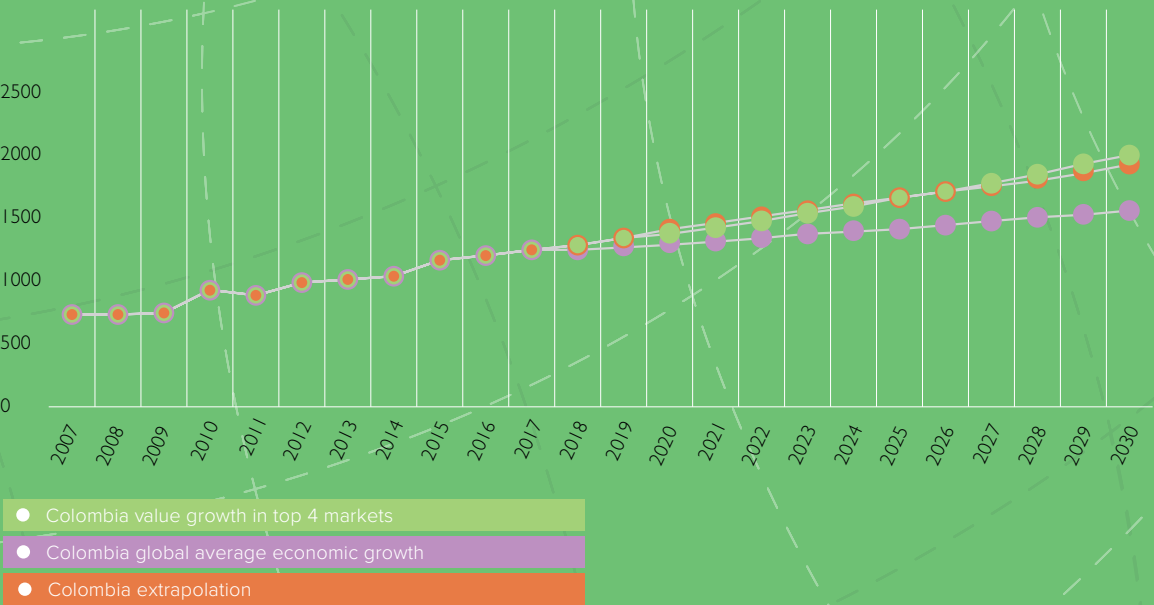
a) Data from Asocolflores and UN Comtrade are combined and extrapolated;

b) We calculated a demand scenario where the majority of production will continue to flow north to the current top 5 clients; USA, United Kingdom, Japan, Canada and Russia. The growth of Colombia's export value is based on a compound average growth of these markets.

c) Global average economic growth rate. Eventually we have to leave it up to the players to define ways to reach other markets we have highlighted. Provided that the production resources of Colombia can sustain

the growth in demand, opportunities will be plenty for Colombian growers, and the above trend lines can go up further.

Figure 13: Colombia export value forecast



# ECUADOR

Ecuador was one of the first countries where the potential for the luxury, large premium rose was explored and eventually matured into a large industry with a world-famous reputation for unique products.

With a total of 5.595 hectares of cut flower production and 3.805 hectares of roses, Ecuador is a true specialist in roses having the advantage of favourable micro climatic conditions at high altitude, with for example consistent day length and temperatures. Ecuador complements its assortment with an array of summer flowers.

The key to this success lies in a combination of high-altitude production locations which have the benefit of fertile volcanic soils, abundant natural resources and relatively cheap labour.

However, it is the latter that has prevented Ecuador from taking full advantage of increasing global demand. Regarding labour costs it is difficult for Ecuador to compete with Colombia, and on top of that in the past decade Ethiopian growers have managed to

come close to Ecuadorian quality standards by growing substitute products at lower cost. Export partners traditionally are the United States at an average value share of 35% and Russia at 18%. China is the new emerging market for Ecuador. Business only really took off in 2014, doubling every year after. Considering the unique properties and brand value of Ecuadorian Roses we expect that Ecuador is in one of the best positions of all mature and emerging exporting producers to take advantage of that.

## FORECAST

If we take our forecasted growth of spending on flowers by the upper classes in China at 295% and project that on the 2017 export value of Ecuadorian flowers to China we reveal a potential value of €38.6 million. However, it is likely that the year-on-year growth of export to China will prove the more likely scenario due to the perfect alignment of China's target groups buying behaviour and preference for brand value. In that case the multiplier till 2030 is based on a CAGR of 48% so

a total of 672% yielding a potential export value of 87 million. This value still seems conservative compared to the trade with USA and Russia where similar demand patterns prevail, yet with smaller populations and consumption value. So we would not be surprised if Ecuador outperforms this forecast and brings China into the top of its export partners. This example clearly reveals the impact the rise (and fall) of a foreign market like China can have on the ornamentals industry in Ecuador.

Both public and private sector would

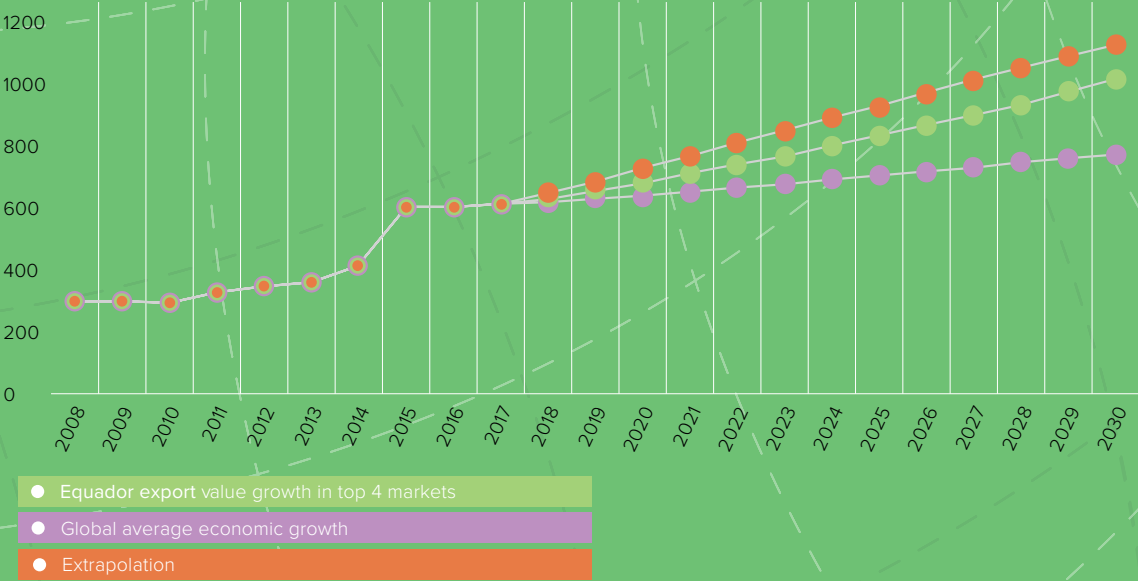
need to collaborate to enable the industry to capture this potential target group. In order to get an understanding of the years ahead, we calculated three scenarios for the forecasting. We used the following factors:

- a) Datasets from the respective country's statistical office, AIPH data, and UN Comtrade, are cleaned and prepared after which a simple linear extrapolation is done;
- b) We calculated a demand scenario where the majority of production will continue to flow to the current top 5 clients; USA, Russia, Europe,

Japan and Canada. The growth of the export value is then based on a compound average growth of the demand development in these markets.

- c) A scenario of a total global long-term average economic growth rate.

Figure 14: Ecuador export value forecast





# KENYA

30 Reynolds Hutchins, "Flower shippers latest to test maritime cold chain,"

31 David Bosomworth, "Shades of green"

Ornamentals exports is one of the top foreign exchange earners for this country, generating just under €663 million in 2016. Of that €609 million is relevant to benchmark Kenya against others as the remainder consists of plant material (cuttings and seeds). Kenya is the lead exporter of rose cut flowers to the European Union with a market share of about 38%. Approximately 65% of exported flowers are sold through the Dutch auctions, although direct export destinations are growing in importance. The main production areas are located around Lake Naivasha, Mt. Kenya, Nairobi, Thika, Kiambu, Athi River, and Nakuru. The industry continues to attract investors comprised of large, medium and small scale producers that have attained high management standards and have invested heavily in technical skills, production, logistics and marketing.

Adjacent to the Africa Logistics Conference in Nairobi, Kenya (2017), we conducted several interviews. The ambition of the players and policy makers are great; as one official stated to us "Kenya should be able to increase its ornamentals exports by 20% per year". Other sources are more conservative, but all mention a continuation of past growth. Despite a well-established production base that is well connected globally, Kenya has a few challenges ahead to enable the industry to grow.

Across the board of interviews, Kenya's flower industry anticipates a global annual

growth of 5% in the flower industry over the next 3 to 5 years. To be a part of this growth, Kenya is going to continue the expansion of the sector while focusing on improved productivity to counter increased costs of production and decreased returns on investments.

## LOGISTICS

Air freight capacity and the speed of export documentation and phytosanitary handling is suggested as an inhibitor for growth. Improving the connections of Kenya to the global airfreight network and increasing the number and capacity of direct flights to the main markets, would provide opportunities to enhance the competitive position of Kenya. Kenyan growers have experimented on a transition from air to ocean freight which could reduce costs by 38% and cut greenhouse gas emissions by 87%<sup>30</sup>. According to a 2007 study<sup>31</sup>, the carbon footprint of flying flowers from Kenya is six times smaller than producing flowers in controlled greenhouses in the Netherlands. On a more practical side; the main production area is located around lake Naivasha, a 2 to 3 hour drive from the Nairobi Airport. However, traffic conditions are unpredictable and transit times can go up to and over 6 hours. The quality of the roads not only affect the transit time, but also the quality of the flowers. Government plans are underway to improve this but have not yet been executed.

## RESOURCES

Water availability and quality is an issue in some Kenyan production areas and could become an inhibitor for further growth ambitions. Effects of decades of below-average rainfall in East Africa are exacerbated by Kenya's limited freshwater supply. Flower production is water intensive, so dwindling resources put pressure on farms' operating models. Furthermore, drought and population growth in primary growing regions conflict the interests between the Kenya Flower Council (KFC) member farms and local communities that have ancestral claims to land and water resources.

In response to water scarcity issues, the KFC has taken two important steps. First, the association partnered with the World Wildlife Fund to establish enabling conditions, including strengthened regulation, for more sustainable management of the Lake Naivasha Basin, the region responsible for 95% of Kenya's cut flower exports. Secondly, the KFC worked across sectors to develop a Carbon Reduction, Resources, and Opportunities Toolkit (CaRROT). This accounting and management solution allows the KFC to measure CO2 emissions, energy efficiency, and water consumption to target opportunities to improve its production efficiency.

Labour is plentiful, yet farms are always on the lookout for improvement to involve people to really dedicate their energy and attention to the job.

This benefits both sides and the worker is likely to retain their position at the firm, and the grower has the advantage that skills and on the job training are not lost to a competitor. Skilled labour is sourced for shift or team leads and management or engineering positions are mostly filled by foreign workers.

## ENERGY

Flower production in greenhouses is an energy intensive activity. Electricity is required for water pumping, lighting, refrigeration, heating, and for sanitary processes. As a result, the flower farms incur significant energy costs which account for 10-20 % of the total operating costs of the farms. Further, flower farms are required under

national laws to meet high social and environmental standards. Against this backdrop, the KFC has introduced a comprehensive, internationally accredited auditing scheme. The results of audits showed a high potential in saving electricity costs through utilisation of solar energy and extraction of biogas from biomass (flower) waste.

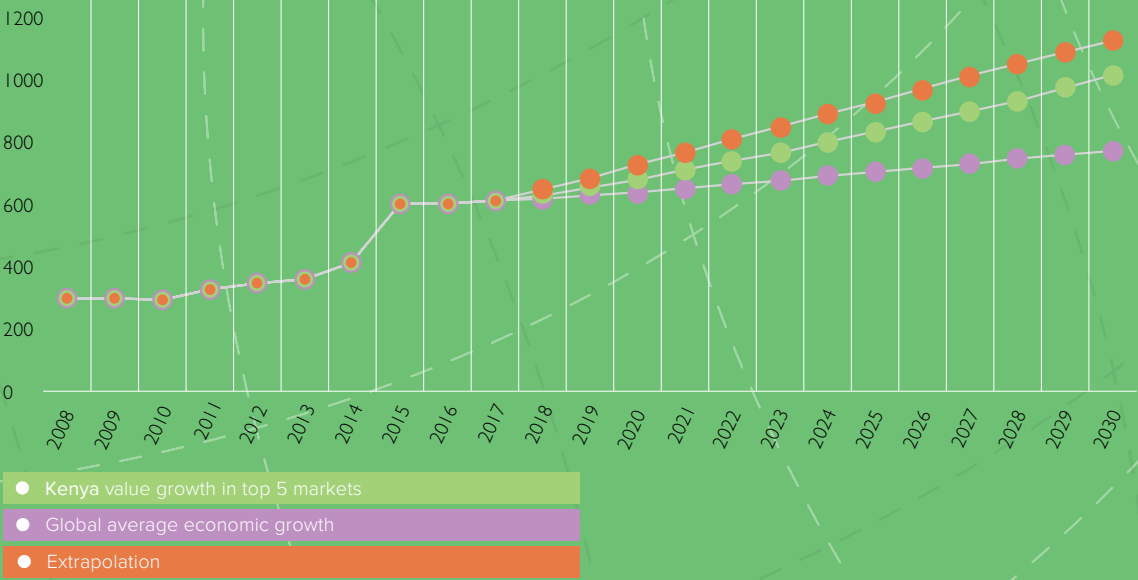
## FORECAST

Kenya is currently not connected to the disruptive growth in China and that will possibly be difficult to capture in the short term due to assortment, cost price and logistics. The assortment of Kenya and China shows similarities, so it is likely that competition will come down to price only at which point proximity

and logistics costs determine who can capture the market. We have used the following factors:

- a) Datasets from the Kenya Flower Council, AIPH data, and UN Comtrade, are cleaned and prepared after which a simple linear extrapolation is done;
- b) We calculated a demand scenario where the majority of the production will continue to flow to the current top 5 clients; USA, Russia, Europe, Japan and Canada. The growth of the export value is then based on a compound average growth of the demand development in these markets.
- c) A scenario of a total global long-term average economic growth rate.

Figure 15: Kenya export value forecast





## 5 | EMERGING DOMESTIC PRODUCERS

In the forecast period of this research of the next decade and a half, it has become evident that the main share of demand growth is concentrated in just a handful of target groups in specific areas of the world.

We have concentrated on the demographic demand development rather than the geographic markets

which are defined by geopolitical borders and have for instance natural resources, infrastructure, labour or specific policy arrangements for ornamentals in place. Emerging producers have the best of both worlds; an increasing domestic demand and abundant resources to satisfy that demand with domestic grown products

# BRAZIL

32 World Bank data

The Latin American continent will be worth just below €3 trillion of urban consumption in 2030, and take 5% of the total global consumption growth, which is mainly driven by their working age consumers<sup>32</sup>. Although quite a performing and sizeable market, we did not investigate the demand developments because a lack of data on ornamentals production value. Moreover, in terms of external trade and market potential for foreign players, Brazil is a typical domestic producer which has protected its market with strict import regulations and trade tariffs and as such not a global player in ornamentals.

In a next research stage, we would like to investigate the large urban areas in São Paulo / Rio de Janeiro, which would be the most likely area where demand spurs will occur. The 2017 population of São Paulo metro area is 21,1 million inhabitants and that will slowly grow to 23,5 million by 2030 (CAGR 0,81%) but their GDP will grow at an annual rate of 5,7% to an expected €753 billion. Again, it is the increase in purchasing power of the middle class that is likely to drive the demand for ornamentals.

Brazil with 15,000 hectares of ornamental production is, in terms of size, in the global major league but keeps the majority of the output for domestic consumption. Brazil has a large grower base of 4,000 enterprises in the south-east of the country and just west of São Paulo that provides a wide assortment to the co-operative auction (Veiling Holambra).

The auction has a very dominant position in the value chain. For example, the auction is in direct contact with large retail multiples to negotiate multi-year supply contracts across the product range on behalf of its growers.

The growers sell through an advanced network where logistics, financial and information flows are orchestrated by the auction. This eco system is very resilient and can absorb strong growth. It has a nation-wide coverage and would potentially be the optimal point of entry in case the demand needs to be complemented with imports.

## Brazil

# MEXICO

In Central America, Mexico is a country to further investigate, and in particular Mexico City stands out as a potential hot spot for demand. Mexico City as a metropolitan cluster of 60 municipalities has a total of just over 21 million inhabitants which is projected to grow to 23.8 million by 2030. They produce a GDP of €420 billion at an expected CAGR of 4,5%, which is quite an achievement compared to their annual population growth of just 1,15%.

Culturally ornamentals are embedded and play an important role in religious festivities, national holidays and major life events.

In 2016, Mexico had 22,700 hectares of ornamentals, of which around 10,000 hectares were of cut flowers and 1,500 in protected greenhouses. The production is heavily concentrated around Mexico City (nearly 40% if the total area is in the Estado de Mexico). Traditionally this local production base grew to serve the urban demand and has no relation (yet) to take advantage of export via airfreight, since the country only exports between 5 to 10%. The logistic network for flowers pivots around Mexico City to serve other areas of

the country.

In total, the industry employs around 200.000 people, and the Ministry of Agriculture estimates that another one million people are indirectly employed in other sectors that serve the ornamentals industry.

Although the government is heavily investing to further develop domestic production of fresh produce, ornamentals are not part of that strategic agenda.

We would wish to see Mexico as a follow up research to uncover the potential for ornamentals.



Figure 16: GDP growth versus population growth in South East Asia



# ASIA

Sources: UN Habitat, World Bank

In many countries in this area, ornamentals are culturally embedded and frequently used in religious ceremonies. Such markets produce huge volumes and are home to a large domestic production base, with many small holding growers. The unit value or per capita spending on ornamentals is relatively low and not expected to change over the forecast period of this research since the underlying buying behaviour is motivated by habits which have not changed in decades or even centuries. We are aware that the potential of a disruptor or a new service provider could be dormant, even in this segment.

This is the continent where the most significant growth on all relevant indicators is expected. Although population growth will slow down in the forecast period, overall economic growth will continue along the high rates we have seen in the past decade. A recent report by Rabobank expects a demand growth for cut flowers and plants of 80% until 2027 across Asia. The figure is mainly based on a compound growth rate of GDP at PPP (Purchasing Power Parity) of 8% per year. Moreover, the players in the industry expect that the Asian countries with the highest demand growth will quickly develop their

own, domestic or regional production capacity to satisfy the local demand.

The question remains where that production will take place and which demand it will serve. In regard to the demand, it is obvious that the usual suspects will account for the largest share of the growth. Economic powerhouses such as China and Japan are leading the growth in consumer spending. They are followed by the population hot spots such as India and Indonesia where the growing size of the emerging middle class increases spending power. In Asia, only a select number of countries seem relevant for a deep dive because of their traditional appetite for ornamentals, which we consider a more important driver in this region than the increase in consumption power.

These countries bring to light that our classification also has room for a hybrid profile where a country can be an emerging domestic producer and an emerging (or nascent) exporter in one.

All because of their proximity to China. All of these countries are members of ASEAN – The Association of South East Asian Nations – a regional intergovernmental organisation comprising 10 Southeast

Asian countries which promotes intergovernmental cooperation and facilitates integration amongst its members and other Asian countries. The group became ASEAN Plus Six with additional countries of China, Japan, South Korea, Australia, New Zealand and India. They are in the process of establishing the Regional Comprehensive Economic Partnership (RCEP), a proposed free trade agreement involving the 16 countries of ASEAN, which could allow the members to protect local sectors.

Today, the agreement does not yet provide the ornamentals industry with a level playing field, as among ASEAN member states policies and trade regulations vary. However, within these countries, population is growing and consumption is taking off.

We see such hybrid opportunities in the following countries to increase their domestic production as their cities are growing into domestic demand hotspots. Based on expert interviews with players from these countries we briefly summarise the key drivers and inhibitors they see for the development of ornamentals in their countries.

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# THAILAND

Thailand is home to a production base of around 14,000 hectares of which a third is dedicated to Orchids. Although production statistics are limited and not reliable, anecdotal reference indicates that volume and value are on a steady rise and that both local demand and export is growing. While the demand is present, the constraints of resources are obstructing growth.

Thailand is facing the following challenges:

- A shortage of labour force. Workers are hard to find as competition between sectors (industry versus agriculture) is hard for the growers due to their lower operating margins. Additionally, the increasing urbanisation combined with the lower wage level is leading to fewer people living in the agriculture production areas.
- An additional negative impact on the prevailing labour situation is the fact that Thai workers can enjoy much better benefits (insurance, living space, food, salary, etc) in the industrial sector than in the agricultural sector.
- The national minimum wage is 300 bath (€8) per day, but many small farmers cannot afford that.
- Thailand is facing difficulties due to climate change. Little to no rain fell in autumn 2017 which caused not only draught problems, but also flooding in cases of sudden rain/due to the compacted soil after long periods of draught.
- This climate change is leading the government and growers to seek solutions in protected horticulture. Mainly simple greenhouses or protective shading nets and simple irrigation solutions are sought after.
- Growers currently use large quantities of methylbromide. Alternatives should be introduced as part of IPM growing protocols.
- The increasing demand can also be met by enhancing the post harvest and supply chain losses. Establishing post harvest best practices for farmers and a government led establishment of logistical (climate controlled) chains.
- The government finds that growers in general are faced with high production costs and high logistical costs. The government sees an opportunity for involvement in cost reduction in these two areas.
- Additionally the government sees a role for itself in the following key areas:

- Better and more infrastructure
- More climate controlled storage space at logistic hubs
- Improving the marketing for flowers.
- Reduction of costs is also a focal point; like the cost of consumables in particular fertilisers is relatively high for the growers.
- The government could potentially improve the labour situation by increasing the number of working visas for people from Myanmar or Cambodia, but that is still pending with no short term solution to be expected.

# MALAYSIA

Malaysia illustrates the example of being a hybrid country with a balanced domestic and export value. The 2016 farmgate value for the domestic market was reported at 400 million RM (€80 million) while the farmgate value for export amounted to 493.6 million RM (€93 million).

Malaysia has in total 1,218 hectares of ornamentals of which 638 in Cameron Highlands which is by far the largest contributor to production and export.

Cameron highlands has a well developed infrastructure and good growers association; the growers fully own their "Flower Association" and organise networking events and initiatives for collaboration.

The government has financial aid programmes for growers in place, in particular for investments, introduction of technology and crop differentiation. The support is in the range of 10% to 20%.

Also Malaysia is in a similar squeeze for an increasing demand and constraints for resources. Some of the challenges they face: • of climate change, mainly temperature increase is a problem – the cost of production is rising because Malaysia depends on the import of chemicals for crop care

and fertilisers, and forex developments have caused the cost increase for growers.

- In general, most consumables and capital goods in agriculture are imported so Malaysia faces a general competitive setback for the primary sector at large.
- The situation of fertiliser shortage has a beneficial side effect: growers are now recycling their waste of organic matter to produce their own compost.
- Labour is an issue in Malaysia; the government estimates a shortage of 3,000 workers in horticulture of Cameron Highlands alone. This is based on an average number of workers of 6 per acre in production and 4 per acre in nurseries.
- The combination of all challenges makes it increasingly hard to find succession for growers. The average age of growers is rising and the new generation prefers other occupations over horticulture.





# PHILIPPINES

The domestic demand is growing at a fast rate as the purchasing power is rising and the working class (mainly the millennials) acquire condominium units. This group has an increasing appetite for greening their living spaces and that demand is served with small succulents and even cacti. This is a paradigm shift because in the past cacti were considered as “unlucky” by traditional consumers while the younger generations just see a living green ornament to care for.

Currently, the orchid plant, aquatic plants, carnivorous plants, terrarium plants and collectible plants (cacti and succulents included) are growing by leaps and bounds on social media.

The trend is unprecedented and is empowering the small growers by creating a direct communication channel between buyers and growers. Online retailing and social media information exchange, complemented with good logistical support for the deliveries seems a trend of the future for ornamentals in the Philippines according to a well informed industry player. “Online retailing addresses the modern lifestyle of common people who do not need to see the merchandise on the shelves. Time and

convenience is more important now than ever”.

The Landscaping industry follows the development of urban areas. Capital investments are pouring in, and this trend brings a bright future for the landscaping industry.

## POLICY

Regarding the external trade potential for the Philippines, one respondent noted “The levelling playing field in agriculture should benefit all members of the ASEAN through strengthening trade from the region. The Philippines is at the initial stage of adjusting. Several major changes need to be implemented first. E.g. the taxes on farm implements and inputs still carries the taxes previously placed on agricultural inputs. Only big organisations and companies may avail of the free tariff.” On the other end, Thailand still subsidises pesticides and fertilisers which makes inputs cheaper for the Thai farmers.” The Federation of Cut flowers and Ornamental Plant Growers, Inc. was able to include the industry as a viable industry through the help of the Department of Trade during the early 90’s and was accepted by the Department of Agriculture with the corresponding

budgets for development. Presently, the ornamentals plant industry is not defined as a priority of the Department of Agriculture, in practice it is the Education Committee of the Philippine Horticulture Society and the Philippine Nurserymen’s Association who lobbies for the interest of the industry. The Philippine Horticulture Society, the leading floriculture industry in the Philippines, has a strong technical team within the Education Committee. The society has acted as a mother organisation for other smaller organisations for more than a decade and stages big floriculture shows yearly.

## LOGISTICS

The Manila Central Flower Market is the central hub for ornamentals. Inter-islands are served by planes and barges that carry buses on and off different islands. Seasonal demand peaks pose a distinct problem due to high volumes inwards into Manila without any return freight.

For bigger companies, cold chains are available but for most small growers, low tech Styrofoam packing is a solution. Small holders who sell cheaper flowers tend to travel as cargo on top of buses. Cooperatives

have trucks going to the central markets in Manila while Manila to the Provinces may be served by buses, train and airplanes (commercial flights cargo).

## PRODUCTION

Production is very fragmented with some exceptions of a Co-operative Growership and some private companies which function as a centralised sales and marketing organisation. The Cooperative Growership unites the corporate cut flower growers and consolidates the supply into one central packing and grading house. Growers are paid monthly by the system. Additionally, these growers supply directly to florists via own outlets at the central flower market in Manila.

The small growers sell their produce to the local flower markets in Baguio and Trinidad where wholesalers consolidate and ship to the Manila market or deliver directly to florists. Alternatively, smaller orders are sent through bus routes and are picked up from the Manila bus stations.

Major producers of pot plants are in Southern Luzon and supply retail outlets directly on a volume discount

arrangement. Main producers of indoor foliage plants are concentrated in Southern Luzon and Central Luzon areas. These foliage plants are normally integrated with the landscaping plants and marketing is similar to landscaping plants. These are purchased directly and delivered by producers and delivered to the consumers. This is a category that grows thanks to the demand for decoration of shopping malls with green plants. Landscaping plants is one of the bigger clusters in the industry involving 5,000 families in Central Luzon region alone. The second group in Southern Luzon is less than 10% of the total area in Central Luzon.

Marketing is basically direct to the projects. Plants are grown en-masse in this condensed area.

This is a very specific community and is considered as a highly educated group of farmers with high quality operations and outputs. Most of the farmers tend to send their children to private schools in Metro Manila. These progressive farmers also supply the labour force to the landscaping industry with landscape artists, landscape gardeners and maintenance gardeners all over the Philippines.

## FORECAST

The Philippines can potentially build a strong export market thanks to the proximity to Japan and China, but with the current operations, growers are lagging behind other production markets as their freight and energy costs are some of the highest in the Asean region. Stronger, consolidated cooperatives could achieve economies of scale to cope with high input costs and generate external trade.





## VIETNAM

The country is home to a production base of 22,000 hectares and an annual farm gate value of €500 million in 2016. The advantage of the country is the tropical climate in which many ornamentals thrive well except for the temperate ones, to supply the increasing local demand. Growers are starting to diversify their crops and varieties and the technology level is increasing. A very clear trend is the focus of growers on plant compounds for the pharmaceutical and aromatic

processing industries.

Industry players from Vietnam have suggested that the industry could be further strengthened by:

- Cool chain enhancement. Local and export flows are clearly divided; only very few local traders have climate controlled trucks. Only for the export markets, the supply chain is nearly all climate controlled.
- Improving post harvest processes, as they are still under par with comparable countries.

- improving the standard of propagation to a higher level
- international cooperation on technology and export marketing

It should be noted that Vietnam is one of the most susceptible countries to climate change and rising sea level due to its long coast and low elevation.

## INDONESIA

Like Japan, Indonesia has seen its industry grow to satisfy a significant domestic demand for cut flowers, foliage and potted plants. With a population of nearly 250 million, it's one of the world's most heavily populated countries. However, its floriculture industry remains relatively small. Traditionally every city has its own local production area to satisfy the local demand.

Despite a thriving domestic market for flowers, exports remain a challenge for many countries within Asia.

Indonesia, for example, has seen its exports fluctuate drastically through the years, due in large part to changing economic policies within the country. New rules for imports and exports of horticultural plants and seeds make exporting not very worthwhile, especially if there is still a large domestic market available.





# IVP REPORT

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## PRODUCTION AND MARKETS, THE FUTURE OF ORNAMENTALS

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