Landscape Networks: Integrating Fragmented Urban Landscapes. 
A proposal for Socio-Territorial Integration.

Karen Cubells Guillen
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Part I: Introduction

1.1 Introduction

The area of the Old Maas River and its surroundings is a region that combines different sized urban areas along and close to the Old Maas River whereas in the rural areas, agriculture is the most dominant land use. The different land uses appears as fragments in the landscape and this fragmented reading is what is called a mosaic landscape.

Likewise, due to the area appears to be a mosaic with urban and rural patches; landscape ecology seems to be appropriate for the understanding of the area. It focuses on the analysis of the land mosaics because is exactly the right scale for planning, bringing clarity and simplicity focusing on spatial arrangements and an application to any landscape (Forman, 2008). Usually, landscape appears as a mosaic of different colors and origins but more importantly, the mosaic landscape (Forman, 2008) is usually formed by farmland which is the most predominant land use, the patches are represented by cities, suburbs, industrial areas and green spaces and the corridor by the river and dikes.

Even though landscape ecology focuses on the patterns of landscapes and their relationship, it can also involve social ecological processes like the relationship between the landscape and how it can affect the well-being of a society or social groups as a whole (Cawood, P & Somers, O, 2006).

1.2 Problematique or Problem Statement

According to Cawood and Somers, there is a close relationship between the physical landscape structure and the social structure in a fragmented society (Cawood, 2006). The social structure is affected by the landscape structure defining behaviours, movements and dynamics, for example, a city with clear boundaries between its neighborhoods, shopping areas and parks will develop boundaries in the social structure as well defining territories.

A fragmented landscape experiences a fragmented society?

In a Regional Scale, a mosaic landscape is composed of urban, suburban and rural patches. In suburbs, which are the majority of urban areas in the Old Maas Region, common to find un-used public spaces due to its use is sectorized by some districts or neighborhoods. In some cases, the reason is because they are out of walking distances or because people claiming territories. In any case, un-used public spaces indicate lack of recreation which can be caused by absence of sense of place and attachment.

Considering that quarter of the population of the whole Old Maas region is between 0 to 19 years old living in suburban areas, the use of public parks and recreation can be crucial to form place attachment and sense of community.

Place attachment is usually understood as the bond formed between people and their residential place like dwellings and neighborhoods but also places with recreational purposes such as landscapes, forests, lakes and so on (Lewicka, 2003). On the other hand, Bow and Boys define place bonds as a correlation of emotions, affect, behaviours, knowledge, beliefs and actions to a particular place (Altman & Low, 1992 & Bonnes & Secchiaroli, 2003). In Addition, there is an assumption that the same process occurring between identity and place are similar to the process occurring between group and identity (Bow and Boys, 2003). In order to create group and identity, both need to be engage in activities in the setting, the more people engaged in activities the more intense the bond with the place will be (Bow and Boys, 2003).

Therefore, as people form bonds with places and landscapes, public parks can be used to promote recreation engaging groups and identity forming place attachment. According to Scannell and Gifford sense of place can be used to encourage the use of public spaces (Kyle, Graefe, B Manning, 2003; Moore & Graefe, 1994; Williams & Stewart, 1998). In brief, the problem statement can be summarized and expressed as the following: If A is place attachment, B is recreation and C are the places with recreational purposes, it can be stated that the relationship between A and B is positive like the relationship between A and C as well.
1.3 Potentiality

Green patches such as recreational parks have a major impact if they are not integrated into the social structure due to they are crucial spaces for recreation and thus, to form place attachment. According to Seymour Gold, open spaces give to the urban citizen a sense of identity, direction and association. It can separate or integrate urban areas or neighborhoods from each other and to the surrounding area (Gold, 1973)

Therefore, the process mentioned before, can be adjusted and inverted in order to achieve place attachment as our main goal in the following way:

However, in order to achieve place attachment through the landscape such as public parks engaging people in recreation, recreation must highlights the physical characteristics of a place rooted to attachment because it provides amenities to support one’s goals (Scanell and Gifford, 2009)

In the past decades, studies have confirmed that attributes of the physical space such as natural spaces and built landmarks, should be explored for their affects on sense of community (Scanell and Gifford, 2009)

However, as the landscape structure has much to do with the social structure, is important to use landscape ecology for the understanding of the fragmented landscape and further, understand the social structure. Consequently, provide and design the necessary interventions that deal with the landscape structure and the social structure resulted from it.

1.4 Relevance

1.4.1 Landscape Structure

Since at any scale, a mosaic landscape is composed of matrix, patches and corridors they confirmed the basic spatial elements of any land and therefore, landscape elements, whether natural origin or human, are the spatial elements at a landscape scale (Forman, 2008)

The relevance of this research is using the patch, matrix and corridor approach to understand the potential that lies in spatial elements of the landscape as integrators of natural spaces, in order to design and develop networks that interact with the different urban and rural patches integrating the landscape.

1.4.2 Social Structure

As the mosaic landscape appears at any scale with different spatial elements and the social structure is affected by the landscape structure, ways of integrating fragmented landscapes should be explored in order to form an integrated social structure with sense of community and place attachment.

Therefore, green patches as parks and open public spaces offer an opportunity for recreation in engaging people together in natural and built environments highlighting the beauty and specificity of the landscape creating sense of community and place.
1.5 Scale

Scale is very important to take into account due to countries, regions, cities and landscapes are composed of the same three spatial elements: matrix, patches and corridors. Therefore, the study of these three spatial elements represent an opportunity and application to any scale.

1.6 Research Question

How to create a continue recreational network in a mosaic landscape able of connecting the different urban areas and public spaces creating place attachment and social identity in Suburbs?

Hypothesis:
1. Using the spatial elements of the matrix as landscape integrators.
2. Using the specificity of the landscape as generator of place attachment.

Research Goals:
• Develop a strategy that could be applied in regional and local scales in fragmented landscapes.
• Explore the possibilities of connection and spatial quality in landscape elements for recreational purposes.
• Explore ways of highlighting the specificity of the landscape through recreation.
River Identity

The Old Maas is the only river of this area that still has green natural spaces along the river and is still in contact with the urban areas, thus, it is a river with recreational potential. The New Maas is a very busy and commercial river mostly used for trade. Hollandse Diep is more natural due to its more into the rural area surrounded by agriculture and ending in the Biesbosch.

Therefore, the idea is to enhance the Old Maas recreational potential taking advantage of the green spaces, relation to the different cities and suburbs as well as its connectivity as water network.

I.7 Context

I decided to work in the area of the Old Maas because of its industrial activity along the river, agriculture in the rural areas, the surrounding suburbs and the green spaces along the river. Therefore, I found myself between two of the biggest industrial city-ports in The Netherlands: Rotterdam and Dordrecht. As a result of two main ports-related cities, smaller cities were taking place between them and along the river as well.

As we can see in the historic analysis, the booming period for suburbs was after the World War II where people moved from farms and cities into new suburbs. Consequently, the distances between home and work increased, bringing housing and highway construction period changing the family’s dynamic. Displacement is caused when “individuals must leave their places such as in the event of a natural disaster or war, immigration, or relocation” losing their social settings and familiar structure (Scanell and Gifford, 2009).

1.8 Historical Analysis

Cities vs Suburbs

Green Patches

Rotterdam and Dordrecht as main developments in the area.

Rotterdam has developed as the main port city stimulating the development of the first suburbs such as Schiedam and Waardingen.

Fast urban growth around and in Rotterdam. The port of Dordrecht is taken by the direction of the port of Rotterdam. Suburban areas starting to grow.

Dordrecht and Rotterdam established as main cities. Within 50 years, the area is totally urbanized mostly by suburbs.
As in many other areas of the Netherlands, it is part of living in the lowlands to live in areas where the river is higher than the cities and thus, the urban experience take place behind dikes. The higher areas are represented by the river and the river beds whereas the cities and polder can reach levels of minus six below sea level.
Dikes cross extensive areas passing through cities, rural areas and along the river. Some cities have one or several dikes crossing by and most of the times forming infrastructure such as roads connecting urban, rural and river landscapes.
2.3 Floodings

As result of living in the lowlands and specifically in an island, the area suffers from periodical floods. These floods can be caused by seasonal changes under the influence of storms and rainfall but also because of river discharge. In addition, climate change represents a big threat for the Netherlands and especially in the river areas causing rivers to overflow and flood the surrounding land.

As we can see in the map, there are many areas experiencing floods which indicates that dikes are no longer enough to guarantee water safety in case of high water levels.
The Old Maas is basically a water platform for tankers and cargos in the transporting of agricultural products and construction materials whereas the New Maas is the starting point or the end for most of the ships. Trade and logistics is under the responsibility and management of the port of Rotterdam.
Camping places and Natural parks with recreation are popular in the river beds especially close to yacht ports. The green spaces and parks along the river represent an opportunity to form a recreational network from Rotterdam to Biesbosch through the Old Maas River. As navigable river, it has also developed several industrial areas that reflect the commercial activity of the surrounding area that involves the port of Rotterdam and Dordrecht.
Dikes not only cross urban areas but also green patches in the landscape providing the possibility of reaching these spaces from the cities through the dikes for recreation. As dikes represent a very important infrastructure for transportation by car and bikes, it is also a landscape element sign for accessibility to the cities and the different green spaces.
The whole area can be experienced by bike and as is appreciable in the map there are a lot of bike routes in the area. However, the most popular ones correspond to river dikes where the view of the river landscape and rural areas is predominant.
Part III. Methodology

3. Approaches

Due to the matrix, patch and corridor approach can be explained at any scale, is important to understand its spatial composition by separating its elements and identifying the role that play in the landscape. Forman describes a mosaic landscape as a composition of patches, corridors and the matrix that define the basic spatial elements of patterns in the land. Therefore, landscape elements may be of human or natural origin and apply to different community types, ecosystems, land uses, etc. (R. Forman, 1995)

3.1 Matrix Model

3.1.1 Definition

A matrix is defined by Richard Forman in "Land Mosaics: The Ecology of Landscapes and Regions" as the background land use type in a mosaic, that has a major control over dynamics and can be characterized by extensive cover and the presence of patches and corridors (1995). For example, in agricultural areas, the matrix is defined by farmlands and extensive cover and the presence of patches and corridors (R. Forman, 1995). Due to the changing economy, in the mid-twentieth century it became a place with abandoned industries, empty factories and abandoned buildings.

3.1.2 General Description

Usually, the matrix is described as the background canvas where corridors and patches are embedded forming a system. The patches most of the times represent interruptions in the matrix whereas corridors link the different landscape elements and patches. Nevertheless, in some cases the matrix is not easily recognizable because of the amount of patches, their sizes and even connectivity. Therefore, in 1997 the Mississippi Minneapolis Plan was published looking for a redevelopment and revitalization of the riverfront and the area along the river. The aim of the project focused on: preserve the history of the place, transformation into a public space, developing new mixed-use residential area, remove barriers and provide with new infrastructure.

In 2010, The Minneapolis Riverfront Design Competition sponsored by the Minneapolis Park and Recreation Board and the Minneapolis Park Foundation announced the beginning of the competition where 2,000 master plans were submitted. The winner team was Tom Leader Studio of Berkeley, CA and Kennedy & Violich Architecture of Boston however; I would like to focus on Turenscape Design Proposal Brochure and its strategy applied was using the river and other green corridors to create a network that could contemplate both objectives.

3.1.3 Study Case

The Resilient River: Minneapolis, U.S.A

The city of Minneapolis started along the Mississippi River due to the hydropower potential of the St. Anthony falls. It began formed by two villages, St. Anthony in the east part of the river and Minneapolis in the west side however; both cities were merged in 1872.

Soon, the presence of the river developed quickly the infrastructure and industrial area until forming a big urban center along the river. Nevertheless, due to the changing economy, in the mid-twentieth century it became a place with abandoned industries, empty factories and abandoned buildings.

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The proposal consists in using nature as mean to achieve the reactivation of the river. The first step was identifying natural assets to create an ecological infrastructure network in order to integrate and enhance its natural and cultural value. Finally, the green network will lead the water storm to the river. In addition to the water network, a green network will be enabled to maintain the river with smaller green corridors able of activating and vibrate the surrounding area. Furthermore, these water and green networks will respond to ecological and sustainable aspects in order to achieve landscape and social integration.

Although the proposal could be catalogued within a corridor approach due to it is focused on blue and green networks; the aim of explaining this project was to understand the matrix patches and the river corridor as potential spatial elements capable of relating the patches towards integration and development of the matrix. In this case, the main aim was achieving landscape and social integration in the matrix and the strategy applied was using the river and other green corridors to create a network that could contemplate both objectives.

Analysis as Matrix

The matrix of the Minneapolis River was developed as an industrial area along the river together with urbanization zones. These two land uses consist in the patches of the landscapes embedded in an urban matrix. The industrial patch and urbanizations are not related between each other and hence, the industrial patch or area can be seen as a physical barrier to the river and its inhabitants.

Nevertheless, the river as natural corridor is used as space activator and identity generator that will be able of creating new relationships between the river, the city and its citizens.

Hence, an ecological network was created in form of corridors that will lead the water storm to the river. In addition to the water network, a green network will be enabled in order to nurture the river with smaller green corridors able of activating and vibrate the surrounding area. Furthermore, these water and green networks will respond to ecological and sustainable aspects in order to achieve landscape and social integration.

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3.2 Area or Patch Model

3.2.1 Definition

The patch landscape is part of the land transformation as part of a dynamic system. According to Richard Forman, a patch is “a wide relatively homogeneous area that differs from its surroundings” (1995). Patches usually define borders between different land uses. Human-dominated patches include industry, commerce, housing and public spaces surrounded by other land uses (Cawood. P. & Somers. D, 2006).

3.2.2 General Description

As part of the mosaic landscape, the system develops patches and corridors with strong boundaries and discontinuities. The origin of a patch lies from people’s lines and nature’s curves whereas its compact shape represents a long period of time. The shape refers to an area clearly attached to intensity human activity, area, perimeter, land uses, soil types, among others (Forman, 1995).

3.2.3 Study Case

Central Park, New York, USA.

New York in 1850 had a population of 654,000 and the living conditions were unpleasant due to the lack of sewerage disposal, air pollution, unpaved and crowded streets where people, carriages, pigs and sheep were collapsing the roads (Tate, 2001). Therefore, the common council of New York agreed with the creation of a park.

The first person in getting involved in landscape plans in New York was Jackson Downing. Downing was a nurseryman and a landscape designer who was living in the Hudson valley.

By July 1856, a central piece of space was purchased. Downing and Bryant were the principal advocates of the park. However, after Downing’s death, his drawings and plans were given to Calvert Vaux, an architect he recruited in London (Tate, 2001).

Calvert Vaux petitioned a competition for the design of Central Park in August 1857. In April 1858, Vaux and his friend, Frederick Law Olmsted won the first prize for their project called “Greensward”. The plan represented a combination of Downing’s ideas about social attitude where people from different social classes could enjoy the same space, the same music, scenarios, etc. Vaux and Olmsted conceived the park as a refreshment place, a place to rest from the urban life (Tate, 2001).

The different routes will free the user from a particular mode of transportation avoiding conflicts with other users and keeping the traffic from the city out of the park. Although, rocks and new soil were imposed in the place together with a considerable drainage system; some original beauty of the place was maintained such as the lake and the reservoir that were the original and natural drainage basins.

Analysis as Area or Patch in the City

Referencing the concept and the general description of an area or patch in the mosaic landscape, Central Park is a green and open space that differs from its surrounding matrix: the urban tissue. As we can see in (Figure 7) the park forms strong and compact edges with its surroundings defining a big rectangular area. In this specific case, the geometrical boundaries make a clear shape, although in other cases it is not as explicit.

Strong boundaries was one of the designer intentions for the park considering the park itself a resting area, an area where people could go and being isolated from the noises, crowd and chaos of the city. As Alan Tate states in “Great City Parks”:

“The park boundaries were thickly planted… the southern part of the park was pastoral; the northern part… was more heavily wooded” - Alan Tate, 2011

On the other hand, although the park was artificially created bringing soil and rocks from other cities, mainly from New Jersey, there are some natural landscape elements remaining in the place such as the water basins, some rocky areas and higher grounds. Therefore, the origin of the patch was transformed from an undefined area with mixed program such as farmland into an artificial defined area that responds to human’s lines and straightness in shape. Other landscape elements such as walking paths, transversal roads, and vegetated strips, among others, represent human-created corridors that will be introduced in the next paragraph.

Figure 7: Central Park, New York, USA

Source: Deaquiydealli Blog

Link: http://www.deaquiydealli.com/central-park/
3.3 Corridor model

3.3.1 Definition

A corridor is a strip of a particular landscape type that differs from its matrix and permeates the land. It has the ability of enhancing water resource management in terms of control of sedimentation, flood control, clean water, and so on (Farman, 1995). However, corridors are not always linear elements or strips. In "Corridors for Conservation: Integrating Pattern and Process" it is stated that widening the concept of corridors to linkages, is possible to consider corridors without a linear or even continuous structures (Chetkiewicz, St. Clair and Boyce, 2008).

3.3.2 General Description

Corridors originate from the same way than patches, whether through nature’s curves such as streams, animals trails and ridges or on the other hand, through human’s lines like roads, ditches, walking trails, etc. However, three types of corridors are visually recognizable in the landscape: Through corridors, wooded strips and River corridors. However, three types of corridors are visually recognizable in the landscape: Through corridors, wooded strips and River corridors. Although the site was strange, they also saw the potential and beauty of the wildflowers and trees that grew in the tracks. Simultaneously, they organized an international ideas competition with the winning proposal for the new Highline and in 2009 the park opened to the public. Finally, in 2004 the FHL selected the Diller Scofidio and Renfro proposal for the new Highline and in 2009 the park opened to the public.

3.3.3 Study Case

The New York Highline, New York, USA

The West side of Manhattan was an industrial area developed as port lands, etc. However, three types of corridors are visually recognizable in the landscape: Through corridors, wooded strips and River corridors. Although the site was strange, they also saw the potential and beauty of the wildflowers and trees that grew in the tracks. Simultaneously, they organized an international ideas competition with the winning proposal for the new Highline and in 2009 the park opened to the public. Finally, in 2004 the FHL selected the Diller Scofidio and Renfro proposal for the new Highline and in 2009 the park opened to the public.

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Analysis as Corridor in the city

Corridors are landscape strips that differ from its surrounding matrix and most of the times connect the patches. Most of the times, human’s line corridors disrupt the landscape causing the division of habitats and the railway from 1920’s was being a disruption in Manhattan’s streets as well. Having the railway on the street level was affecting the pedestrian flow endangering the safety of the inhabitants and being a cut in the city tissue. Therefore, with the creation of the Highline and after the design proposal, the railway became a corridor able of connecting the neighborhoods offering a walking structure that will ensure a continuous flow through different urbanizations. Therefore, the potential as corridor was enhanced taking advantage of the railway as connector to turn it into a green corridor.

The New York Highline became a public and green space network that contemplates recreational spaces, tourism and biodiversity, that will ensure the activation of its surroundings and a social integration. As green network it also became a greenway. According to (Jongman, Kulvik and Kristiansen, 2004) in “European ecological networks and greenways” a greenway can be defined as a linear open space established along a natural corridor or along a railroad converted into a canal, a recreational space, other route or a scenic road (Little, 1990). As a comprehensive network, greenways also includes recreational, ecological and cultural heritage aspects (Fabos, 1995).

The potential that lies in the connectivity of corridors, whether artificial or natural is something to take into account in presence of infrastructure and green networks due to they can be turned into landscape integrators playing a much more important role in cities with low social interaction. The implied spatial qualities in corridors can open a range of possibilities for urban and landscape planning.
4. Applicability and Strategy Development

The approach that suits best the area is the matrix model because the study area responds to matrix characteristics with spatial elements such as embedded patches and corridors. Moreover, due to the aim is creating a network able of connecting the different urban and rural areas as well as the green patches, the corridor approach can be seen as potential connector that will facilitate the interaction among the patches achieving integration.

4.1 Aim

In order to achieve integration and interaction between the patches, corridors will be used as unifying element due to they are facilitators of relations and have connectivity potential in forming networks with recreational purposes.

4.2 Network Definition

In the area of the Old Maas, it is recognizable two main corridors: the river and the dikes. Whereas in local scales can be identified dikes, streets and sometimes the river as well. Therefore, as corridors are present in the matrix and usually connect the patches, the framework should contemplate the river corridor or “blue network” formed by the Old Maas river. The public and open green spaces or the “green network” representing the green patches. And finally, in form of corridors, the river and the dike as a multi-scalar landscape element existing in regional and local scales.

Nevertheless, the dike has been seen as an utilitarian landscape element more than an opportunity creator. Therefore, exploring its recreational potential in integrating landscapes promoting sense of community and identity will be the aim of the design process.

Figure 9: Sea Dike. Photo by Marc Ryckaert. Bugbog Travel guides and photos Link: http://www.bugbog.com/gallery/netherlands_pictures/netherlands_pictures_dr.html
4.3 Expectations of the Regional Scale

1. **Green Patches**
   Integration of the different urban areas and public open green spaces such as parks due to their recreational potential.

2. **Network**
   Creation of a network that links the different urban and green patches in order to have a fluid structure that brings people together in recreational purposes while showing the different stages of the landscape.

3. **Place Attachment**
   Using recreation in open public areas and through the dike as mean to create sense of place, attachment and identity.

   District, City and Regional identity and place attachment will be promoted through recreational green spaces in the landscape such as parks but also the natural areas along the river.

   On the other hand, it can also be used as mean to create attachment and thus, protection to the green and open spaces once people get involved in activities that take place in these spaces.

4.4 Ambitions

1. **Identify**
   - Identify the cities and public parks in order to set the areas to be linked into the system and the network.

2. **Integration**
   - Integration of the areas through the dike. The dike as connector and corridor able of providing a flowing and continue platform that intents to form a recreational network.
   - Develop a strategy that combines the dike as facilitator for connectivity and recreational purposes adjusted to the different types of dikes in the landscape.
   - Explore possibilities of integration by the river between Rotterdam, the Old Maas and Biesbosch.

3. **Represent**
   - Apply the developed strategies to a specific location in order to prove the reliability of the network as system and to get a grip on the social context.
Part IV. The Dike as corridor and network

5. Strategies of the Regional Scale

The dike as connector of green and recreational spaces.

5.1 Boat Network
5.2 The Utilitarian Dike
5.3 The Recreational Dike

Integration of Green Spaces

Accessibility to Green Spaces:

Accessibility:
- Car
- Bicycle
- Pedestrian

Dikes

Application of the Methodology

Landscape Networks

Fragmented Urban Landscapes

Dike System

Green Patches

River System

Corridors

Accessibility

Patent

Local Scale

Corridors

Regional Scale

Corridors

Riv er

Dik es

Roads & Canals

Matrix

40
In order to promote accessibility through the river and a water route, the existing yacht ports (red circles) linked to camping places were identified as potential arrival points in visiting cities and suburbs. On the other hand, three other ports (black and segmented circles) are proposed for creating a route through the green and natural spaces along the river with guided tours.

The idea is forming two recreational networks linked to different purposes. The first one is for large groups of people wanting to visit the cities and suburbs as well as seasonal activities such as festivals. And the other route is related to promoting the natural beauty of the spaces along the river and the river landscape.
Recreational Port: Route through the Old Maas with stop in the different cities. Boat for big groups of passengers suitable to transport people to festivals that take place in spaces along the river.
Natural River Parks: Route through the Old Maas’s natural parks. Boat for small group of people. Can be distinguished by color.

Guided tours through the Natural areas of the River
5.2 The Utilitarian Dike

Figure 10. The Utilitarian Dike
Source: Dutch Dikes, 2015

The Dike
5.3 The Recreational Dike

The dike as connector of urban and green areas.

Dikes were analyzed in the area identifying the polder dikes and river dikes in order to understand their difference and select the ones with recreational potential.
The selection of the dikes was made taking into account the green areas and the cities. The selected dikes have the potential of integrating these patches and form a recreational network among the cities connecting the green and open spaces of the area.
After defining the dikes with recreational potential, it is important to define a typology that works with the area that is crossing in order to understand the spatial relation as multi-scalar corridor, whether city, polder or river landscapes; the dike should respond to the different situations as fluid infrastructure and landscape element.
5.3.1 The River Dike

Current Situation

Operation #1
High Speed Dike
Separating speed flows for safety and to emphasize the perception of the landscape in one side of the dike.

Operation #2
Permanence spaces for contemplation to highlight the beauty of the landscape.

Operation #3 Recreation & Program
In case of recreation on the floodplains, the dike should work as vertical connector to the land and its biodiversity. Recreation can be used to protect these valuable river spaces and their biodiversity.
5.3.2 The Polder Dike

Highlighting Landmarks for collective memory and identity.

Ecological Measures and Opportunities.

Current Situation

Operation #1

High Speed Dike

Separating speed flows for safety and perception of both sides of the landscape without interrupting cars flow.

Operation #2

In case of agriculture in the area, transform the ring canals into bio-filters with reed in order to purify the water before being pumped into the river opening up new possibilities for biodiversity.

Operation #3 Involving the Farmers Community

In special occasions, an exposition can take place adding a temporary structure so farmers can sell their products.
5.3.3 The City Dike

Operation #1
Low Speed Dike
Softening the dike slope can allow more visual connection to both sides and therefore allow a better interaction.

Operation #2
For pedestrians, an intermediate path can be created for gathering spaces and flow continuity. The dike as infrastructure and transportation not only for cars and bikes but also people.

Operation #3 Recreation
In specific points, the dike can also be part of recreation adding some steps on the slope in order to create permanence and transition to other recreational spaces.

Current Situation

Grasses, shrubs and trees can provide a new ecological input for birds and butterflies.

Steps on the dike slope can represent a playful invitation to green spaces for recreation to which the dike has contact to.

A softer dike slope can allow a better relation between two neighborhoods allowing spaces for gathering, walking and other activities.
**Guidelines**

**Flexibility:** Due to the amount of different dikes and situation in The Netherlands, sometimes one dike responds to two different situations. Therefore, the system can be combined and so the operations depending on the intervention goal.

**Priority and budget:** Any of the operations will be taken as a good progress. They do not have to be implemented in order and they will depend on the budget.

**General Remark:** Trees can not be planted on dike slopes because they can affect the dike safety. Therefore, they should be planted on the ground (not on the dike) but recreating the dike shape filling it with clay or sand as shown in the example. However, this technique of using trees on dikes can also introduce rhythm, framings, program, entrances to a recreational area and continuity. Other opportunities as seasonal changes, blossoms, etc., can also be taken into account in order to show the beauty of the landscape and its elements.

**Example**

- **Rhythm and Seasonal Trees:** Planted at the same distance to create rhythm. It can represent program on the dike or in case of a seasonal tree, an entrance to a natural area with recreation or a seasonal change such flood in Spring.

- **Perspective Trees:** Will indicate continuity and high speed.

- **Enclosure Trees:** After creating enclosure with several trees, the view will suddenly opens up. This strategy can be used to frame views.
Due to the dike is a crucial element for cars, bikes and pedestrian accessibility; all the entrances to the dike system were considered in order to make the recreational route recognizable. Therefore, the selected dikes with recreational potential that will connect the parks and the different urban areas could allow a different image than other dikes.

For example, the bike path can be painted differently in a polder, city or river dike so the user will always know which color should follow if he wants to go to the river, polder landscape or entering to a city.
Special attention was given to the bike accessibility, aiming to enhance the use of bikes as a way of transportation in the future. Due to the bicycle being the preferred way of transport, a recognizable dike for cyclists is important to take into account in linking cities with recreational spaces. For example, if a festival takes place in one of the green spaces that the dike is connecting, an object can be temporarily placed at the entrances of the dike as a guiding element.

The object proposed as an example in the following image is a hot air balloon that can easily light up by the users that pass by or the cyclists. In this case, this object not only represents a temporal activity taking place in the dike route but also an indicator of the cyclists’ community using the dike.
Recognizing the Polder Routing

Activity indicator along the dike. Temporal Condition
Site Selection Criteria:

These three areas were selected as the ones with more recreational potential for their location along the river and presence of dikes. The areas must fulfill the following criteria:

a. Contemplate green spaces with recreational potential.

b. Lack of Recreation and Program.

c. Dike Potential.

c.1 Albrandswaarderdijk (Summer Dike)

c.2 Achterzeedijk (Summer Dike)

c.3 Lindtsedijk (Summer Dike)

Both are divisors between landscapes.

Lindtsedijk is the only dike connecting both side landscapes visually due to the road located on top of the dike. Also, the area that Lindtsedijk crosses presents major lack of recreation than the others. Therefore, Zwijndrecht is going to be taken as study case to apply the developed strategies and elaborate a design proposal.
The Nolly Map reflects how the industrial area is located along the river and behind it, the urbanizations. On the left side, there is the rural area occupied by agriculture plots and farms.

Most of the times, the neighborhoods are formed by complex of houses or buildings forming an inner or central space between them, where some recreational activities take place such as gathering. Following, the different building typologies will be explained in order to understand the relationship between people and public space.
7.1.1 Building Typologies

Typology 1:
Linear buildings with gardens in the inner space

Typology 2:
Building complex forming a central patio

Typology 3:
Houses with garden in between

Typology 4:
Linear buildings with gardens in the inner space

Typology 5:
Buildings with central public space

Typology 6:
Isolated Units

Typology 7:
Industrial area - port related

Typology 8:
Mixed industrial area

All the residential typologies described respond to an inward space, whether houses or linear buildings, they are always forming an inner space between buildings or a complex of buildings denying the public spaces of the city. Introverted buildings characterizes most of the typologies but more importantly, the buildings in the Southern districts.

7.1.2 Conclusions

Local Analysis
The parks and other green open spaces are located in the Northern part of the city which makes it hard for people living in the South or East to reach them by walking. The park located along the river has some recreational intentions however, people that go to this space are mostly from the agriculture area. People from Zwijndrecht hardly frequent this space.
The parks of Zwijndrecht are very attractive and well designed contemplating different kinds of recreation and activities such as basket courts, soccer, skating and so on.

The Northern park is called Molenvliet, a park with sport courts and skating. More south-west, the Munnikenpark contemplates an arboretum with views to the canal. South-east, the Hoge Devel which is a sport center with beautiful green spaces and sculptures. Finally, the Veerplaat/Oude Maas which is not designed but has some recreation intentions such as contemplation spaces, playground furniture and paths through the area.
The area is very diverse in program despite the fact that each land use is defining areas with clear boundaries. These areas are: industrial, urbanization and rural area.

The only program that appears to be joining the rural and the urban areas, are some of the public spaces of the city, offering an opportunity of integration.
The rural area is defined by the Polder Landscape with some agriculture such as vegetables, potatoes, corn, and wheat plots. In contrast, the green in the city is defined by the parks and grassland with trees along the streets and canals. In contrast, the natural area of the river is very rich in species such as reed, marshes, forest, etc., but divided by the industrial area between the south and north part of the river.
The water structure is defined by three landscape elements: ditches, canals and the river. Ditches are the most distinctive elements of the polder landscape and hence, of the agriculture land whereas canals to the city. Both water elements are very different from each other but distinctive for each area while the river shares and joins both, the urban and the rural areas.
As the result of a fertile soil, most of the rural areas are occupied by agriculture. Basically, the majority of crops are temporary grasslands for cattle raising. On second hand, vegetables and potatoes and thirdly, corn and wheat are the predominant agricultural production.
The three types of dikes identified in this map correspond to the same typology established on the Regional Scale: the city dike, the Polder dike and the River dike.

The city dike is located in the in-between space between the industrial area and the urbanizations perceived by the inhabitants as a limit or a border. The river dike is located, one part between the river and industries and on the other part between De Hooge Nesse Polder and the river, which is the summer dike. And last, the Polder Dike is located between De Hooge Nesse and the Grote en Kleine Lindts polders, called winter dike.

Usually, the summer dike is smaller and separates the floodplains to the polders or cities while the winter dike is the second flood defense line that usually pass through cities and polders.
In general, in the city there are more enclosed views while the river is not perceivable whereas reaching the agricultural land there is more openness.

However, the experience strongly depends on the dike section, such as when the experience is on top of the dike defining the best way of appreciating both sides of the landscape.
The main bike routes in the area of Zwijndrecht take place in the spaces along water bodies such as the river or the canal. The most popular routes pass through Zwijndrecht and continue to other cities making use of the dike in the city.
Dikes are the favorite infrastructure to move around cities. They allow a direct connection between different points of the city and also offer visual connections especially if the experience is on top of the dike to see both sides of the landscape.

The main dike in Zwijndrecht, is Lindtsedijk, which connects the urban, the rural area and the river landscape.
8.2. Social Environment

8.2.1 Demography

In Zwijndrecht and Dordrecht the predominant population profile is formed by young people from 0 to 19 years old and secondly in order, by people from 50 to 64 years old. This is an indicative that both cities have a familiar environment basically by young families.

A recreational network would make a bigger impact in cities and suburbs formed by young people that need spaces for recreation and leisure.

8.2.2 Entertaining

Dordrecht has a major variety in functions, facilities and program than Zwijndrecht where most of the entertainment and facilities are located in the city center. In our study area, which is the one along the river area, there almost none facilities or cultural activities and even the green areas are not reachable easily by walking.

Lack of recreation and program is a major problem in Zwijndrecht especially in the Southern part of the city.
Most of the recreational activities take place along the dike and along the canal. The Northern part of the city is more active than the south part even when the river is located in the south. The recreational park along the river is most of the times empty or under use although it is a bit more active during the weekends.

On the other hand, the Northern parks are more active during the weekends where people like to have walks but mostly walk with their dogs.
Due to most of the public parks are located on the Northern part of the city, people who live in the district of Nederhoven have the parks within walking distances. In around 1 km all parks of the city are reachable. However, people who live in the district of Kort Ambacht have the first park within 1 km and the other in around 2 km.

On the other hand, the park that is along the river is located within 2 km from the center of Nederhoven and almost 3 km from Kort Ambacht which indicated that the river park is out of walking distance and it could be a reason why is under use and the lost connection to the river space.

Relation between walking distance and time:
- 250 m = 3 min walking
- 500 m = 6 min
- 750 m = 9 min
- 1,000 m = 12 min
- 2,000 m = 24 min
The movement in Zwijndrecht during week days is basically from the City center and Dordrecht to the city and vice versa. The main routes are active and around schools and commercial establishments it is possible to see kids and young people.

The most active neighborhood is Kort Ambacht which is mainly the area with more schools and a big commercial zone. This district is also the one that connects the city center and the rest of the neighborhood and hence, an area that people use to pass through.

During the week, kids and young people can be seen around schools, playgrounds and some commercials. However, the public parks are mostly empty including the park along the river.

Conclusion:

No use or very low use of the Public Parks during the week.
During the weekend, the movement is predominant in one neighborhood: Nederhoven and mostly in the Northern part of the canal where the parks are. People that go to the river park are mostly staying at the Ars Hotel or people that come from the rural area.

During the weekend, most of the people you see enjoying the public parks are adults, couples, and elderly people whereas kids mostly enjoy the play spaces and gardens.

Conclusion:
Use of the Public Parks just by half of one Neighborhood. Sectorized Use.
Most of the people who live in post-war neighborhoods like Zwijndrecht do not show place attachment for their city. Talking to people, I realized that adults do not show enthusiasm by the city and their spaces and young people even less.

Young people go to Den Haag and Rotterdam looking for activities and recreation because they feel there is nothing interesting to do in Zwijndrecht.
Studying the movement of pet owners it is remarkable that they are basically the users of the public parks whereas the rest of the society basically move to the shopping areas. However, the movement also depends on the district their living and the walking distance.

People living in the district of Kort Ambacht, usually move around the area or to the Hoge Devel which is the closest park. However, people living in the district of Nederhoven are usually the users of the public parks although they just move in the surrounding area, not to other districts.

Would they still use the public parks without owning a dog?

Conclusion:
The use of the public parks is strongly dependent on owning a dog. Without the dog, the use will be almost zero.
There is a difference between behaviours in the North part of Nederhoven to the south part and the district of Kort Ambacht. The south part of Nederhoven and Kort Ambacht behave similarly making use of the street and playgrounds as public spaces. On the contrary, the streets in the Northern part of Nederhoven are totally empty but the parks are more active.

This division of behaviour is related to the income and the amount of immigrants in the area. The blue area corresponds to medium to low income area and where immigrants are located.
The use of the streets as contact space provides the platform for people to meet and create sense of community. In low income neighborhoods there is a major sense of community than in high income neighborhoods. Even when people from high income areas see the low income neighborhoods as a threat, these neighborhoods have form a community that takes care of each other being safer.

Although low income buildings have a bad relation to the streets with blinded facades for deposits and garages, these neighborhoods have a more friendly relation between each other and hence, more open to participate in community activities.
9.2 Conclusions

**Under Use Public Parks**

Parks are being used for basically the Northern part of Nederhaven district.

**Lost Connection to the River**

The use of the park along the river is very rare. Sometimes once or twice a year.

**Interest for Natural Walkable Spaces**

Some people in Zwijndrecht show an interest for the Develbos park because of its natural value and walking paths.

**Search of Activities for Young People**

Teenagers and young people move to other cities searching for more social activities.
Part VI. Design

10. Design Inspirations

Figure 15. Several images from different projects
Source: Google Images
The Intention of the design is to highlight the landscape beauty and elements in order to show the attractiveness of the city’s spaces and create place attachment engaging people in activities sharing the same spaces.

Therefore, three spaces were chosen because of their strategic location related to the dike and their meaning as city’s spaces. The first spot to be designed, was selected because of an existing playground in which the dike will provide an invitation and the transition to enjoy this space. The second point was chosen because it is the first time where the view opens up and is possible to contemplate the river landscape. And last, the third intervention takes place in the rural area where a farm was chosen due to their potatoes and vegetables crops surrounded it.
10.2 Program and Communities Involved

**Playful Space** connected first through a playground and providing a starting point to connect the other *green spaces* of the city. Relating the playground and parks of the city in the dike structure in order to *invite people* from the city to the rural area.

**Contemplation** of the river landscape in a viewpoint and **Connection** by boat to Ptershoek, Rotterdam, Biesbosch and other cities. This intervention pretends to be a distribution point to *integrate* people from other cities or suburbs and provide a platform for festivals, music performances and other cultural activities.

**Tasting Culture**: A farm and the dike acting as scenarios for trying products from the crops. A place to interact with the farmers community and help them buying some potatoes and vegetables while showing the most common *function* of the polder: *Agriculture*. 
The three interventions proposed on the dike will touch three different scales and identities. First, in the neighborhood scale, the intervention aims to use the playground as interaction space between people from the surrounding district but also from other parts of the city due to the dike will act as invitator and transitioning element. Therefore, this intervention will address the neighborhood identity.

Secondly, an agricultural bazaar in the rural area will involve the farmer’s community and citizens of Zwijndrecht in trying and buying vegetables and potatoes cultivated in the polders. This intervention and interaction will addresses the city identity involving people from the city and the surrounding area, connecting them in one place.

Finally, a viewpoint will take place between the city, the rural area and in contact with the river in order to offer a distribution point from Zwijndrecht to the different cities and suburbs and vice versa, connecting people from the regional area and in where festivals and other cultural activities can take place. This intervention will addresses the Regional community and identity.

Particularly the viewpoint will be connected with the regional boat network ensuring the activity in the area. As it was explained before, the boat network will provide of two main routes: The urban route which will stop by the cities of the Old Maas and the Natural Route which will stop by the parks and green spaces along the river in recreational tours.

The interventions made in the city of Zwijndrecht represent a starting point in designing the dike network. It is easy to imagine that these kinds of interventions and approach to the landscape can be applied through the other cities and rural areas of the Old Maas until forming a complete and fluid recreational network capable of managing identity and sense of place in all scales.
If the approach used for designing the interventions in Zwijndrecht is applied in other urban and rural areas of the Old Maas, it is possible to create a complete recreational network that will address different scales and therefore, different communities and identities. In addition, it is not hard to imagine more orange and green points starting to appear in other cities will strengthen the network for recreational purposes.
10.5 General Plan and Relation to the Surroundings

Every designed point have specific relations to the surroundings, whether important streets, program, connection to a park or to farmland, all of them respond to contextual situations as will be explained following:

1. The Playground: The first intervention responds to the neighborhood scale in which as shown in the social analysis, people from the district of Kort Ambacht use the streets and playgrounds as public spaces and therefore, in the design, streets will be used as attractor to the playground and the dike. Moreover, some of these streets were selected for a further intervention taking the street as a corridor which will be explained further in the “Steps for the future” chapter.

2. Viewpoint: The second intervention on the dike is a view and distribution point which represents the final point in a linear green space located in the industrial area. Also, this linear space is connected to the district of Nederhoven through a pedestrian bridge.

3. Agricultural Bazaar: The last intervention is a bazaar or little restaurant that will use potatoes and vegetables from the surrounding crops involving the farmers community and the urban dweller.
According to the function, program and image of each of the interventions, several things were considered in the design in order to achieve social integration and also a connection to the dike.

For the Playground, as the streets are live spaces of the Kort Ambacht district, they were used as attractors to the space and the dike. First, from the dike the transition between the dike and the playground is made through wooden steps on the slope as a sort of playful stair connecting both spaces. However, from the neighborhood to the dike, these wooden steps recreate the continuity of the streets that end in the playground. Therefore, the streets and the dike point to attract people emphasizing the location of the playground. The existent trees were kept but some others were add to recreate the borders of the playground and differentiate it from other spaces in the neighborhood. The streets that surround the park were equipped with sidewalks and benches to make it a “place” for permanence while the program makes it a flexible space that people can take over for barbecues, play in the water, swings on the trees, and so on.

The viewpoint pretends to connect the green space of the industrial area and also making a connection to Nederhaven district through a pedestrian bridge. The building works as viewpoint framing the river landscape and providing a platform for cultural activities such as music festivals and performances, yoga classes, resting point, etc. In addition, the industrial area in front of the building has a big parking space that can serve for the purposes of the viewpoint as well. This intervention was designed thinking in a place in which young people could meet maybe in the summer time for festivals and feel proud about it that is taking place in Zwijndrecht. It will provide an arriving point for people from other cities and therefore, a meeting point.

In the agricultural bazaar, the dike provides the scenario with tables for the small restaurant while the garden will be an attraction itself where the path crosses by while the farmer can explain the process of cultivation etc. It is also possible to plan tours to the crops in order to understand the cultivation process. A pergola was added to provide shadow and make it recognizable.
10.7 The Playground

10.7.1 Contextual Analysis

Design Intentions

The intervention pretends to provide an invitation from the dike to the playground and green open space using the street as an attractor. The district of Kort Ambch uses streets as public space and thus, streets must be the guiding element to the playground. The steps on the dike provide a playful way of connection aligned with the street perspective attracting people to the park and making it a place for interaction and contact between the people from the neighborhood.

This intervention will affect the social dynamic of the surrounding neighborhoods combined as well with the program of the area such as the school and the shopping center which also are considered activators.

The main streets should be considered as corridors as well and therefore, further interventions could be explored as it is shown in Part VII.
10.7.2 Zoom in Plan

10.7.3 Space Bird Eye View
Materialization and Image

The borders will be materialized with stones to ensure durability and maintenance.

Wooden steps or planks will be used in all interventions in order to keep the same image and make them recognizable. In this case, the Wooden path are used as attractors from the street, to the park and the dike.

Water Gushes will be located close to the wooden steps in order to attract people but especially kids to play in the water.

Carex Pendula

Water Gushes

The borders will be materialized with stones to ensure durability and maintenance.
Design Intentions

The intention behind the design of the cultural platform and balcony was to enhance and evidentiate the first opening of the view and the visual direction that gives the dike. On the other hand, it also a point where two directions meet depending on if you are moving from East to West or vice versa. Therefore, the balcony needs to receive and project both directions while offering a platform to enjoy the view and contemplate.

This point not only is important because of its visual, connectivity and program relevance but also because a particular situation happens on the right side of the dike. In every visit to this place, a flock of sheeps is occupying the right side of the dike which makes it even more pleasant being there. Therefore, this intervention will enhance this particular situation allowing people and visitors to enjoy their presence.

The program proposed embraces not only cultural purposes but also a distribution point from which is possible to reach the city of Puttershoek, Rotterdam and Biesbosch. However, the whole intervention will increase the recreational potential of the area making possible future connections to more cities.
10.8.2 Zoom in Plan

Ground Level

Dike Level

ESC: 1:500
Fragmented Urban Landscapes

Section B-B'

10.8.3 Detailing
Zoom in Plan

ESC: 1:200
Asphalt on Dike

Wooden Seats will resemble the other interventions keeping the same image.

The transition between the dike level and the river will take place through the dike in a sort of theater to contemplate the river landscape. The steps were kept green with grass but reinforcing the borders with concrete slabs.

The inner space of the viewpoint allows the surrounding grasses interact in a patio.
Design Intentions

At this point, the polder landscape is the most important experience and hence, as agriculture is the most characteristic land use in polders, a farm was selected in order to create an agricultural bazaar. This farm is one of the biggest on the left side of the dike.

This farm possesses vegetables and potato crops in their surrounding area and also a small garden in its inside. It also has an spacious parking which can be used for visitors. The idea was setting a point in the dike route in which would be possible to involve framers community to other people. It will be a point to taste and try some of the crops products, understanding the process of agriculture and food origin. An opportunity to talk, eat and enjoy sometime with farmers recognizing their job and also helping them buying some vegetables and potatoes.
The garden allows different kinds of ornamental grasses and native grasses that will keep it colorful and dynamic throughout the year.

Wooden steps will keep the same image with the other interventions and will allow the grasses grow through the spaces between planks.

Wooden Curbstones will separate the area of the garden and the path making it easier to maintain.
Internal View
Part VII. Future Steps

Future Steps

This Chapter will provide future guidelines and interventions should be considered and applied in order to achieve a complete socio-territorial intervention that takes into account the streets as corridors of the city and changes in the river beds and floodplains in order to fulfill ecological purposes and flood protection.
In order to create a recreational network that includes the public spaces and parks of the city, some small interventions need to take place in punctual streets that could connect to the different green spaces of the city.

After the social analysis, streets were found to be a contact place for the majority of the neighborhoods in Kort Ambacht and south Nether- haven district. Understanding that pedestrians are our first priority: the street must allowed not only bike paths but also sidewalks. If the street is important or principal it could allow permanence spaces such as squares. And finally, if possible or necessary, a bridge can help to integrate both sides of a canal.

The idea is to offer the necessary structure using other corridors such as streets, to achieve a better integration among the public parks and green area of the city.
Bridges on canals can lead integrating neighborhoods.

Sidewalks should be the priority in streets corridors provided with urban equipment and resting spaces.

Some small squares can take place in long ways or as meeting spaces for communities.

11.1.2 Example: Future Situation

Current Situation

Operation #1
Sidewalks

Streets must have pedestrian paths in order to allow continuity. Also, allowing pedestrians to walk will increase the use of the public spaces and their activation.

Operation #2
Bridging

If necessary and in case of an important street, a bridge can be built to increase interaction and integration of both sides.

Operation #3
Squares

Sidewalks can also respond to meeting spaces such as squares in case of a long and important connecting street.
II.2 Room for the River Programme.

II.2.1 Flood Safety

As the green areas have been decreasing in size sometimes almost until extinction, they need to be protected and offered as potential spaces for the Room for the River Programme in which is possible to increase the physical diversity, develop the ecological and scenic value of the landscape as well as, strengthen the openness of the river while promoting recreation in the area.

Room for the River Programme

Objectives:
- Increasing the physical diversity between the river branches.
- Maintain and strengthen the openness of the river with its waterfronts.
- Conserve and develop the scenic, ecological, geological, cultural and historic values.
- Promote use of the main navigable waterways by professional and recreational craft.

Areas Targeted:
Areas around the Rhine branches from Lobith and to the sea at the Maeslant storm surge barrier and the Haringvliet sluices (Upper Rhine, Pannerdensch Canal, Lisse, Lower Rhine/Lek, Waal, Merwede, Nieuwe Maas, Dudie Maas, Hollandsch Diep and Haringvliet).

Source: Spatial Planning Key Decision Room for the River. Approved decision 19 December 2006. Report

Implementation & Responsible Organizations:
Provinces, municipalities, water authorities, Directorate General for Public Works and Water Management (Rijkswaterstaat), Minister of Infrastructure and the Environment and ultimately Secretary of State for Economic Affairs.


Measures

1) Lowering flood plains
2) Removing hydraulic obstacles
3) Setting back dikes
4) Detention reservoir
5) Lateral flow channel
6) Lowering of groynes
7) Deepening of narrow channel
8/9) Dike reinforcement

Source: Peter Jessen. “Rijkswaterstaat, Minister of Watermanagement, Transport and Public Works.”
As a result of the dike interventions, the area will increase its recreational potential and more paths will take place in the floodplains. Consequently, due to the area suffers from periodical floodings, especially in winter and spring seasons: the river and multiple floods will start changing the ecosystem of the Hooge Nesse Polder into a more natural land.

This natural land changing process will enhance even more the experience on the dike, recreational opportunities and ecological value in the area.
A Reed Border helps to slow down the water causing less erosion.

In case of developing recreation, paths should be lifted to preserve the biodiversity and soil.

Lowering the floodplains give more space to the river and make sure biodiversity is in contact with water.

11.3 Recreational Purposes: Wetland Park

Current Situation

Operation #1
Creating a small mound with reed in order to slow down the water.

Operation #2
Leveling and lowering the floodplains so its biodiversity can be in touch with water constantly. Also provides more room for the river.

Operation #3
Develop recreation program will promote the protection and attachment to the area. In case of building paths, they should be lifted so they can not harm or altered the natural vegetation.
As consequence of a more natural land, resulted throughout the years; not only the area will be intended to be a space for the river but also for new biodiversity enhancing the ecological value.

New grasses such as Marshes, Reeds, Osiers and other kinds of trees will start growing and with it, more possibilities for wetland birds such as the Wulp, Purple Heron, Tureluur, and so on.

In addition, with the reed slowing down the water and an increasing biodiversity in the river beds, fishes like the Cod can use this area for reproduction an habitat.
Fragmented Urban Landscapes

River Landscape Future Situation
11.4 Ecological Potential

Section D-D'

Tree Species
- Fraxinus Excelsior
- Alnus Glutinosa
- Populus x Canadensis
- Acer Saccharum

Grasses
- Spartina Alterniflora
- Phragmites
- SalixVirginica
- Molinia Caerulea

Animals
- Cad
- Purple Heron
- Turdeus
- Wulp
12. Seasonal Changes

12.1 Spring Time
12.2 Winter Time
13. Timeframe

**Room for the River Program**

As part of living in the lowlands, flood control and safety have been one of the main objectives of the Dutch Government. Therefore, these green spaces can be proposed for the Room for the river Program in solving flood problems.

These green areas located along the river can work not only for releasing the pressure of high tides and high water level but also, once it is flooded, it can form different ponds for water retention and storage. Thus, it is very important the way the land and the relieve is treated in order to provide spaces to be flooded but also to serve ecological purposes.

The order for the intervention can start solving the major problem, the flood problem, with the Room for the River Program providing safety. Afterwards in order to increase accessibility, tourism and promote regional identity, the regional strategy can be applied in the dikes selected with recreational potential forming a network enjoyable by boat through the river and by bike and cars through the dikes. The punctual interventions will grasp the cities scale increasing recreation and forming sense of community interacting with the districts and neighborhoods which leads us to the last intervention in hierarchy, the streets interventions.

**Regional Strategy**

- **10 - 15 Years**
  - Room for the River Program
  - Dike Interventions & Recreational Development in the river area

- **6 Years**
  - Street Interventions

- **1-3 Years**
  - Regional Strategy

**Street Interventions**

**Regional Strategy**

**Room for the River Program**

**Dike Interventions & Recreational Development in the river area**
Part VIII. Reflection

Reflection

The aim of the reflection will point out information about the relationship between the theme of the thesis, the theoretical framework and the design in order to provide a review about the graduation studio, chosen methodology and the design.
14. Reflection

14.1 Introduction

The study area is the region of the Old Maas River and its surroundings urban and rural areas. The starting point of the theoretical research started from the vision of looking at the area as a mosaic Landscape. Since at any scale, a mosaic landscape is composed of matrix, patches and corridors they conformed the basic spatial elements of any land and therefore, landscape elements, are simply the spatial elements at a landscape scale (Forman, 2008).

The relevance of this research is using the patch, matrix and corridor approach to understand the potential that lies in spatial elements of the landscape, in order to design and develop networks that interact with the different programmatic situations integrating the urban and rural areas of the landscape. The integration will take place through corridors as facilitators of relations in order to form a recreational network capable of creating attachment to the site promoting identity.

Moreover, the method and strategies developed can be applied in highly urbanized areas around regions and countries. The corridor approach is suitable to any landscape due to it is presence at any scale.

14.2 Relationship between Research and Design

The relationship between the research and the design can be simply summarized into the relationship that lies between the corridors as spatial element of the matrix and the dike as spatial landscape element. Basically, dikes are corridors and landscape elements of a matrix or region. The studied method revealed the different corridors at all scales and their connectivity potential, whether natural origin or artificial, they are in most cases fluid connectors. Studying and identifying the different multi-scalar corridors of the landscape and selecting one of them to explore its connectivity and recreational potential; it is possible to establish the necessary infrastructure to achieve landscape and social integration. After exploring multi-scalar corridors, the dike was chosen as the infrastructure and landscape element capable of integrating the different urban, suburban and rural areas. It seems to be the perfect spatial element with the potential of relating the surrounding suburbs and communities, showing the beauty of the landscape and genius loci. However, the dike has been seen as a utilitarian tool for flood defense since centuries rather than a spatial tool to narrate and create attachment to the landscape which represents for me, an unexplored field full of new opportunities.

In addition, the river is also a natural corridor able of connecting different scales such as the city scale but also a region and even countries. Therefore, the study of dikes and rivers as corridors in the landscape and their possibilities for recreation in forming attachment and identity is an open field with endless possibilities that deserves to be explored in the designing of integrational networks.
14.3 Relationship between the theme of the graduation studio and the method chosen

The theme of the graduation studio is flowscapes, where flow means movement and scapes make reference to spatial entities like territories. The aim of the studio is relating the landscape as relational structure in connecting scales, spatial situations, ecology and social entities. The chosen method was the study of landscape ecology and its spatial elements: matrix, patch and corridors in order to connect the different patches through scales.

Choosing the corridors as framework and translating the functionality and flow purpose to the dike and river infrastructure, I am exploring the infrastructure as type of landscape which is the main objective of the graduation lab. Landscape infrastructures, whether natural origin or human, integrate movement and flows through different scales facilitating spatial relations and attachment. Therefore, the method chosen is precisely on the line of thinking that the graduation lab demands and aim to address.

14.4 Relationship between the methodical line of approach of the graduation studio and method

The methodical line of approach of the graduation studio is focused towards innovative spatial opportunities in the process of guiding urban and rural developments while representing cultural relevance through the use of landscape infrastructures. Therefore, the graduation studio focuses on different kinds of infrastructures such as: transportation, green, water and spatial infrastructure in which the dike as corridor fits mostly all of them. It is for transportation, it can allow ecological relations and connect different green areas creating a green network; it is a flood line defense which makes it very related and in continuous contact with water and finally, it is a spatial element of the landscape. I would like to add a new function as infrastructure related with the social context such as: recreational infrastructure.

The chosen framework is a representation of corridors as networks capable of combine different kinds of infrastructures.

14.5 Relationship between the project and the wider social context

Throughout the research process, the dike was studied and analyzed as facilitator of social and recreational relations in regional and local scales. In all cases, the dike appeared to be a landscape element with endless spatial possibilities capable of integrating different cities with suburbs and urban areas with green and public areas.

In the Netherlands, dikes are structuring flood defense lines that are being fragmenting or stitching the landscape. In my personal opinion, I prefer consider them connectors rather than divisors of the landscape that embedded an enormous potential as connectors and social integrators. In the project, the dike is used as connector to the different types of landscapes responding to different situations such as: the river landscape, the polder landscape and the city landscape understanding not only the landscape itself but the communities and people that inhabit these landscapes. Whereas the dike provides the necessary infrastructure in order to connect the different patches, it also will be connecting people between the Old Maas Region. Relating, interacting and integrating landscapes and people while creating identity.

As in the problem statement a fragmented social structure is identified, especially in suburbs with low or none attachment for the landscape and therefore, no recreation and un used open spaces, the proposal aims to start first creating attachment and identity through recreation in open and green spaces in order to provide the space for people to interact and socialize.

As the dike and the river form networks that integrate different scales, identity will be tackle from the neighborhood scale, city and region in order to promote neighborhood, local and regional identity as well.
Part IX. Appendix

Appendix

In this Chapter, a catalogue of all interventions possible on the dike will be shown, including the ones already explained in order to have a complete overview of all the interventions that can be done on the dike in highlighting the beauty and specificity of the landscape.

**Other Interventions:**

1. A routing in the summer dike: The purpose of a routing in the summer dike is realizing about the polder border and structure. As polders are very rooted into collective memory and attachment, highlighting its presence and boundaries could be used as strategy for place attachment.

2. Viewer Tower: The viewer has double purpose: the lower terrace is pointing out towards the river landscape and the horizon whereas the second terrace, in an upper level, points out towards the highest point visible in the landscape as landmark that corresponds to a tower from a sugar fabric in the city of Puttershoek.
15. Appendix

15.1 Playground

15.2 Viewpoint
15.3 Routing in the summer dike
15.4 Agricultural Bazaar

15.5 Viewer Tower
Part X. References

- Bow, V. and Buys, L., 2003. Sense of community and place attachment: the natural environment plays a vital role in developing a sense of community. Queensland University of Technology.
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