# **Energize vacant land** landscape regeneration in shrinking Kerkrade West

Jialing Zhang 4123433 Mentor: Inge Bobbink Daan Zandbelt

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# **1** Site Intro

Green metropolis Historic development



# **Green Metropolis**

Green Metropolis is a project proposed by IBA, combining the most important post mine cities within three countries, Germany, Holland and Belgium.

In the region of Holland, the project hopes to cast a new vision of South Limburg, especially the Parkstad, where new urban development takes on in former industrial cities, together transforming their past mining image to a greener and more sustainable future.

Within this rigion, the research takes Kerkrade West as an experiment site, which is also one of the top five shrinking neighbourhood in Parkstad.

This city is located at the edge between NL and Germany and has one of the oldest mines in South Limburg but also the most severe problems of shrinkage, unemployment and aging. Moreover it seems that shrinkage for most cities is in fact a result of rapid and unlimited development from the past decades. Different approaches on urban planning are demanded in order to regenerate these areas. Thus it's very important to think about how can this small city get recovered with limited investment, and to what kind of future can be expected and realized?



# What does the history tell?

South Limburg used to be agriculture village ribbons ever since the medival time. However when mining resource was exploited in the region, just like other industrial cities, urbanization started at vast pace.

No more than 100 years, the mining resource is all excavaed the now all those cities now start to suffer shrinkage more or less. It's not hard to imagine that for now another round of transformation is eagerly called for within the region. However, wait a minute, are we going to start another round of fast and large-scale urbanization again?

Within this region, you can clearly tell the characteristic of a industrial city through its typical buildings of mine clonies and massive living buildings during the 1960s. What's more, the public space is relatively poor since the city really focuses itselve in economic development. You can imagine that the city developed so ambitious that certain small process is already missing and everything looks just so similarly simple.

On the other hand, due to the economic crisis, how can such a small city achieve certain investment for re-generation? What's the role of landscape architects in this urban project? Before a round of traditional urban planning starts again, why not take a rest first and think for a while?



Methodology Case study Conclusion



# Landscape as social process

For most cities that are seeking for ways of development, there still are cities suffering population decline, which may even lead to economic loss and environmental deterioration. What strategies can be applied to renovate the urban space in these shrinking cities, how and what kind of role can landscape architects play in this specific situation are what I'd like to study in this project.

Through a variety of researches, it can be drawn that it's very hard to see population recovery in a short-time urban planning, mostly due to the investment pressure and political difficulties. In the research of Just Hollander on shrinking cities, it is described that,

'Fuhrich and Kaltenbrunner (2005) advocate intellectual and political honesty about German shrinking cities, arguing that few are likely to see large-scale growth anytime soon—a point true of almost all shrinking cities. Leipzig was one of the first cities to undergo the painful process of moving from planning for growth toward planning for shrinkage (Glock, 2005). In fact it may be easier to carry out these green urbanism strategies in shrinking cities with more available vacant land and less development pressure (Hollander, 2009). '

The most practical problems that need to be faced are the limitation of financial and political support. Thus how can cities get recovered with limited investment and can develop at an easier pace is the starting point for a landscape approach. According to what is stated above, landscape can really be an instrument to help a city grow at an easier pace. Besides, shrinkage for most cities is in fact resulted from fast and over development in the past few decades. As a result, how come are we going to repeat the history again? Thus, my research really forcus on the understanding of a city's development and how can landscape design integrate with this process.

In other words, Landscape should grow together with the urbanization. They should be effected with each other. In the case of Kerkrade West, how to transform the city from mining city to a sustainable city under limited condition will be shown as an example. Under this notion, the research will start with the study of spatial strategy for shrinking cities and related energy study (according to the regional scenerio and the local energy potential) based on the point view that landscape as social process (respect for the historical context in Kerkrade). During the whole procedure, from the point view of landscape architect, landscape as social process is the start point for all research.



# **Historical Line**



## Landscape eases the developing step



# Methodology

The research and analysis method is largely referred to the Morphological tools raised by Franz Oswald and Peter Baccini (Netzstadt, 2003) in which the interest is to perceive in the urban system formal characteristics in a landscape that humans have changed. The morphological analysis method Netzstadt developed will help to determine and understand the possibilities for reconstruction, and will also illustrate how the elements of today's architecture emerged historically, were changed and can be reshaped. (Oswald and Baccini, 2003) Thus the analysed elements can become the design tools for future plan.

Through the study of shrinking strategies, one fact can't be neglected in every case is that the economic goal is always the most focal point to cencern with. Where to get the investment, how much and what benefits can be drawn through the investment are always the questions need to be answered first.

In the case of Kerkrade, the whole image of the city is largely concerned with its industry type, whereas the past or present. Accordingly, how the existing business can help the city transform into a better one and what kind of new industry type can be involved is one of the clues for future development.

As a result, landscape approach doesn't merely mean to beautify the image of the city but it works as an instrument to look for possibilities and help to seek for the people who may have the initiative to participate in the city development.

## **Spatial strategy**

female

male

female

Foreigen inhabitants

248 229

31 981

18 649

13 332

249 395

32 788

18 953

13 835

251 212

33 528

19 289

14 239

255 877

30 197

16 724

13 473

253 167

32 298

18 351

13 947



Strategy transformation in Leipzig Reference from www.shinkingcities.com

As mentioned before, the strategy towards shrinking cities is changing from plan for development to plan for shrinkage, which start to consider shrinkage as potential rather than problem and de-population is a good thing which can produce more space. Under this notion, landscape projects start to involve the city development more positively.

Instead of making profit from new immigrants, plan for shrinkage considers more on the people who are left in the city and create better living environment for them.

# **Reference case**



the former infrusture kept as a strong image and place essence very low price lent to youth who would like to have a career

Hofpleinlijn - Rotterdam

landscape designers work on a book to show how gardens can be operated at very low price

public participation to turn vacant land into gardens

Vacant-land use Pattern book - Detroit



whenever a house breaks down, landscape appears red to make the existance of a lost building

Pixelation - "Stadtumbau Dessau" planning workshop

According to a series of case study on landscape projects in shrinking cities, it can be found that all the projects are more focused on spatial strategy than visual effect. Especially for cities that can not get investment but still desire a lot in urban space, the way landscape architects involve in is usually to use little intervention but can make large impact.

Thus it's very important to find ways not only to solve the existing problem but can also help to seek for more possiblities, which may even transform the disadvantage to advantage.

As is shown in the three case, the shrinking space where used to have the hidden danger of safety, environment deterioratio...etc. becomes new prospective space with very simple strategy making. Instead of creating new space, the project inherits the unique spatial characteristics of the site which turns the problem into potential.



Landscape shows a continuous social process

Research of the Landscape approach process

Consequently, this research is about finding new strategies within landscape architecture, in order to turn the decline into a more sustainable relation between city and landscape, made possible by vacant, cheap land. By introducing landscape architecture as an approach to improve the living environment and to turn the decline, process thinking is introduced. Next to that public participation guided by landscape architectonic interventions should stir the process of change.



Historic development Spatial analysis Shrinking as potential

# Historic Development in Kerkrade



Mining caused the formation and the shrinkage of the city, also brings out the new industry.









# Analysis

Kerkrade west used to be a mining city, such history also affect on the urban space. For now after the closure of mine, the city is composed by half neighbourhood and half industrial cities surrounding the city. Not only the industrial land but also highways and vacant land block the neighbourhood to the outside. The connection to the outside largely depends on vehicles.

Inside the city, most activities gather on the main shopping street in the neighbourhood while most recreational area are situated at both end of this road, concluding a future railway station.



# Undesigned useless landscape; no playground or other working landscape

# **Open space in Kerkrade West**

Most open space can reflect the industrial history that the city formation was taken place in a very short time.

Large propotion of the outdoor space in Kerkrade west turns out to be parking lots or vacant lawns.

However the misuse of the vacant space shows that open space with multifunction is largely needed.

# Energy problem





**Energy supplier** 



Kerkrade West

**Energy demander** 



Despite the spatial problem, Kerkrade West is now a large energy consumer in South Limburg instead of the former identity as energy supplier. The city is occupied by almost half industry land and half neighbourhood area, which also cost the most energy in the city, while the rest land functions little, remains vacant for years and still needs large amount of unnecessary expense on maintenance.

Under the vision of whole europe to get energy neutural before 2050, for Kerkrade West, there are still 38 years to go to make the transition. Thus instead of occupying vacant space to produce new energy, an easier and slower transformaiton is promoted. That is to first reduce the energy demand through the effort from citizens or local business.

The question is: what landscape can do within this frame?

#### **Heating Grid**

Main pipes links the industrial area Sub pipes links the neighbourhood Residual heat emits to nowhere

Main Heating Grid Sub Heating Grid Heating Cluster

# Shrinking space in Kerkrade West



opportunity

Thus the idea is to occupy the vacant space with productive landscape first.

As is stated above, shrinking space can actually becomes the potential to improve the urban space in Kerkrade West.

Landscape approach also can help make the development more prospective to realize with little finalcial requirement, and easier to call for public participation. Not to mention it can make profit and energy friendly at the same time.

The following will describe the strategy that can be taken to call for public participation in helping regenerate the urban space in Kerkrade West and two design case will be show as example and experiment to show the possibilities and the outcome.



Bottom up Case reference

# Strategy



# **Municipility Plan**

- 1 New Shopping street 2 New Housing 3 House renovation 4 Green Carpet
- **5 Business type transformation**

What the municipility plan mainly shows is to create a more liveable city. However the plan still relies a lot on the government investment is quite ambitious to make a change in 10 years.



# Instead of

Housing

But

· · · · · ·		



Small group of people

# Prolong the development through public participation

Instead of more housing investment in Kerkrade west, the strategy is to use the least intervention to call for people's participation. Different level of scale will work together to improve the living enrionment in the neighbourhood.

#### Top Down : establish new energy image





**Public Participation** 

Little interventions



City image and whole neighbourhood

#### Reference Case The spontaneous city, Urhahn Urban Design

Urbanisation in El Alto, Bolivia



1st year: living and growing vegetables for own use



3rd year: opening a shop at the street side of the plot

Land Distribution -Change from public space to private property

Urban Acupuncture -Little intervention by cooperating with local entrepreneur



15th year: exstention of work space, bigger house



30th year: very dense plot in an urban setting



Strategy for the CabFab to continue and improve the transformation, by increasing accessibility of a promenade, adding life on water, by densifying, and by adding housing.











**Old Amsterdam** 



Reference frome The spontaneous city, Urhahn Urban Design

# Mostly relys on BOTTOMS UP!



Just like the formation of Old Amsterdam, the development of the city is regarded mostly depend on Bottom UP, in which only a few guidelines is presented from the top and more freedom and flexibility is given to the bottom!



Inspire people's fantacy on making their own homeland

Control of the end product people design themselves

# **Toolbox** For each target group custmize their property; Possibilities on operation of the land shown

# **1 Shifting property** Family scale 20м **Business scale Community scale** 2 Guideline Landscape intervention THE ST Parking lot Bare soil Groundcover Forest Shrinking building Basement Orchards Energy base Urban agriculture Glass house Passive building Cooling water storage **Building Guideline** Family scale Building area < 50% Height < 15M 20M Business scale Building area < 75% Height < 20M 40M Community scale Building area < 25% Height < 20M 50M

#### Unknown result...

Accordingly, the strategy is mainly to call for the public participation by transferring the property owner from public to private. Thus the land can be operated by certain group of people. Thus, the target constomer needs to be studied. Toolbox and policies need to be made for existing citizen and entrepreneur or new out-comers to customize their property.

Ahthough the tricky of the project is that the outcome is hard to be estimated, however such uncertainty should not be the reason for not doing anything, neither for everything. As long as we pay for the patience, the outcome will show spontaneously.

As the case of Franzosisches Viertel in Tubingen, Germany, the government don't want to develop monotonous low-rise buildings, which leads to the idea of public participation. The first building took 10 years to complete, but the rest process gradually gather momentum and the district mostly attracts young families who don't want to live in apartment.

Therefore, it can be expected that as long as we make all the gestures and care for the patience, progress will follow!







Process Planning Master plan of projects in main street

#### 2015 Emptiness calls for awareness

From mining history to shrinking colony From Parkstad to Germany Free use and overview of the empty land

#### 2020 Energy as Identity again

Open up the vacant space Make it accessible Little programme added

#### 2025 Spontaneous city

Land sale Public parcitipation! Neighbourhood & business grow together!



Accordingly, in the case of Kerkrade west, though money may be limited and government's burden may be heavy, with the initiative from citizens, the city still can have a prospective future. What the government needs to do is very simple.

1 Open up the shrinking space

2 Make it accesible and available 3 Infrustructure 4 Guideline & Policy making

×

# Cooperation with various groups of different initiated people



The main shopping street in Kerkrade West which links Heerlen and Germany and possesses the most frequent daily activities in the neighbourhood can rightly be a 'display' street to show what is going on in the city. Through cooperating with different group of people, the changing of the city can be sceized and can attract more people to involve in later on!















Master Plan of the main street

Vacant space into productive landscape (working with residents or neighbourhood)

Little intervention of shrinking building (working with new house owner)

-

vacant space into productive landscape working with residents or neighbourhood)

Shrinking building transform into studio (working with young people who hopes to start with a career)

Exhibition plaza (working with residents and artists)

Post-mine park (working with local entrepreneur)



# **6** Design Experiment

Site Choice Willem-Sophia Mine Central Heilust

# **Site Choice**

The sites are two very important location for Kerkrade West. In the center is the neighbourhood of Heilust which used to be mine colony in the mining period and is the place that first starts to shrink. It located in the highest point in Kerkrade West and has a central church. However for now after the buildings are gradually teared down, the site is only covered with lawn. While for the Willem-Sophia mine, it's another story. Though the mining area caused formation of the whole city. After its closure, it's now totally blocked by forest, waste rail and the backyard of neighbourhood houses, like it never exists. Thus how to transfer the old image into a new one that calls for public's attention and awareness to change city by their own initiative is the goal of design.



## Two design sites applied with different approach

Participation is regarded very important for a city to grow at an easy pace. Moreover, for a shrinking city the investment is always limited thus how can the government call for public initiative with least intervention is largely concerned in the design. To begin with, the government needs to take action first to establish certain images or instructions. Later, when the awareness is increasing, the public can take initiative. Thus the two design will be conducted under such hypothesis and assume the best and possible results of the design. In the design, questions like what must be done, what can be optional and what can be done by the public are always raised during the whole procedure, to ensure the essence of the design.



A strong image of the changing of the city From post-mining to a recreational energy landscape





Public participation in the design of Central park Government as assisstant

# Willem-Sophia Mine

Instead of creating a new image for Kerkrade West, the project will take place under the existing situation and re-image the post-mine landscape. Thus firstly, the transformation of the mining site is studied to draw a proper way of intervention later.

Soil type





# 5 Mine water







The most intervention will happen in the excavated area, where a platform will be built to make the land totally accessible for the citizens. Thus the mining history get revealed and transformed into a new one.

The design can be operated by the current local entrepreneur who is running business at the site. After the rock-dump and the coal is re-used the site can be transformed into new function. Thus the platform in the excavation area can be flexible in use and can well utilize the unique post-mine landscape of the site.



The excavation area for recreational use.



Inside the new platform people can participate and give functions to it.



Section of the excavated area



Wood deck seprate the old from the new one

Section of the Coal soil storage

Clay covers on the other places in the site and leaves the stage for industrial heritage.

#### **Energy Potential in Kerkrade West**



#### **Possible Proposal**

According to the existing document of the mining shafts, one of the shaft can reach the depth of about 600 meters under the NAP level which ia about 28-30 degrees. Such energy resource may be used for new building development around the site, while the cooling water can be stored in the excavation area.

# Bird-eye view



#### Bird-eye view Vision



After the post-mine image is tranformed by the local business people, owner of the mining area, the surrounding forest which is currently useless can be sold to people and let them intervene with the land.

# **Central Heilust**

Heilust used to be the mine colony and starts to shrink just after the closure of mine. For now the government plans to break down the 6 high buildings and building new massive living house. However in the research, a design based on the existing situation will be presented.



#### **Experiments on possibilities**

Living (original plan)



New Business / Public use



Possible business: green energy studio / Culture or art business Investment mostly goes to the conservation and reconstruction several buildings in the middle kept while others showing the history of the land

Landscape showing the process



Landscape showing the process of the city development Working landscape with multi-functions instead of doing nothing

focusing on meditaion (identity seeking) --> Identity --> Regeneration

Goverment mainly intervene at first stage 1 open up the space at the highest point in Kerkrade West 2 little interventions to show the possibility of renovation

New business and conservation of the housing can be conducted by the neighbourhood or individual after initial projects.

Landscape conbines everything and will show the difference.

Shrinking Process & building investigation



The condition of every building is investigated carefully to assume for the future possible use.

Accordingly, certain building which has really bad condition will be removed, and however, their material or left sign as basement will be still kept in the site to show the shrinking process of the neighbourhood and works as a new identity.

All the rest buildings and land can be sold to families or entrepreneurs, existing or new comers, and give them the freedom to transform the site by their own.



# Images in different stage

Stage 1 Emptiness calls for awarness

1 One sinking plaza 2 Tree transplant 3 Earthwork - open up the sapce 4 optional







Main transportation road

Main Plaza



Residential area is seperated with the public space by height differences.



# Stage 2 Possibilities of public Participation!







Vacant space turns into shared orchards or allotment garden





Basement re-used such as cooling pond, recreation, garden or urban agriculture...

Building sold to different target group at low price and be renovated for creative use.

# Stage 2 - Participation makes variants

#### A Possibilities for vacant space

For the vacant space in neighbourhood, it can becomes orchards owned by individuals or shared by community.



Section 2-2



Productive landscape takes over vacant space and provides programme. Water feature also absorbs the residual heat.

Section 3-3



Vacant flat becomes private gardens; Community shares the outside garden. Private garden turns into semi-private orchards.



#### **B** Possibilities for Remained buildings

When a family is left, it can be sold at very cheap price to the others. Buildings can be re-constructed into new living housing, public buildings or offices. Instead of making new buildings, old buildings provide enough space to transform into new function. If not government can take initiative to change it into public gardens which helps to store heat for the neighbourhood.



# C Possibilities for Removed buildings

When no one wants a house and it has to be broken down, the basement can be left as heritage, which can be used freely by the neighbourhood.



Thus, shrinkage becomes the identity of the neighbourhood.





As a result, instead of clearing everything out of the shrinking neighbourhood, most can be kept and renovated by the power of participation. Certain policies can be made to support green energy renovation.

Thus the energy optimum is to to reuse all the materials from the removed buildings, transform all the land into orchards or energy crops managed by the neighbourhood and turn all the houses into green houses or water storage or passive house, which can produce energy 85Mwh per year that equals the energy to cool 20 houses and to feed more than 150 people.



# **7** Conclusion

Conclusion Reflection Reference

## Conclusion



The public participation also can reflect in the way of energy transformation. Through the process design, instead of relying everything on the governent, citizens can get more control of their own life. Also in order to get energy neutural before 2050 which all the mining cities are facing, instead of create new energy supplier, through the effort from every citizen by reducing the energy demand or creating own energy, it still can be realized. Though it may sound too ideal, however there're still 38 years before the deadline, and the only effort of the experiment needed is to be patient :)

As a test, the research offers a design experiment on a landscape architectonic bottom-up strategy in Kerkrade West. The design experiment of two different sites, with different situation are developed towards a new 'Landscape Urbanity'.

Such strategy may also be referred to new uban devolopment concerning landscape urbanism and public participation, especially for places that are desired to get improved but with little caressness. With a simple landscape approach, the living environment can get controlled while the future can be more prospective.

As Rome is not built in one day, new Kerkrade shouldn't either. Today's uncertainty should not be the reason for not doing anything. On the contrary, as long as we make all the gestures and care for the patience, progress will follow!

When we look back to history, urbanization in post-industrial cities happened in a few decades. Most of these instant cities are not highly appreciated by their citizens. With the approach of landscape intervention, people's emotion to the land and building environment can be called back. A city is not just a place to live in but rather a way of dwelling. The transformations of shrinking cities into a new more balanced landscape urbanity can help to understand the way we want to live in the coming decades.

# Reflection

#### the relationship between research and design

Since the south Limburg was develped so fast during the past decades and suffers shrinkage soon after the former industry declines, how landscape can intervene the social process and help the city not to develop too fast but easier is what I would like to study. Through the study of shrinking strategy and the understanding of the city's process, what landscape can do for the future develpment of the city becomes clear. In the case of Kerkrade west, landscape can help to lead more possibilities in the future and ease down the pace of develpment but calls for participation from the whole city, which can help the city grow at a stable pace in the future.

#### the relationship between the theme of the studio and the subject chosen by student

In the Energy Landscape lab, how landscape design can be related with energy is the question that needs to be answered. In this research, what kind of energy is the best scenario for the local and what kind of energy problem does it need to be solved and can call for participation is larged concerned instead of just responding to the regional scenerio and letting government to decide everything for the city. The proper choice of energy type should be considered under the local condition. In Kerkrade West, the heating demand is the major problem that needs to be solved before 2050. Thus the answer becomes clear after the study of its current energy consumption and for this shrinking neighbourhood, landscape design will mainly combined with heating cascade.

#### the relationship between the methodical line of approach of the studio and the method chosen by the student in this framework

For the Energy landscape lab, it is suggested to think about how to fit the design with the regianal scenario. For South Limburg, the regianal scenerio is wind, solar and geothermal energy. However, in my methodology I would like to focus on how landscape can show the social process and how landscape can intervene in the social process. Thus the understanding of the city's develpment and how to make it continuous in the future is very important and thus the energy scenario is mostly depended on the local problem and local potential.

#### the relationship between the project and the wider social context

Through the study, we can see that one of the reasons that most industry city develops so fast is that a lot of decisions are not by the people and most people are not local from the very beginning, which makes industry cities not that humanistic as other cities. Thus I would very like to view shrinkage as potential for a healthier future for the city. What landscape can do is to save the investment and help the city seek for more possiblities. Through the understanding of the history and the present of the city that changed by human, we can draw the possible future and in the meanwhile calls for people's participation that can let the city recover in a gradual but stable pace. In the whole methodology, the study of the continuous process and the stragegy to apply landscape design as part of the municipility plan which makes the development with less pressure but more fun are very important and can be hopefully be referred for other cities.

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