

# STRANDVELD SANCTUARY

## STRIVING FOR BALANCE

The role of agriculture in the future urban environment.  
Can urban agriculture play a role in making our cities  
more sustainable and resilient?

MLA DISSERTATION 2018  
Charleen Grobelaar  
CNNCHA007

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STRIVING FOR BALANCE

The role of agriculture in the future urban environment.  
Can urban agriculture play a role in making our cities  
more sustainable and resilient?

A Dissertation presented to the University of Cape Town  
(120 credits)  
In partial fulfilment of requirements  
for the degree of  
Master of Landscape Architecture

**Author: Charleen Grobbelaar**

CNNCHA007

December 2018

Cape Town

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## EXECUTIVE SUMMARY

As more and more people are leaving their rural hometowns, the growing cityscapes are threatening our eco-systems, climate and sustainable food production. In this thesis I aim to explore the use of productive corridors into the urban fabric. Counteracting urban sprawl with "rural sprawl" (Mancebo: 2016). Connecting left-over spaces, next to canals and road verges and incorporating existing public open space, with a combination of indigenous plant species and appropriate agricultural produce. The aim is to establish a closer interaction between the constructed and the natural environment, improving living conditions through agriculture while at the same time improving eco system services and improving biodiversity.

Addressing social, environmental and economical issues, I argue that the value of urban agriculture is much wider than economical benefit. These corridors become places where productive, social and ecological activities meet. Encouraging interaction between neighborhoods, marketplaces to sell goods, education and creating awareness of our food systems while at the same time addressing infrastructural issues such as incorporating rain gardens.

Sustainable urban agriculture is used as catalyst to create social and ecological corridors through the city. Agricultural interventions are explored as part of the solution towards creating sustainable and just cities, contributing to a positive development in the society and for the environment.



## THE STUDY

### ABSTRACT

The study started off in the form of an investigation into the global phenomenon of declining agricultural land.

Several case studies with different approaches were overlaid onto the project site and from there the concept of a socio-ecological corridor network was born. The idea to create corridors that stretches through the urban fabric, connecting areas of biodiversity as well as potential production sites. Creating social and economic benefits for the region.

Having deduced that the area of interest lay to the east of the PHA an investigation of the existing models of intervention in this specific area was undertaken. A number of urban agricultural projects run by independent non-profit organizations were identified. Focussing on community gardens, these projects were then researched and mapped. Focussing on the SEED organization, a basic model of intervention was developed. The deduction was that it is very difficult to compete with the scale of production of the PHA on a financial level.

In the search for another model the Herbanisation project offered a different scenario. Indigenous plants with traditional medicinal qualities were planted as part of an open-access street garden. This was done in response to a PHD study that highlighted the economic value of the trade in these plants as well as the social problem of access to plant material that were traditionally freely available, but are now typically found within conservation areas, making foraging an illegal activity. By creating street gardens not only were these materials now freely available to the wider public,

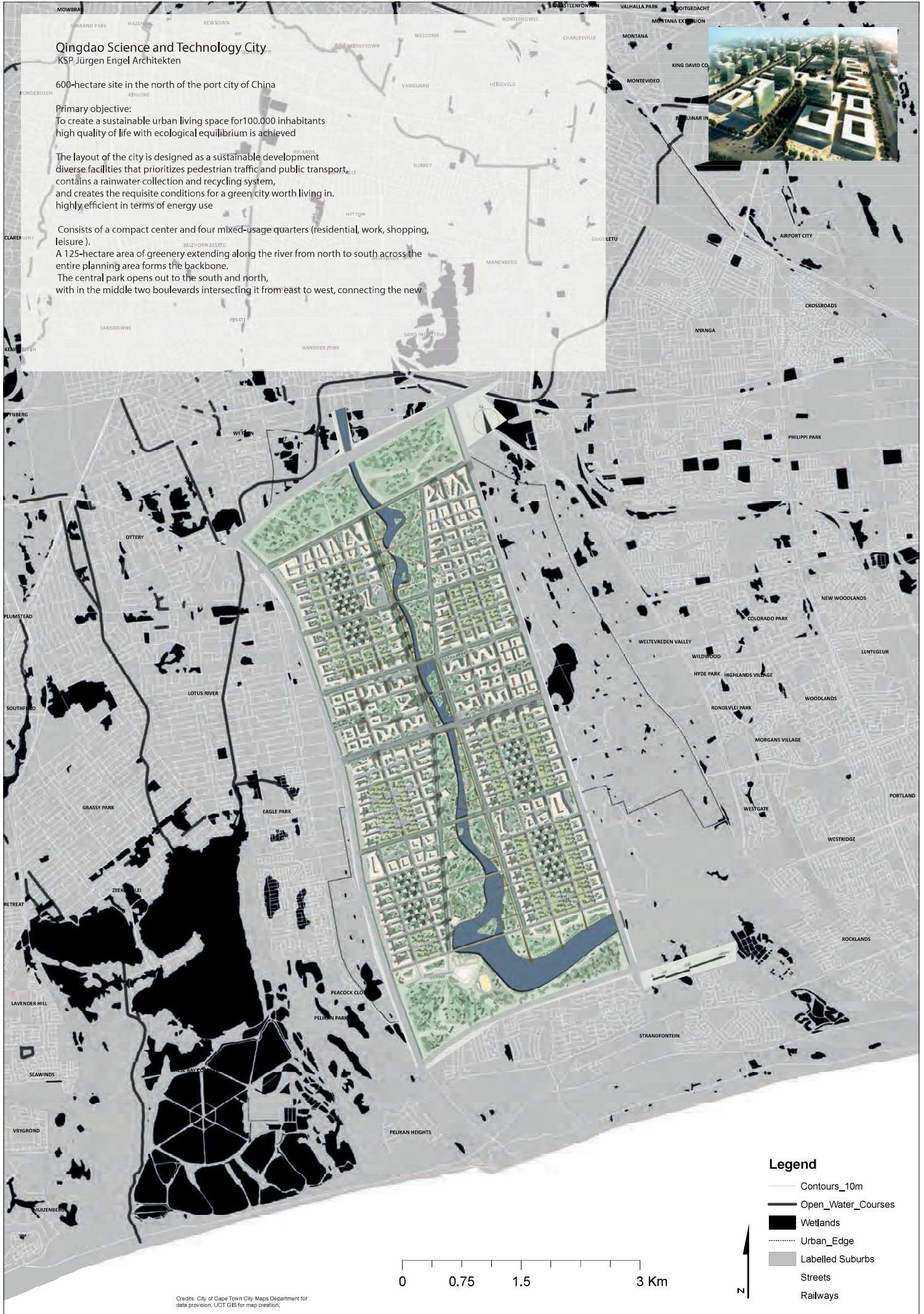
**Qingdao Science and Technology City**  
KSP Jürgen Engel Architekten

600-hectare site in the north of the port city of China

Primary objective:  
To create a sustainable urban living space for 100,000 inhabitants  
high quality of life with ecological equilibrium is achieved

The layout of the city is designed as a sustainable development  
diverse facilities that prioritizes pedestrian traffic and public transport,  
contains a rainwater collection and recycling system,  
and creates the requisite conditions for a green city worth living in.  
highly efficient in terms of energy use

Consists of a compact center and four mixed-usage quarters (residential, work, shopping,  
leisure).  
A 125-hectare area of greenery extending along the river from north to south across the  
entire planning area forms the backbone.  
The central park opens out to the south and north,  
with in the middle two boulevards intersecting it from east to west, connecting the new

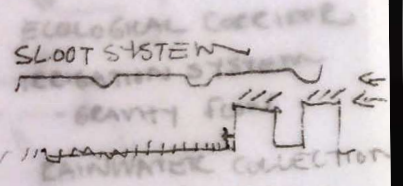


Credits: City of Cape Town City Maps Department for data provision, UCT GIS for map creation.

URBAN LIVING

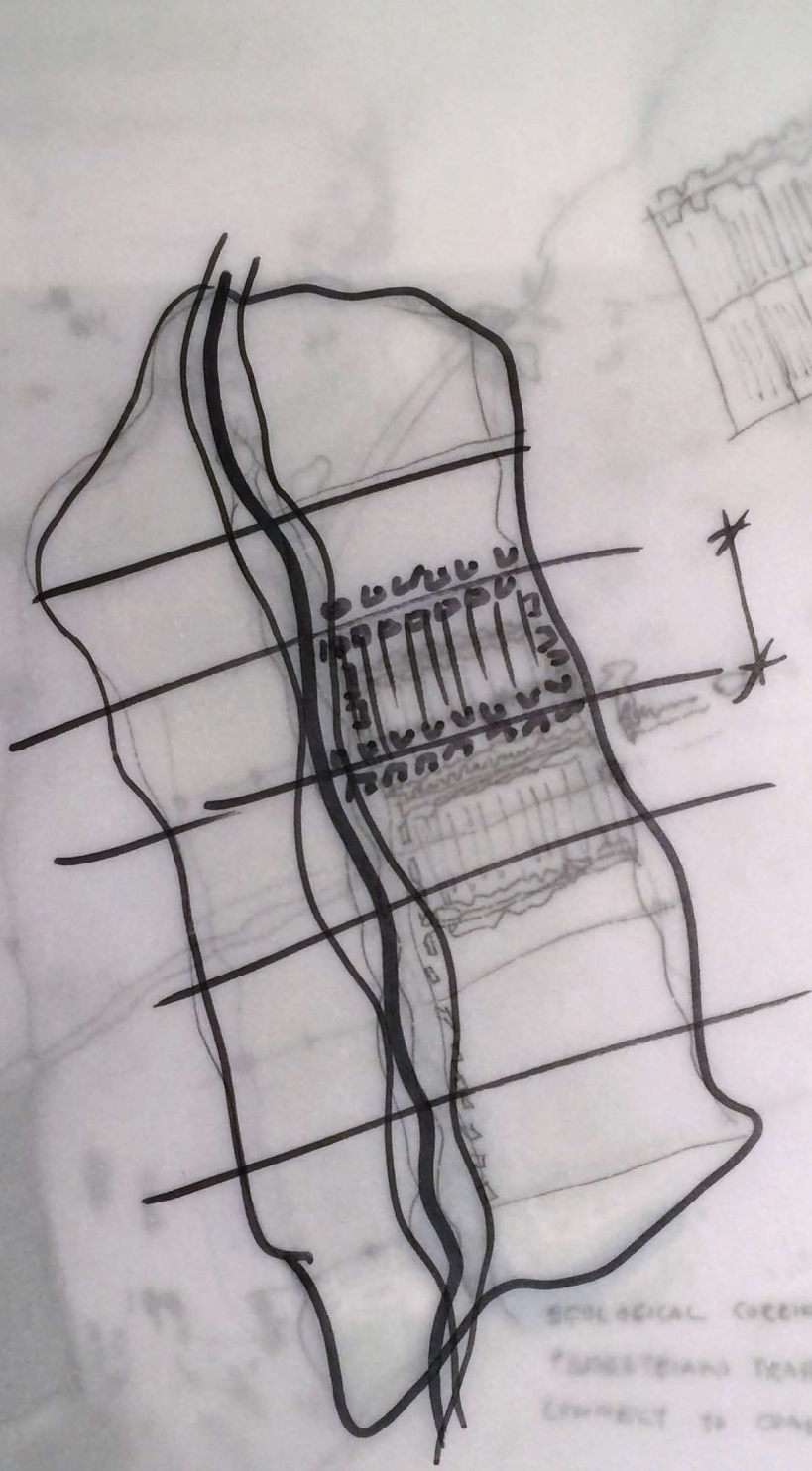


COMMUNITIES - SMALL VILLAGES  
HOUSING ON VERGES  
WATER FLOW - IRRIGATION  
2. Ha. allotments



- HOUSING AS WINDBREAKS
- SECURITY GOOD
- SOLAR ENERGY
- RAINWATER COLLECTION

ECOLOGICAL CORRIDOR - ON AQUIFER  
PEDESTRIAN TRAFFIC  
CONNECT TO COAST.



COMMUNITIES - SMALL VILLAGE  
HOUSING ON VERGES  
WATER FLOW - IRRIGATION  
2 Hr. allotments

SLOOT SYSTEM

- HOUSING AS WIND BREAKS
- SECURITY GOOD
- SOLAR ENERGY
- RAINWATER COLLECTION

ECOLOGICAL GREENHOUSE - ON AQUACULTURE  
FORESTED AND TERRACE  
CONNECT TO COAST.

# Songzhuang Arts and Agriculture City

## Sasaki

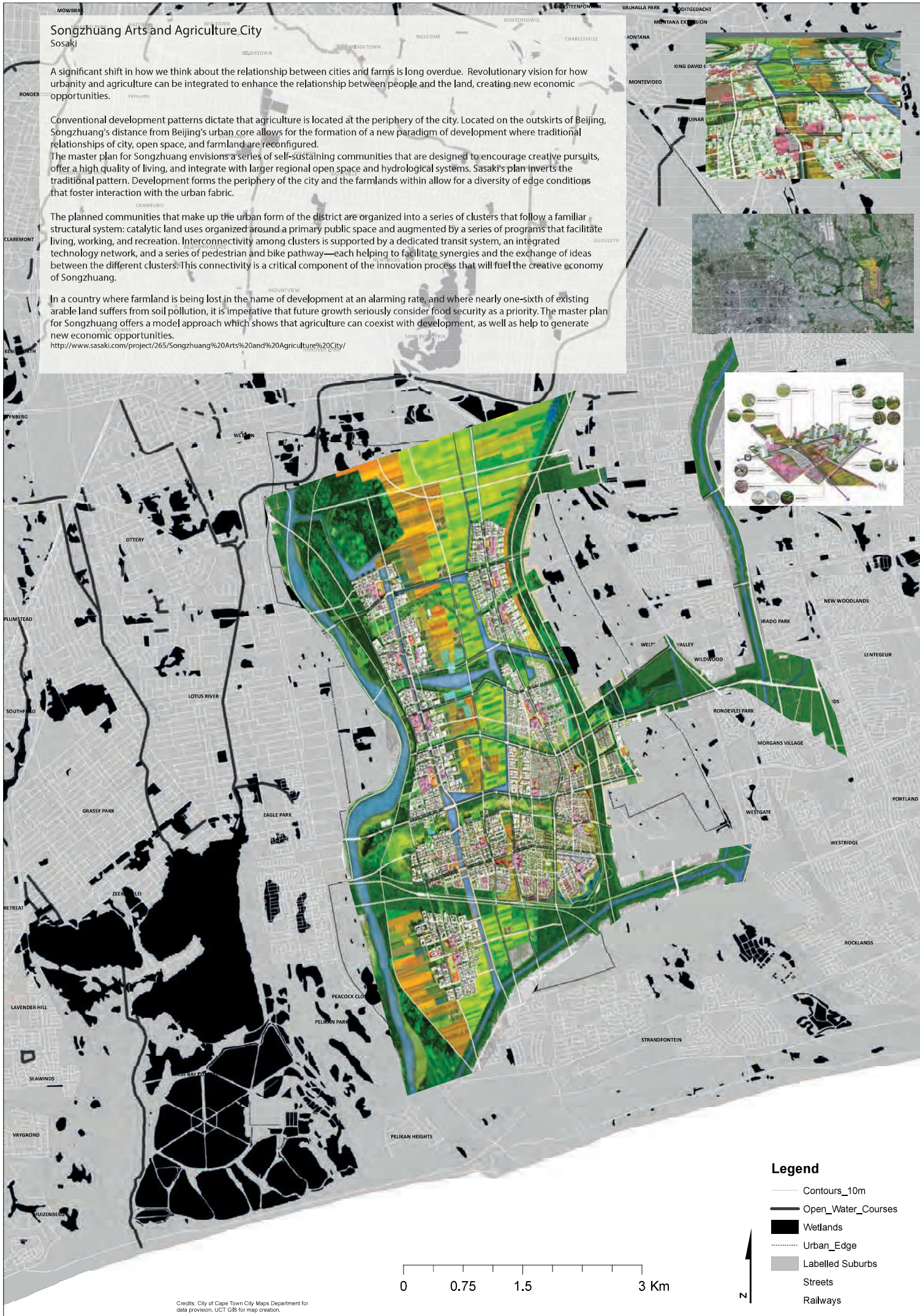
A significant shift in how we think about the relationship between cities and farms is long overdue. Revolutionary vision for how urbanity and agriculture can be integrated to enhance the relationship between people and the land, creating new economic opportunities.

Conventional development patterns dictate that agriculture is located at the periphery of the city. Located on the outskirts of Beijing, Songzhuang's distance from Beijing's urban core allows for the formation of a new paradigm of development where traditional relationships of city, open space, and farmland are reconfigured. The master plan for Songzhuang envisions a series of self-sustaining communities that are designed to encourage creative pursuits, offer a high quality of living, and integrate with larger regional open space and hydrological systems. Sasaki's plan inverts the traditional pattern. Development forms the periphery of the city and the farmlands within allow for a diversity of edge conditions that foster interaction with the urban fabric.

The planned communities that make up the urban form of the district are organized into a series of clusters that follow a familiar structural system: catalytic land uses organized around a primary public space and augmented by a series of programs that facilitate living, working, and recreation. Interconnectivity among clusters is supported by a dedicated transit system, an integrated technology network, and a series of pedestrian and bike pathway—each helping to facilitate synergies and the exchange of ideas between the different clusters. This connectivity is a critical component of the innovation process that will fuel the creative economy of Songzhuang.

In a country where farmland is being lost in the name of development at an alarming rate, and where nearly one-sixth of existing arable land suffers from soil pollution, it is imperative that future growth seriously consider food security as a priority. The master plan for Songzhuang offers a model approach which shows that agriculture can coexist with development, as well as help to generate new economic opportunities.

<http://www.sasaki.com/project/265/Songzhuang%20Arts%20and%20Agriculture%20City/>

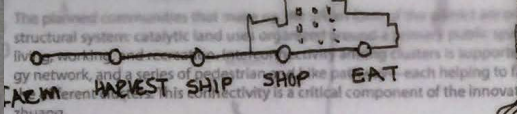


- Legend**
- Contours\_10m
  - Open\_Water\_Courses
  - Wetlands
  - ..... Urban\_Edge
  - Labeled Suburbs
  - Streets
  - Railways

Credits: City of Cape Town City Maps Department for data provision, UCT GIS for map creation.

**INTEGRATION OF URBAN + AGRICULTURE  
PEOPLE - LAND**

**PRODUCTIVE SYSTEM**



**CURRENT SCENARIO**



**INTEGRATED URBAN AGRICULTURE SCENARIO**



**INTERCONNECTED SERIES OF VILLAGES BASED ON HYDROLOGICAL SYSTEMS**

**BALANCE OPENSPACE + DEVELOPMENT**

**POSSIBLE REHOUSING, BUT KEEP SOCIAL NETWORKS**

In a country where farmland is being lost in the name of development at a rapid rate, and where nearly one-sixth of existing arable land suffers from soil pollution, it is imperative that future growth strategies consider food security as a priority. The master plan for Songzhuang offers a model approach which shows that agriculture can go hand in hand with development, as well as helping to create new economic opportunities.

<http://www.sasaki.com/project/265/Songzhuang%20Arts%20and%20Agriculture%20City/>

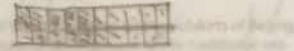
- o PRODUCE
- o GREENHOUSE / TEST BED
- o FISH FARM
- o COMMUNITY GARDEN
- o ORCHARD.



**INTEGRATED URBAN AGRICULTURE SCENARIO: 1**

INTEGRATION OF URBAN + AGRI  
PEOPLE - LAND

CURRENT  
SCENARIO



INTEGRATED  
URBAN AGRICULTURE SCENARIO



INTERCONNECTED  
SERIES OF VILLAGES  
BASED ON HYBRID  
SYSTEMS

BALANCE OPENSPACE +  
DEVELOPMENT

PRESERVE REMAINING BUT  
DEEPENING NETWORKS

• FRESH  
NEEDS/DEMAND (FRUIT, VEG)

• FISH FARMING

• COMMUNITY GARDENS

• REQUIRED.

INTEGRATED URBAN AGRICULTURE SCENARIO: 2

# FARMADELPHIA

"Urban Wolds: Grounds for Change"  
City Parks Association and the Van Alen Institute

Proposes to transform the urban environment by introducing bucolic farmlands into the city's urban fabric. The insertion of incongruous rural elements assigns a new use for the abandoned parcels, creating juxtapositions between farm and city that challenges its residents to revitalize their surroundings and daily lives. Farm and City function as one integral machine, combining the pleasure of open sky and land with the richness of city living.

Inexorably, he thinks, the country is coming to the city. Soon there will be cattle again on Rondebosch Common; soon history will have come full circle.  
—Coetzee, J.M. Disgrace. 175.

<http://frontstudio.com/farmadelphia/>

Promote freedom of movement, and to make all parts of public space as seamless as possible in order to make the most out of this limited but important resource. To do this, we are focusing on redesigning parts of parks that interact directly with the surrounding neighborhood: entrances, edges and park-adjacent spaces.

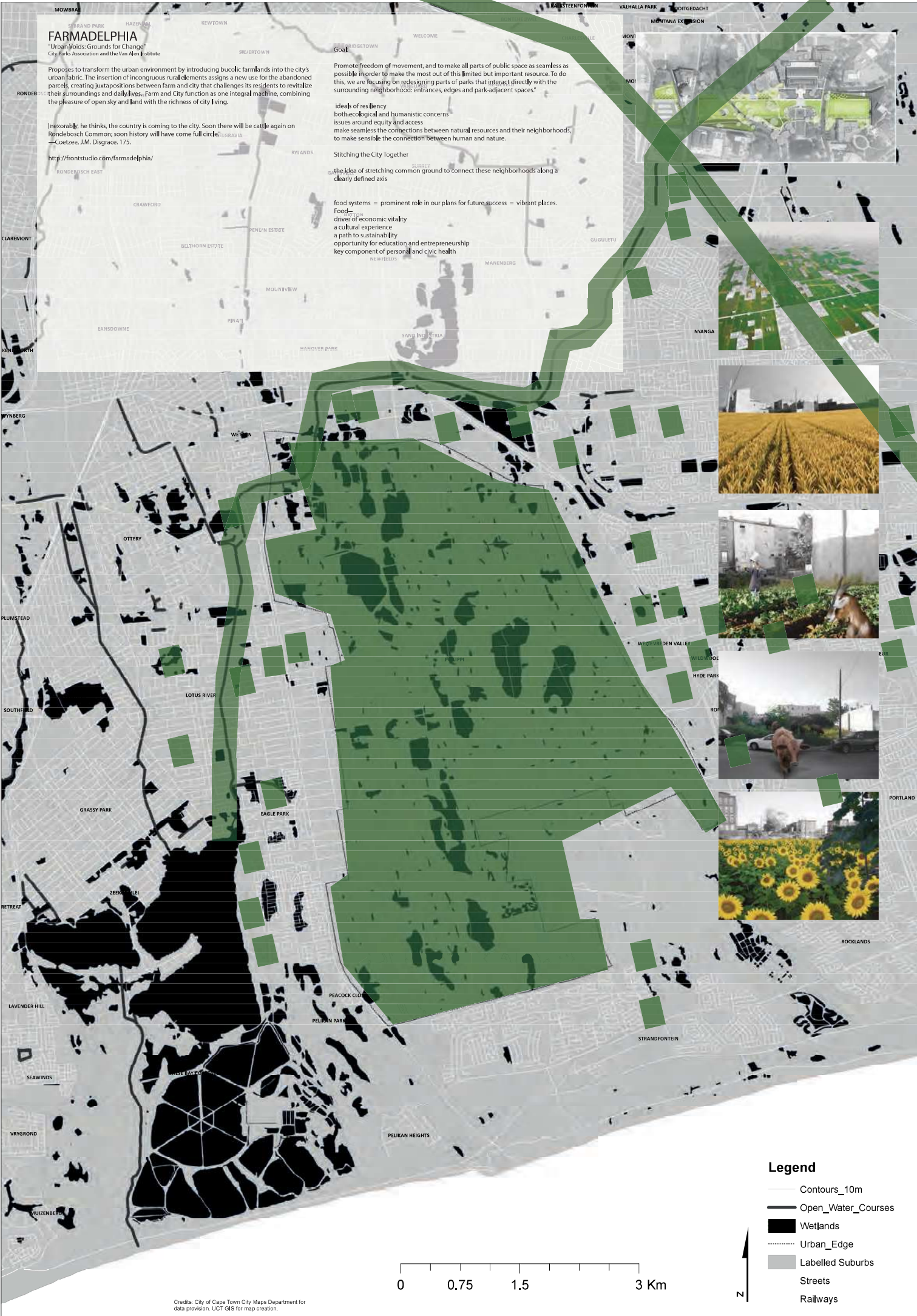
Ideals of resiliency both ecological and humanistic concerns issues around equity and access make seamless the connections between natural resources and their neighborhoods, to make sensible the connection between human and nature.

Stitching the City Together

the idea of stretching common ground to connect these neighborhoods along a clearly defined axis

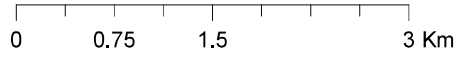
Food systems = prominent role in our plans for future success = vibrant places.

Food as a driver of economic vitality  
a cultural experience  
a path to sustainability  
opportunity for education and entrepreneurship  
key component of personal and civic health



**Legend**

- Contours\_10m
- Open\_Water\_Courses
- Wetlands
- ..... Urban\_Edge
- Labelled Suburbs
- Streets
- Railways



Credits: City of Cape Town City Maps Department for data provision, UCT GIS for map creation.

# FARMADELPHIA

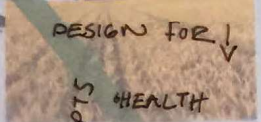
BOUNDARIES - EDGES  
WHERE WE BELONG  
DONT BELONG

PUBLIC  
PRIVATE

PUBLIC REALM OF THE CITY.

A NEW FLUIDITY INTO THE URBAN FABRIC

EASING TRANSITION



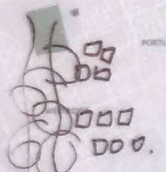
DESIGN FOR  
HEALTH  
HAPPINESS  
PROSPERITY

ABSTRACT CONCEPTS

ECOLOGY  
SOCIAL BENEFIT

GREEN SPACES  
SOCIAL + ECOLOGICAL CORRIDORS

"STITCHING" THE CITY TOGETHER  
COMMON GROUND TO CONNECT DISPARATE URBAN FABRIC



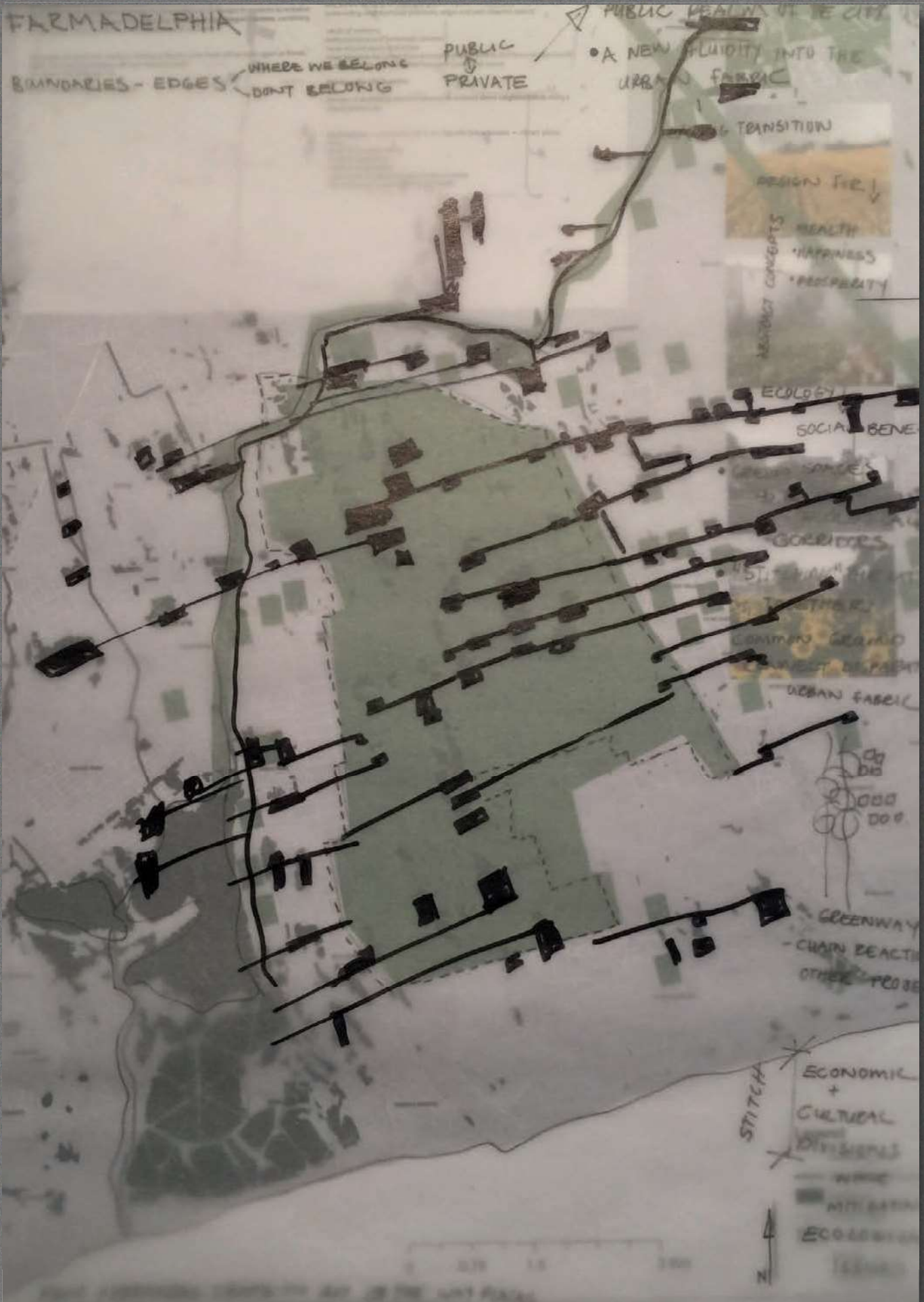
GREENWAY  
CHAIN REACTION  
OTHER PROJE

STITCH  
ECONOMIC + CULTURAL DIVISIONS  
Contours 10m  
WHITE

MITIGATING ECOLOGICAL ISSUES.



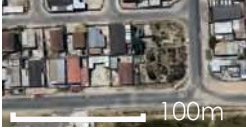

## GREENWAY CHAINS: 1

MINT, RASPBERRY - MIDWEED FOR BUTTERFLIES



GREENWAY CHAINS: 2

# EXISTING MODELS OF INTERVENTION

	SEED MODEL	UWC	HERBANISATION	CAPE FLATS NATURE	COMMERCIAL
FOCUS	Vegetables Seedling trays Culinary herbs Oils for extraction (Lavender)	Indigenous plants (Special focus on species from: Cape Flats Dune Strandveld Cape Flats Sand Fynbos)	Indigenous medicinal plants	Conservation	Financial Wild Olive: extracted oils Fynbos infused gin Beauty products Culinary
APPROACH	Permaculture community gardens	Nursery & nature reserve	Open access street garden	Selected conservation sites Ordinary Magic: The Alchemy of Biodiversity and Development in Cape Flats Nature	Buy raw / processed from growers
PROJECT LESSONS	Establishing permaculture gardens on land leased from schools. Education of students. Community involvement with the aim for the community to run the garden independently after 3 years. International accredited permaculture courses. Produce sold to nurseries and at markets. Seedbank producing acclimatized seed. Aim to provide feeding schemes with vegetables. Organic waste recycling and worm farming.	Making plants available at low cost to community in order to encourage indigenous home gardens with the aim to establish a corridor from UWC to Driftsands.  Outreach greening.  Education - propagation workshops	A open-access street garden of 250 indigenous medicinal plants on a degraded roadside in a working class settlement. Focus on plants with medicinal and economic applications. Principle of open access important - reflects the current state of wild harvesting practice and does not impose economic and cultural uses. Degraded landscape regeneration of public open space. Partnership of conservation professionals with Rasta bushdoctors. Local champion as driver of project.	Building the meaning and relevance of biodiversity in the everyday lives of ordinary people living around nature reserves, contributing to what was important to local people, and doing it in a way that strengthened local community structures and processes. It was both about addressing community needs through nature conservation and about catalyzing conservation action as an ordinary part of community life. It was about building an understanding of how natural systems support life in our cities. Our work challenged "biodiversity first," a notion deeply held among traditional nature conservators, who saw it as their role to provide voice to biodiversity amid uncaring citizens. Cape Flats Nature was instead interested in building a constituency for conservation among citizens who understand themselves to be living as part of natural systems. Ordinary Magic: The Alchemy of Biodiversity and Development in Cape Flats Nature	The value of fynbos species are slowly being recognized worldwide. Financial potential in various sectors.
SIZE					

## Herbanisation Project:

An open-access, medicinal street garden project for greening, healing and connecting in Cape Town.

### PROBLEM:

Illicit harvest of plant material from the City's protected areas coupled with decline in natural habitats from which to collect has brought bushdoctors and conservation authorities into conflict and raises questions concerning **rights to access** and the harvest of wild resources.

Within the Cape Town area wild-harvesting is estimated at 271 tons per annum

Cape Town's trade in bush medicine is worth over R115 million per year ...

greater than the annual municipal budget of 22 million a year for conservation

(Petersen et al. 2014)

Points to a considerable undervaluation of local natural capital



<http://livelhoods.org.za/causes/herbanisation-2/>

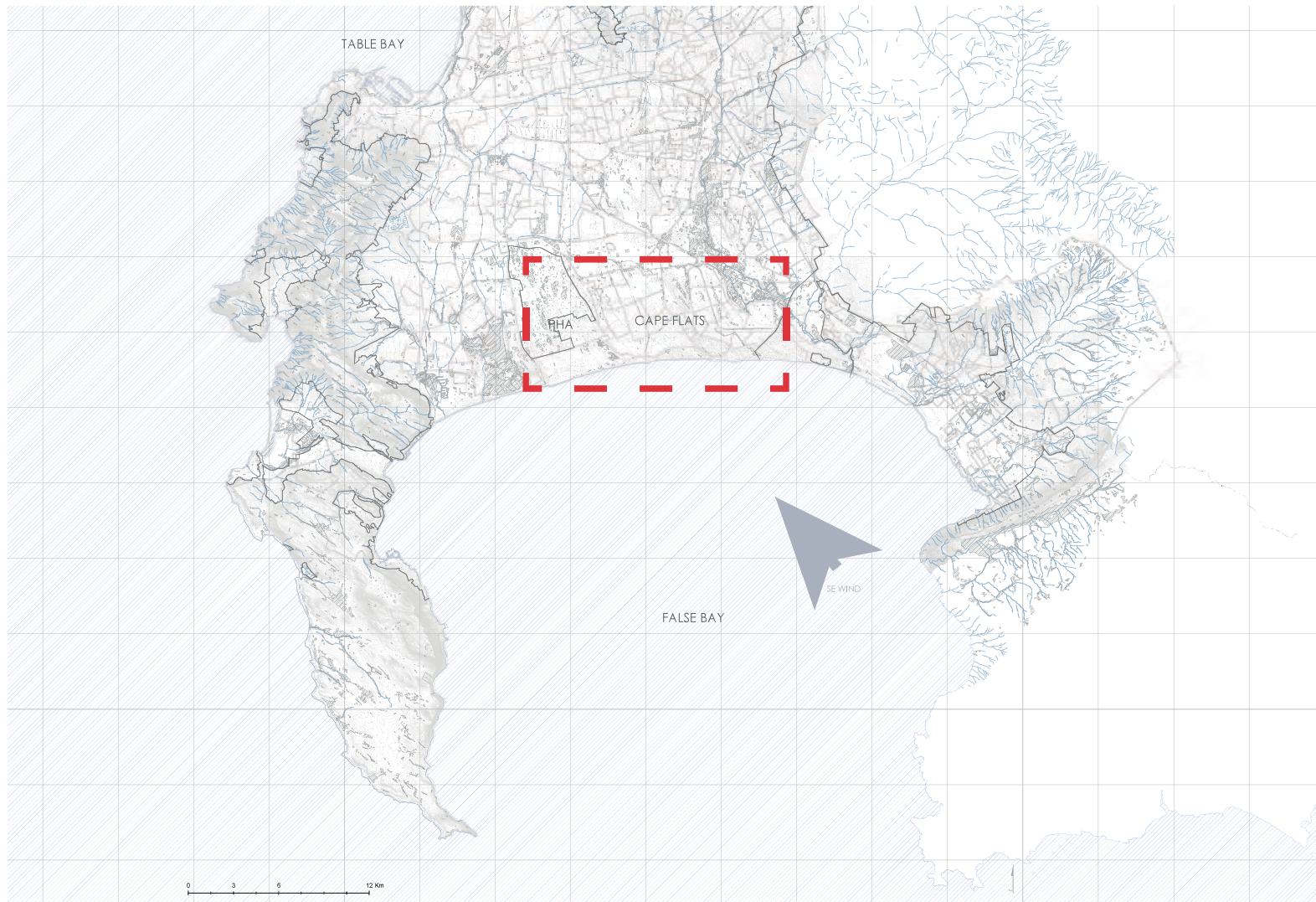
FORAGING WAS ONCE A WAY OF LIFE FOR EVERYONE. IT IS IN OUR DNA.

DISSERTATION



# STRANDVELD SANCTUARY

STRIVING FOR BALANCE



## DISSERTATION TITLE

The role of agriculture in the future urban environment.

Can urban agriculture play a role in making our cities more sustainable and resilient?

## PROPOSED SITE

The Philippi Horticultural Area (PHA)

## KEY RESEARCH TOPICS

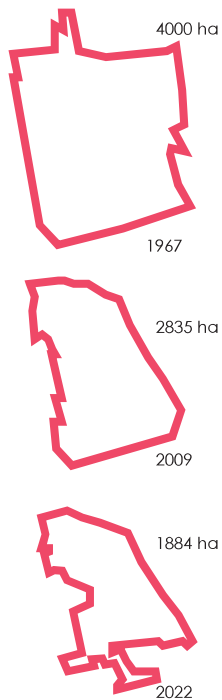
biodiversity, community gardens, continuous productive urban landscapes, environmental sustainability, equity, food security. urban agriculture, water security

The global phenomenon of urbanisation has taken its toll on the Western Cape. Distinct geographic boundaries often force urban sprawl into sensitive rural areas that, without calculated intervention, will be eradicated over time. This thesis explores the establishment of productive rural corridors within the urban fabric... ring-fencing urban pressure, but also encouraging a transition in local land use attitudes. The corridors are to be both ecologically and commercially viable, but most importantly, socially inclusive to ensure sustainability. A cohesive network of these capillaries facilitates the controlled intermingling of agricultural zones through the urban fabric, reconnecting it with the otherwise isolated natural remnant vegetation.

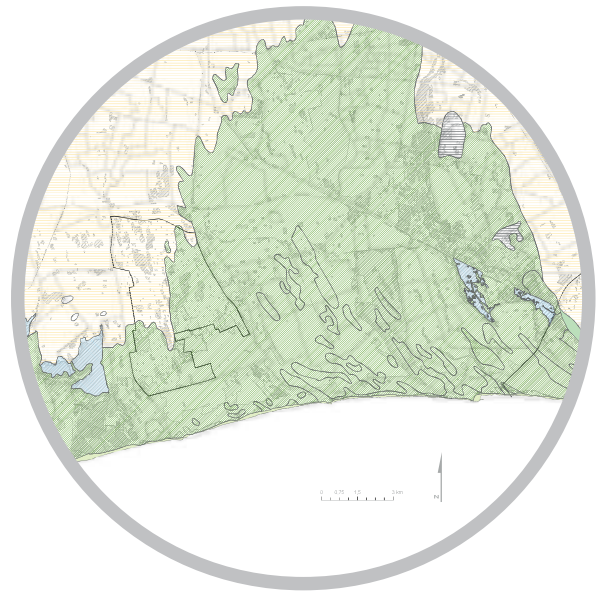
In a once pristine natural zone, but now under immense commercial pressure, the aim remains to strive towards re-establishing balanced land use for a sustainable future.

# STUDY OF THE HISTORY OF THE STUDY AREA

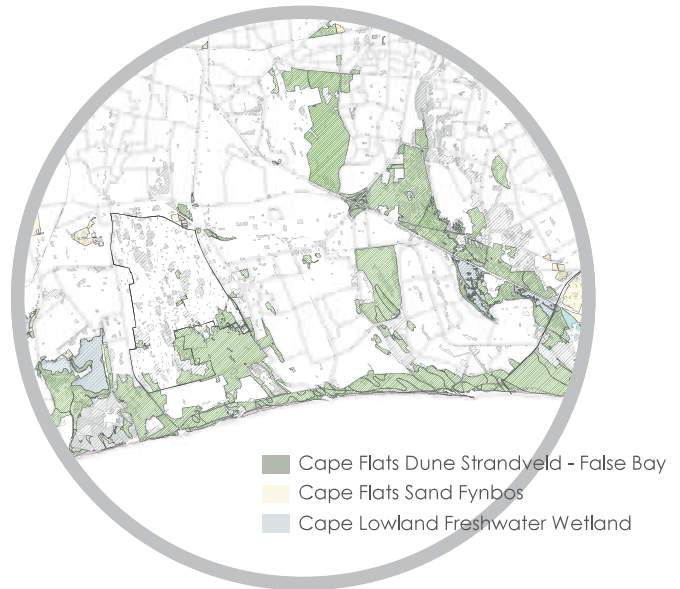
5000 AD	Khoikhoi Nomadic existence Living of the land
1652	Dutch settlers Trading Post Wild Almond hedge
1811	J Burchell Deep sand of Cape move at will before the winds. Travelling difficult.
1827	Import wattle Australien plants imported to stabilise the sand. Ecological havoc.
1877	German farmers Develop ways to farm on sand- dunes.
1950	Group Areas Act Forced removals and new settlements on Cape Flats.
1994	Migration Migration laws lifted. CT popula- tion doubles in next 20 years
2002	Food price spike 80% of CT popula- tion considered food insecure.
2007	CT Urban Agriculture Policy Formally recognizes Urban Agriculture. Land use rights
2002- 2007	Land loss 76% High potential agricultural land lost to low density housing.
2016	Food basket 80% of CT vegeta- bles grown in PHA



REDUCTION OF RURAL ZONE



HISTORICAL VEGETATION COVER



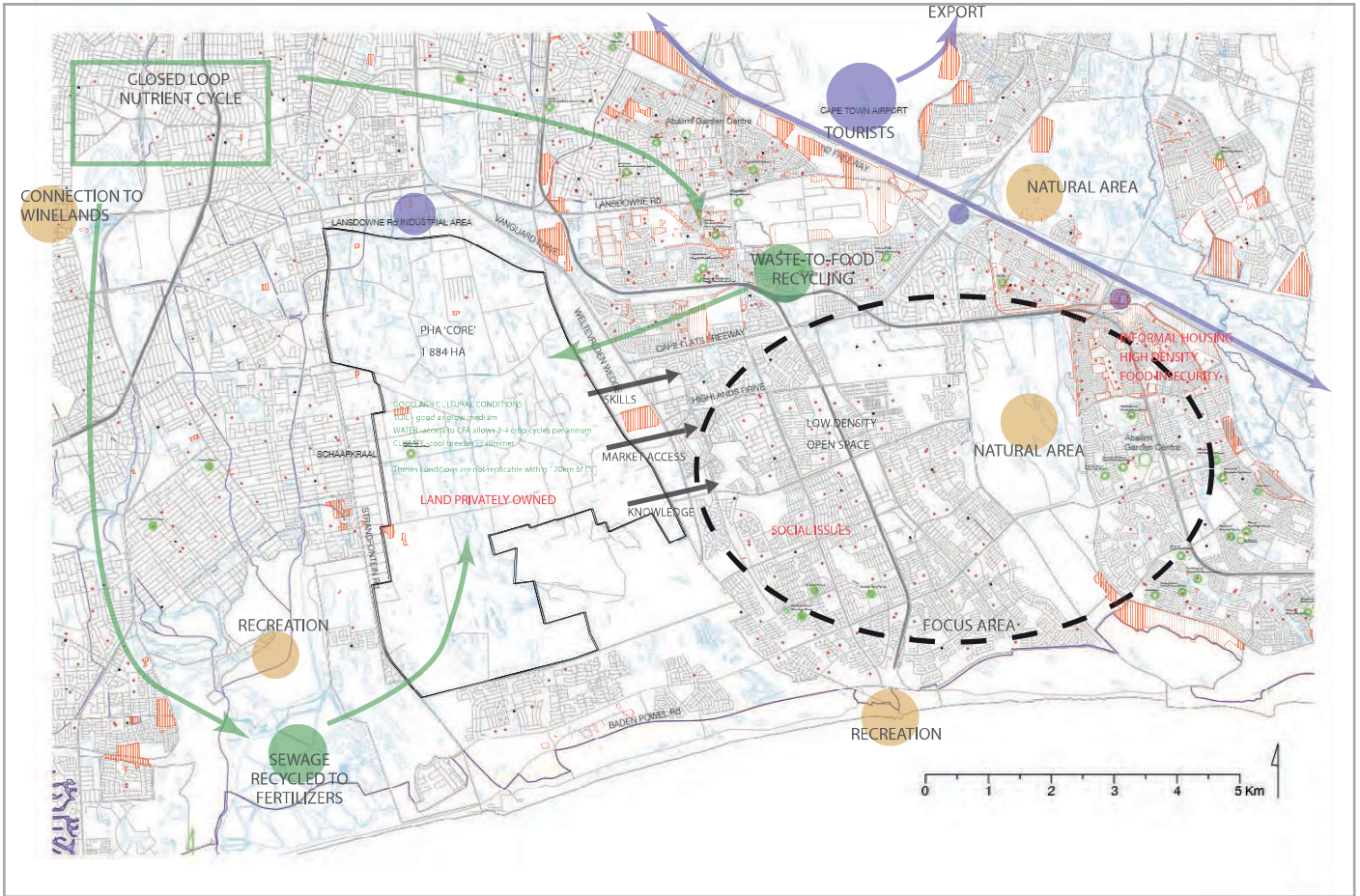
CURRENT VEGETATION REMNANTS



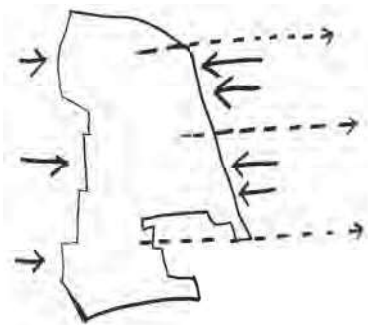
REMAINING DUNES

TIMELINE INDICATING EVENTS ON CAPE FLATS

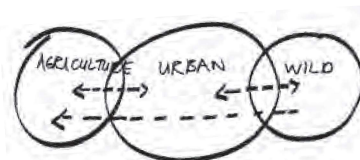
# ANALYSIS AND CONCEPT DEVELOPMENT



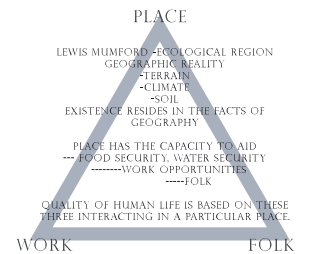
## DIAGRAM HIGHLIGHTING ISSUES WITHIN STUDIED URBAN SETTING



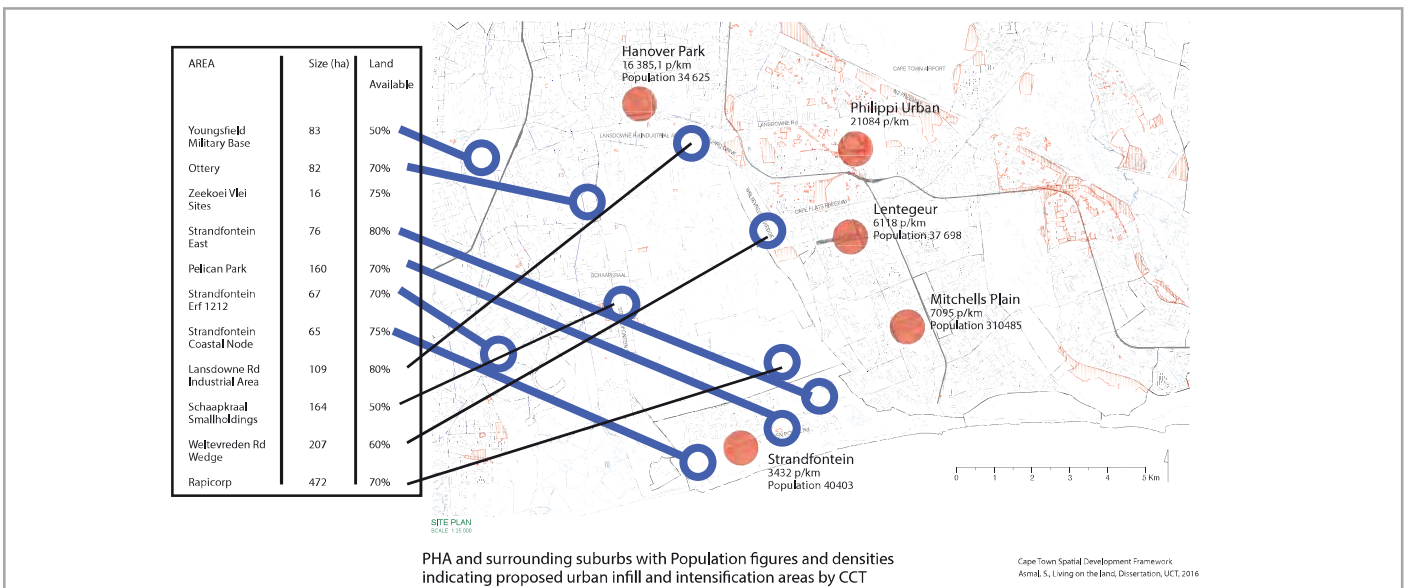
URBAN SPRAWL INTO RURAL SPRAWL



POTENTIAL CONNECTIONS



LOOKING AT MUMFORD'S 'ECOLOGICAL REGION', 1920

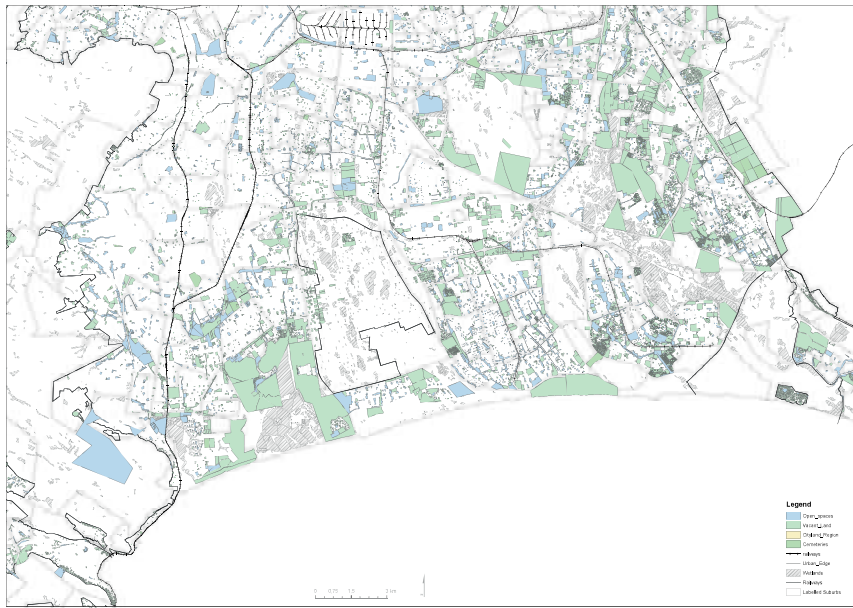


PHA and surrounding suburbs with Population figures and densities indicating proposed urban infill and intensification areas by CCT

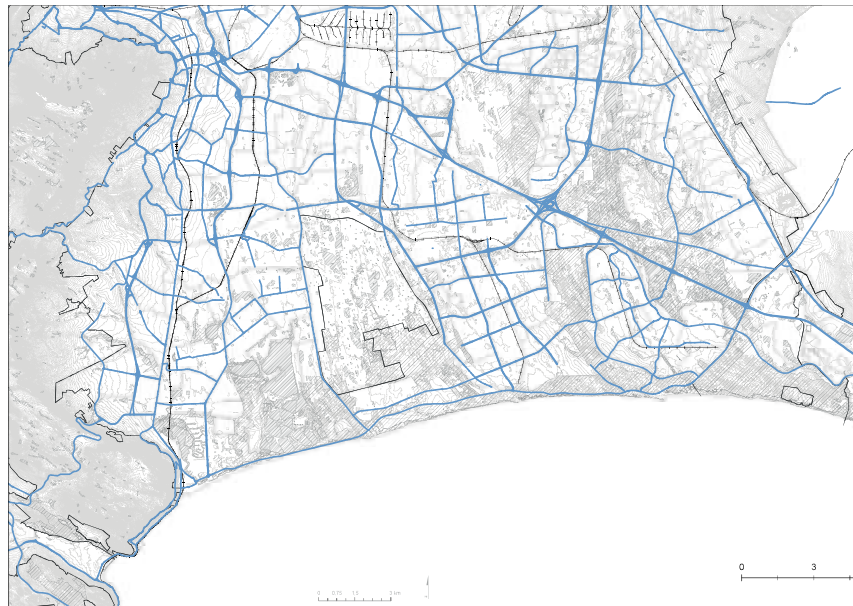
Cape Town Spatial Development Framework  
Arnold, S., Living on the Land, Dissertation, UCT, 2016

## PROPOSED DEVELOPMENT ZONES AND CURRENT POPULATION DENSITY

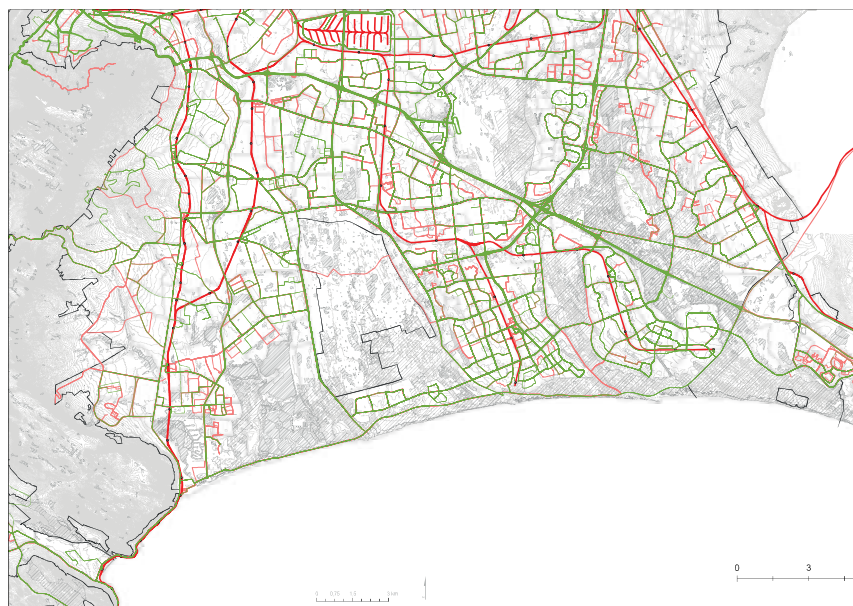
# SITE ANALYSIS



OPEN SPACE

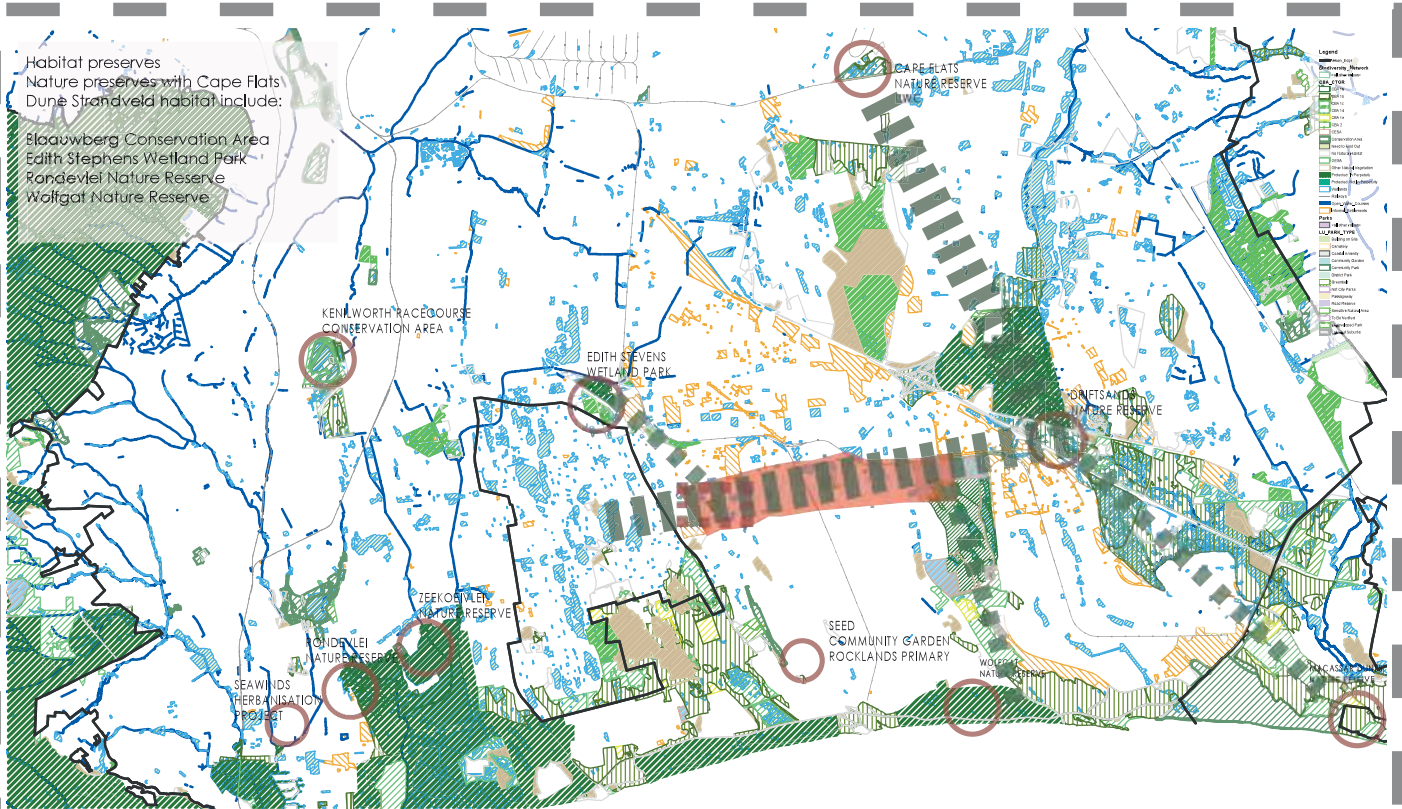


MAJOR ROADS



PUBLIC TRANSPORT

# ECOLOGICAL ANALYSIS



## CONNECTIVITY ANALYSIS

The Importance of backyard habitat in a comprehensive biodiversity conservation strategy was done based on a model by Rudd based on the Green Links project in Vancouver..

Ecosystem fragments remaining in cities are far more important than their limited size and disturbed state might suggest (Gilbert 1987; Schaefer 1994). In fact, habitat fragments contribute significantly to the viability of the greater ecosystem as part of metapopulations—assemblages of local populations that are connected by migration (Hanski & Gilpin 1991). It is clear from metapopulation theory that the greater the number of patches and the closer they are, the better the colonization (Hanski & Thomas 1994). Seed dispersal and wildlife movements are key processes in determining the survival of metapopulations. Such movements are directly related to the connectivity of the landscape (Schippers et al. 1996).

Preserving parks is only part of the solution. Without connections between them, isolation and loss of genetic diversity is imminent (Hobbs & Saunders 1990). Green corridors, utility rights-of-way, and backyard habitat are important parts of urban planning, because they increase biodiversity in cities and improve the quality of life for all residents. They increase opportunities for wildlife viewing, human relaxation and education, and controlling pollution, temperature and climate, erosion, and noise (Adams & Dove 1989).



**Approach:**  
Identify the biggest nodes. Smaller nodes will become part of the corridors between the major nodes of the network.  
The small distances between nodes enables the large number of links to be created through backyard habitat enhancement, forming a matrix of pathways through the zone.  
This high degree of connectivity is just as important to maintain regional biodiversity as are the sizes and or number of

**Metapopulation zone:**  
A zone is an area bounded by major physical barriers to the migration of flora and fauna. Barriers include major roads and highways. Zones contain a variety of green spaces referred to as nodes.

**Nodes:**  
For this study green spaces include all parks, green corridors and road reserves.

**Mother node:**  
Large green spaces that have a greater influence over satellite nodes. Usually one mother node within a green zone. The Denel site was chosen as mother node.

**Satellite nodes:**  
Smaller green spaces that act as peripheral habitat.

Nodes provide important peripheral habitat to species in the mother node. Satellite nodes are partly or entirely dependent on individuals immigrating from the mother node.

As the urban environment becomes increasingly more fragmented, satellite nodes are getting smaller and farther away from the mother node, making dispersal even more difficult. As a way of preserving the biological integrity of a landscape, corridors and habitat matrices must be in place to allow dispersal between green spaces.

**Mother Node: Denel Site**  
Critical Biodiversity Area (CBA) 1a.

All wetlands on site have been classified as Dune Strandveld Isolated Depressions – a highly threatened ecosystem type and hence their high priority for conservation (Snaddon and Day 2009).

This habitat is largely unimpacted and provides diverse seasonal wetland habitat characteristic of strandveld wetlands on the Cape Flats. The topography of the Denel site is largely natural.

# HETEROGENEITY

## DUNE HABITAT CHARACTERISTICS:

The characteristic shape of a dune is determined by a variety of factors such as wind, waves, and vegetative growth. As a dune begins to form, it takes on a characteristic shape in relation to the prevailing wind. A prevalence of south easterly winds led to the formation of the dunes on the Cape Flats.

Dunes formed are parallel or at right angles to the wind direction depending on wind strength. The windward slope is generally more gradual than the leeward slope.

Vegetation increases surface roughness, reduces wind velocities to below the threshold velocity for sand movement, and succeeds in trapping sand.

An obstacle such as a mound or hillock will produce wind reductions for great distances to the lee of the obstacles and a short distance in front.

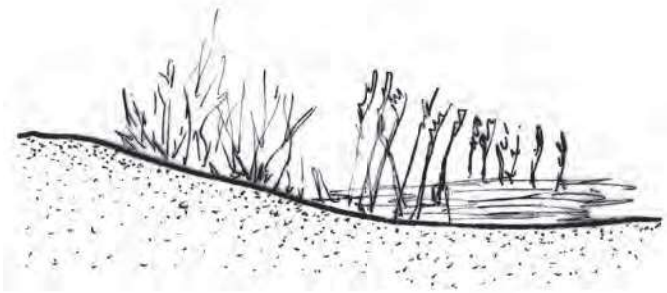
Removal of all or a part of a dune will restrict the types of plants able to reestablish on the dune. Reduction of dune height will result in lower humidity, higher winds, more sunlight, and greater temperature extremes. In effect, leveling a dune **homogenizes** the ecosystem allowing less diversity of plants and animals.

Dunes create a series of microenvironments by differences in temperature, moisture, and light intensity within the sand dune ecosystem.

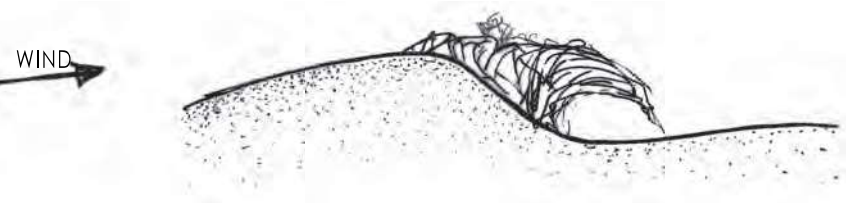
Examination of these small environments is essential to a clear understanding of the 'whole' ecosystem. The diversity of organisms in sand dune areas is made possible by the variety of habitats found in relatively small areas. Any alteration of the dune which homogenizes the ecosystem will allow less diversity of plants and animals.

Depending on the orientation of the dune, variations will exist in the vegetative cover, sunlight intensity and winds. Microclimatic differences on the dune are evident on 1) dune plateau; 2) solar slopes; 3) shade slopes; 4) windward slopes; 5) leeward slopes; 6) intermediate slopes; and 7) dune hollows (33). In addition, various topographic differences among dunes, i.e. blowouts, hummocks, pathways, etc., lead to different conditions within the same general area of the dune environment. This variety of microenvironments allows for a diversification of species that would not be expected in a more uniform environment.

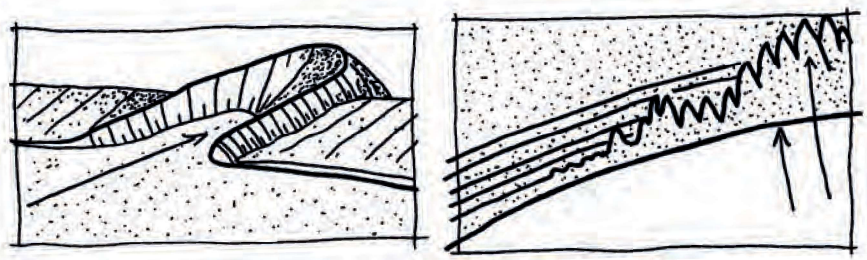
## MICRO HABITAT CREATION:



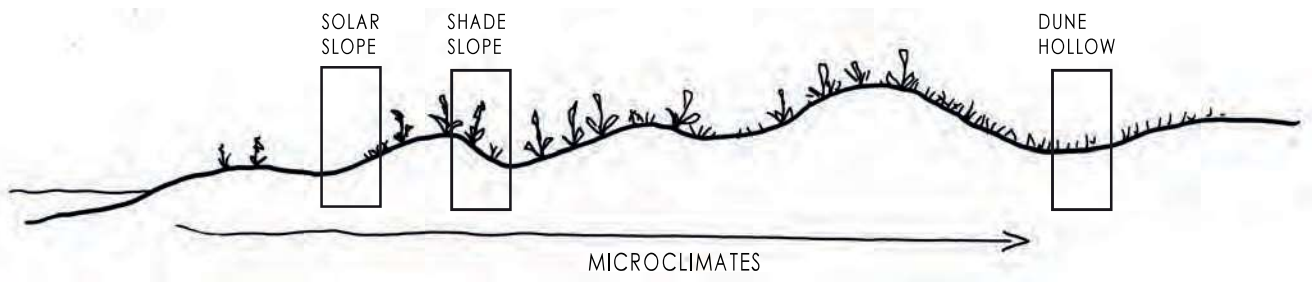
An area of duneslack wetland that is similar in character to Wetland Area



WIND POCKET CREATING HABITAT



LONGITUDINAL DUNE SYSTEM



# WETLAND REMEDIATION

## SEASONAL WETLANDS:

Wetlands within the Denel site comprise high ranking wetlands in terms of relative biodiversity importance.

97% of the mosaic of seasonal wetland habitats that used to be extremely common on the Cape Flats have mostly disappeared, making them highly threatened systems.

Support rare plant and animal species that are highly adapted to these unpredictable and stressful conditions.

## HABITAT DESCRIPTION:

Cape Flats Dune Standveld vegetation type.  
North-West to South-East aligned dunes.

Extensive areas of seasonally saturated or inundated duneslack wetlands.  
Calcareous sands of marine origin.

Imperata wetlands provide habitat that supports a number of endangered faunal species.

Extensive swathes of seasonally inundated and saturated mosaic duneslack wetlands.

## FLORA:

The grass, *Imperata cylindrica* is the most common plant species associated with the wetlands.

Seasonally inundated wetlands:

Wetter areas support stands of *Cladium mariscus*, *Falkia repens*, *Centella asiatica* and *Juncus capensis*. Also, patches of *Elegia tectorum*, *Capeochloa cincta*, *Ficinia nodosa*, and *Typha capensis*.

Seasonally saturated wetlands:

Swathes of *Imperata cylindrica*, with patches of *Ficinia nodosa*

Wetland area 4 has been impacted by sand mining activities in the past. Vegetation characteristic of this region include wetland plants typical of transitional areas such as *Senecio halimifolius*, *Nidorella* sp. and *Searsia (Rhus) laevigata*. Despite loss of habitat integrity in this area, this habitat may still provide an important corridor function linking wetlands on the site to that further south.

Other plant species identified along the drier outer margins included arum lilies (*Zantedeschia aethiopica*), *Senecio halimifolius* and *Nidorella* sp.

*Imperata* wetlands support the endangered and highly restricted butterfly *Kedestes linis* (Day 2002)



*Elegia tectorum*



*Juncus kraussii*



*Ficinia nodosa*



*Lobelia anceps*



*Falkia repens*



*Cladium mariscus*



*Paspalum* sp



*Schoenus nigricans*

# DUNE REMEDIATION

## PIONEER PLANTS

Low productivity and scarcity of nutrients limits the number of primary consumers that the environment can support.

### Agathosma collina

Mildly aromatic, hardy shrublet  
Feeds bees. Buchus prefer a rather dense planting as this helps to retain soil moisture. Plants require a good watering in winter and only moderate watering in summer.



### Chrysanthemoides monilifera

Stabilises coastal dunes.  
Its fruit is attractive to birds, rabbits, other animals and even some insects such as ants.



### Metalasia muricata

Stabilises coastal dunes.  
Wind and poor sandy soils. This is one of the first plant species to reappear after a fire, and offers shelter to less resilient plants when they emerge after being burnt.



Pioneer animal communities on the dunes such as beetles, burrowing spiders and grasshoppers establish in response to the changing plant communities on the dune.

Plant species colonizing one area alter nutrient content, moisture level, and substrate stability

### Rhus laevigata

Small, bushy, evergreen tree

### Rhus glauca

Small tree or bush

### Carpobrotus acinaciformis

Sprawling succulent groundcover, pink-purple flowers.  
Fruits are edible and are used in to make a traditional jam.  
Grazed by tortoises and other herbivores.



The conditions become favorable for new species to establish: succession.

## SECOND AND THIRD YEAR PLANTS

The entire successional series takes hundreds of years to complete.

### Carpobrotus edulis

A pioneer in disturbed sites  
Pollinated by bees many beetle species. Eaten by rodents, porcupines. Shelter for snails, lizards, and snakes.

### Mesembryanthemum

Vygies, scrambling and short lived perennial grows on the lowlands, growing underneath larger shrubs for protection from the harsh sun. Dependent on rain for seed dispersal. Many pollinators. Elevation of mood & decreasing stress.

### Geophytes

Disa draconis  
orientalis

Variety of daisies

Restios

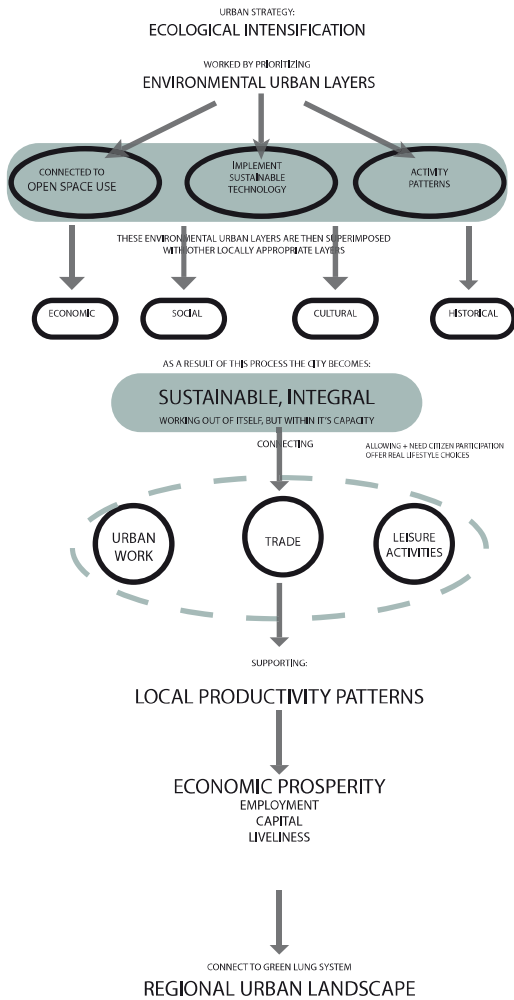
Herbs

greaniums

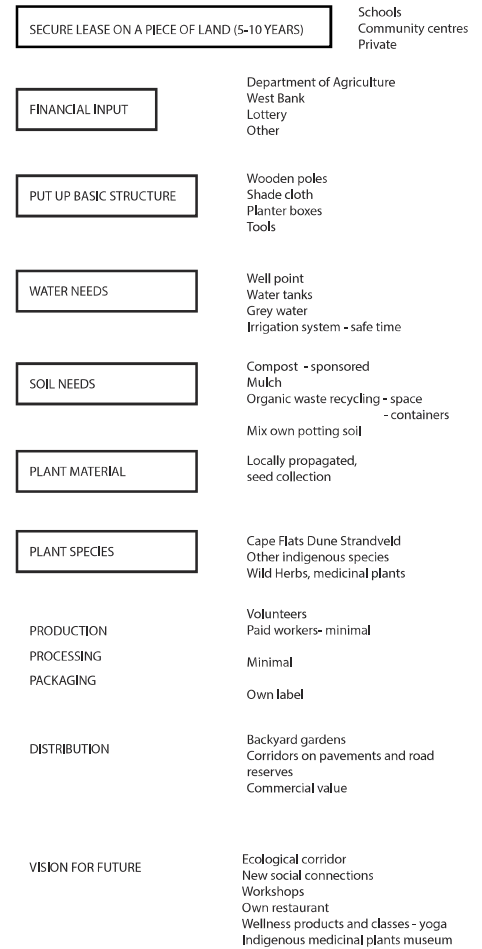


# INTERVENTION STRATEGY

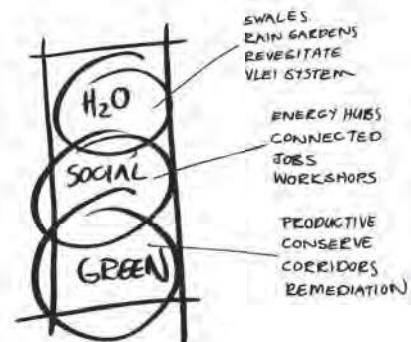
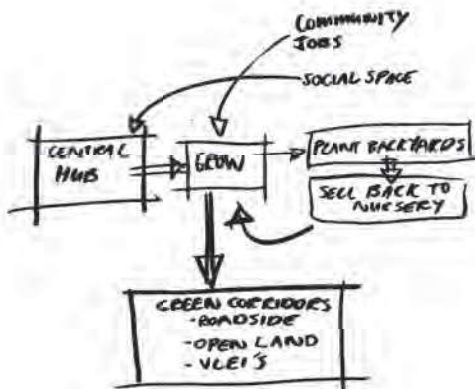
## CONTINUOUS PRODUCTIVE URBAN CORRIDORS



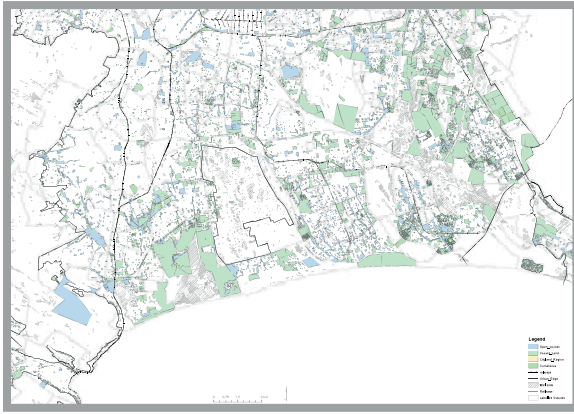
## PROPOSED INTERVENTION MODEL



Author's own developed based on Viljoen et Al.

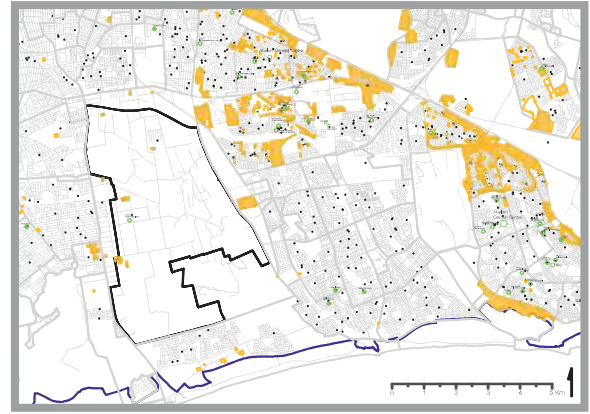


# INTERVENTION STRATEGY



MAP OF EXISTING OPEN SPACE

GIS CITY OF CAPE TOWN 2016



MAP OF EXISTING COMMUNITY GARDENS

GIS CITY OF CAPE TOWN 2016



MAP INDICATING OPEN SPACE TYPES COMBINED WITH SUGGESTED INTERVENTION TYPOLOGIES

## OPEN SPACE TYPES

- |   |                                   |  |              |
|---|-----------------------------------|--|--------------|
|  | EXISTING PARKS                    |  | CORRIDORS    |
|  | ROAD RESERVES                     |  | REMEDIATION  |
|  | LAND ASSOCIATED WITH INSTITUTIONS |  | CULTIVATION  |
|  | PROTECTED LAND                    |  | CONSERVATION |

## APPROACH

- |                                    |                       |   |
|------------------------------------|-----------------------|---|
| 01 SOCIAL                          |                       |   |
| a: Existing community gardens      |                       | Potential   |
| b: Existing school schemes         |                       | Need  |
| c: Informal settlements            |                       |   |
| 02 GREEN                           |                       |   |
| a: Ecological                      | Remnants              | Continuous corridors<br>Forman Patch theory<br>Habitat creation<br>Microclimate |
|                                    | Critical Biodiversity |   |
|                                    | Nema Protected        |   |
| b: Productive                      | Existing productive   | Keep agricultural<br>Food security<br>Job creation                              |
|                                    | Potential             |   |
| c: Park space                      | Existing              | Recreation<br>Beauty  |
| d: Future development              |                       |   |
| 03 BLUE                            |                       |   |
| a: Wetlands                        |                       | Flood control<br>Improved water quality<br>Habitat creation<br>Recharge aquifer |
| b: Urban run-off                   |                       |   |
| c: Aquifer recharge                |                       |   |
| d: Sanbi freshwater priority areas |                       |   |

# DESIGN INTERVENTION

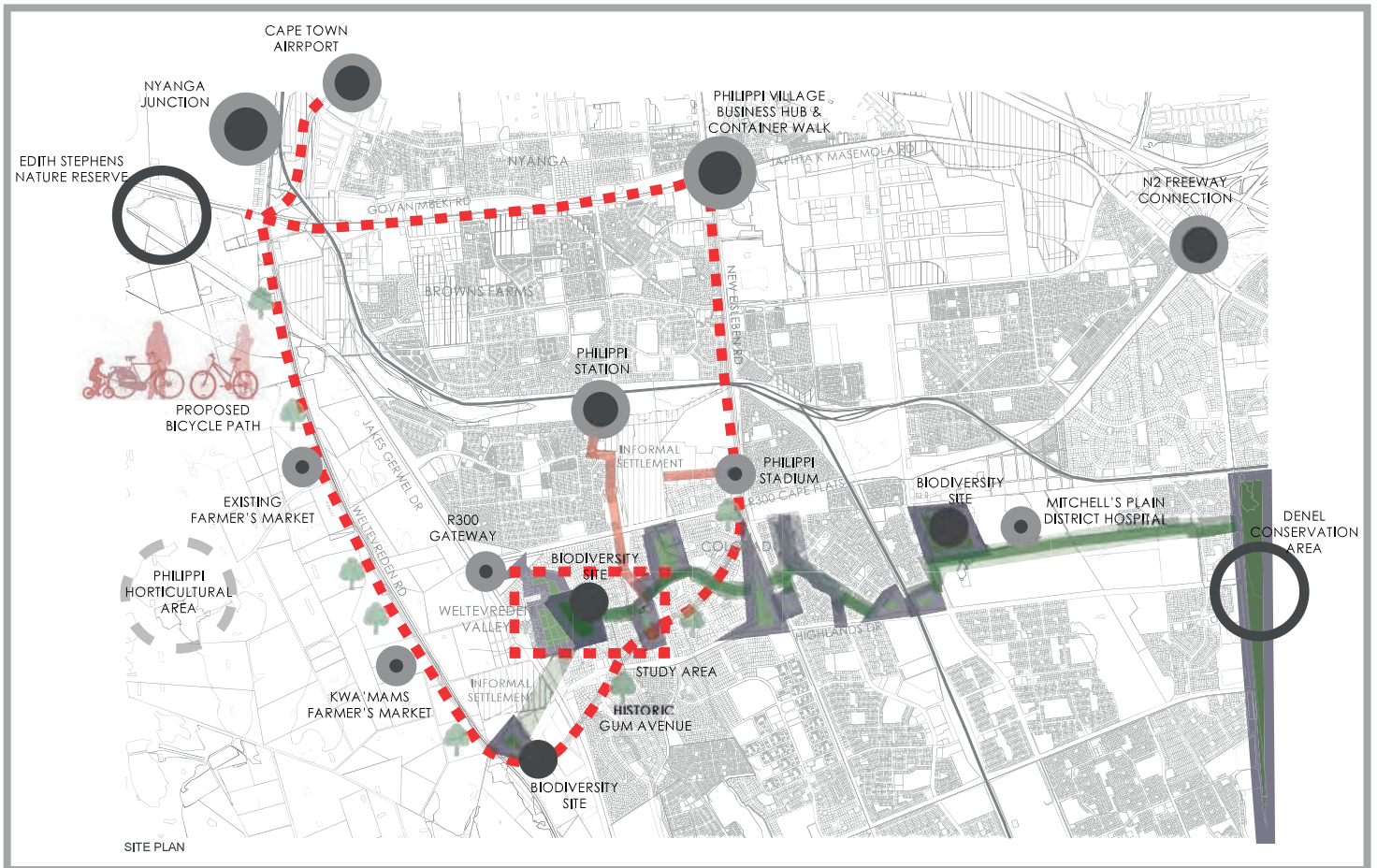
## THE LAND GIVES THE LIVING



1940 MAP SHOWING THE AVENUE



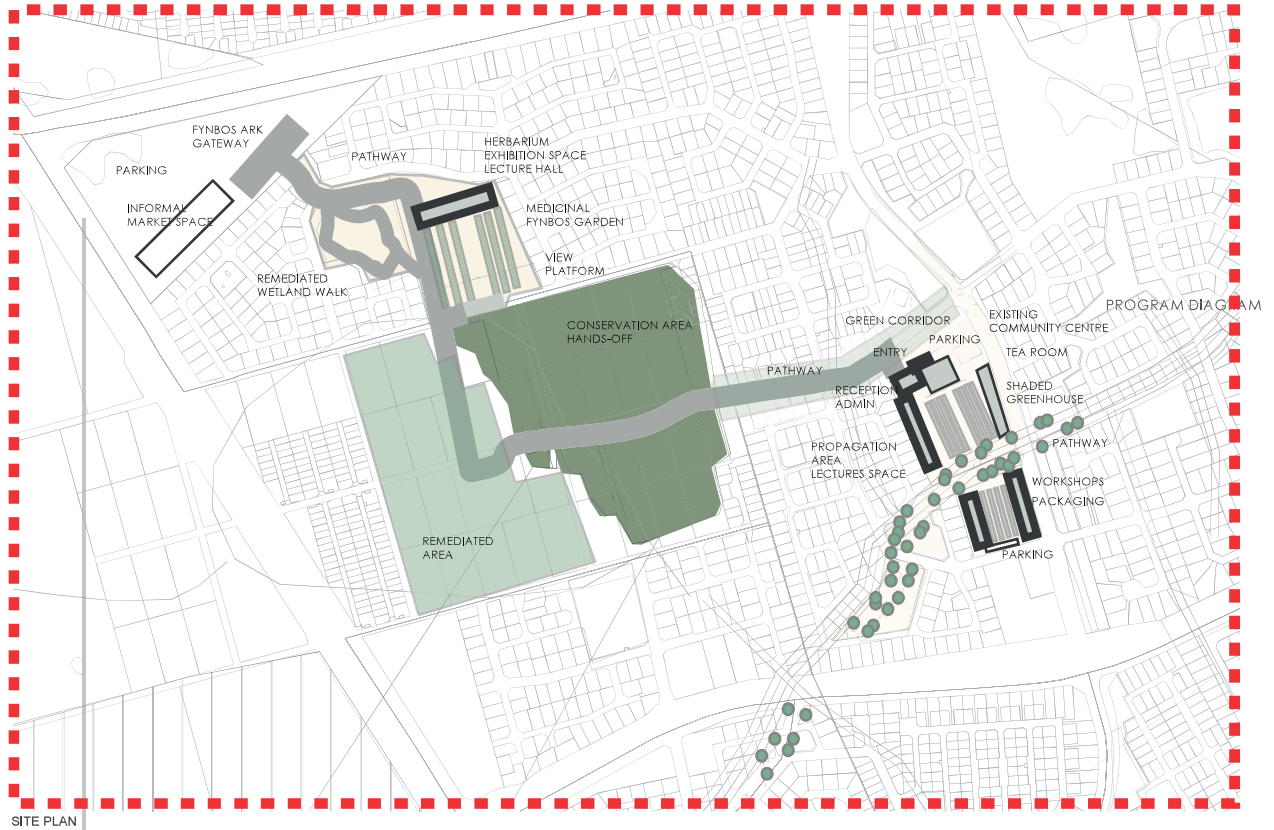
2000 MAP



REGIONAL SCALE INTERVENTION

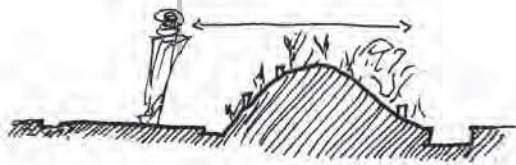
# DESIGN INTERVENTION

## THE LAND GIVES THE LIVING



SITE PLAN

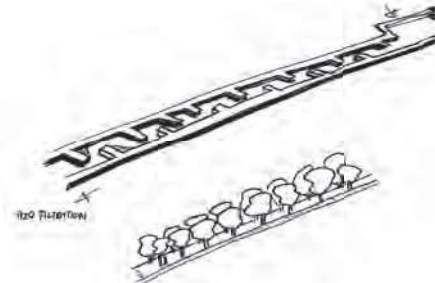
### NEIGHBOURHOOD SCALE INTERVENTION



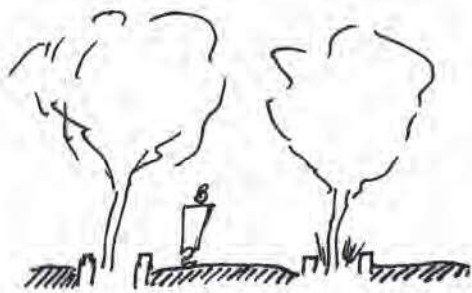
A. MOUND/DUNE



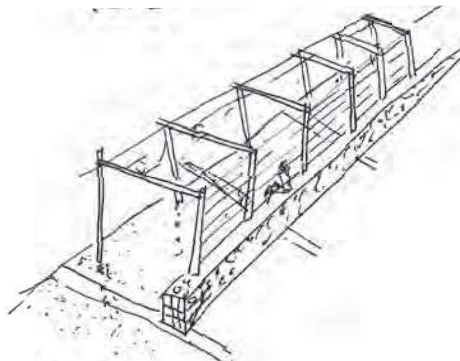
B. CANAL: H<sub>2</sub>O



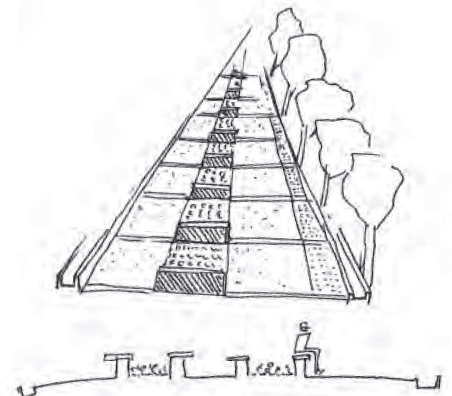
EDWARD AVENUE  
LANDSCAPED WITH 1:20 TOLERANCE  
BIODIVERSITY  
INTERCLIMATE



C. AVENUE



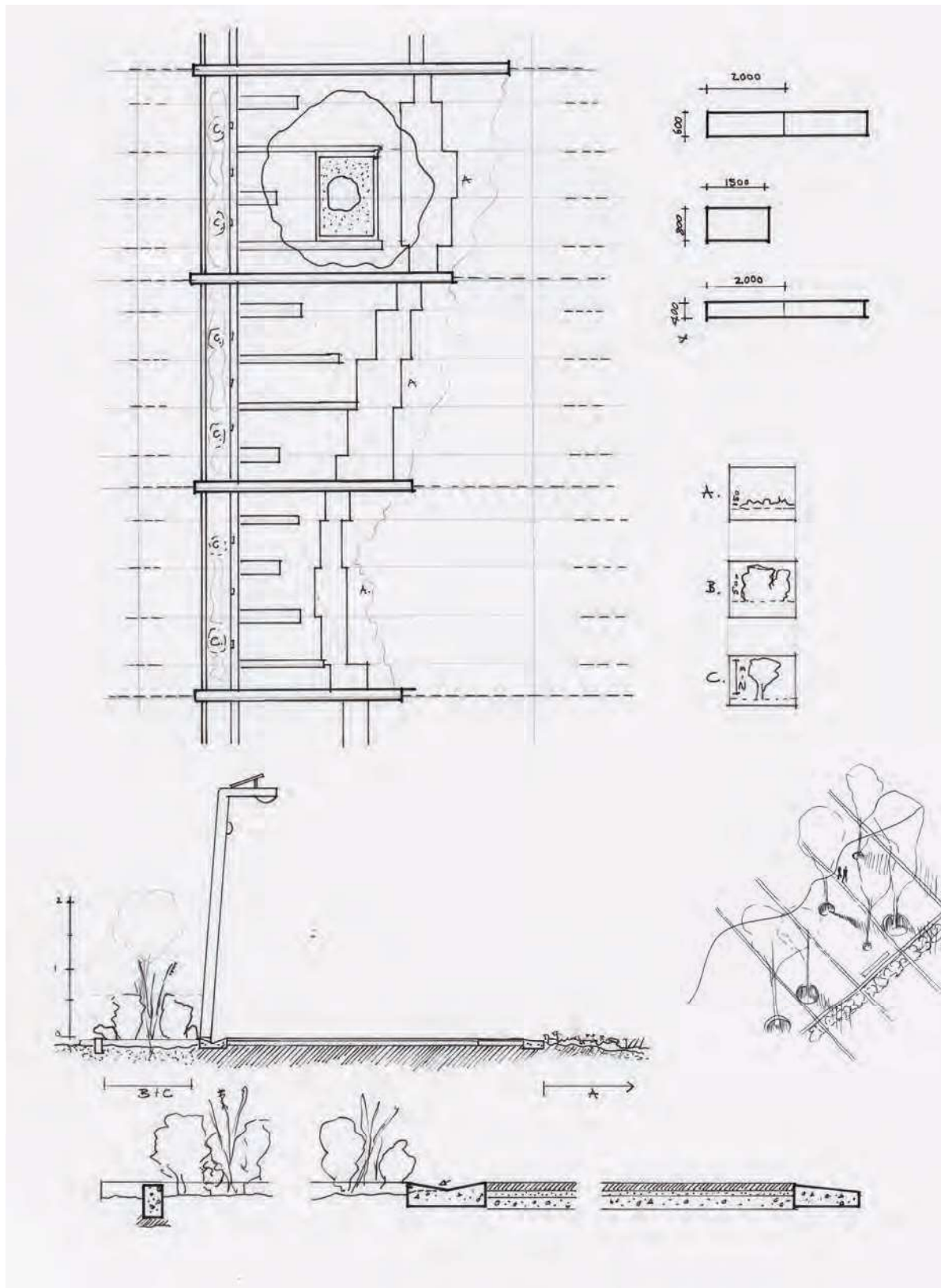
D. TRELLIS WALK



E. ALLOTMENT AVENUE

# DESIGN INTERVENTION

## THE LAND GIVES THE LIVING



## PATHWAY DESIGN

# DESIGN INTERVENTION

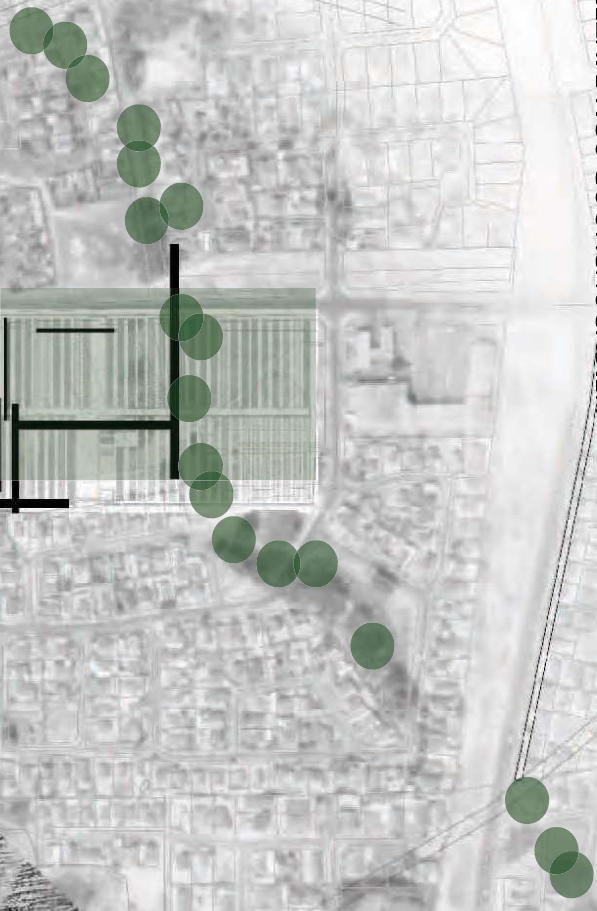
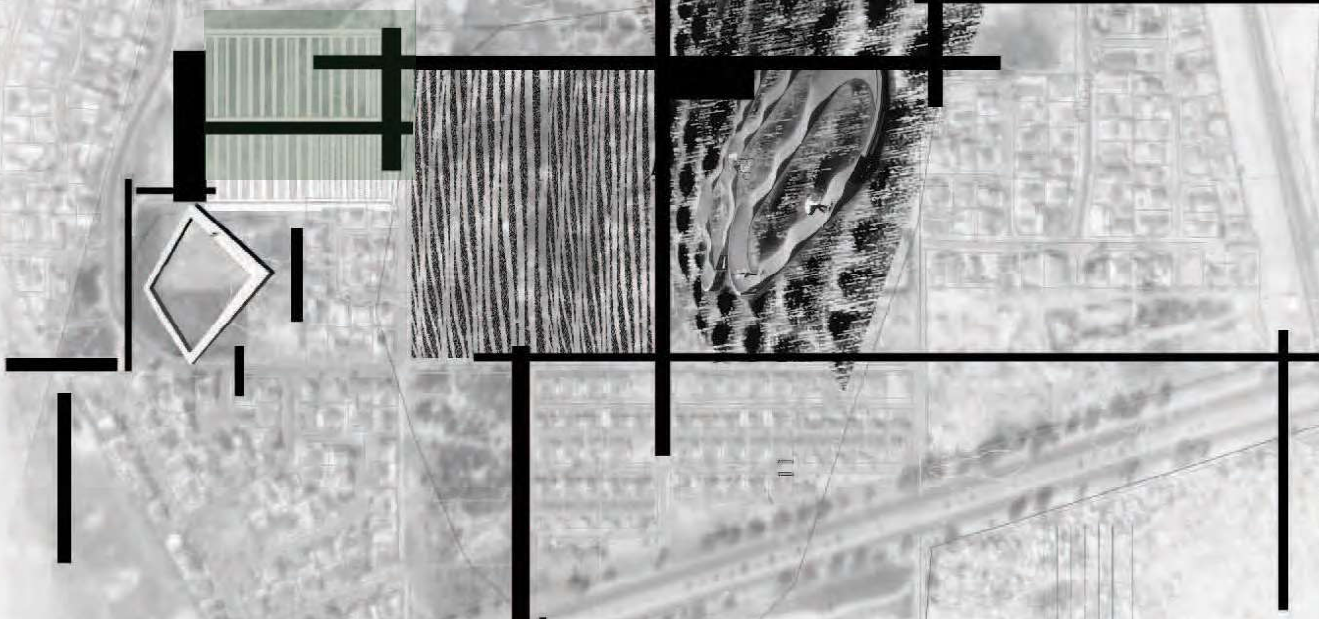


VIEW OF DISTRICT PATHWAY

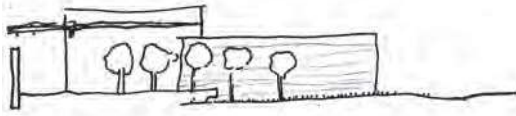


WETLAND INTERVENTION

# DESIGN INTERVENTION



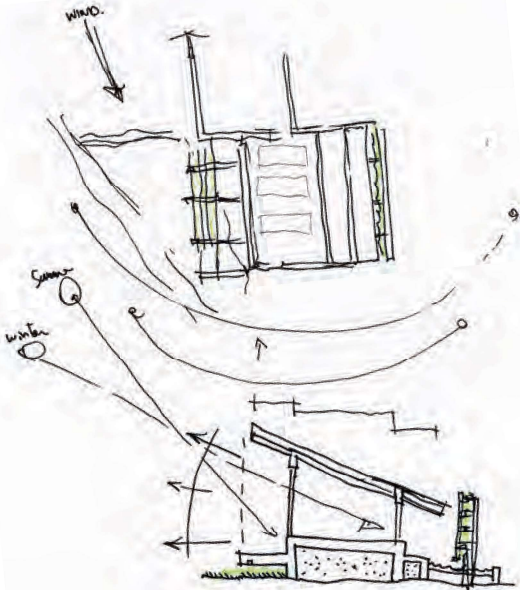
# DESIGN INTERVENTION



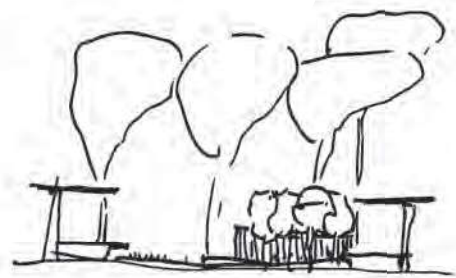
ELEVATION OF ENTRY



HEDGE TYPOLOGY



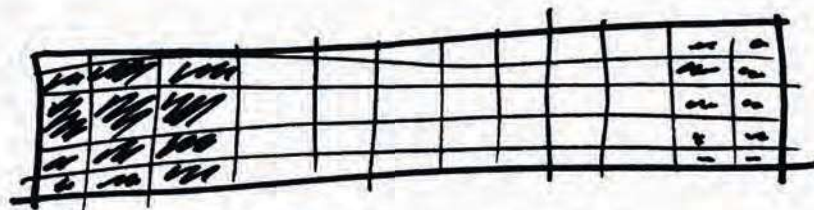
DESIGN OF WORKSHOP SPACE



LOOKING TOWARDS PATHWAY



LOOKING TOWARDS THE CAFE



EXISTING ZONING OF AGRICULTURE, URBAN FABRIC AND CONSERVATION SITES

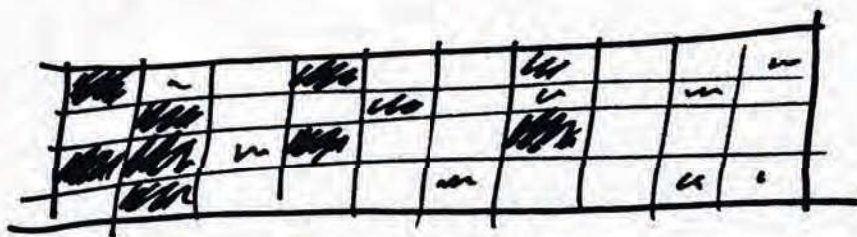
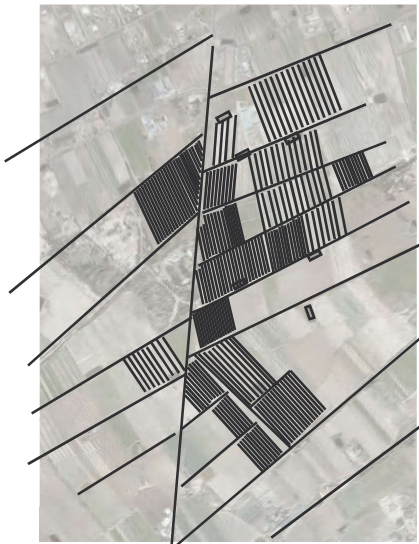


DIAGRAM SHOWING PROPOSED INTERVENTION OF TYPOLOGIES



AGRICULTURAL GRAIN

Design process:

Site selection - Choosing an actual boundary as first step of design process. Here many factors came into play, community involvement is fundamental to the success of the scheme and therefore the existing community centre is used as point of departure.

Environmental factors and heritage farming practices were used as guidelines to design layout.

Investigate the hidden, sensuous qualities of the landscape-phenomenological understanding to develop a sense of place and site specific experience.

The experience of moving through is seen as one of the main programmatic elements.

The aim was to develop different paths, narratives, sequences of events to be experienced on different overlapping routes.

Create a restorative environment, 'a place away.'  
Kaplan: "Small parks can have a sense of intimacy. At 22m people can 'talk with raised voice, and they can see the general outlines of the expression on one another's faces' (Alexander et al. 1977).

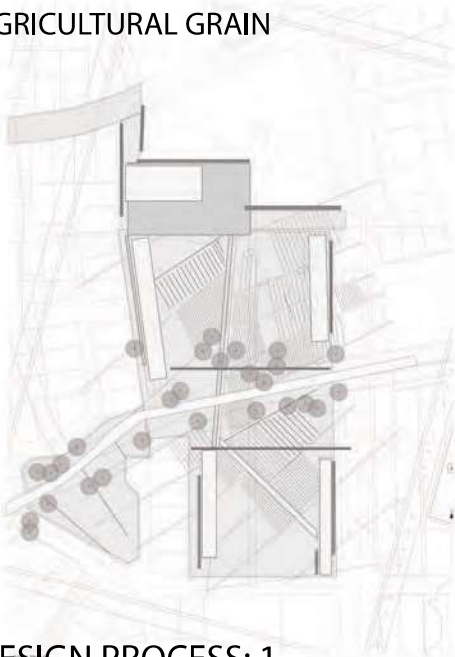
4 Components that are integral to a restorative environment:

Fascination....direct attention can rest

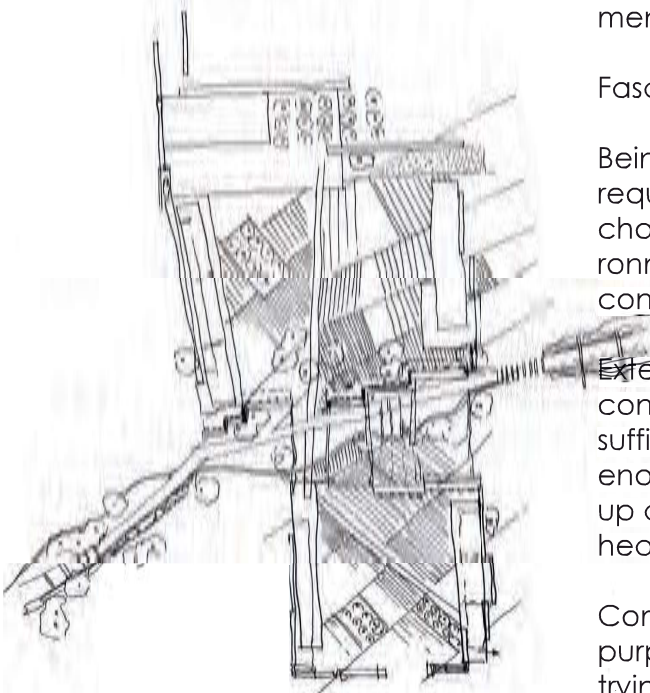
Being away...in principle, frees one from mental activity that requires directed attention support to keep going. A change in the direction of one's gaze, or even an old environment viewed in a new way can provide the necessary conceptual shift.

Extent...be rich enough and coherent enough so that it constitutes a whole other world. "Such space must be of sufficient scope to engage the mind. It must provide enough to see, experience, and think about so that it takes up a substantial portion of the available room in one's head."

Compatibility... between the environment and one's purposes and inclinations.."the setting must fit what one is trying to do and what one would like to do". (Kaplan et Al)



DESIGN PROCESS: 1



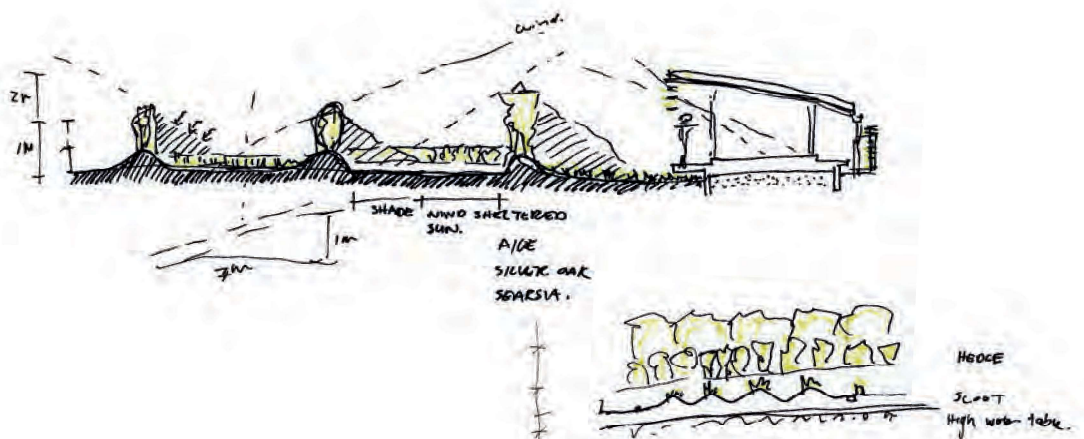
DESIGN PROCESS: 2

# DESIGN INTERVENTION

## THE LAND GIVES THE LIVING



NURSERY: SITE PLAN



SECTION INDICATING WAL, SLOOT AND HEDGE

# DESIGN INTERVENTION

THE LAND GIVES THE LIVING



SITE PLAN SHOWING POTENTIAL FUTURE INTERVENTIONS

# CONCLUSION

Connecting leftover spaces, next to canals and road verges and incorporating existing public open space, with a combination of indigenous plant species and appropriate agricultural produce. The aim is to establish a closer interaction between the constructed and the natural environment, improving living conditions through agriculture while at the same time improving eco system services and improving biodiversity, improving the resilience of the city against climate change while at the same time bringing people closer to nature, decreasing the mental distance between "urban" consumers and "rural" producers.

Addressing social, environmental and economical issues, I argue that the value of urban agriculture is much wider than economical benefit. These corridors become places where productive, social and ecological activities meet. Encouraging interaction between neighborhoods, marketplaces to sell goods, education and creating awareness of our food systems while at the same time addressing infrastructural issues such as incorporating rain gardens. Sustainable urban agriculture is used as catalyst to create social and ecological corridors through the city.

Towards a mosaic of sustainable, regenerative production systems  
As we face climate change, the flexibility of small scale organic farming will be an essential element in achieving long term sustainability

# APPENDIX

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