Regional developments in the peri-urban Rotterdam area

- better regional coherence as future challenge -

Report of a Study Tour by international experts to the Rotterdam area, 17 - 19 October 2012, as a sequel to the Windsor Castle's consultation on Building Sustainable Communities in Today's World

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Table of contents

1. Introduction

The first decade of the twenty-first century has shown dramatic shifts in economies, politics and society to multilevel world systems. On one hand these shifts are associated with the increasing globalisation: a progressive transfer of economic and political functions to plurinational and global levels, resulting in extended interdependency. On the other hand, there is a countervailing trend to the reinforcement of economic and political life at the subnational, regional level. Regions are acquiring self-consciousness as socio-political and economic entities and are becoming the critical locus of economic and social order. The economic and social geography is becoming an emerging mosaic of regional systems across national borders. In the current world of elevated uncertainty and volatility, it is becoming even more critical for regions, communities and industries to understand and adapt to future events. What are the economic logic and the political meaning of these developments? How does it affect local communities and how can they adapt and continue to build their future?

To explore such issues and examine the challenge of building sustainable regional communities, Future iQ Partners[1] in cooperation with St George's House had invited international leading thinkers and practitioners to the Windsor Castle's Consultation[2], last October. The proceedings will be published at the beginning of 2013.
In addition to the Consultation, some of the participants – mainly from Canada and the US – did a short, intensive study tour to the Rotterdam area, commissioned by Future iQ Partners and hosted by Interactive Consult. Due to the limited time – only two and a half days – no in-depth exploration was possible. Nevertheless, acquainting an area and experiencing the common issues of a specific region in practice including the historical backgrounds and the future challenges, will make it easier to exchange views and contribute as experts later on to local initiatives.

This report identifies some of the local issues and links those issues to the themes discussed at the Windsor Consultation. It also provides participants with background information of sites visited, and the Rotterdam area and the Netherlands in general.

Apart from this report, Future iQ Partner and Interactive Consult have at request of the Expertise Network Regiowaarde produced an informative brochure[3] as kind of a summary report, including reflections on some of the main issues for future development in the Rotterdam area.

[1] Future iQ Partners is a global consulting company, specialising in helping regions and organizations create their future in a new way.
[2] See: http://future-iq.com/projects/st-georges-house/
[3] Amongst others available on the website of Regiowaarde: http://www.regiowaarde.nl

2. Objectives of the study tour programme

2.1 Objectives

At the consultation by Future iQ Partners and St George's House at Windsor Castle, five key themes for building sustainable regional communities were discussed: Sustainable Quality of Life, Future Workforces, New Economies, Civic Engagement & Networks, and Language & Culture.
The study tour – following on, but set up prior to the consultation – was meant to see the discussed issues in practice. Despite the consultation's major themes, the study tour did not aim to visit thematic best practices in either sustainability or community building. As a matter of fact we deliberately choose to visit a vibrant area as a whole, including all kinds of developments that manifest simultaneously. Together with the region's history and diversity of future opportunities, that would best show the complexity and the dynamics, many regions in the western world currently find themselves in.

The three main objectives for the study tour programme were:

1. *to explore current affairs in regional development and exchange views on how these are related to the consultation's major themes, regarding sustainability and communities;*
2. *to gather impressions of the visited region by experts in order to reflect on ongoing developments and regional issues;*
3. *to obtain participants' expertise and to consider how the outcomes of the consultation might be of assistance to the local communities within the visited area to build their future.*

2.2 Overview of the region

Given the diversity in backgrounds and interests of the participants, the study tour's programme has been set up within the constraint of available time to get a good overview of the broad range of developments. The chosen region to visit was the area of Rotterdam. It is a peri-urban region with:

- *a city of regional and international economic importance*; Rotterdam is the Netherlands' second largest city, with an industrial and harbour complex that is of global economic importance for its chemical industry and transshipment of containers and bulk. The port of Rotterdam provides much employment to workers, that are mainly living in nearby towns and villages, instead of the city of Rotterdam;
- *urban developments that are affecting the rural area*; housing and spatial planning have changed the landscape and the accessibility of the region for better and for worse. Economic development has influenced social life in the city as wells as in surrounding towns, villages and countryside and vice versa;
- *a variety of businesses*: process industry, transportation, coastal & port services, business services, as well as arable and dairy farming, horticulture and leisure & tourism;
- *a range of local communities*; from multicultural districts in the millions' conurbation Randstad to small rural villages with only some hundreds of people, and all within a range of about 40 kilometres;
- *a diversity of regional identities*, based on geography and demographics, history and religion, traditional livelihoods as fishery or agriculture as well as on many temporary jobs for urban dwellers and expatriates, and so on;

- *complex and entangled governmental issues*, like the right scales to cope with global issues with local effects – e.g. global warming and the rise of the sea level – and the according organising of public-public and public-private cooperation and partnerships;
- *meaningful historical developments*, allowing to oversee long-term perspectives and to draw lessons from, like moving and expanding the harbour area, and the planning and implementation of the Delta Works to defend the population from the sea.

2.3 Programme

The visited sites can be summarised as follows[4].

- The City of Rotterdam, mainly the developing of the city's skyline along the river Maas and port related issues like expanding and moving harbour activities to the periphery.
- Maasvlakte 2, the most recent and major project of land reclamation for expanding the harbour.
- Several sites of the Delta Works (dams, dunes, storm surge barriers), showing the long-term investments in water & land engineering, improved accessibility of the islands and nature preservation in the delta area, and the economic opportunities for leisure & tourism.
- The expanded city of Spijkenisse with its former turbulent growth in housing and population, and current consolidation and focus on improving the urban life's quality by investing in facilities and enlarging its centre function for surrounding villages.
- The diversifying agriculture with an example of a consumer instead of EU-markets focused farmer, and the successful Dutch horticulture: the world's biggest flower auction and a pot plants nursery as representative of innovate, large-scale production in greenhouses.
- The Dutch cuisine: taste and origin of Dutch food with a diverse, however growing attention to local, sustainable produced and or organic food.

Against these backgrounds the study tour aimed at finding out about the coherence between global and local issues, and between urban and peri-urban developments.

Fig. 1: Maasvlakte 2, reclaiming land from the sea to extend Rotterdam's harbour complex

[4] For the full programme of the study tour, see appendix 6.1

3. General trends and issues affecting the region

3.1 Preparing for change

At the turn of the century, the Dutch national government had designated seven environmental issues that remained unresolved, despite firmer environmental policies. Those issues, among which climate change, declining biodiversity and energy supply[5], seemed to be persistent. A systems' change was needed and to enable that change: a shift of paradigm. Therefore transition management was introduced by research institutes, initiated by government funded programmes. It would provide the knowledge, methodology and tools for the needed changes that were expected to take at least 30 years. It was recognised that national governmental bodies themselves would not be able to effect these changes, as politicians and policymakers focus on much shorter terms. Industries, research institutes, local authorities as well as NGOs would have to be involved, despite a lack of common sense of urgency. It also became clear that the persistent, global issues were not limited to the environment, but affected economy and society on regional and local level as well.

After successful pilots with innovative approaches in urban development, the global and national trends were translated to the regional level, and a number of projects for regional development were started. Many of them were part of government-funded research programmes and aimed at restructuring the difficult and complex spatial planning and reinforcement of regional economies.

3.2 Current trends

Meanwhile, the context on which the transitions were based changed dramatically and turned out to be much more complex. The interest in sustainable development from the late 1990s was substituted for gaining economic competitive advantages after the recession in 2001. The financial – and following economic and monetary – crisis, which started in 2008, showed that unthinkable events and changes can become reality "almost overnight". The emphasis on transitions had contributed to a raise in awareness of occurring global shifts in the world's systems, not at least by the investments in major research programmes. However, the world changed more rapidly than transition management could facilitate. Most of these programmes have ended, budgets have been cut and the national policy to induce systems' changes has been abandoned. Many governmental responsibilities are subsequently passed down and the long-term focus on transitions has been replaced by short-term objectives for tackling current crises. It underlines the need for new leadership.

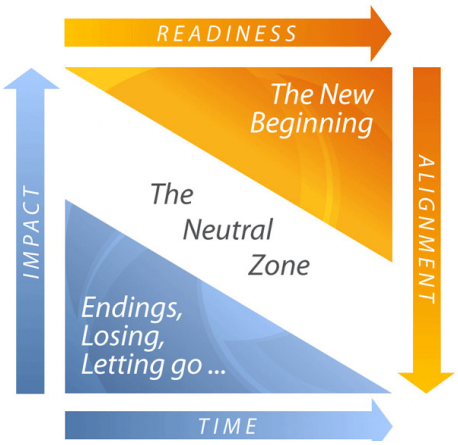

Fig. 2: Twenty-first century: age of change?

At the same time the influence of civil society increased; stakeholders in industry sectors have become aware of the need to cooperate. Economies and policies are shifting from a national-global to a regional-global orientation. Local authorities perceive that policies only would not lead to change and many NGOs became convinced that cooperation would better help to achieve their goals than continued opposition. Moreover, as budgets were cut it became clear that support and

[5] 4th National Environmental Policy Report (NMP4)

initiative by civil society are crucial to rebuild economic growth and adapt our systems, which should facilitate the twenty-first century's challenges.

3.3 Importance of the regional level

Many societal changes turn out to become manifest at a regional level. Regional communities – not nations, cities or local communities – are the nodes where all kind of developments come together. So, regions are becoming increasingly important entities, though the regional level is mostly less institutionalised than the local or national levels. This offers opportunities but also brings along responsibilities for civil society. Local people themselves are the key factor to a region's prosperity. Their involvement and initiatives are conditional for the success of projects and processes, and for achieving regional goals. In addition, professionalism, adequate scale and binding leadership are needed to direct the complex multipurpose, multilevel and multistakeholders developments.
However: who is taking initiatives for multilevel approaches across a variety of stakeholders? We are a well-organised – not to say over-organised – country with one or more interest groups for every thinkable issue. How can we make processes of coordination and consultation (the so-called 'polder'-model) more efficient and more responsive? Are there alternatives for fragmented or one issue advocacy? Is there still room for visionaries that look beyond individual or sectoral interests, and beyond the short term?

Chapter 5 summarises some examples from the Rotterdam area, how such trends affect the region and how they have been responded to.

4. The study tour's experiences

This chapter gives an overview of some findings from the sites visited. It is not a summary of discussed items, neither a balanced enumeration. The information given is just meant to attribute to the impressions during the visits. Firstly, a short description of the region.

4.1 The Rotterdam area

Rotterdam is the second largest city of the Netherlands, located along the river Maas in the west of the Netherlands. It has been for long the world's biggest port and although surpassed by some Asian ports like Singapore, Rotterdam is a world key player, the biggest port for Europe's hinterland and still growing. The city is part of the conurbation Randstad, which also includes Amsterdam, The Hague and Utrecht and their suburbs. North and east of the city is rural area with mainly dairy farming. At the south side are the islands of the delta area with a diverse countryside consisting of agriculture in polders, small towns and villages along dikes, massive water surfaces and high-tech engineered flood defence works. To the west lies the harbour and industry complex, which stretches over 40 kilometres to the North Sea at the north side of which, close to The Hague, is the largest greenhouse area.

Spatial development

The interdependency of urban and peri-urban area clearly manifest in this region. Due to urbanisation and economic growth, Rotterdam needed more space for housing, infrastructure, industry, recreational areas and so on, which could only be found in the former more rural areas. The expanding of the harbour and industry complex in the past half a century into the direction of the North Sea was only possible by annexation of rural area. When running out of space for housing the workforce, covenants were agreed upon with neighbouring towns to build large residential areas.

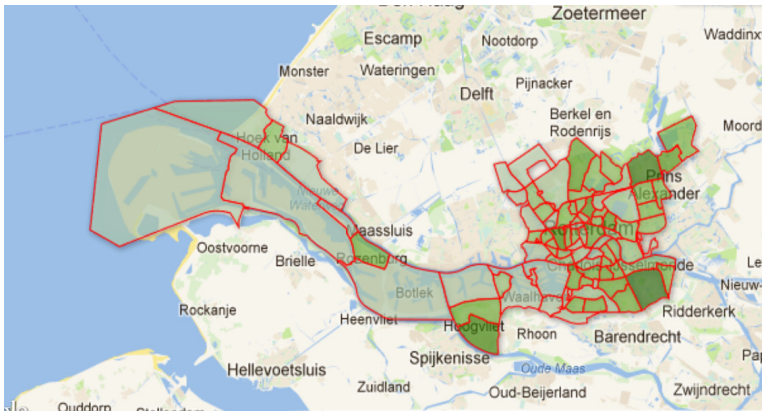

Fig. 3: Municipality of Rotterdam and its boroughs

By now, Rotterdam has hardly any space left for expanding the city. As Dutch policy regarding spatial planning is to keep the remaining rural areas as open as possible, the city started in the early 1990s a strategy to regenerate the disused dock areas in the city centre (as harbour activities had moved to the city's periphery) by creating new public facilities, building architectural sky scrapers and so improving its urban quality. This is done with respect to historic sites as Hotel New York and the terminal of the former Holland-America-Line. Now the Rotterdam's Southbank can compete with other global cities, regarding its urban quality. It offers nice work and living conditions for those who like urban living. The city's facilities (culture, shops, education etc.) make Rotterdam more attractive for its own inhabitants, as well as for those living in the peri-urban area and for tourists.

Trends in housing

Through the years the employment in the harbour and industry of Rotterdam required a higher technical skilled workforce. A substantial part of Rotterdam's multicultural and low or uneducated population did not meet the jobs' requirements. A number of them now find jobs in the greenhouse horticulture near The Hague. Many of the employees in the harbour and industry are coming from neighbouring towns, for instance Spijkenisse. This town amongst others was designated in 1975 as an expanding town to facilitate the growth of the regional population (and workforce) by building new houses on a large scale. Its population grew from 14,000 to 72,000 in about 40 years. Due to the rapid expansion many similar houses were built, especially single-family houses. That has certainly not contributed to an urban image. Moreover, the social facilities lagged behind. This made Spijkenisse primarily a commuter town.

For large recreational areas or living in the countryside, Rotterdam is depending on its surroundings. Through the years there is a trend of suburbanisation: the more affluent part of the population moved from the city to more rural towns and villages with an expected higher quality of life. When in the mid 1990s the Rotterdam area again needed to designate new housing areas, much attention was given to architectural design and integration into the landscape. Nowadays, many companies pay attention to the living conditions for their employees as part of their settlement requirements, and are rather interested in the surroundings than in the city of Rotterdam itself. Although this has increased the number of habitants in nearby towns and villages, this trend did not always contribute to the local economy. Many of the "immigrants" are commuters and do their shopping in the city.

4.2 Island of Goeree-Overflakkee and its touristic potential

The first visit of the study tour was to Goeree-Overflakkee, to hear from an engaged local about cultural and historical backgrounds, and current trends and economics of this rural area. We met at Port Zélande, which is a marina and holiday resort on one of the seawalls that connects the islands in the southwest delta. Resort, location and the history of the delta area form a unique combination for future opportunities for sustainable leisure, living and quality of life. However, it comes with dilemmas that require long-term vision, better regional coherence and last but not least: local engagement and initiative as this case showed.

Characteristics of the island

The southwest of the Netherlands is a delta area formed by the estuary of three important European rivers. The area stretches over three provinces, though the main part belongs to the province of Zeeland. The island Goeree-Overflakkee is often expected to be part of the province of Zeeland with which it has much in common like scenery and dialects. However, it is the southernmost island of the province of South Holland. Originated from several smaller islands, Goeree-Overflakkee now stretches over 60 kilometres and counts 25,000 hectares of which 72% are agriculture and 17% nature. It is enclosed by the North Sea and the two biggest lakes of the country. The island can be accessed in the eastern and in the western part by dams that have been built as part of the Delta Works.

Fig. 4: Position of Goeree-Overflakkee with respect to Rotterdam and the southwest delta area

Merging of local authorities

The 14 villages and some hamlets have 48,000 inhabitants in total and are organised in 4 municipalities. As of January 1, 2013 the current municipalities will merge to a new one, becoming the largest municipality of the province in terms of area. This is ordered by higher authorities for financial reasons and a better equipped administrative power, notwithstanding local opposition. Such merging is a common trend for small municipalities in the Netherlands, as many lack the leadership, staff, skills and finances to deal with increasing tasks and responsibilities that has been passed down. The national policy however has changed; initiatives for merging will no longer be taken on a provincial level, but be left to local communities. Nevertheless, there is also a future national plan that municipalities should join or merge to at least 100,000 inhabitants, except for remote areas. This ongoing trend of merging will retain having impact on communities, as culture and regional identities take much more time to adapt than administrative agreements.

Regional identity

Through its length and its history of isolation, the culture on the island is still one of being on their own. Some of the inhabitants have never ever left the island, or even their municipality. The island is part of the Bible-belt. Especially in the more religious western part of the island the Sunday rest is honoured, causing a constant tension with the 24/7 tourism in summer. Not only religion determines the regional identity. Historical local differences in origin, livelihood, and prosperity created a cultural variety, that manifest for instance in several dialects and customs. The population's character is a bit rigid and closed. A unifying part of the cultural identity is that all people are in awe of the power of the sea. With the North Sea flood in 1953 1,800 people in country – but mainly in the delta area - drowned and 100,000 people lost their homes. The resulting 50 years of building the Delta Works to defend the area from 'ever to be flooded again' illustrates the impact on the regional identity.

Local economy

Livelihood in the villages on the west side has for ages been based on fishery, as the soil was too poor and sandy for prospering agriculture. The building of seawalls caused a dramatic decline in the local fishery economy, as well did the surplus of fishing capacity after the modernisation of vessels, and the European quota for sea fishing. There still is a fleet of fishing vessels and a fish auction.

The middle part of the island has the largest town, which has a centre function, offering facilities like high schools, a hospital and a shopping area. Healthcare services, retail and trade are the main economic activities, apart from agriculture (arable farming) in the outer area and the eastern part of the island.

Fig. 5: Biking, running and extreme water sports are favourite along the beaches of Goeree-Overflakkee

In the second half of the previous century, tourism along the western coast with extended beaches started flourishing with many camp sites and recreational houses. The village of Ouddorp still is well-known, attracting many holidaymakers from especially Germany. Nevertheless, many of the facilities are outdated. There are for example hardly any hotels on the islands. Given that, it is almost astonishing that the village of Ouddorp counts over 2 million overnight stays annually.

The Delta Works have stimulated and transformed the local agrarian to a more diversified economy. Thousands of former agricultural workers found jobs in the port of Rotterdam, which had become easy accessible by the new

build dams and roads. On the other hand, people from elsewhere choose to recreate on, or even move to the island. Some figures: in 1950 the island had 34,000 inhabitants, a workforce of 14,000 of which 50% in agriculture and over 2,000 farms, and 500 people working outside the island. In 2012 the population is 48,000, the workforce is 20,000 of which 500 people work in agriculture on about 450 farms and 6,000 of the population work outside the island.

Nevertheless, as many rural areas elsewhere (all over Europe), the population is likely to shrink as many young people leave the area for tertiary education and for (better) jobs elsewhere. Through the years several plans to reinforce the local economy have been formulated by local authorities as well as by an entrepreneurs' innovation platform. Somehow, the region misses strong leadership and entrepreneurial spirit, as to date some obviously present opportunities has hardly resulted in initiatives that could lift the local economy to a level of national or European importance.

Future economic potential

Location (sea, lakes and beaches), scenery (Dutch polders), historic villages and space provide very good living conditions and opportunities for further expanding of tourism. And extreme (water) sports have become very popular. On the other hand, expanded housing or large scale tourism could easily go together with disadvantages regarding spatial planning, nature area and landscape and not at least the local community or sustainability objectives. This might put (public) decision makers in a complex dilemma.

Meanwhile, eight villages on Goeree-Overflakkee (as well as elsewhere in the delta region) have now a marina of which the one of Stellendam offers access to the North Sea. One of the first holiday resorts was Port Zélande, which has been built in 1990 by the idea, initiative and design of an international operating local architect. He had the ambition to set new standards in sustainable leisure by combining requirements of leisure markets with design and with local scenery and nature. It resulted in a holiday resort, situated close to the touristic town of Ouddorp and along the country's biggest lake Grevelingen, on one of the Delta Works' seawalls. The resort consists of over 700 holiday houses and also comprises a large camp site and the biggest regional marina. Port Zélande is one of the leading holiday resorts in the Netherlands. The park is known for its striking architecture, an imitation of a southern French fishing village.

Fig. 6: Holiday resort Port Zélande is one of the leading leisure resorts

Since then, several resorts have been built all over the delta area mostly by project developers and a number of them exploited by national of international leisure companies. The area offers lots of opportunities for further expanding and innovations for the leisure market and for the market for housing (permanent or semi-permanent living).

Dilemmas for local governments

The question is whether these developments will contribute to a sustainable regional economy. How could the socio-economic potential be utilised best? Of course, the new built resorts offer employment for locals, but to a satisfying level? Is there also social return on the investments, like

better facilities or education for the population? What considerations should be made, by whom and in what way for further building in or near nature areas?
Perhaps building can go hand in hand with sustaining nature, like the starting point of Port Zélande's architect: creating one hectare extra nature area for each hectare of new built area.

Apart from fundamental and ethic questions there is the issue of the right organising and directing level. Several municipalities have developed promotional and investment plans, some in cooperation and some on their own. There are also many private initiatives, several advocacy organisations and even provincial and national governments that have plans and objectives for reinforcing the regional economy.
How are these plans related? Is not there some unintentional competition? It is obvious and understandable that all involved parties put themselves at the centre and start seeing the future from there own interests. A turn to outside–in thinking and acting, looking for trends and then concluding about opportunities, would probably more effective and at least avoid much redundancy in the efforts for future planning.

Is there a sense of urgency to better coordinate these developments? Would better coherence lead to more effective investments or just result in endless consultations? To some degree: yes, as we see a trend of up-scaling in private cooperation. However, this trend seems to be induced by scarce resources and be limited within the same constraints as always have been, instead of new innovative outside-the-box thinking.

Despite of what have been effected so far, it is obvious that only a small part of the many plans from the past have been realised. It is a constant returning phenomenon that every three to five years new long-term visions and plans are developed, as the step to execution turns out to be far more difficult. Perhaps better coherence in current plans, visualising the network of influentials and decision makers and engaging local communities are the best investments for the region's future.

4.3 Peri-urban Voorne-Putten and the centre function of Spijkenisse

Geography of Voorne-Putten
Voorne-Putten is the area situated directly south to the harbour and industry complex of Rotterdam. It has two urbanising towns, some historic towns, two seaside resorts and a number of rural villages and hamlets. All are part of one of the five municipalities on the island and together they count at around 160,000 inhabitants.
Being part of the delta area, the island is formed through the ages by a continuous natural interaction between land and water with sometimes dramatic consequences. In more recent years, say the second half of the last century, it is human intervention that dramatically changed the geography of the region by large-scale investments in infrastructure. The urban influence is much stronger on Voorne-Putten than on the neighbouring and more rural island Goeree-Overflakkee.

Fig. 7: Recreational buffer and canal at the north side, separating Voorne-Putten from the industry complex

Voorne-Putten is some kind of a transition area. Harbour and heavy industrial activities are located outside the island. Nevertheless, there are lots of port related activities on Voorne-Putten, while moreover many workers of the harbour and industries are housed on the island.

The north side of Voorne-Putten is mainly reconstructed area by the damming of a river and the construction of Rotterdam's harbour and industry complex. It is turned into a green and recreational buffer between the industry and the countryside. The city of Spijkenisse is on the east side and stretches its urban influence (housing) into the agricultural landscape. The middle and south side of Voorne-Putten are agricultural with a variety of farming. To the west the island borders the North Sea with beaches, dunes and nature areas of international importance. However, also here is the urban influence as an earlier and the recent reclamation of land from the sea caused silting of the coast in the front of the town of Oostvoorne, that now actually is no longer on the coast.

The current access to Voorne-Putten mainly dates from the 1960s, while the number of inhabitants has increased since. The main access consists of a bridge in the northwest and two bridges in the northeast. Furthermore, a seawall connects Voorne-Putten in the southwest to other islands of the delta area, but that is of much less significance for the regional economy. Currently, substantial investments are made to broaden the motorway along the harbour and industry complex of Rotterdam including an extra freight railway. The motorway is also important for access to Voorne-Putten, but as it is located just outside the north edge of the island, the current connections to the motorway will remain bottlenecks for Voorne-Putten. There are advanced plans to connect Voorne-Putten in the east part to another motorway and build an extra river crossing. However, these plans exist for decades already without being implemented. Investments in urban areas seem to be prioritised over those in the peri-urban area as local governments have constantly encountered.

Remains of a rich history

The island consists of the formerly two islands Voorne and Putten, divided by the river Bernisse that in the Middle Ages was part of the shipping and trading route from Rotterdam to Antwerp. Due to silting, the river lost its economic function. Nowadays, it provides fresh water to and helps avoiding salinization of the industrial area. Moreover, the Bernisse banks are a 300 hectares nature and recreational area, functioning as a buffer in the east part between the urban area of Spijkenisse and Rotterdam, and the rural part of the island.

On the island there are several fortified towns like e.g. Brielle and Hellevoetsluis, as remains of a rich commercial and military history. Brielle, a mainly from the seventeenth century dating fortress, is a national monument and one of the best preserved fortifications in the Netherlands. During the Middle Ages Brielle had a flourishing trade with the Baltic States and even had its own trading colony in Sweden. The town is still known for its rebellion against the almighty Spanish Empire that had conquered most of Europe and lasted for about 400 years (from 1492 till 1898). Brielle is well-known from its Capture in 1572, around the start of the 80 years' Dutch War of Indepence (1568 – 1648) against Spain. The Capture of Brielle is still celebrated yearly. Nowadays, the fortress is still an attractive site for tourists. Moreover, Brielle is situated within as large water sports and recreational area, making tourism and leisure of local economic importance.

The fortress of the town of Hellevoetsluis was also built in the early seventeenth century, to defend its trading port. In that time it also became the naval harbour of the former republic of Holland, which it remained till the nineteenth century. The digging of a canal through the area Voorne-Putten in the year 1830 improved the accessibility to Rotterdam from the sea, giving Hellevoetsluis a reinforced strategic position.
Silting of parts of the delta area however forced Rotterdam to create new access to the North Sea. After finishing the digging of the current canal Nieuwe Waterweg in 1872, Hellevoetsluis lost its position. When in the 1930s the naval harbour was moved to another city, the local economy

declined. In 1960 Hellevoetsluis and some other municipalities merged. In the 1970s the town – like Spijkenisse – was designated to large-scale housing, which gave new impulses to the local economy. It took up to the 1990s before the Municipal Council decided to invest in reconstruction of its town centre and harbour, and in conjunction with the local marinas make the town more attractive and accessible for especially sailors.

Fig. 8: New built marina, upgrading the nautic image of Hellevoetsluis

As these historical cases illustrate, successful regional development is depending on gradually as well as dramatic future changes, some of which are induced by mankind and some caused by natural influences. Many changes could not be foreseen, but learning from a region's history can be helpful to anticipate on current issues, to think in possible future scenarios and to adapt to unexpected and even unthinkable events.

Position of Spijkenisse

Spijkenisse is the largest town on Voorne-Putten, located on the east side and directly neighbouring the city of Rotterdam on the opposite side of the river. Spijkenisse is thought to have originated as farming and fishing community 10,000 years BC! Till the mid of the twentieth century it was a small village with a population of 2,500, mainly craftsmen and farmers. From the 1960s the town started growing as many harbour workers settled in Spijkenisse for living closer to the new developed industrial areas. The influence of Rotterdam immigrants changed the cultural identity of Spijkenisse, e.g. causing the disappearance of the ancient local dialect. In the mid 1970s Spijkenisse was designated to facilitate large-scale housing. Within 40 years its population increased from 14,000 to 72,000. Social amenities were lagging behind the rapid growth of the population; Spijkenisse became a real commuters' town with hardly any urban quality. Despite the expanding of the town, it was not the most affluent population that moved here. The educational level in Spijkenisse turns out to be lower than the Dutch average.

From the 1990s the Municipal Council changed its strategy from expanding to consolidation, and started investing in new facilities and a more attractive town centre. Many houses in old districts are being rebuilt as well as the city centre. New apartment buildings on the river bank and a variety of new houses make the town more attractive. Attention to architecture changes its image. Nowadays, more educated and skilled staff is needed in the harbour and Spijkenisse has an attractive key to house that workforce, as this town is actually closer to the harbour and industry complex than the city of Rotterdam.

Recently, the Municipal Council started the next phase in building the city's future by better external positioning the city in relation to the developments in the region and stimulating a vibrant society with thriving communities and flourishing entrepreneurship. With its "View on 2020" the council articulates its view on facilitating the further expansion of the port of Rotterdam (which has enlarged its area by recent land reclamation with 20%), by offering nearby quality of life for the work force and attractive settlement conditions for companies with port related activities. Some of the priorities for the 2020 period are:

- centre function for the region regarding shopping, sports, culture, nightlife, education and so forth
- improving the accessibility of the town by new river crossings
- better chances for the next generation offering diversified education and better local career opportunities, in order to remain attractive for young people to stay
- initiating and stimulating community building in the town districts for enhanced civic independency
- attracting new businesses to settle by offering attractive conditions
- regional cooperation within Voorne-Putten as the region's spatial and green qualities are additional to Spijkenisse's urban facilities
- partnering with similar towns in the Rotterdam area, and within ''New Towns"-networks for learning from experiences of other towns

Fig. 9: New built library in Spijkenisse, nominated for an architectural reward

Confronted with the economic crisis and decentralisation of governmental tasks, the council had to not only economise its budget, but also revise its role and tasks. As a former expanding town, the municipality had always been proactive. In the next coming years it will adapt its role to the network society and change its executional tasks to supporting and stimulating community initiatives. The municipality sees a network approach as best to make her "View on 2020" effective.

Municipal cooperation on Voorne-Putten

The increasing dynamics and complexity of society puts pressure on especially the smaller local governments. They face the same issues as larger authorities but do not have the same experience, qualified numbers of staff and financial resources. Moreover, do small communities have enough qualified candidates to be elected as councillor? To find out about the situation on Voorne-Putten there has been an evaluation in 2007 of the administrative power of the five municipalities. One of the recommendations was to start inter-municipal cooperation and so they decided. In the past five years cooperation was started on topics like economic affairs, tourism & leisure, spatial planning and housing, traffic & transportation and social affairs. It is a kind of federal cooperation; decisive power is left to the individual councils, but they all act as one to external parties.

Despite good intentions and nice examples of implementation, this approach does not give access to additional funds, while time for consultation did not decrease. In other words: this kind of cooperation is not effective enough and does not give sufficient economies of scale to meet the necessary budget cuts. Gradually, the councils drew their plans how to get on. Some of them would like to merge, others prefer to stay independent.

Bernisse is one of the municipalities on the island with six villages. It is the smallest in number of inhabitants (12,500), but has the largest area. For financial reasons, the municipal executive is seeking opportunities to merge, preferably with all four others. However, at least the municipality of Hellevoetsluis is absolutely convinced they should stay independent and blocked Bernisse's preferred option. As an alternative the municipal executive of Bernisse now wants to merge with its neighbour Spijkenisse, who is willing. Coming December the final decision will have to be made to start the procedure for merging as of 1 January 2015.

Within the communities of Bernisse, there is a lot of opposition, not at least while the political party with the majority in the council fought for an independent Bernisse at the last elections, and now is proposing to merge. Besides, some communities would like to be merged with another, more nearby town.

It is not known yet, how this case will end. However this case definitely illustrates the importance of a future vision, creating scenarios for different, sometimes emerging situations and last but not least: to engage the local communities in an early stage and to stimulate and use their creativity and ability to get things done on their initiative.

4.4 Dutch horticulture and flower auction FloraHolland

The Dutch horticultural sector

The Netherlands is home to all aspects of horticulture, from the laboratory where new crops are refined, the greenhouses and greenhouse systems where these crops are grown under glass, the fields full of mushrooms, street trees, full-soil vegetables, cut flowers and bulbs, right through to the auction infrastructure and logistics to export all the products.

The country has some of the largest greenhouse areas in the world that produces mainly vegetables, cut flowers and pot plants on about 10,000 hectares. Greenhouses began to be built in the mid-nineteenth century, when grapes were grown in simple glass constructions against a solid wall that took up solar heath in daytime and provided warmth at nights. By the early twentieth century, greenhouses began to be constructed with all sides built using glass, and they began to be heated, nowadays only by gas. This allows for growing crops that does not ordinarily grow in the country and climate, and (almost) independent of the seasons.

Economic importance

The Dutch horticultural sector is a total concept. In a small space, a large amount of added value is created because of the combination of market gardeners, traders, suppliers and logistical service providers. The horticultural sector exports over 15 billion euro, including re-exports. Of this amount, 45% is made in sales of flowers, bulbs and trees, while food horticulture is responsible for the complementary 55%. The suppliers to the greenhouse farming sector, the greenhouse farmers and greenhouse farm builders are global market leaders in their field; 40% of their turnover comes from exports.

Fig. 10: Greenhouse farming with additional artificial light

In 2012 the number of specialised enterprises in greenhouse horticulture is about 3,500, one third of which is in vegetable production. The number of enterprises is decreasing for decades at a stretch. Due to up-scaling of the production - sometimes to three of four-fold - in particularly vegetable growing to an average area per holding of 3.5 hectares, the total area of greenhouse horticulture remains about the same at approximately 9,500 hectares. The sector employs over 65,000 workers in primary production only. When trade and retail are taken into account, the total work force is twice as much.

As this business sector has never been part of the EU's Common Agricultural Policy, the sector has always relied on the free world market for its sales. Today, Dutch flowers are sold everywhere from New York to Moscow and Dutch tomatoes, cucumbers and peppers are sold in supermarkets throughout Western Europe. The total production value of vegetables, plants and flowers is about € 4.5 billion, some 80% of which is exported, making the Netherlands a global leader in the horticultural industry. Also Dutch base materials – seeds and cuttings – are exported and cultivated in greenhouses all over the world using climate systems that originated in the Netherlands. Even the auction clock, used to sell flowers and vegetables, is an export product. In short, the results of Dutch greenhouse farming are everywhere.

Ambition

Due to its economic importance, the Dutch government has designated horticulture and the production of base materials as one of the nine top sectors for the national economy that it wants to invest in, in cooperation with the business sector. Now that other countries can deliver high quality at low prices, crop improvement – by designing new varieties in improvement labs – is increasingly important in the Dutch horticultural sector. It requires technical expertise that can not simply be brought in. That development has expanded tremendously.

The aim for the horticulture sector is to be world leading in sustainable solutions for food security by 2020. It is expected that the sector's innovation power and position in the global market can also substantially contribute to solutions for climate change, the scarcity of natural resources and in the meantime double its value added.

Success factors

- Innovation and investments

Greenhouse horticulture has always been very innovative in applying new techniques, even before they are fully developed. Dutch growers are investing heavily in machines, equipment and software to optimise production lines and climate systems. It really takes entrepreneurial spirit to keep up with the latest innovations in greenhouse farming. From closed greenhouses and advanced climate and control systems to automation, the technology is becoming increasingly complex. Of course, high land prices, large areas with greenhouses and innovative techniques make the business sector very capital intensive and dependent of funding.

- Energy

The greenhouse farming sector is now facing the major challenge of how it can develop from a large-scale energy consumer into an energy supplier. Energy is one of the major cost items for all growers in the Netherlands and abroad. Energy-saving measures are therefore not only beneficial for the environment, but also extremely important for growers' profit margins. The Dutch government, research institutions and the business community are working together to turn greenhouses into a sustainable energy source: greenhouses, that are able to use solar energy not only for heating, and the growing of the crops, but also transform the surplus of solar energy to

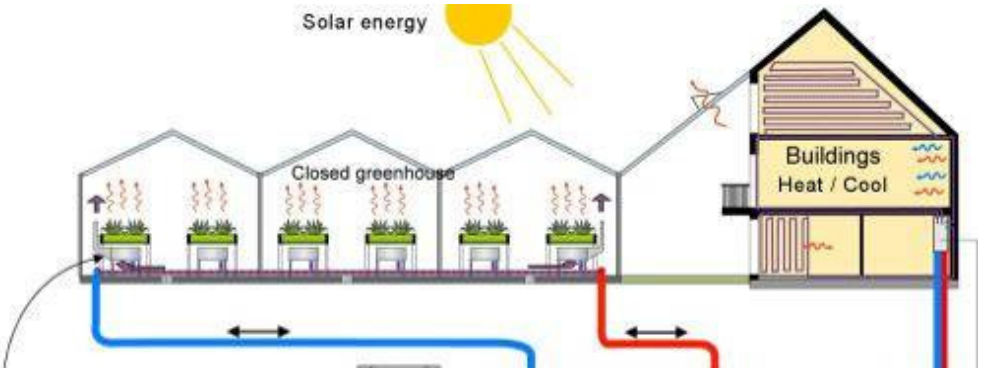

Fig. 11: Innovations in horticulture: greenhouse as supplier of energy

heat and electricity, and deliver it via local or the common energy distribution networks for application in nearby schools, houses or whatever.

- Cooperatives

Many of the latest developments come from the Netherlands. Dutch companies and research institutes work closely together, so that all new concepts fit seamlessly into the system, which produces highly efficient solutions. Though Dutch farming is mainly a sector of small and medium sized (family) businesses that actually are competitors on the market, the sector has a tradition of collaboration for over 125 years. Cooperatives have been set up for producing & research (sharing knowledge and experience), purchasing, marketing & sales (the famous auctions) and financing. Many companies in the food supply chain have originated from these farmers owned cooperatives, or still are cooperatives like for instance FloraHolland, the Greenery and the Rabobank (banking). That culture of cooperation is very much unique throughout the world.

- Clusters

What makes Dutch horticulture unique are highly developed clusters of companies in a small space, called the Greenports. These are comparable to the logistical main ports such as Schiphol Airport and the Port of Rotterdam. Within a cluster, companies are strongly linked to one another, bringing together growers, auctioneers, retailers and horticultural suppliers. Greenports are often also home to knowledge institutes, and refiners and growers of plants and seeds. Because all the important players are in such close proximity to one another, an extensive exchange of knowledge is fostered, and companies and knowledge institutions encourage each other to deliver the very best level of performance. Two of these Greenports are: Aalsmeer Greenport near Schiphol Airport, an area with a heavy concentration of florists, and the Westland-Oostland Greenport, the Netherlands' largest greenhouse farming cluster, west and north of the city of Rotterdam. The cluster concept attracts interest from all over the world. Equally, Dutch market gardeners and suppliers fan out across the world to capitalise on the horticultural cluster concept – after it has been adapted to the local circumstances, of course.

- Entrepreneurial spirit

The power of the Dutch horticultural industry lies in the ability to adapt to changing conditions. Dutch market gardeners are above all pragmatic individuals with a substantial amount of professional expertise and the nerve to invest and innovate. In addition, many market gardeners have an exceptionally good business instinct. You can go far with that combination of qualities, especially if the natural conditions are not ideal. For decades, horticulturists have been forced to operate under difficult conditions, including expensive land, high costs for energy and labour, stringent environmental laws and massive amounts of red tape. Those difficult circumstances, combined with world-renowned horticultural expertise, have brought out the best in the sector. The ingenuity involved in solving these problems often leads to closer cooperation.

Flower auction FloraHolland

Fig. 12: Auction clocks at FloraHolland

FloraHolland is the largest auction of flowers and plants in the world. As an auction, FloraHolland is the market place for bringing together supply and demand for flowers and plants from all over the world. It serves more than 90% of the Dutch, as well as much of the international trade in floricultural products. Each weekday, FloraHolland sells some 35 million flowers and 2.5 million plants with a total turn-over of almost 10 million euro per day and a yearly turn-over of almost 4.5 billion euro. That makes the flower auction market

leader and key player in the international floriculture sector. As a company, FloraHolland employs over 4,500 people and is one of the larger Dutch employers.

The sale of flowers and plants takes place in various ways. Best known are sales according the so called Dutch auction system with an auction clock. In the open descending price auction the auctioneer begins with a high asking price, which is lowered until some participant is willing to accept the auctioneer's price. Bidders get only a few seconds to bid on the flowers before they are shipped off to the new owner's business. By continually updating this originally old-fashioned and successful auction method, it remains a strong selling instrument. FloraHolland has 38 clocks at six locations. Additionally, the flower auction provides intermediary services in direct transactions via the FloraHolland Connect organisation. A large import department is also part of the business.

Fig. 13: Well-organised logistic and distribution systems guarantee just in time delivery of purchased flowers

For the vast majority of businesses in floriculture the auction is the World Trade Centre: the best way to realise an assortment of flowers with a scope as broad as possible, produced across the world, and available for market price. The auction provides a hugely diverse selection of trade companies with equally diverse quantities of flowers and plants. From large uniform batches for exporters and store chains to a couple of bouquets for flower shops and market stalls.
From all parts of the world, large batches, with hundreds of thousands of units of one variety, are brought to auction. Exporters then take these flowers and plants, divided into smaller batches and combined with countless other varieties, from the Netherlands to anywhere in the world. Every retailer, exporter or wholesaler acquires exactly the flowers and plants they want. Unique in the global market!

The daily flow of millions of flowers and plants that are sold at auction places high demands on logistics. To deliver tulips to New York on time and without loss of quality, for example, an optimal infrastructure is essential. The location of each specific flower must be clear at any given moment. Customers are also demanding more and more information about the products, such as the product's origin, method of production and shelf life. Directing this information flow is integrated in the logistics and distribution systems. An enormous task when you consider that the individual flowers that make up a single bouquet sometimes come from ten different countries. The Netherlands is still the global

centre of the flower trade, even now that the world's bestselling flower – the rose – usually comes from Kenya, where it is sometimes grown by a Dutch grower who has started a company in Africa.

FloraHolland is a cooperative. This means that the members – approximately 8,000 growers – are the owners of the business. They select the board and decide on policy together. They sell all their flowers and plants via FloraHolland. For over a hundred years this structure has proven to guarantee a stable, broad and international supply as well as ensure the best pricing process.

The total logistic and auction process is about as follows. The auction process starts at the nursery. Some tens of thousands of growers from the Netherlands, as well as other European countries, Africa, South America and the Middle East, harvest and classify their products to quality schemes. The products are packed in water-filled containers that are designed to safely transport the product and see it through auction, and delivered at the auction buildings. Products from other parts of the world often come by plane. On arrival at the auction products go into the refrigerated area. Several refrigerated areas with different temperatures provide the best climate for each type of product.

In the course of the night, quality inspectors perform quality controls on the flowers and plants supplied, so that the buyer can be assured that the quality as indicated is correct, as well as other product information. At about dawn the sales process starts. The auction clocks provide all necessary information about product, grower and total supply. Buyers can attend the sales process within the auction halls as well as via the Internet. In a matter of hours, the auction sells millions of flowers and plants through tens of thousands of transactions, every day.

Directly after the flowers and plants are sold, they move to the distribution area. Here the FloraHolland employees make sure the sold products get to the customers as quickly as possible. Customers at FloraHolland range from street corner stand to the world's largest export companies. Once the buyer has his purchase at his place, he prepares for dispatch the same day. Most of the transportation is done by road. Thanks to the efficient distribution system the yearly twelve billion flowers and plants arrive at the right destination and on time, every day.

4.5 Multi-functional agriculture

Common trends
Over the last say 15 years, role and societal relevance of agriculture have been broadly discussed. Of course, the primary role of farmers remains the provision of good, healthy and affordable food. But farmers, as society and politicians have recognised, play a much wider role in rural areas: protecting the environment, preserving rural heritage and being the motor of the rural economy. Modern agriculture and the globalising economy haven't brought prosperity for everyone. At the base of the supply chain, the producers that provide the resources for the food chain usually do not receive a reasonable part of the profit. Margins tend to accrue on the levels of purchasing and retail organisations. As a result, agriculture has been diversifying.

Some farmers choose to continue to produce for the global market, and invest in technical innovation and the according up-scaling, to lower the cost price in order to stay competitive. Others choose to escape from what can be seen as a race to the bottom and find their ways in diversifying their business, either to a more traditional, or even organic way of farming, or to multi-functional agriculture. Driving forces that make producers decide to change their business model are for instance: intrinsic motives, bad economic exploitation, and no ability to finance necessary investments, spatial limitations or new, promising perspectives. Right now, common forms of multi-functional agriculture are: care farming and child care, agricultural nature and landscape management, agro-tourism and regional produce.

Farm Bieslandhoeve

Jan Duijndam is such a farmer that changed his business strategy. With his farm in between two cities, two motorways and a nature area he had no options for expanding his business, which would have been necessary to survive. As he had no plans for moving from his ancestor's site, he became conscious of the restraints of modern agriculture and drew his conclusions. He now runs a multi-functional farm with a focus on nearby consumers' wishes instead of the global market's requirements, where he produces organic food for local sales, offers employment for disabled, provides education and integrates farming within nature management. The website www.hoevebiesland.nl provides the following English summary of his farm activities.

Fig. 14: Multifunctional farm "Hoeve Biesland"

Organic farming

Organic farming is the term used for agricultural production with little or no help from artificial aids. An organic farm uses no artificial fertiliser, chemicals or man-made pesticides. Animals are housed and fed in natural (in as far as possible) surroundings, and not given genetically modified fodder. The ideal behind this method of production is to develop an agricultural system, which does not damage local nature (ground, water, plants and animals) and gives the farm animals a worthy life. At the nearby Café DuMidi the menu features local meat from the "Biesland Cow" and also a lunch prepared from regional produce. Meat can also be bought directly from the farmer. However, we recommend that you contact the farmer before visiting the farm.

"Farming for nature" project

Here in the Bieslandse Bovenpolder, organic dairy farmer Jan Duijndam has developed his business into a remarkable multi-functional enterprise. Taking organic farming a step further his aim is to create agricultural production with no input of fertilizers and nutrients and no output of any other product then milk and meat.

In addition to being an organic farmer, Jan Duijndam is the manager of a valuable nature area. He has adapted his farming methods to promote and protect wildlife and rare plants. He has even converted pieces of farmland into wetlands. In addition, the area is open for recreation. Jan Duijndam tries to keep a sound balance between recreation, the production of organic produce and nature. On his land there are:

- *footpaths*: walk over gravel paths to experience the farm at close range
- *tree groves*: distract the eye from the enormous blue IKEA building and provide habitat for small mammals
- *toad pool*: a pool with sloping banks so that toads can quickly warm themselves in the sunshine
- *cycle path*: rustic cycle route past pollard willows
- *spoonbill ditch*: a shallow ditch in which spoonbills forage
- *wetlands*: an ideal area for water birds because it is waterlogged for nine months of the year.

Keeping the area open
Since 2000, Jan Duijndam has been the sole tenant of the Bieslandse Bovenpolder (35 hectares). Keeping the area open as farmland is not easy in the face of the growing urbanisation in this part of the Netherlands. Jan Duijndam is very aware of this problem and tries to enthuse all people who live in the surrounding cities and warm their hearts to the cause of the Bieslandse polder.

The Bieslandse Bovenpolder and the neighbouring Polder of Biesland form the last fragments of traditional landscape, wedged between the urban expansion of Delft, Pijnacker, Delfgauw and The Hague (Ypenburg). However, thanks to a combined effort between the farmer, the municipal council and enthusiastic local nature groups, it has been possible to ensure that organic farming here goes hand in hand with nature development, recreation and education.

Why is this so special?
Organic farming combined with nature development is the main feature of the Bieslandse Bovenpolder. Here, Jan Duijndam is manager of natural elements, as well as a farmer. Green space is vital for the physical and mental health of urban residents. By uniting these different green activities in this remnant of green polder, Jan Duijndam contributes to a healthy and varied peri-urban environment, which also has a great recreational value.

4.6 Economic opportunities of the Port of Rotterdam

Characteristics of the port
The port of Rotterdam is the largest harbour and industrial complex (HIC) in Europe. The port stretches out over 40 kilometres and is about 10,500 hectares. By the end of 2012, the area will be extended with 2,000 hectares by land reclamation from the sea (Maasvlakte 2). The port is one of the most important junctions of good flows of the world. These various cargo flows relate oil, ores and coal, fruit and dry bulk, roll-on/roll-off and containers and so forth, and amount to 430 million tons a year. That is more than twice, respectively three times as much as the second and third largest European ports of Antwerp and Hamburg.

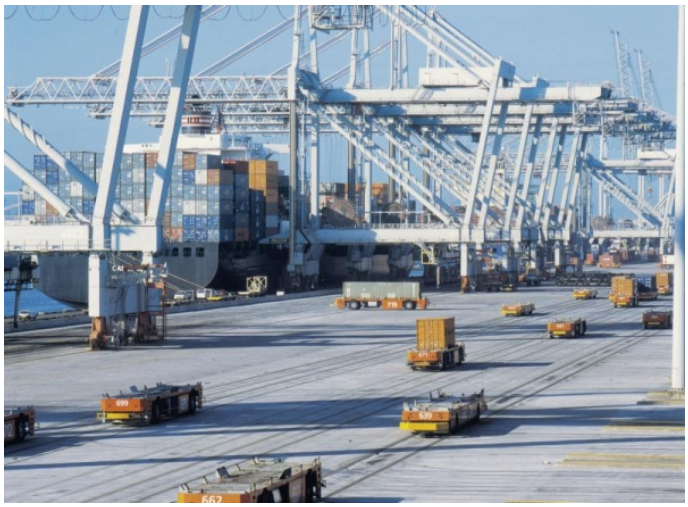

Fig. 15: Container transshipment
Much of the container loading and stacking in the port is handled by autonomous robotic cranes and computer controlled chariots, or automated guided vehicles (AGV). The chariots navigate their own way around the terminal with the help of a magnetic grid built into the terminal tarmac. Once a container is loaded onto an AGV, it is identified by infra-red "eyes" and delivered to its designated place within the terminal. This terminal is also named "the ghost terminal".

Rotterdam thanks its position to the excellent, 24/7 accessibility via the sea with no dependency on tide. Ships with the deepest draught of over 24 metres can dock easily without passing locks. That allows even the world's largest cargo vessels to enter the port of Rotterdam. Annually, some 34,000 sea-going vessels and another 105,000 inland vessels are loaded and unloaded. Other advantages are the many companies and organisations providing supplies, services, knowledge,

infrastructure and so forth, and the hinterland connections giving access to the European markets of over 450 million consumers.

From Rotterdam goods are easily transported by short sea, inland shipping on the European rivers Rhine and Meuse, pipelines, and by rail and road transport. Due to the worldwide network of connections and efficient multi-modal ways of transportation, goods arriving in Rotterdam can be delivered within 24 hours to most of the major industrial and economic centres of Western Europe.

Exploiting the harbour and industry complex used to be a responsibility of the Municipality of Rotterdam. However, in 2004 exploitation, maintenance and development has been privatised to a new commercial business: the Port of Rotterdam Authority. The authority is non-listed public limited company, which shares are held by the Municipality of Rotterdam and the Dutch State.

Typical industries and activities

Some of the most relevant industrial activities are container handling, oil and refinery, the petro-, chemical and bio-based industries, the supply and distribution of energy, dry bulk like coal, minerals or agro-bulk, and maritime services. The supply and distribution of energy is one of the key strongholds. The port has become an international centre for the trade in and distribution of energy sources and aspires to become Europe's energy port. To ensure a sustainable future, the production in Europe of bio-fuels such as biodiesel and bio-ethanol is increasingly important.

The many ships that visit the port each year and the extensive maritime and technical knowledge available in the region make Rotterdam a natural place of business for shipbuilders, ship repair and a wide range of maritime suppliers. Rotterdam also offers specialised facilities and services for the offshore-industry.

Rotterdam also has numerous facilities for the processing of agricultural products, which makes sense as for instance the biggest flower auction and the biggest trading company in fresh fruit and vegetables are nearby. The region also accommodates a number of other renowned agricultural trading houses and service providers for storage, quality checks, etc.

Economic importance

The economic relevance is usually expressed in terms of added value and employment, which fluctuates yearly around 22 billion euro, that is about 3.7% of the Dutch Gross Domestic Product. The HIC offers direct employment to 90,000 workers. Indirectly another 55,000 people find employment in port-related businesses, with even a greater, hard to quantify spin-off. The expected volume of investments in the coming years is around 10 billion euro.

Fig. 16: Fact and figures of the Port of Rotterdam

Ranking:	the number one in Europe, and number 4 worldwide
Value added:	22 billion euro annually
Employment:	directly: 90,000 employees, indirectly: 55,000 employees
Area surface and quay length:	10.570 hectare (exclusive Maasvlakte 2) resp. 90 kilometres
Number of business establishments:	1.315

The actual importance for the region and the Netherlands as a whole is considerably higher when taking into account not only the economic, but also the strategic importance of the Port of Rotterdam. For the Netherlands, being a high income country, a strategic contribution through innovation and more advanced business networks and management is the most important source for maintaining and improving its international competitiveness, according to Porter's Diamond model.

Port Vision 2030

During the past 150 years, the development the city of Rotterdam has been inextricably linked with that of the port and industrial complex. And that has set to continue in the future.

By the end of 2012 the Port of Rotterdam authority will publish its long-term vision for the next say twenty years. Finally, the port authority will come to agreements on a shared vision and strategy implementation with the Dutch State, Province of Zuid-Holland, the City of Rotterdam and Deltalinqs as representative of the companies in the harbour and industrial complex. The future's prospects will be built on Rotterdam as Europe's most important port and industry complex. The harbour and port complex is in 2030 expected to be a strong combination of a Global Hub and Europe's Industrial Cluster, both leading in efficiency and sustainability. Rotterdam will be closely connected with other North West European industrial and logistic areas. Leading companies will be investing in modern facilities. Cooperation between companies, government and universities is expected to result in a high quality labour market, good quality of life and accessibility. The adaptive powers will be unique. And thus, Rotterdam is seen as a major pillar for the prosperity in the local area, in the Netherlands and in Europe.

Coherence in the region's ambitions?

As a major player in the region, the Port of Rotterdam authority and its network partners have defined priorities and actions to make its ambitions effective by 2030. The planned actions are related to other stakeholders, like citizens (being part of the workforce), public authorities (for improved decisiveness) or societal institutions like education (for better skilled future workforce). And forced by legislation, the port authority will invest in nature areas as compensation for the land reclamation.

Nevertheless, it remains unclear how the future vision of the Port of Rotterdam is mutually related to future visions, ambitions, policy plans or strategies of other relevant parties and initiatives, that – of course – have based their views on their own interests. Apart from policy plans of public authorities like (departments of) the national government and the Province of Zuid-Holland, one can think of the city of Rotterdam and its suburbs, the common vision of partners in the Metropole Region Rotterdam The Hague, the cooperating municipalities on Voorne-Putten, the Rotterdam Climate Initiative and so forth and so on. On a certain high strategic level, there will be many similarities in the objectives as all claim to strive for prosperity and sustainability. However, when elaborating future visions in strategic priorities, action plans and investment budgets, the ambitions usually start diverging, either due to deliberate decisions or to a lack of information. Though it might seem harmless if future visions and strategies of different parties in a region are not coordinated, they all affect that same region: its citizens, companies, institutions et cetera. Without coherence, many intentions might not be effected or – even worse – have opposite effects.

For a more effective regional planning, investment in coherence is conditional, particularly in areas with a high degree of organisation and thus fragmentation. This also and certainly applies for the Rotterdam area, as many autonomous and planned developments manifest together and at the same time. Better coherence might lower the frequency of the need to revise future plans.

Fig. 17: Many people, many views.
Much talking and lots of reports.
Only a few good ideas and even less entrepreneurial initiatives.

How to align intentions and engaged local communities to shape their desired future?

4.7 Delta Works: long-term vision with massive impacts

After the flood of 1953 [6], the Delta Plan was developed to build a series of water works to defend the Dutch delta area from being flooded ever again. It took decades to build the defence works and the project was finally finished in 1997 after completion of the Maeslant barrier.

Maeslant barrier
The Maeslantkering is a storm surge barrier in the river that gives sea vessels access from the sea to Rotterdam. It was the final stage of the Delta Works and turned out to be one of largest moving structures on earth. The main objective of the initial project was improving the safety against flooding of the Rotterdam harbour and the surrounding towns and agricultural areas. It turned out that reinforcement of the existing 50 kilometres of dikes would take at least 30 years and would also mean that historic, sometimes 400 years old town centres had to be broken down and rebuilt behind renewed, larger dikes. Therefore the initial plan was put aside and the Ministry of Waterways and Public Works organised a competition for a plan for the construction of a reliable yet relatively cheap storm surge barrier that would not block the shipping route.
The winning plan called for two large floating gates on both banks of the river. A major advantage of this plan was that construction of the storm surge barrier could take place under dry conditions, in dry docks. Other advantages were that no vital parts of the barrier had to be placed under water, and maintenance of the barrier would be easy because of the dry docks. Finally, there would be almost no inconvenience for passing ships. The construction of the barrier started in 1991.

It is composed of two curved steel gates, each 22 metre high and 210 metre long. The gates are welded to steel trusses, that would standing upright be as high as the Paris Eiffel Tower. These arms have to withstand the forces of the sea water when the gates are closed and transmit the power to one single joint at the rear of each gate. During the closing or opening process, this ball shaped joint acts like a ball and socket joint, such as in the human shoulder or hip. The ball shaped joint is the largest in the world, with a diameter of 10 metres, and weighing 680 tons.


Fig. 18: The Maeslant storm surge barrier

The barrier is connected to a self-operating computer system which is linked to weather and sea level data. Under normal weather conditions the two doors themselves are well protected in their dry docks and a 360 metre wide gap in the waterway gives ships enough space to pass without any inconvenience. But when a storm surge of 3 metres above normal sea level is anticipated in Rotterdam, the barrier will be closed automatically. Thirty minutes before closing the dry docks that contain the gates are flooded. After this, the gates start to float and two so-called "loco mobiles" move the gates towards each other. When the gap between the gates is about 1.5 metre wide, water is let inside the hollows of the gates, so that they submerge to the bottom of the waterway. The bottom has been elaborately dug and then laid with layers of broken stone, so that the gates are able to form a relatively watertight fit when submerged.

The Maeslantkering took six years to construct. The barrier is expected to be closed once every ten years due to a storm surge. With the rise in sea levels the storm surge barrier will need to close more frequently in 50 years time, namely once every five years. In its first ten years of operation the barrier was never closed due to a storm.

[6] For more backgrounds, see appendix 6.4

Delta Plan as classic example?
Afterwards it seems rather rational how a catastrophe like the flood catalysed the Delta Plan processes that resulted in the building of the water defences. However, it takes insight and especially imaginary capabilities to fully understand the importance of a sustaining long-term vision and the needed ingenuity to resolve all technical, financial and organisational difficulties for over a fifty years' period. And it might take even more to get an idea of the impact, not only on water management issues, but also what numbers of investments have been made, the effect on employment for over half a century, the relevance for social life and regional economy of the improved accessibility of the delta area, the impact on biological and maritime biotopes and so forth.

Of course, the implementation has had its ups and downs. Nevertheless for decades society, politicians and experts remained convinced of the necessity to finish de Delta Plan. How did the threat from the sea become part of the regional culture? What made people keep going to implement the Delta Plan? And more: what does this imply for nowadays planning?

The study tour did not give detailed answers or lots of numbers about investments, employment, revenues, and safety statistics and so on. But visiting some of the Delta Works has at least confronted participants with the possibility of unthinkable events, and with the power of a unified, consistent and sustained approach. There is a lot to learn for a better, more effective approach to contemporary issues in society. The following brief description of some aspects of the creation of the Delta Works are certainly not sufficient, but applies only to illustrate some impressions gained during the study tour.

Lessons to be learnt from Delta Plan process
The Government's Department of Public Works already in the 1920s recognised the danger of flooding as many dikes were too low, and started building the Afsluitdijk ("Closure Dike") in 1932. During the Great Depression and the Second World War investments were cancelled, but resumed at the beginning of the 1950s. Soon after the disaster of 1953 the national minister set up the Delta Commission to advise him on protection of the country from new floods. A good example of decisiveness, though probably initiated by the severity of the disaster. Half a year after its start, the commission came up with the first plan for a part of the delta area. Within two years and a half the Commission delivered four more plans, each with a specific solution for a part of the delta area. The final plan included an estimation of time and costs: building the Delta Works was expected to take 25 years and would cost 700 – 900 million euro. After the Commission's last opinion, all plans were submitted in the proposed Delta Law, which was accepted by the House of Representatives in 1957 and came into force at the beginning of 1958.

The inducing process of the Delta Plan shows a powerful initiative and adequate decisiveness on matters of high importance with complex integrated objectives and much uncertainties. After all, the plan was not only to provide security, but in addition other benefits also: improved water control in a large part of the country, less land becoming brackish, the establishment of freshwater basins to supply agriculture, new areas for recreation and - across the dams - better connections in the Southwest of the Netherlands. Moreover: new techniques would have to be developed in full speed. No other country in the world had ever dammed off such deep, broad tidal inlets. Past experience and existing techniques would be inadequate to deal with these huge projects.
This seems an illustrative case to reflect on nowadays approaches of politics and society towards current issues. One thing is clear: a common sense of urgency, as leadership theories also state, is pre-conditional to adequate decisiveness.

The greatest part of the Delta Works in the southwest of the Netherlands has been carried out by the Deltadienst, a newly established department within the Ministry of Public Works, in collabo-

ration with many, many contractors. Developing and building the Delta Works offered employment to tens of thousands people in the province of Zeeland and beyond for many years. Moreover, the received assistance directly after the disaster had brought in so much money, that many victims were financially better off than before the disaster. In the years after the flood the province of Zeeland is having its florescence; within a few years it developed exponentially. For the Netherlands as a whole the Gross Domestic Product grew in the year of the disaster by 8.4 percent, according to the Central Bureau of Statistics, an unprecedented high percentage. The government screwed consumption by ten percent and the investments in 1953 were sixty percent higher than the year before. The total expenditure over the years (not adjusted for inflation) is estimated on more than 5 billion euro, half of which was spend on the most innovative, inflatable Oosterschelde storm surge barrier. All this gave a strong boost to the Dutch economy.

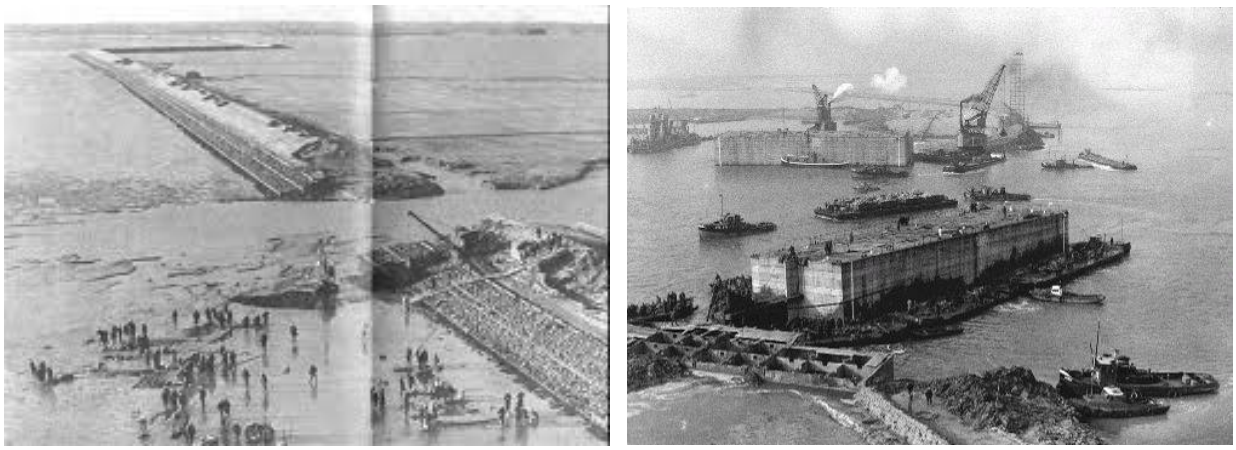

Fig. 19: Need and start of building the Delta Works

Altogether, the Delta Works are a unique showcase how visionary leadership, dedicated commitment, adaptiveness and innovation made a regional society and economy flourish. This seems an illustrative case to reflect on nowadays approaches of politics and society towards current issues. Perhaps, it can inspire today's leaders for a more coherent and decisive approach for building the region's future. One thing is clear: a common sense of urgency, as leadership theories also state, is pre-conditional to adequate decisiveness.

5. Reflections and recommendations

Preparing for the future

A key recurrent theme throughout the study tour was the impact that decisions and events, either planned or sudden, can have over time. The history of the estuaries shows how nature gradually as well as overnight has changed the communities' future in the past. Also human activity has had profound consequences. Whether it be the recurring decisions to expand the port of Rotterdam or the initiating of the Delta Plan, today's economy, society and environment are the result of major decisions from the past, which impact and consequences were unforeseeable, but which underlying visionary perseverance grounded success.

Our world has meanwhile become much more complex and dynamic. How do local leaders and the regional community anticipate on future events? Are the many studies, reports and visions for the parts of the whole region and the frequent updates or revisions due to more volatility and uncertainty of major global trends and their probable future impact? Or are these just incremental attempts to simplify the complex reality into clear themes that we can plan as we used to do? Where are the visionary leaders that we have known in the past? What ambitions does the regional society have, regarding compelling global issues and challenging opportunities like climate change, energy supply, food provisions, health and ageing, education and youngsters, quality of life?
The rich history and the diversity of the region offer many opportunities, as became clear during the study tour. However, efforts seem to be fragmented; every municipality and interest group has its own priorities and strategy. Platforms for joint action just add extra objectives to the pile. A coherent vision for the region with corresponding ambitions, a cohesive approach and engaged communities are missing. Time for a new Delta Plan that can mobilise the same lasting spirit?

Civic Engagement & Networks

Due to the economic crisis, public funding shrinks, governmental responsibilities are passed down and the long-term focus on sustainable development has been replaced for short-term competitive advantage. Regions are becoming the most important entities to link global trends to local initiatives. Local authorities in the Rotterdam area anticipate on these trends by up-scaling their administrative power. Would that be sufficient? Is not that a defensive strategy, induced by shortage of finances and skilled staff? Where does that leave the capabilities of the business sector and societal organisations?
In a network society, coming together as regional communities offers the ideal course of action. This provides a chance to combine efforts and resources to plan for the future and begin to take actions that will create sustained prosperity and build vibrant communities. There are small examples of very local initiatives, particularly in the villages on Goeree-Overflakkee and Voorne-Putten. New types of leadership will be required to find creative ways to engage businesses and the citizenry in new partnerships, to take initiatives and responsibility for defining innovative social and economic solutions.

Language & Culture

It is very commendable that for instance the municipality of Spijkenisse is very aware of the need to enable their youth to identify themselves as being from Spijkenisse, to try to install their pride in being from that community. The fact that this is a concern, suggests that the rapid growth of Spijkenisse has resulted in an inability to develop a uniqueness of community what would create that natural link between the youth of the community and the community itself.
On the other hand, also in small communities in the more rural parts of the region difficulties with young people occur. Does society offer them sufficient opportunities for education or sports? With what aspects of the regional cultural identity can youngsters identify themselves? Are there rele-

vant role models available with whom the can identify? No matter the causes, to attract young people to stay in the area and become part of the future workforce, solutions need to be found for bonding them to the local communities at early age. Spijkenisse needs to capture its history and the remaining heritage. Familiarity with the town's roots are – apart from the nowadays' built urban image – the basis for building a community's identity and civic pride in this commuters' town.

New economies

Regarding water sports, tourism and other recreational activities, the region seems to envy the Province of Zeeland. Repeatedly, plans are constructed and initiatives taken to promote leisure on (parts of) Goeree-Overflakkee and Voorne-Putten. Why such a fragmented approach? Most (of the foreign) visitors on one of the islands in the delta area might not even know what island they are on. Joining forces in promoting leisure on the scale of the southwest delta of the Netherlands could be a starter to attract investors. Funding is needed for the reconstruction of the old-fashioned Brielse Maas and Bernisse areas, for increasing of accommodation like hotels and for concepts for better, sustainable exploitation of the many beaches and lakes.
Apart from Spijkenisse's ambitions to offer good conditions for living and working, and attract businesses to settle, the town could distinguish itself regarding touristic attractiveness by developing "industrial tourism", in cooperation with the businesses in the harbour and industrial area. That would not only contribute to the local economy, but also create a better public awareness and understanding of the economic cores of the region.
Regional food provisioning could be another topic for reinforcement of the local economy. The region already has a variety of farming and fishery, and regional and global traders nearby. Usually, food production in the Netherland is seen as an activity in more "remote" rural areas for the global markets. However, the consumers' increasing interest in local food offers opportunities for especially peri-urban regions with lots of consumers nearby.

Sustainable development

There are some initiatives and apparently many intentions for more sustainable development. However, for a region as a whole, it is not convincing at all. The region – and all communities within – could distinguish itself by radically creating some real sustainable development and become a show piece for that. The impressions now are that the region's idea of sustainability is "doing less harm" rather than actually going beyond that. It seems that real sustainable development is missing. After all, there is a difference between "sustainable development" and "sustaining development".
The Rotterdam Climate Initiative might be a useful "vehicle" for joint actions towards more real sustainable initiatives. Why not broaden it to the whole region, including the industrial and rural areas? The region has lots of values and sites worth to sustain for a better the quality of life, environmentally as well as socially and economically. The success factors of the horticultural sector (see chapter 4.4) could also be applied to the Rotterdam area as a whole: entrepreneurial spirit and focus on social and technical innovation, clustering related business to stimulate cooperation and exchange, building partnerships, and combining being local based while focusing on an international market.

Concluding

From a helicopter view it could be concluded that there is an increasing awareness and sense of urgency to adapt to changes in economy and society. At the same time, the current initiatives seem fragmented and originated from old ways of thinking and acting. The consultation at Windsor Castle showed that the very nature of a regional society demands for more adaptive and comprehensive approaches based on local ownership, although it is not a path well trodden. During the study tour many ideas and associations originated of which a very few are mentioned above. It is recommended to have a more in-depth elaboration of those and other ideas. External expertise like from the study tour participants could be of help for outside-in thinking.

6. Appendices

6.1 Programme of the Study Tour

Wednesday 17 October
- Arrival in Rotterdam
- Acquainting the city centre of Rotterdam, sightseeing, shopping time
- Welcome dinner at restaurant Prachtig with organic food and explanation by the chef

Thursday 18 October
Visit to Port Zélande
- meeting the former secretary of the regional Business Innovation Platform
- discussing history, trends and opportunities of the rural island Goeree-Overflakkee

Visit to Maasvlakte 2
- stopover at the beach with a nature reserve and the Slufter, where harbour sludge is being stored and processed
- seeing new reclaimed land from the sea and the extension of port of Rotterdam
- visiting the exposition centre Future Land

Visit to town of Spijkenisse
- presentation by one of the municipal executives, followed by discussion how a small rural village expanded to an urbanising town with a regional centre function
- walk through the town centre, experiencing the centre's make-over

Visit to Deltalinqs - advocacy organisation for the Rotterdam harbour and industry business
- presentation by the deputy director and discussion about the spatial, social and economic opportunities and consequences of expanding the port

Dinner at restaurant Mooii, informal meeting with a local former alderman and chair of businesses

Friday 19 October
Visit to flower auction FloraHolland
- guided tour through auction halls, the auction clock and the distribution centre

Visit to pot plant nursery
- meeting the owner who also is vice-chair of the flower auction's board
- experiencing the production process

Visit to the storm surge barrier, part of the Delta Works
- guided tour alongside the surge barrier and visiting the exposition centre

Visit to the farm Bieslandhoeve
- tour through the farm and discussing the social and environmental aspects of a multi-functional farm with the owner
- lunch with home-grown organic produce

Farewell dinner in Amsterdam at the Five Flies

6.2 The Netherlands in general[7]

Geographics

The Netherlands is located in North-West Europe. It borders the North Sea to the north and west with a 450 km cost line with sandy beaches and dunes. Belgium is its neighbour in the south and Germany in the east. The Netherlands in its entirety is often referred to as Holland, although North and South Holland are actually only two of its twelve provinces. Much of the Netherlands' territory is water, while about 40% of its land area and population is located below sea level (up till 7 metres). This distinct feature contributes to the country's name: literally it means The Low Countries. Most of the areas below sea level are man-made, caused by centuries of poorly controlled peat extraction, lowering the surface by several metres. From the late sixteenth century land reclamation started and large polder areas are now preserved through elaborate drainage systems with dikes, canals and pumping stations. Much of the Netherlands is formed by the estuary of three important European rivers, which form the Rhine-Meuse-Scheldt delta. Most of the country is very flat, with the exception of foothills in the far southeast (with its highest point of 321 metres above sea level) and several low hill ranges in the central parts.

Fig. 20: The Netherlands with its 12 provinces

Demographics

The population is about 16.7 million people, of which over 80% is urban. With an area of 41,500 sq km the Netherlands has Europe's largest population density of about 495 inhabitants per square km (water excluded). Population density varies strongly: from 1,250 in the Provence of South Holland (red coloured on the map, in the west) with Rotterdam and The Hague to about 200 per square km in the upper three provinces.

None of the Dutch cities has over 1 million inhabitants. The country capital and the biggest city is Amsterdam with a population of 800,000. Next largest cities are Rotterdam (616,000); The Hague (500,000), which is the seat of government, and Utrecht (320,000). The "ring" in the western part of the country of those four cities and their neighbouring towns form the most urban part called Randstad, housing 40% of the Dutch population.

Politics and administrative divisions

The Netherlands is a parliamentary democracy. The monarch is the head of state, at present Queen Beatrix. Constitutionally, the position is equipped with limited powers. The executive power is formed by the cabinet, the head of which is The Prime Minister. The cabinet is responsible to the bicameral parliament, the States-General, which also has legislative powers. The 150 members of the House of Representatives, the Lower House, are elected in direct elections, which are held every four years. The States-Provincial are directly elected every four years as well. The members of the provincial assemblies elect the 75 members of the Senate, the upper house. Due to the multi-party system, no single party has held a majority in parliament since the nineteenth century, and coalition cabinets had to be formed. The Dutch political system has been dominated for decades by three families of political parties: the Christian democrats, the social democrats and the

[7] Information adapted and shortened from http://en.wikipedia.org/wiki/Netherlands

liberals. Five elections in the last 10 years (due to the fall of several cabinets) changed the political landscape with new political parties and many more votes for socialists as well as conservatives. In most recent elections, September 2012, the liberals and social democrats regained many votes, got a majority and formed the new coalition cabinet.

The Netherlands is divided into twelve administrative regions, called provinces. They are divided into over 400 municipalities. Each four years the members of the municipal councils are elected. Parties with a majority in the council nominate candidate aldermen that are elected by the council as a whole. Aldermen (mostly 2 – 6 persons) and the mayor, who is appointed by the Queen, form the Executive that is responsible to the Municipal Council.
The country is also subdivided in about 25 water districts, governed by a water control board, each having authority in matters concerning water management. The creation of water boards actually pre-dates that of the nation itself, the first appearing in 1196. In fact, the Dutch water control boards are one of the oldest democratic entities in the world still in existence.

Dutch politics and governance are characterised by an effort to achieve broad consensus on important issues, within both the political community and society as a whole. Both trade unions and employers organisations are consulted beforehand in national policymaking in the financial, economic and social areas. They meet regularly with government in the Social-Economic Council. This body advises the national government and its advice cannot be put aside easily.

Economy

The Netherlands has a well-developed economy and has been playing a special role in the European economy for many centuries. Since the sixteenth century, shipping, fishing, trade, and banking have been leading sectors. The Netherlands' location gives it prime access to markets in the UK and Germany, with the port of Rotterdam being the largest port in Europe. The Netherlands is one of the world's ten leading exporting countries. Food stuffs form the largest industrial sector and the Netherlands are the third largest global exporter of agricultural produce. The country continues to be one of the leading European nations for attracting foreign direct investments and is one of the five largest investors in the United States. It has the seventeenth largest economy in the world, and ranks tenth in GDP (nominal) per capita. Unemployment is rather low, the lowest rate in the EU.
Amsterdam is the financial and business capital of the Netherlands. The Amsterdam Stock Exchange (AEX) is the world's oldest stock exchange and one of Europe's largest. The city is also the fifth busiest tourist destination in Europe with more than 4.2 million international visitors.

Fig. 21: The Amsterdam canals attract many tourists

Agriculture

A highly mechanised agricultural sector employs 4% of the labour force but provides large surpluses for the food-processing industry and for exports. The Dutch rank third worldwide in value of agricultural exports, behind the United States and France, with exports earning 75 billion euro annually. A significant portion of Dutch agricultural exports are derived from fresh-cut plants, flowers, and bulbs, with the Netherlands exporting two-thirds of the world's total. FloraHolland is the biggest flower auction of the world and key player in the international floriculture. The Netherlands exports a quarter of all the world's tomatoes, and the trade of one-third of the world's exports of sweet pepper, tomatoes and cucumbers goes through the country. The Netherlands also exports one-fifteenth of the world's apples.

Transport
Rotterdam has the largest port of Europe, with the rivers Meuse and Rhine providing excellent access to the hinterland, upstream reaching to Basel, Switzerland, and into France. In 2006, Rotterdam was the world's seventh largest container port in terms of Twenty-foot Equivalent Units (TEU) handled. The port's main activities are petrochemical industries and general cargo handling and transshipment. The harbour functions as an important transit point for bulk materials and containers between the European continent and overseas. From Rotterdam goods are transported by ship, river barge, train or road. In 2007, the Betuweroute, a new fast freight railway from Rotterdam to Germany, was completed.

Nature and Landscape
Most of the country is flat. The eastern and southern part have some hills, caused by glaciers in the penultimate ice age, which driving force and weight led to the emergence of lateral moraines. Those are still recognisable in current landscapes. Much of nowadays landscapes are man-made, as by-product of (former) economic sectors like forestry, peat winning, agriculture and land reclamation. Only a few original nature areas are left, mainly some forests, heath fields and dunes. To preserve nature and halt the decline of biodiversity, several national parks has been designated and another twenty National Landscapes with less restrictions than national parks. Nowadays (also European) environmental policy is focused on connecting the large and many small nature areas by buying privately owned land, nature development and privatised and agricultural nature management.

Culture
The seventeenth century was the age of flourishing trade and culture, with famous painters such as Rembrandt van Rijn and writers as Joost van den Vondel. The Netherlands is also the country of the philosophers Erasmus of Rotterdam and Spinoza. Famous Dutch artists of later centuries were amongst others Vincent van Gogh (painter) and Multatuli (writer). Well-known literature of the twentieth century is Anne Frank's Diary of a young girl, which was published after she died in the Holocaust and translated from Dutch to all major languages.
Replicas of Dutch buildings can be found in Nagasaki, Japan. A similar Holland Village is being built in Shenyang, China. Windmills, tulips, wooden shoes, cheese, Delftware pottery, and cannabis are among the items associated with the Netherlands by tourists.

About two thirds of the population participates in sports weekly. In the Netherlands, soccer, tennis, golf, hockey, equestrian sports, swimming and skating are sports with most members of sports clubs. Biking is not only a popular sport, but also a common way of transportation for commuters as well as for recreational purposes.

Traditional Dutch cuisine consists of working class meals. Many traditional dishes are mashed dishes, for instance potatoes mashed with kale, sauerkraut or endive. These dishes are served with greasy, smoked sausage and gravy. Another traditional dish is split pea soup.

6.3 City of Rotterdam

Rotterdam is situated in the west of the Netherlands. As one of Europe's most vibrant, multicultural cities, Rotterdam is known for its university (Erasmus), cutting-edge architecture, lively cultural life, striking riverside setting and maritime heritage. Rotterdam's territory covers 320 square kilometre of which 2/3 is water. It has a population of approximately 616,500. Together with the suburbs it is the Netherlands' most urbanised area with a population of about 1.3 million. On a higher level, Rotterdam is part of the conurbation Randstad, which also includes Amsterdam, The Hague and Utrecht and their neighbouring towns. Randstad counts 7.1 million inhabitants and is

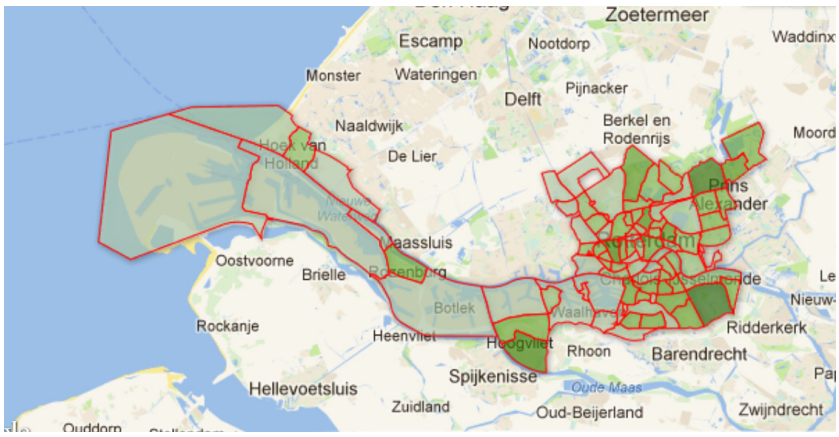

Fig. 22: Municipality of Rotterdam and its boroughs.

Europe's sixth largest metropolitan area. The city has been well-developing over the past two centuries, especially after digging the canal Nieuwe Waterweg, 150 years ago, which gave the city a direct shipping route to the North Sea. After the bombing in World War II, the city was gradually rebuilt and extended from the 1950s through the 1970s. At the same time new harbour and industry complexes were constructed more westward into the direction of the North Sea by annexation of neighbouring towns and villages, enabling taller vessels to visit the port of Rotterdam. From 1962 Rotterdam was the world's largest port. By extending, port and city have geographically grown apart. Although still growing, the port of Rotterdam was surpassed by Shanghai and Singapore in the 2000s. Future growth is enabled by recent reclamation of 2,000 hectares land from the sea, enlarging the port area with 20%. Yet, Rotterdam is and will maintain the biggest global gateway to Europe's hinterland.

In the 1990s, the city's skyline appeared by building the first Dutch skyscrapers. Nowadays Rotterdam – still being the only Dutch city with high-rise buildings, sometimes called Manhattan on the Meuse – continues to extend its skyline with daring and new-style buildings, bridges and more, making it an interesting architectural city. In 2013 a new building, composed of three towers, is expected to be completed in the city centre on the south river bank. It is designed by architect Rem Koolhaas and is the biggest building in the Netherlands that has been built in once. Its designer calls it the vertical city, referring to the variety of function under one roof, among which the new city hall, offices, a hotel and shops, apartment and so forth.

Fig. 23: Architect Rem Koolhaas' newest creation

For centuries the continuing developments have offered employment and housing for many people, from the nearby rural areas as well as for immigrants from a variety of countries. To date, Rotterdam is a global capital city with offices of many multinational companies and with a trade and port related economy, characterised by a hard-working (blue collar) mentality. About 50% of its multicultural population is of foreign origin.

6.4 Floods and land reclamation

Threat of flooding

The Netherlands can be divided into the higher plains with sandy soils in the south and the east, and the part below sea level with peat and clay that was formed by sediment from the sea and three large rivers. Natural sand dunes and man-made dikes, seawalls or dams and floodgates provide defence against storm surges from the sea. River dikes prevent flooding from water flowing

Fig. 24: Much of the Netherlands is below sea level

into the country by the major rivers Rhine and Meuse, while a complicated system of drainage ditches, canals and pumping stations (historically: windmills) keep the low lying parts dry for habitation and agriculture. Over the centuries, the Dutch coastline and the estuaries of the rivers Rhine, Meuse and Scheldt have been subject to flooding and changed considerably as a result of human intervention and natural disasters. Most notable in terms of land loss is the storm in the year 1134, which created the archipelago of the current Province of Zeeland in the southwest. In some areas floods were partially increased in severity through draining relatively high lying swampland to use it as farmland. This drainage caused the fertile peat to compress and the ground level to drop, whereby they would lower the water level to compensate for the drop in ground level, causing the underlying peat to compress even more. Also, up until the nineteenth century peat was mined, dried, and used for fuel, that further added to the problem.

Nowadays, the climate change influences the threat of flooding by the rising sea level and by more extreme rainfall. Rain from a huge part of Germany and Belgium is transported by rivers to the Netherlands, causing "internal" flooding from rivers.

Water works engineering

To guard against floods, a series of defences against the water were contrived. In the first millennium AD, villages and farmhouses were built on man-made hills called "terps". Later, these "terps" were connected by dikes. In the twelfth century, water control boards (local government agencies) started to appear, whose job it was (and still is) to maintain the water level and to protect a region from floods. As the ground level dropped, the dikes by necessity grew and merged into an integrated system. By the thirteenth century, windmills had come into use in order to pump water out of areas below sea level. The windmills were later used to drain lakes, creating the famous polders.

To save many towns on the coastline of the former Zuiderzee (an open inner sea in the centre of the Netherlands) from flooding, the Afsluitdijk ("Closure Dike") was built and completed in 1932. It turned the Zuiderzee into the inner sea IJsselmeer from which later on four polders totalling 2,500 square kilometres were reclaimed.

Delta Works

A study done by the Department of Public Works in 1937 showed that the sea defences in the southwest river delta were inadequate to withstand a major storm surge. The proposed solution was to dam all the river mouths and sea inlets, thereby shortening the coast and creating freshwater lakes. However, because of the scale of this project and the intervention of the Second World War its construction was delayed and the first works were only completed in 1950.

After the North Sea flood of 1953, a commission was installed which had to research the causes and seek measures to prevent such disasters in future. They revised some of the old plans and came up with the so called Delta Plan. Instead of analysing past floods and building protection sufficient to deal with those, the Delta Works commission pioneered a conceptual framework to use as norm for investment in flood defences. The framework is called the "Delta norm" and works as follows:

- major areas to be protected from flooding were identified. These are called "dike ring areas" because they are protected by a ring of primary sea defences;
- the cost of flooding was assessed, involving damage to property, lost production and a given amount per human life lost (valued at € 2.2 million - 2008 data);
- the chances of a significant flood within the given area were calculated by using data from a purpose-built flood simulation lab as well as empirical statistical data.

The plan consisted of blocking the estuary mouths. This would reduce the length of the dikes exposed to the sea by 700 kilometres. The mouths of the Nieuwe Waterweg and the Westerschelde were to remain open because of the shipping routes to the ports of Rotterdam and Antwerp. The works would be combined with road and waterway infrastructure to stimulate the economy of the Province of Zeeland and improve the connection between the port of Rotterdam and Antwerp.

Fig. 25: Map of all the Delta Works

In 1976, under pressures from environmental groups and the fishing industry, it was decided not to close off the Oosterschelde estuary by a solid dam but instead to build the Oosterscheldekering, a storm surge barrier which is only closed during storms. It is the most well-known (and most expensive) seawall of the project. A second major hurdle for the works was in the Rotterdam port area. A storm surge through the Nieuwe Waterweg would threaten about 1.5 million people around Rotterdam. However, closing off this river mouth would be very detrimental for the Dutch economy, as the Port of Rotterdam uses this river mouth. Eventually, the Maeslantkering was built in 1997.

Future developments

Due to climate change and relative sea-level rise, the Delta Works as well as river dikes will in future probably have to be adapted again. This is a long term uphill battle against the sea and effects of heavy rainfall. In September 2008, a new Delta commission advised that the Netherlands would need a massive new building program to strengthen the country's water defences against the anticipated effects of global warming for the next 190 years. According the commission, the country must plan for a rise of the North Sea level of 1.3 metres by 2100 and 4 metres by 2200. The plans included drawing up worst-case scenarios for evacuations and included more than € 100 billion, or $ 144 billion, in new spendings through the year 2100 for measures, such as broadening coastal dunes and strengthening sea and river dikes.

Recent land reclamation[8]

The Rotterdam port is by far the largest and most important port in Europe. Thanks to its location directly on the North Sea and its deep port basins, Rotterdam is one of the few European ports where the largest ocean-going vessels can safely and swiftly load and unload 24 hours a day. Every year, an average of some 34,000 ocean-going vessels and 105,000 inland vessels visit the port.
After decades of growth, the existing port area has reached its limits. To also play a significant role in years to come, the port needs to expand. In 1993, the Municipality of Rotterdam drafted the 2010 Port Plan, which included a proposal for a second Maasvlakte. Working in consultation with regional interest groups, the municipal and provincial authorities a plan for a seaward expansion to the west of the current Maasvlakte was outlined. Two requirements were set for the new expansion plan: besides promoting the economic growth of the port area, the plan would also have to improve quality of life in the region. This is achieved by better utilising the existing port area and constructing 750 hectares of new nature and recreation areas in addition to the construction of Maasvlakte 2.

[8] Also see: http://www.maasvlakte2.com/en/

6.5 Agricultural trade and development

Economics and export
The Dutch agricultural sector comprises the primary agriculture (arable as well as livestock farming), horticulture and fisheries. It is closely related to other business sectors for supplying products and services, and the processing industry. The entirety of economic activities associated with agriculture and food is called the agro-complex, which is seen as a coherent supply chain. It is of considerable significance for the Dutch economy. The agro-complex employs a labour force of about 650,000, which is about 10% and contributes the same percentage to the Dutch Gross Domestic Product.

The Dutch economy has a strong international orientation and the agricultural sector is no different. The export of agricultural products increases yearly and has in recent years exceeded 75 billion euro, which is equivalent to roughly 15% of the total export value. Most exports go to other Member States of the European Union. The Netherlands is the second largest exporter of agricultural products in the world, after the US and followed by France. A substantial part of activities within the agro-complex concern the trade and processing of imported raw materials like drinks, cocoa, tobacco and tropical fruits. The Netherlands imported agricultural products (mainly meat and dairy products) add up to 11% of the value of total Dutch imports, leaving about 25 billion euro surplus of agricultural trade in 2011. This is 60% of the total Dutch trade surplus.

Total production value of the agriculture and horticulture sector in 2011 was over 25 billion euro. Arable and horticulture crops accounted for almost 12 billion euro and the value of livestock and animal products was 10 billion euro. In the arable and horticulture sector, flowers and ornamental plants demonstrate strong increases. Dairy products had the largest share of the livestock and animal products sector. Since 1995, exports have been generating about three quarters of the value added and employment of the agricultural complex.

Farming characteristics and conditions
The Netherlands has a total land surface of over 3.7 million hectares. About 60% of the land is farmland. Of the total farmland in the Netherlands 58% is used for the cultivation of arable and horticulture crops, 40% is permanent grassland and some 2% is used for permanent crops. The main crops are cereals (mainly wheat), fodder crops (e.g. maize for animal feed), potatoes and sugar beets. Major export products are meat and meat products and dairy products. In horticulture, greenhouse production is most dominant, comprising the cultivation of vegetables, cut flowers and ornamental plants.
The total area of agricultural production remains about the same, but the number of farms decreases for decades at a stretch with an average of some 3% per year. In 2011, the total number of farms amounted to 70,000. Dairy farms made up the largest group (25%), followed by farms with grazing stock, cows for slaughter, sheep and goats (about 20%). The number of arable farms, producing mainly cereals, potatoes and sugar beets, was some 10,000 (15%). Some 11,000 businesses operated in the full soil vegetables and glasshouse sector.

The Netherlands is favourably situated regarding its main export markets like Germany, UK and France with millions of consumers. Moreover, the climate is very moderate, the soil very fertile and there is a huge body of knowledge within the sector, as well as in research. Dutch agriculture has also anticipated and profited from the EU's Common Agricultural Policy through the years. These conditions have created the successful Dutch agriculture.

Developments in farming
Nevertheless, the agricultural sector has some serious vulnerabilities: there is little space in this densely populated country, causing high prices for land and labour. The intensive use of farmland and inputs has disadvantages for the environment, e.g. crop protection chemicals, manure and the

occurrence of animal diseases. Economically, we have had a surplus of milk, butter and grain. These symptoms illustrate that agricultural production was no longer primarily initiated by the need of food, but had become a supply-driven system in itself. The food supply chains that have facilitated efficient production and trade, had also created a gap between consumers and producers, between city dwellers and rural people. The Dutch agriculture and horticulture sector entered a new phase in the last few decades of the twentieth century. There are two parallel developments: further modernising and diversifying of farms.

Mega-farms

On average, low costs per unit of products is the dominant strategy, causing expansion and increase in intensity and productivity. Between 1990 and 2006 the number of farms has fallen by almost a third, which is mainly due to the decline in the number of small farms. However, the number of large farms has increased considerably. In 2006 the average intensive livestock farm was twice as large as in 1990, and the average broiler farm was three and a half times larger.

Some large farms have increased in size by such an extent that they are now classified as mega-farms. A typical mega-farm would have some 400 dairy cows, 13,000 fattening pigs, 185,000 layers or 385 hectares of arable land. Mega-farms are relatively common in glasshouse horticulture. 10% of businesses in the glasshouse vegetable sector have an area of 5 hectares or more, accounting for almost 40% of the total area for this sector.

Recently, the public opinion has opposed to mega-farms due several animal diseases of which the last one was Q-fever on goat farms. Policies are being changed to halt the unlimited increase of farm size, by setting boundaries on numbers of animals or land surface per company.

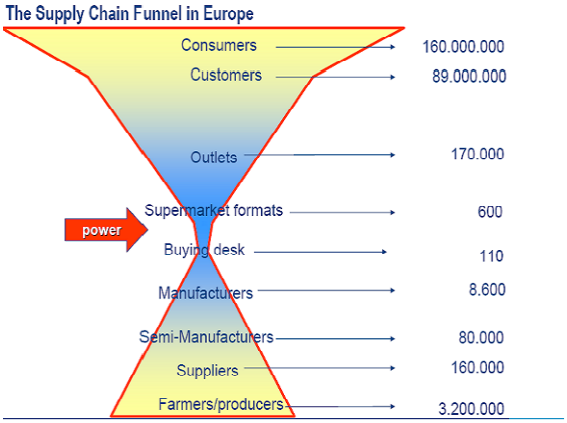

Fig. 26: Due to a well-organised food supply chain with many mergers in trade and processing, a supply funnel has been created with a concentration of purchasing power

Diversifying

Modern agriculture and the globalising economy haven't brought prosperity for everyone. At the base of the supply chain, the primary sector of producers provides the resources for the food chain, but usually does not receive a reasonable part of the profit. Margins tend to accrue on the levels of purchasing and retail organisations. As a result, agriculture has been diversifying. Driving forces that made producers decide to change their business model are for instance: intrinsic motives, bad economic exploitation, and no ability to finance necessary investments, spatial limitations or new, promising perspectives. Right now, common forms of multi-functional agriculture are: care farming and child care, agricultural nature and landscape management, agro-tourism and regional produce.

Concluding

Regarding the urban food provisioning there are two modes now. The first is a global, industrialised and corporate food regime, which is dominant in industrialised countries and gaining ground in developing countries. The second mode comprises local, traditional and artisan farmers that are most common in developing countries and are also gaining ground (again) in industrialised economies like the Dutch. So, one could say that developing countries are upgrading their food production and agricultural systems to a modern level, meanwhile probably loosing the rural characteristics like diversified farms, local produce with local short supply chains and culinary traditions. On the other hand, modern countries seek alternative agricultural systems that meet societal needs and rediscover traditional rural values that seem to be lost, but still are mainstream in developing countries.