

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
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Studio		
Name / Theme	HARVEST/ Parkstad	
Main mentor	Frits van Loon	Landscape Architecture
Second mentor	Mo Smit	Architecture
Argumentation of choice of the studio	Studio: Flowscape from Landscape Architecture Graduation Lab: HARVEST	

Graduation project	
Title of the graduation project	Rethinking Parks in a Shrinking Setting: The Marrying of Social Restoration and Urban Services for a New Urban Park System : Using nitrate-remediation as an example
Goal	
Location:	Heerlen Parkstad, South Limburg, NL
Background Context	<p>Located in South Limburg along the border with Germany, Parkstad is an administrative region formed by 7 municipalities (Beekdaelen, Brunssum, Heerlen, Kerkrade, Landgraaf, Simpelveld and Voerendaal). The geomorphological characteristic of the site is that it has a hilly landscape, formed by slopes, plateaus and valleys; it has fertile soil (Loess: silt, mineral particles deposited by wind to form top layer); the area has two main brooks, and deep groundwater depth. The region is famously known as the once-prosperous mining district that thrived until its closing in the 70s. The morphological, economic and social change of the region have been drastic.</p> <p>To contextualise the raised problems of Parkstad, its site context has been summarized and curated in the following three themes:</p> <ul style="list-style-type: none"> - Black to Green morphological transformation - Shrinking city - demographic-economic: - Post-mining social-cultural aftermaths:

Context

Black to Green morphological transformation:

The area was mainly agricultural thanks to its fertile soil, until the discovery of coal which drastically transformed the region. During the period of 1880 to 1970 mining industry transformed these cities. Not only that they filled the region with mines and industries, mining colonies (housing and community for workers) were built, the urban areas expanded enormously. Inspired by the garden city movement at that time, neighbourhoods were surrounded by green, for mental restoration and food production. One thing to notice is that these neighbourhoods were meant to be 'small scale', so to prevent large concentration of workers and the possibility of strikes. The current morphology of Parkstad's urbansiation was shaped.

After the closure of mines in the 1970s, the area experienced yet another major transformation. The 'From black to green' program was launched, almost all traces of the mining past were demolished, replaced with new developments or with greenery. In 1999, the collaboration of 'Parkstad' began, further pushing the region to a 'city of parks' development position. Today the basic morphological structure of Parkstad consists of densely urban/ suburban areas (Brunssum, Heerlen, Kerkrade, Landgraaf), surrounded by large piece of rural agricultural landscape (Beekdaelen Simpelveld, Voerendaal).

Shrinking city - demographic-economic:

Deindustrialisation turned Parkstad from one of the richest region to the poorest - the dominant industry vanished. Today Parkstad is one of the most representative cases of urban shrinkage (with Heerlen being the most severe?). It is among the first three regions of the country (together with Eemsdelta and Zeeuws-Vlaanderen to experience shrinkage, with the largest number decline in population (by 39,000, -16%), household numbers (by 14,000, -12%) and potential labour force 48,000 (-31%).

What these mean for Parkstad is population decline, demographic dependency, decaying city outlook, weakened economy, lessened investment, unemployment, decreasing property value, vacant buildings and vacant shops. To manage its urban shrinkage, 7500 houses needed to be removed to balance housing market; most areas in Parkstad will also need to be diluted in the long term transformation plan.

Post-mining social-cultural aftermaths:

The demographic-economic sector is not the only area that suffer, the social sector has been deeply impacted yet has received less attention than the economy has (Kasper, 2012). Some significant social problems nowadays are, to name but a few, low initiatives/ involvements, low self-esteem, lack of collective identity, crime rates and lack of trust within the society. First of all, during the prosperous days of Parkstad, neighbourhoods were laid out by the mining companies, social lives and social roles were also organised by both the catholic church and the mining industries. After the closure of mines, a lot of money were poured in for social aids and jobs for people living in the area - many believe that these are the causes that shaped the low-initiatives mentality. Secondly, the disappearance of the once thriving mining industry signifies a loss of city identity, the devaluing of people's skillsets and experience causes lowered self-esteem. The decaying city outlook is also often linked with lowered self-esteem and perception of safety in many urban shrinkage studies. Unemployment and crime rates also impacted the perception of safety, leading to a lack of trust, and therefore, also social involvement and cohesion. Recently there are more attempts in improving the social-cultural condition of Parkstad, together with the 'black to green' approach, many new public parks initiatives in the urban areas have started.

<p>The posed problem,</p>	<p>These together resulted in four key, specific problems for my design project to be situated in.</p> <p>4 key Problems</p> <ol style="list-style-type: none"> 1. Parkstad is not socially sustainable* 2. Parkstad has too much property/ retail/ land vacancy 3. Most open public spaces are more 'green' than 'social' 4. Public park has been a successful game-changer yet a 'negative investment' in a shrinking city where new occupants/investments are lacking. <p>*Definition for social sustainability: "Development (and/or growth) that is compatible with the harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups while at the same time encouraging social integration, with improvement in the quality of life for all segments of the population" (Polèse & Sten, 2000, p.15)</p> <p>Problem statement</p> <p>Parks are powerful tool for social-restoration and a band-aid for urban-vacancy, but Parkstad can no longer rely on the old 'single-use' public park model in its economically shrinking context.</p>
<p>Motivation</p>	<p>The vision started during our site visit -- I was genuinely touched when the Parkstad officials brought us to a new neighbourhood park (Mijn Speelpark West) situated on the ground of demolition. According to Geert Lamers from the Parkstad department, starting from 2011 over 500 houses, amongst them 2 highrises, were demolished. The park was built with an aim to improve the social condition of a deteriorating neighbourhood and they did succeed in doing so. They went on telling us their negotiation process with the municipality government, with the bank and with other sectors. Being on the site, I was genuinely touched; but also somewhat saddened by the fact that they were willing to go this far for building this park even though the project was considered a 'negative investment' --- Public space project like this park can be such a game changer for the wellbeing of the people and for the community, it transforms a decaying outlook to a healthy nearby nature for people's</p>

urban lives. However, in shrinking areas where no/ less new residents or investment could be expected, especially in the short run, are (nicely designed) parks a luxury to have?



' A successful transformation, experts now say. "As good as it is in Heilust, you don't see it anywhere in Parkstad and perhaps not in the whole of the Netherlands. Heilust has changed enormously. In a positive sense," says sociologist Maurice Hermans of the Neimed knowledge institute in Heerlen, where he is mainly concerned with cities that are no longer growing due to economic decline and population decline Hermans lived in Heilust during his youth. '

Extracted from *De Limburger* news article 'Living in Heilust becomes a joy again' (2018)
https://www.limburger.nl/cnt/dmf20180920_00074089/het-wordt-weer-een-lust-om-in-heilust-te-wonen

Design vision
(theocratical
concept)

A New Park Model Needed

Given such a post-industrial shrinking condition of Parkstad --- where the 'social' aspect is in desperate need of restoration, its urban area in particular, and where city shows clear signs of decay and abandonment, where economy is shrinking, where people are leaving. More and more temporary/ permanent public park initiatives have started in hope of a better city image or quality of life, most of them on land of former demolishment. Some of these parks showed evidently very positive social impacts. Yet these single-use recreational parks appear either as non-profit/ money-losing welfare (small scale parks) or as investment/ tourism/ residence attractor (large scale parks). Both of these can be economically unsustainable/ burdening for a shrinking economy.
Therefore, a new model, or a new philosophy is needed to make urban park an asset in itself, that the urban values/ services it provides can directly support its existence for the social good.

Service Value of Public Park: Urban Services

I believe new parks should be useful and become in itself a form of necessary urban services for the city, a hybrid model, you may say. This idea echoes with the vision of the Public Space's Service System project (PSSS), a recently completed research project conducted by a team of 14 interdisciplinary scholars and researchers --- 'better continuity or integration [of public space] is needed to promote real meaning as urban systems and provide more social, environmental and economic value return, so as to assure time-life Public Space sustainability' (abstracted from Goal of the research project "Public Space's Service Value as an Urban System. An integrated assessment methodology", 2016-1019)

Featured Urban Service: Nitrate Remediation

The idea is to give 'urban park' a significant role in terms of urban services, and the

	<p>possibilities are limitless, from eco-services to energy or food production, to water infrastructure and beyond. For the sake of a more focused scope of study and design implementation, one particular topic is chosen – Nitrate remediation. It is chosen not only because of its high concentration in groundwater in the wider South Limburg region, but also because of its widespread urgency in terms of water safety and environmental health, and for its relatively ‘newness’ in the field. Not a lot of landscape projects have been done regarding to this issue. Making it an urgent, challenging and exciting urban service to experiment and marry park design with.</p> <p>WHY nitrate remediation in Parkstad?</p> <ul style="list-style-type: none"> - Parkstad belongs to one of the highest groundwater Nitrate concentration regions (way above EU maximum standard), drinking water extraction points are soon to be affected. Extra cost will be needed for purification. Human and ecology health would be impacted. - Agricultural activities within and in the larger region - Loess soil type contributes to higher nitrate concentration
<p>research questions and</p>	<p>Research Question</p> <p>In a shrinking region, how may socially and economically sustainable public parks be created through marrying social restoration and nitrate remediation services?</p> <p>The research objective is to find out how can public parks thrive even in a shrinking region; how may new public parks be created and developed in a socially and economically sustainable way, specifically in terms of the possibility of marrying social restoration with nitrate remediation services; In what way can public parks with nitrate remediating property create social opportunities that enhance social cohesion and social sustainability, vice versa? And how philosophies of park may help revitalise the ‘garden city’ green network of Parkstad with contemporary interpretation.</p>
<p>design assignment in which these result.</p>	<p>Design Assignments</p> <ul style="list-style-type: none"> - Analysis study (Region, Parkstad, Heerlen) - Masterplan for an urban-park network (Heerlen focused) - Schematic Regional Vision of urban parks and their influences on other open spaces/ landscape network (Parkstad) - Site Design (a Nitrate-remediating Urban Park for social wellbeing) <p>The proposed urban parks shall be social on a daily basis, useful as part</p>

of a more integral city system --- in other words, to carry major city function and become more than 'just a park'. Using 'nitrate remediation' as an example, the projects aims to provide alternative view of public park network, values and services --- the new network of parks in Parkstad shall create mutual benefits for social restoration and nitrate remediation.

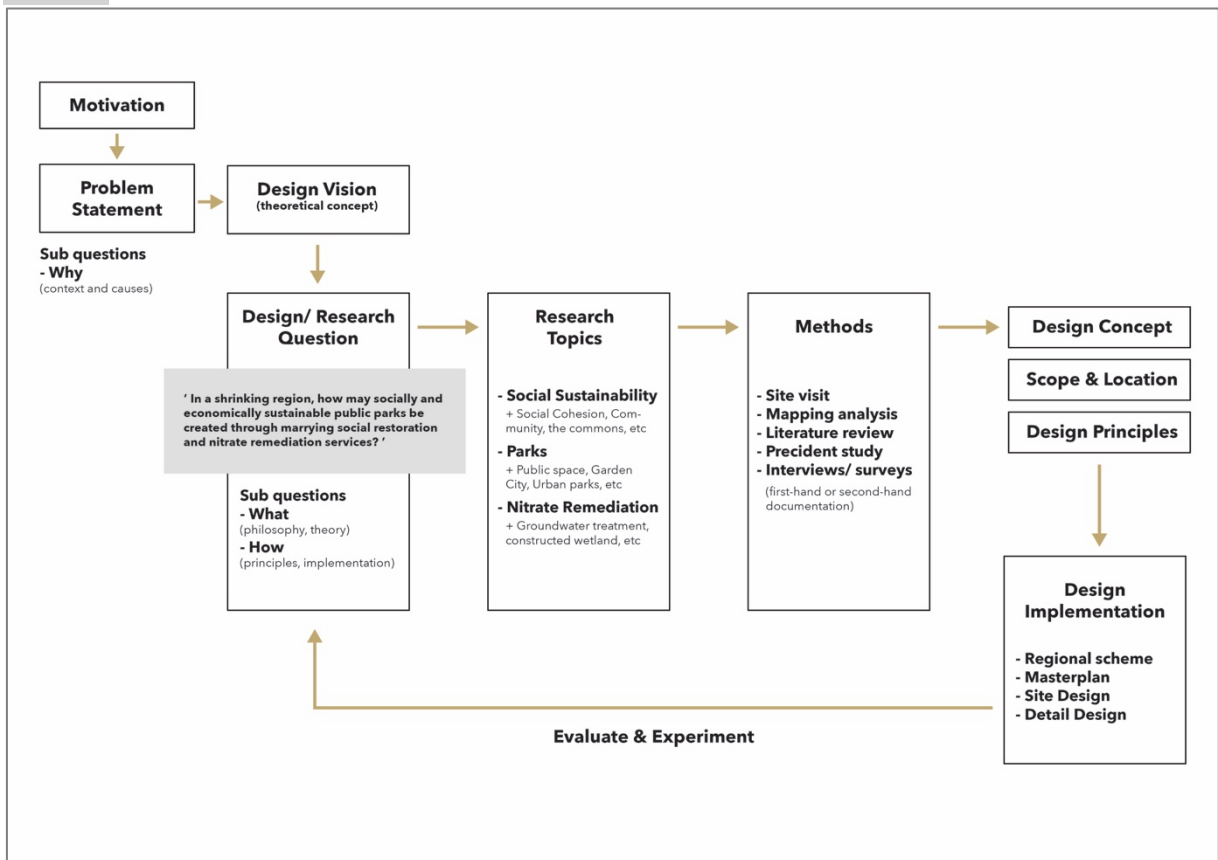
Process

Method description

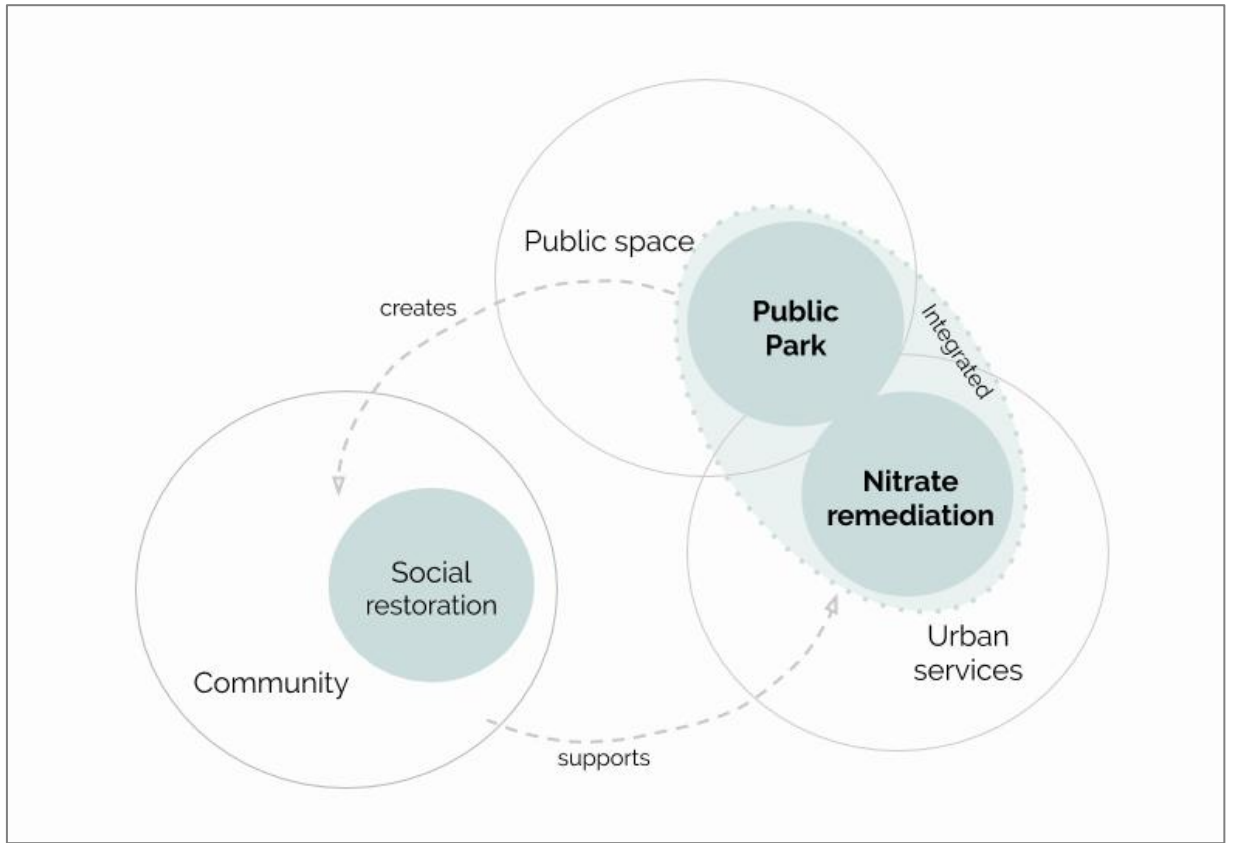
Scope of design (to be determined) and site scale

Given the social emphasis of the project, the unique condition of different communities should be regarded as a design determinant. The time allowed for this project may not be sufficient to cover each and every neighbourhoods of Parkstad. Therefore the site of design and zoom-in analysis would begin starting with the capital city of Parkstad, Heerlen (which has the most severe social problems and is central in its location of Parkstad), connecting it with the wider system of Parkstad, and then, using it as a city-level prototype to suggest similar urban park approaches for the rest of Parkstad.

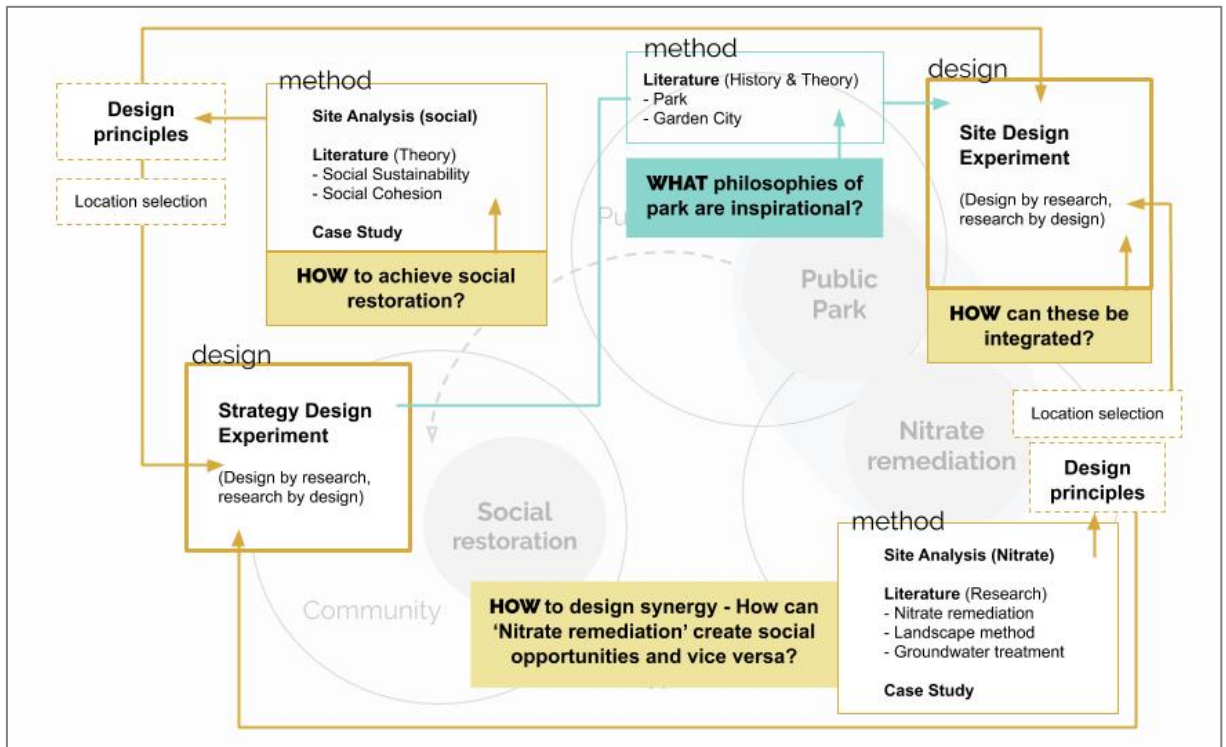
Method



Methodology Structure



Theoretical Design Concept



Theoretical framework

- Literary review and theoretical framework

The project will be based on literary review revolving around the three main topics of: public park, social sustainability and nitrate remediation. Theories of public parks help establish the philosophical backbone of the design concept while literary reviews on social sustainability and scientific research paper on nitrate remediation provide the bases of design principles.

Park philosophy

keywords: public park, public space, urban park, garden city...

Social sustainability

keywords: social sustainability, social cohesion, community health and sustainability...

Nitrate remediation

nitrate remediation, groundwater remediation method, surface water remediation method...

- Site analysis

Site analysis leads to the identification of site specific problems and intervention opportunities, the analysis are done on several scales through mappings, literary research and site visit ---

on context scale:

to understand the landscape condition, social condition and nitrate condition of Parkstad in relation to or in comparison with the rest of the country.

on Parkstad regional scale:

to study the morphological patterns, existing park network, social condition and nitrate condition (in relation to agriculture and water system) of Parkstad as a whole.

on city + neighbourhood scale (Heerlen):

Using Heerlen as an example site to understand specific city level and neighbourhood level problems regarding parks, social condition, nitrate remediation opportunity.

- Precedent study

Projects that integrate nitrate remediation/ water management/ water remediation with urban park or landscape design

- 'Carbon T.A.P.// Tunnel Algae Park' by PORT Architecture + Urbanism
- 'Constructed wetlands for cost-effective and energy-efficient remediation of plumes', June 2018 Frank Pels (HMVT) & Nanne Hoekstra (Deltares) With the cooperation of Jasperien de Weert, Johan van Leeuwen, Bas van der Zaan and Jan Gerritse (Deltares)

Projects that are built in similar post-industrial shrinking conditions with successful social or social-economical restoring impacts

- Speelpark West and Heilust neighbourhood, South Limburg
- Park Gravenrode, South Limburg
- Leberecht Migge's model of socializing urban vegetation (city of Berlin, Frankfurt etc)

Literature and general practical preference

Brandão, A. L., & Brandão, P. (2017). Public Space, Infrastructure, Landscape: an interdisciplinary matrix for urban spatial continuity. *The Journal of Public Space*, 2(1), 123-134. doi: 10.5204/jps.v2i1.55

Henderson, K., Lock, K., & Ellis, H. (2019). *The art of building a garden city: designing new communities for the 21st century*. Newcastle upon Tyne: RIBA Publishing.

Kasper, H. (2012). The Aftermath of The Closure of The Dutch Coal Mines In South Limburg: Regional Economic and Social Reconstruction.

Muhana, S. A., Hazeleger, C., Stangelaar, Y., Boogaard, J., & Klaver, J. (2015). The transformation in functionality and liveability of Heerlen. Retrieved from http://www.jorritboogaard.nl/wp-content/uploads/2017/09/Final-paper-_Group-11_05082016.pdf

Rocak, M., Hospers, G. J., & Reverda, N. (2016). Searching for Social Sustainability: The Case of the Shrinking City of Heerlen, The Netherlands. *Sustainability (Switzerland)*, 8(4), 382-. [382].
<https://doi.org/10.3390/su8040382>

Schrama, G. (1998). *Drinking water supply and agricultural pollution. Preventive action by the water supply sector in the European Union and the United States*. Dordrecht/Boston/London: Kluwer Academic Publishers.

Verwest and Van Dam (2010). From combating to managing: Demographic decline in the Netherlands. Policy strategies for current and future shrinking regions. The Hague: PBL Netherlands Environmental Assessment Agency.

(More to be added)

for Speelpark West, Heilust:

- MijnHeilust series (documentary)
<https://11.nl/mijn-heilust/?pagina=2>

- Speelpark West design process and social involvement:
<https://www.kerkrade-west.nl/html/heilustpark.html>
http://www.westwint.nl/deelprojecten/heilust/park_west

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

I have always seen Landscape Architecture as a mediator between all the many different sectors in the world -- a field that, humbly speaking, is never an expert in geography, nor in biology, sociology, human psychology, engineering, nor in any other singular subject; but a field that thrives in becoming the expert of creatively and sensibly mediating between all these mentioned fields in a complex reality. My project reflects this attitude. It is an attempt and an experiment to mediate between the social ideal (of social welfare and happiness), the economic reality (of an economic shrinkage setting) and an environmental threat (of nitrate).

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

The relevance of my project in the larger social, professional and scientific field is that it concerns a new urban issue that most cities are, or yet to be, facing - the shrinking city phenomenon. I believe a new urban-services park model will be beneficial to most shrinking cities. The specific angle of nitrate remediation on the other hand, will contribute especially in the research of its integration with more public settings and designs, since not many projects have been done in this regard.

Time Planning

