← WEEK DAYS

waiting for transport home — **Greenwood School**

washing, cooking, sleeping — **homeless community**

washing, selling of food and goods, resting, open outdoor space — **informal settlers**

shelters in proximity providing support for the park community — **Angels of Hope shelter**; **Community Ministres shelter**

WHAT IS THE PARK USED FOR?

shelters in proximity providing support for the park community — **Kopano Manyano shelter**

social gathering, selling of food and goods, resting, open outdoor space — **Townlands social housing** (residents)

open outdoor space, social gathering — **Princes Park Heights** (residents)

lunch spot, resting, meeting and waiting for transport to other parts or out of the cbd — **commuters** (business and retail)

waiting for the next trip, parking, resting, lunch spot, washing their vehicles — **taxi & bus drivers**

WEEKENDS →

WHO IS THE PARK COMMUNITY?

street church goers (outreach programme) — outdoor church services and soup hand outs

New Apostolic Church goers — socialising before and after the church service

homeless community — washing before outdoor church service, open fire cooking at night, sleeping

informal settlers — washing, selling of food and goods

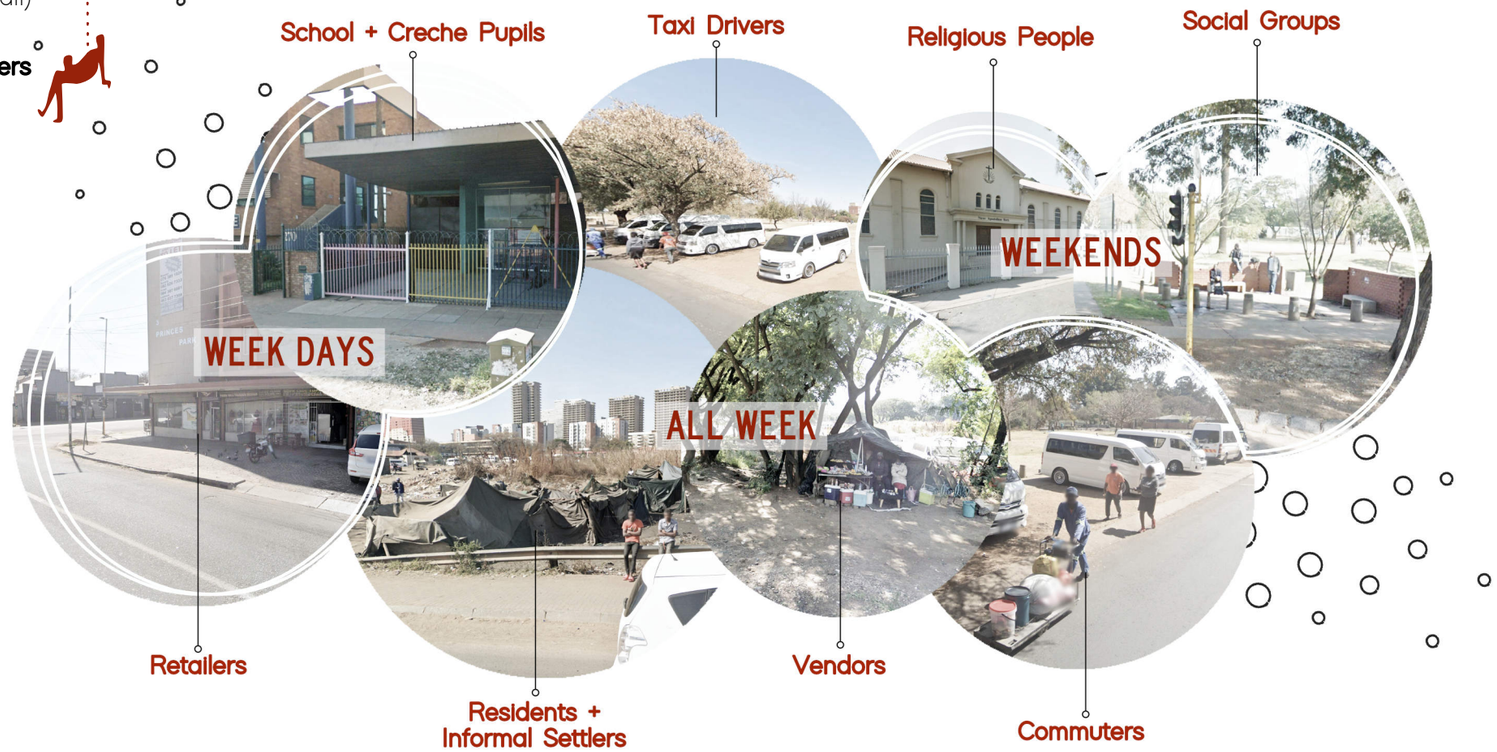
WHAT IS THE PARK USED FOR?

Soccer team — fitness and skills training

friends and families — social gathering, eating and celebrating

commuters — meeting and waiting for transport to other parts or out of the cbd

Police officials (on Francis Baard and Church St) — traffic control stops and license checking



USER PROFILE AND ROUTINES

STAKEHOLDERS

COMMUNITY ENGAGEMENT →

Lessons in Conservation NPO

Ithemba Upliftment Foundation

Royal Schools Prince's Park

existing partnership

founder of

FUNDING →

Nedbank Pretoria Central

Old Mutual Investments

Divercity Urban Property Group

CLIENT POOL

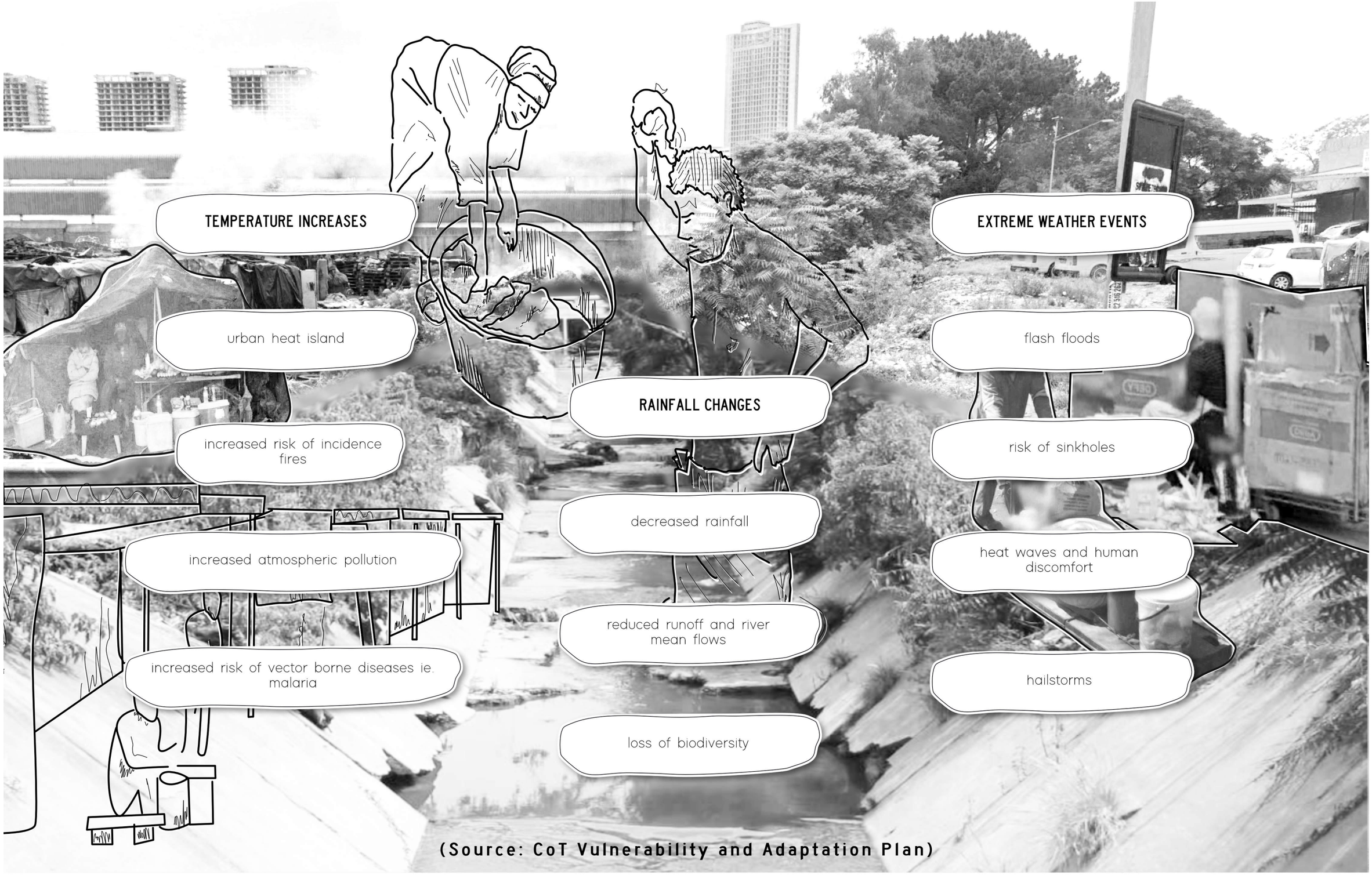
CoT Municipality, Prince's Park Heights (residential complex), Greenwood college (Gr 1-12 school), NAPTOSA House (national teaching union), New Apostolic Church Pretoria Central (place of worship), Cool Kids (Daycare centre), Bearing Agent (car repairs), Timken (auto body shop), PEP Clothing (clothing retail), C de Wet Clinic & Hospital (healthcare) and the Bus Depot.

CLIENTS

- CoT Municipality
- Greenwood college
- NAPTOSA
- var. developers

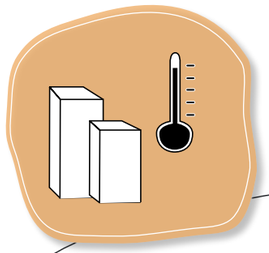
CLIENT AND STAKEHOLDERS

WHERE TWO AXIS MEET



(Source: CoT Vulnerability and Adaptation Plan)

URBAN REALITIES



green infrastructure as climate change adaptation:

- mitigate urban heat island
- reduce flood risks
- improve resilience of the city to climate change

(Bui et al, 2014)

urban green infrastructure benefits:

- human health & well being
- enhancing biodiversity
- mitigate effects of climate change
- improved quality of urban environment

(James et al, 2009)

TOWARDS RESILIENT URBAN ENVIRONMENTS FOR STRONGER HUMAN-NATURE RELATIONSHIPS

multifunctionality of floodplains (restoration and rehabilitation): an ecosystem services approach

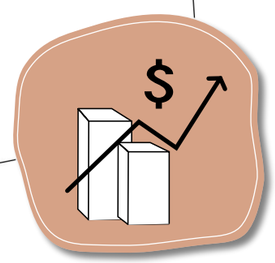
- enhancing supply of provisioning
- regulating and maintenance
- cultural services

(Schindler et al, 2014)

economic valuation of urban green infrastructure

- property value enhancement
- energy savings
- health cost savings

(Kendal et al, 2012)



IMPROVED QUALITY OF URBAN ENVIRONMENT

REPAIRED BIODVERSITY

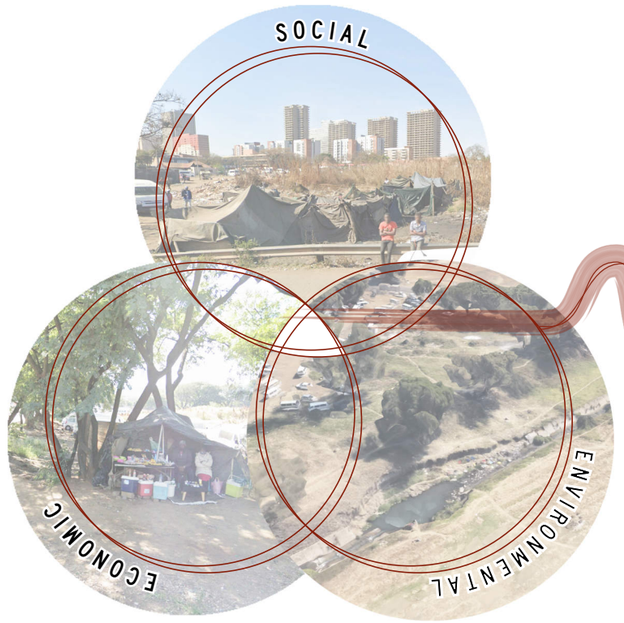
INCREASED PROPERTY VALUE

MITIGATED URBAN HEAT ISLAND

REGULATING BLUE- GREEN INFRASTRUCTURE

SMALL ECONOMY SCALED PUBLIC SPACE

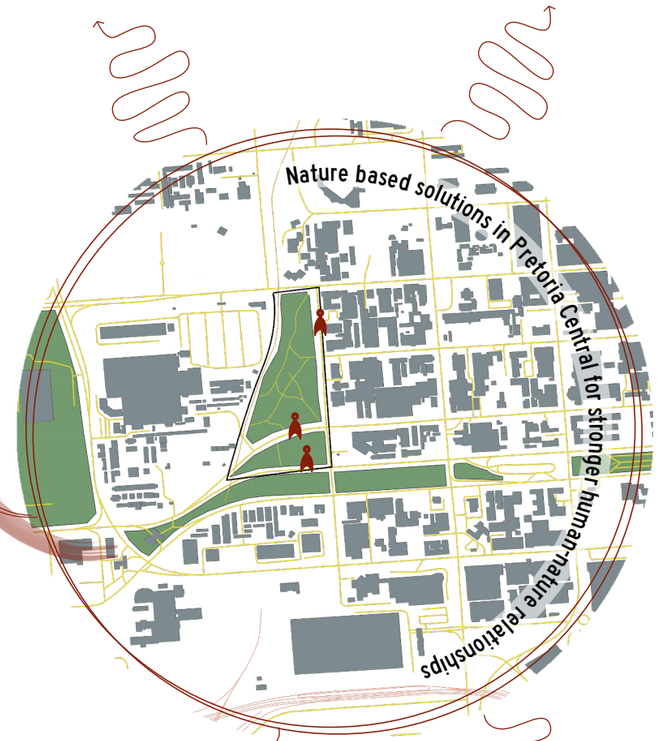
BROADER SPATIAL THEORY TOWARDS DESIGN GOALS

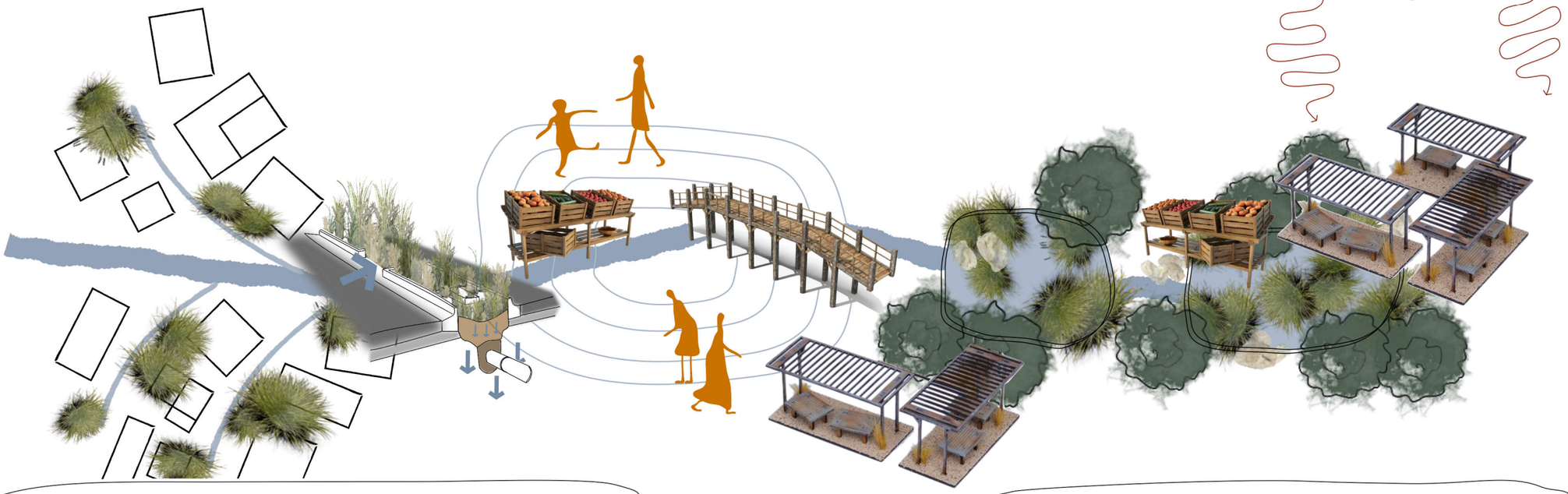


opportunity for development of small urban **ECONOMIES**

awareness of **ENVIRONMENTAL** protection

effective **SOCIAL** impact to reconnect nature and the community





ecological spine hosting and supporting **economies**

local **small**

towards **urban ecological resilience** and strengthened **human-nature relationships**

EARLY VISON DEVELOPMENT

1 Which human-nature relationships exist in the South African urban context and what influences these relationships locally?

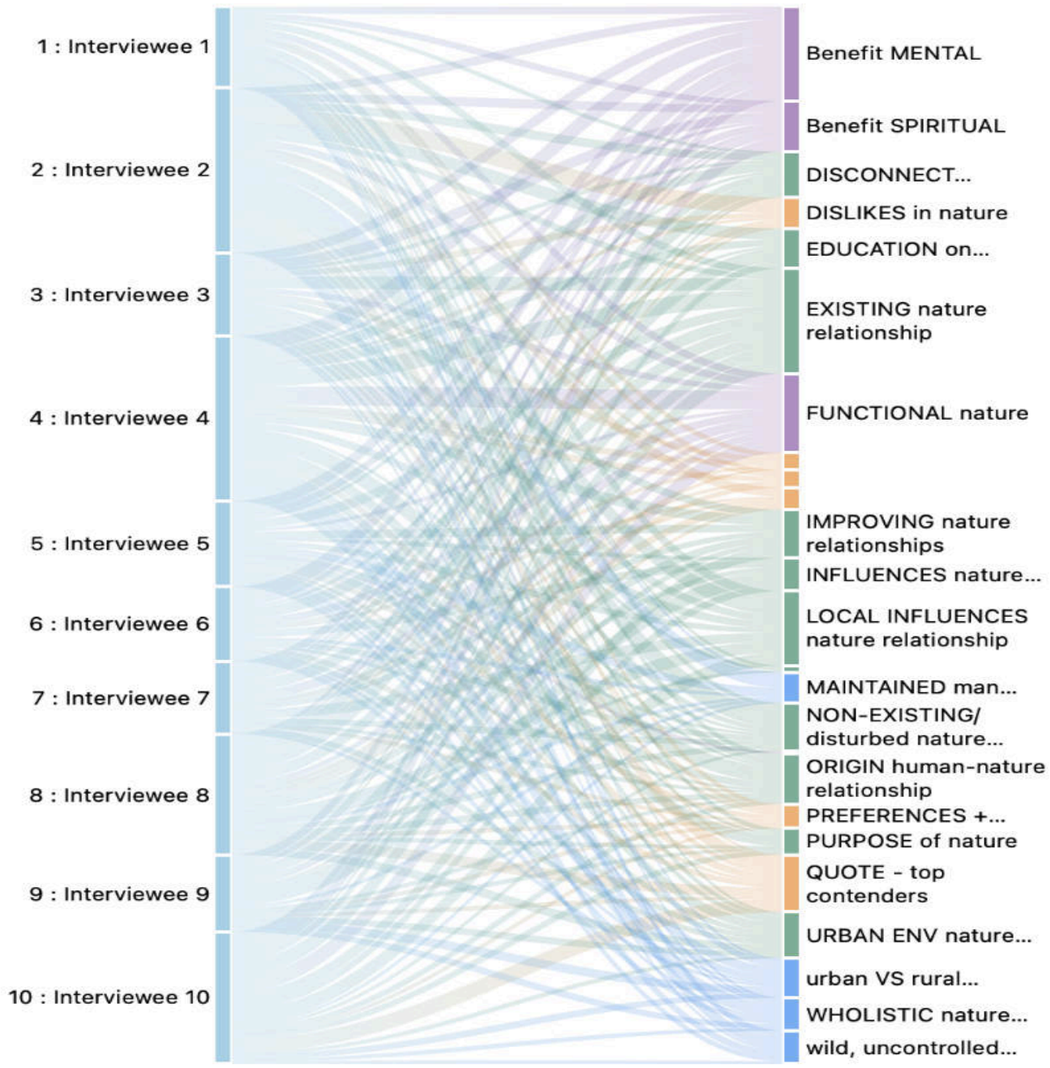
2 Which physical environmental and/or demographic aspects inform the functional nature relationships and priorities in the City?

1 Research Question

- ***1. The value of nature***
- ***2. Community influences, indigenous and family identities***
- ***3. Governmental nature relationship influences***

2 Research Question

- ***4. Education and awareness of nature***



nature relationships

community influences

childhood exposure

human nature disconnect

How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?

economy over environment

accessibility

knowledge and awareness

governmental influence

COT FIELDWORK RESEARCH

adressing climate change in Sub-Saharan African cities:

- requires community enablement and co-management of urban spaces

- Low-carbon solutions - lower capital costs - higher local job creation - easier to maintain when built on local knowledge

(Lemaire, 2021)

towards resilient cities:

- a healthy city implies a closer contact with nature through biophilic design and biomimicry

- the recognition of urbanity as the creation of commons

(Chatterton, 2019)

nature based solutions towards:

actions to protect, sustainably manage, and restore natural and modified ecosystems that address societal challenges effectively and adaptively, simultaneously benefiting people and nature.

(International Union for Conservation of Nature, 2020)

green economy in the cbd:

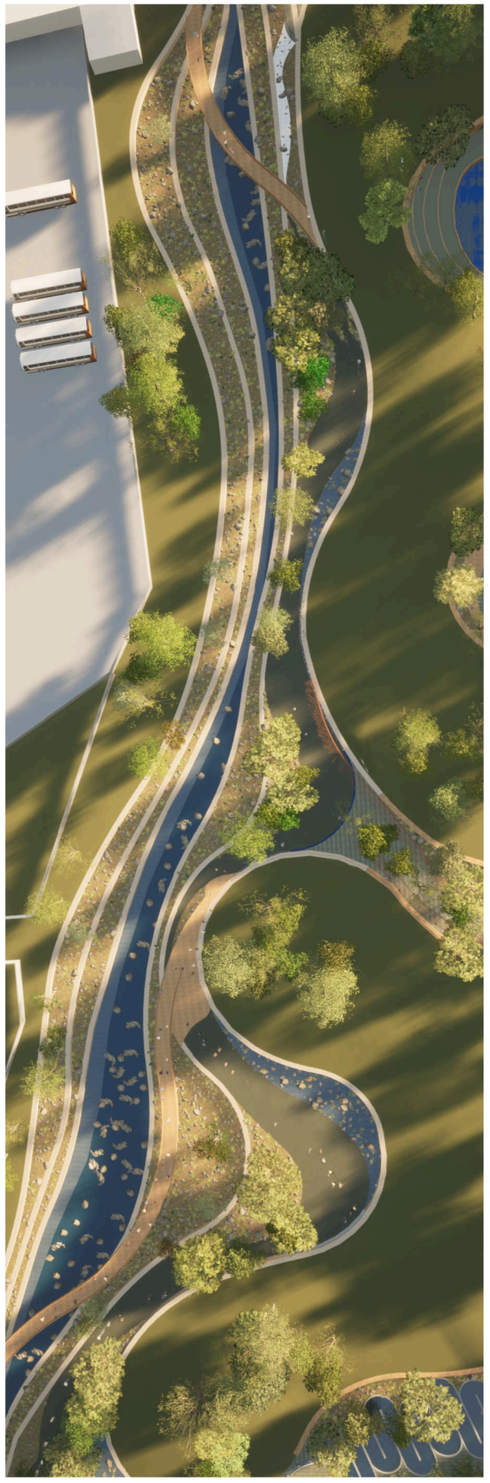
- green space improves an area's image - attracts high value industries, new business start-ups, entrepreneurs and workers (NENW, 2008)

- create new jobs, limit the environmental impact of towns and cities, and capital city cost savings of 15 to 80% (SDC, 2010) + (LID, 2007).

- study in Turkey - a 100hectares park can lower city air temperature detectable up to 4km away

(Bayram et al., 2012)

FOCUSSED DESIGN QUESTION THEORY



URBAN CHALLENGE

degrading river channel infrastructure

river access and safety

unmanaged water runoff

invasive specie domination

rising urban heat

weather-exposed produce sale tables

vulnerable infrastructure and homes

temporary gazebo vendor stalls

trolley vendors inbetween cars

limited accessibility of existing vendor stalls

THEORY

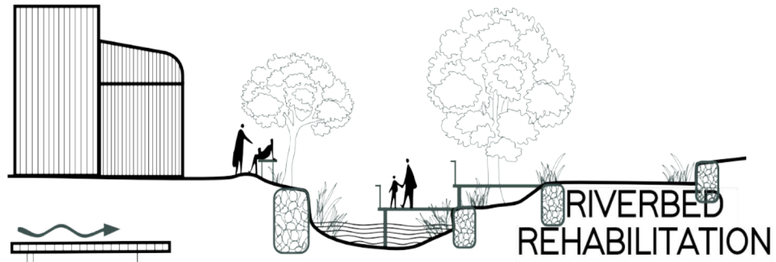
RESILIENT CITIES
(Chatterton, 2019)

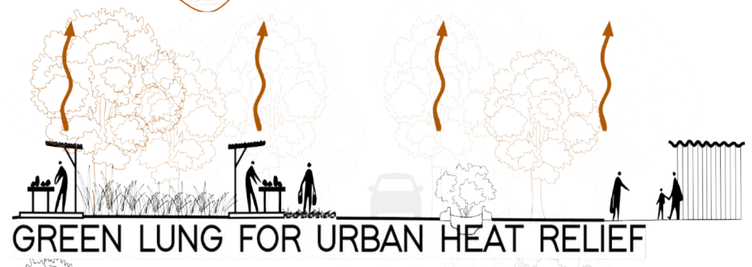
SUB-SAHARAN CLIMATE CHANGE ADAPTATION
(Lemaire, 2021)

NATURE BASED SOLUTIONS
(International Union for Conservation of Nature, 2020)

GREEN ECONOMY
(Bayram et al., 2012)

SOLUTION / PROPOSAL





THEORY INFORMING DESIGN DECISIONS | SUMMARY

OPEN GREEN SPACES

nature based solution

working with residents of the informal settlement of Kibera

meet their physical, social and economic needs.

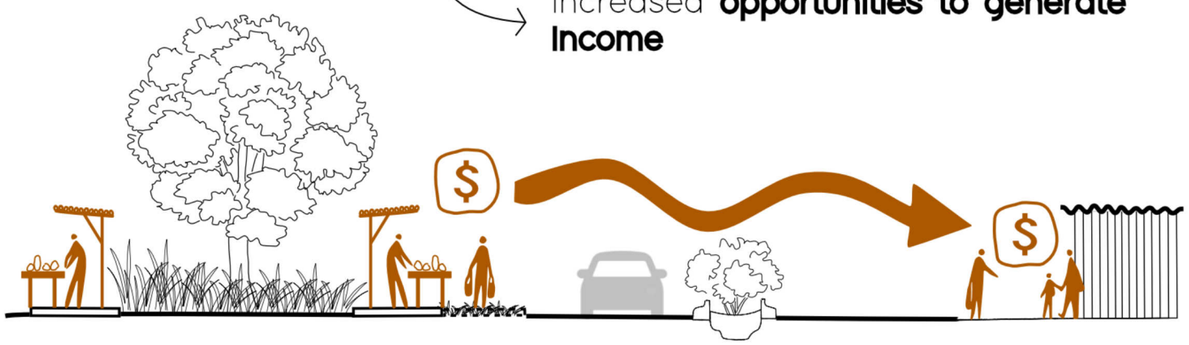
design and activate a network of Productive Public Spaces

using **local materials** and construction processes

safe environment

cohesive community

increased **opportunities to generate income**



DESIGN DEVELOPMENT | PRECEDENTS

NATURE CONNECTIONS

biodiversity as a key entry point for connecting people to the urban river system

improving water quality through litter traps, filtration and slowing the water flow

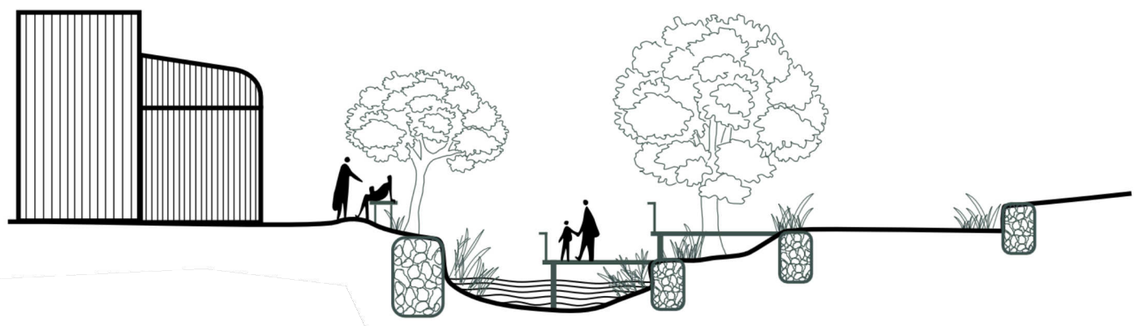
slower water flow for reintroduced biodiversity and habitat creation

bring people closer to the river

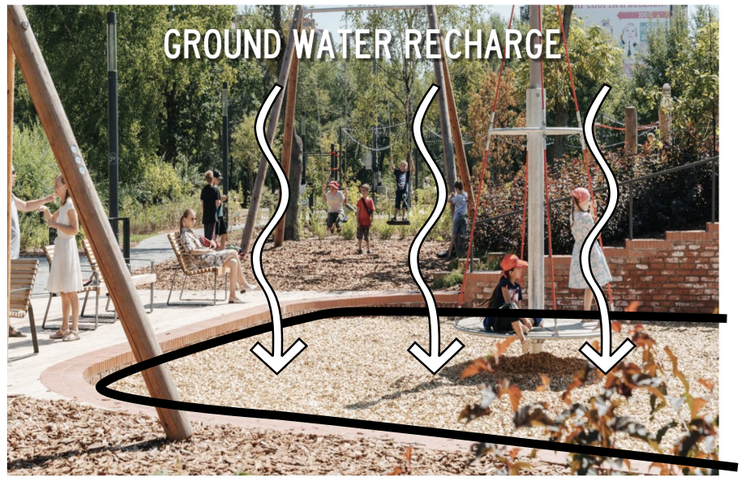
natural weir for water aeration

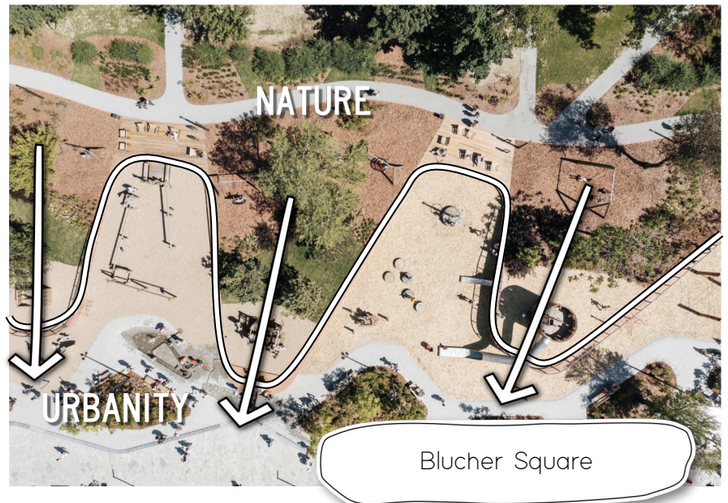
interested and **affected people as key stakeholders**

educating people on how to **work with nature**



DESIGN DEVELOPMENT | PRECEDENTS



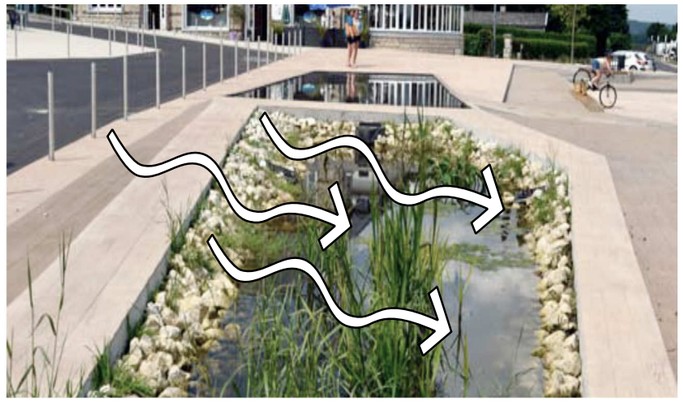


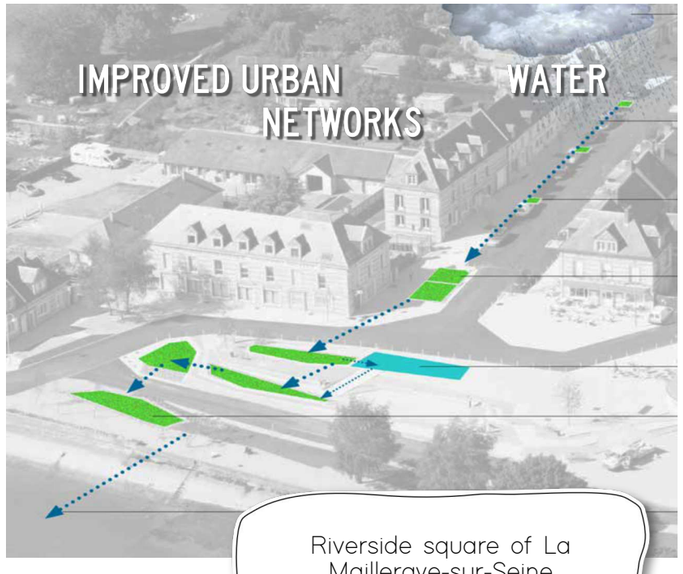
Blucher Square

by AFA, Russia

Werksviertel Mitte

by var Urban Planners, Munich

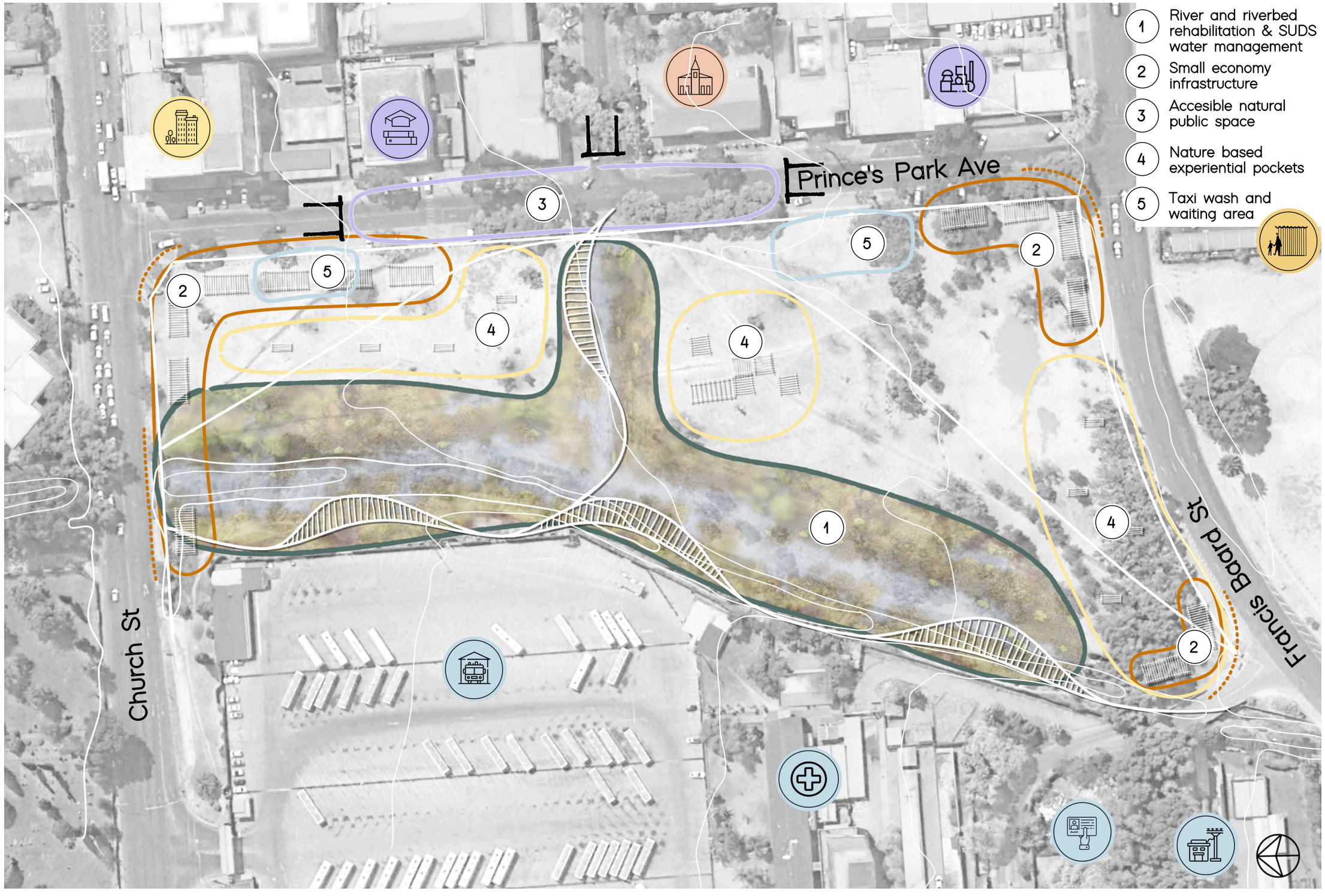




Riverside square of La Mailleraye-sur-Seine

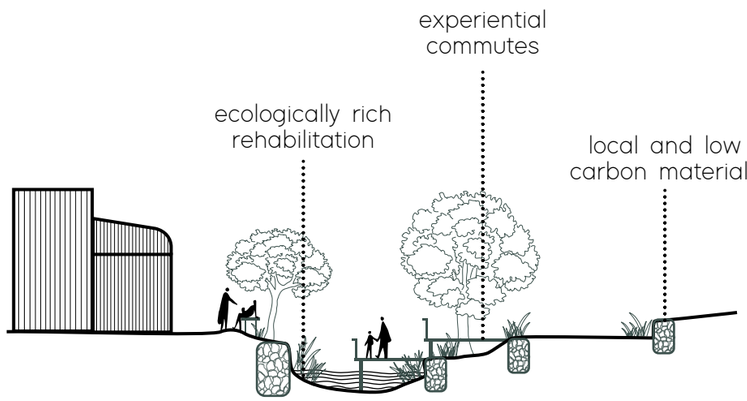
by Agence Babylone, France

DESIGN DEVELOPMENT | PRECEDENTS

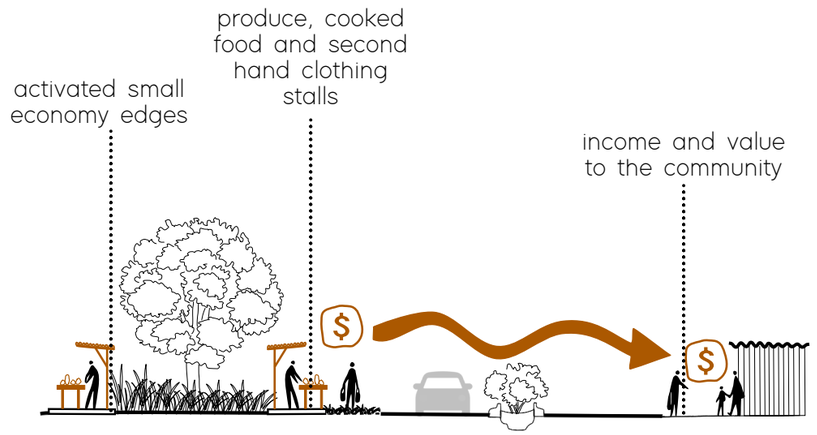


PROGRAMME DEVELOPMENT | INITIAL ZONING

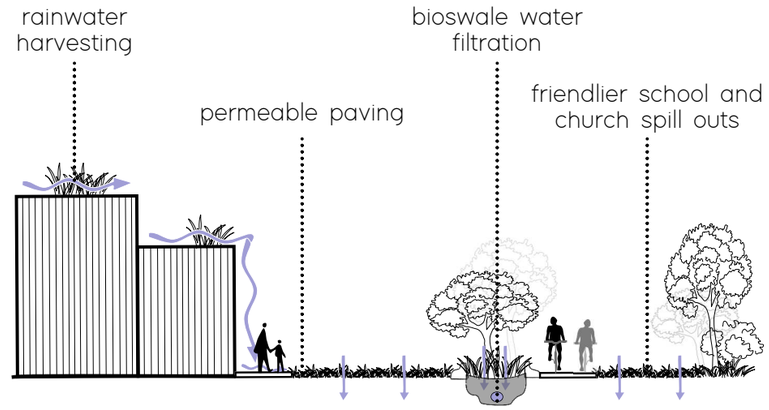
① River and riverbed rehabilitation & SUDS water management

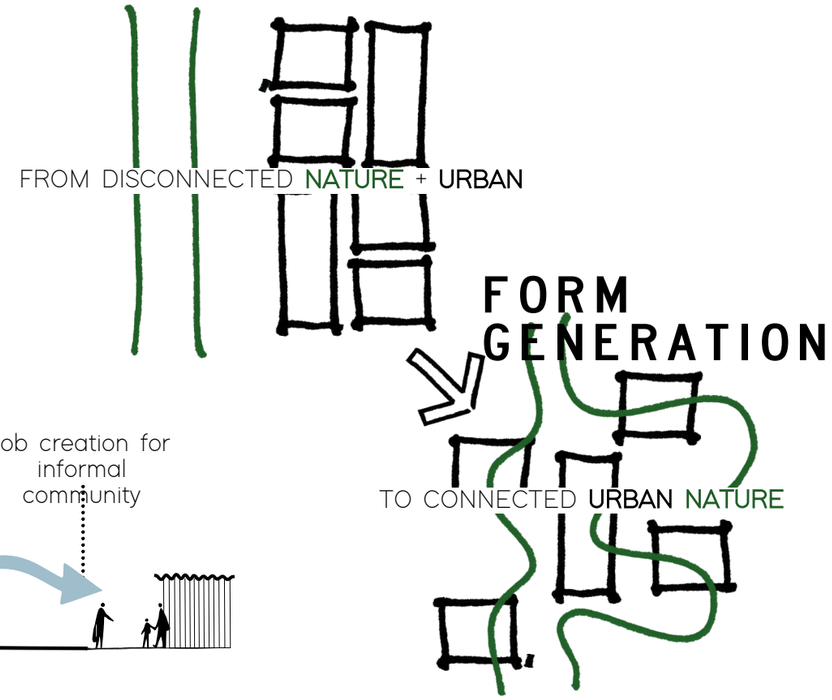


② Small economy infrastructure

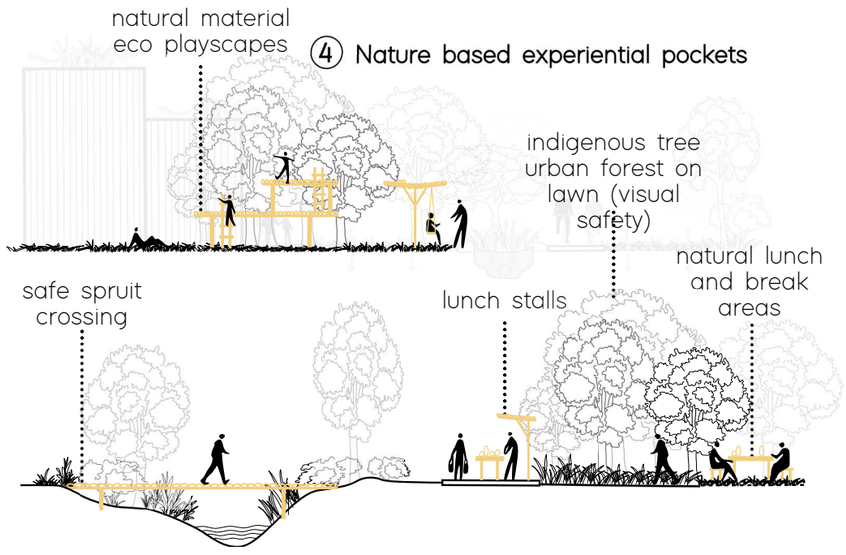


③ Accesible natural public space





④ Nature based experiential pockets



⑤ Taxi wash and waiting area

PROGRAMME DEVELOPMENT | OBJECTIVES AND INFORMANTS

Project Assessment measure: SITES

SITES

RATING SYSTEM

For Sustainable Land Design and Development

conserve — manage — restore — generate

EXISTING CONDITIONS + DURING PROJECT DEVELOPMENT + FUTURE CONDITIONS

GOALS

- Create Regenerative Systems and Foster Resiliency
- Ensure Future Resource Supply and Mitigate Climate Change
- Transform the Market through Design, Development, and Maintenance Practices
- Enhance Human Well-Being and Strengthen Community

RATING SYSTEMS SECTIONS

- SITE CONTEXT
- PRE-DESIGN ASSESSMENT + PLANNING
- SITE DESIGN - WATER
- SITE DESIGN - MATERIALS SELECTION
- CONSTRUCTION
- SITE DESIGN - HUMAN HEALTH + WELL-BEING
- OPERATIONS AND MAINTENANCE
- SITE DESIGN - SOIL + VEGETATION
- EDUCATION + PERFORMANCE MONITORING
- INNOVATION OR EXEMPLARY PERFORMANCE

ASSESSMENT MEASURE AND PERFORMANCE FRAMEWORK

SITE CONTEXT RESEARCH

community influences

nature relationships

childhood exposure

human nature disconnect

How can **nature based solutions** form infrastructure frameworks for **small economies** in the urban domain towards a **resilient** urban environment for stronger **human-nature relationships**?

RESEARCH QUESTION

accessibility

economy over environment

governmental influence

knowledge and awareness

MOST RELEVANT CRITERIA

- SITE CONTEXT
- PRE-DESIGN ASSESSMENT + PLANNING
- **SITE DESIGN - WATER**
- SITE DESIGN - MATERIALS SELECTION
- CONSTRUCTION
- **SITE DESIGN - HUMAN HEALTH + WELL-BEING**
- OPERATIONS AND MAINTENANCE
- **SITE DESIGN - SOIL + VEGETATION**
- EDUCATION + PERFORMANCE MONITORING
- INNOVATION OR EXEMPLARY PERFORMANCE

ADDRESSED ON SITE

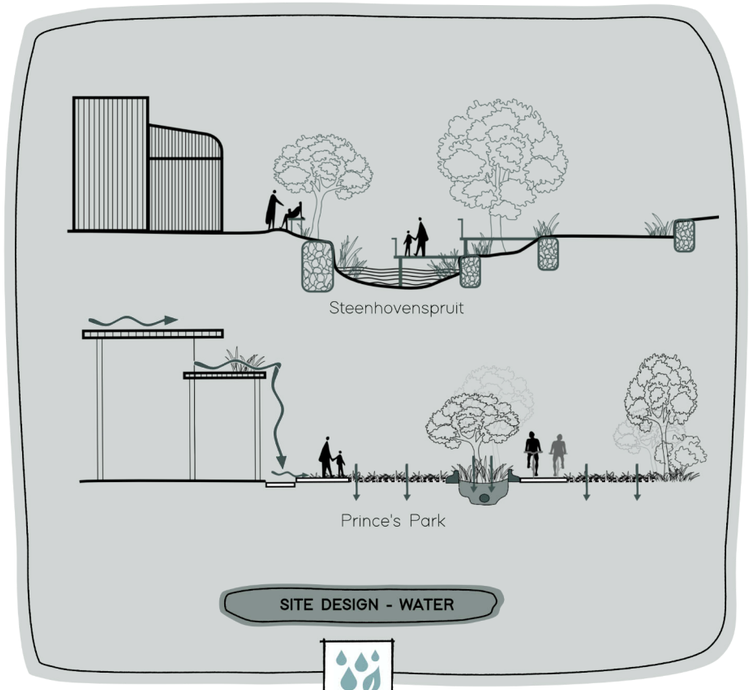
manage precipitation on site
reduce water use for landscape irrigation
manage precipitation beyond baseline
design functional stormwater features as amenities
restore aquatic (riverbed) ecosystems

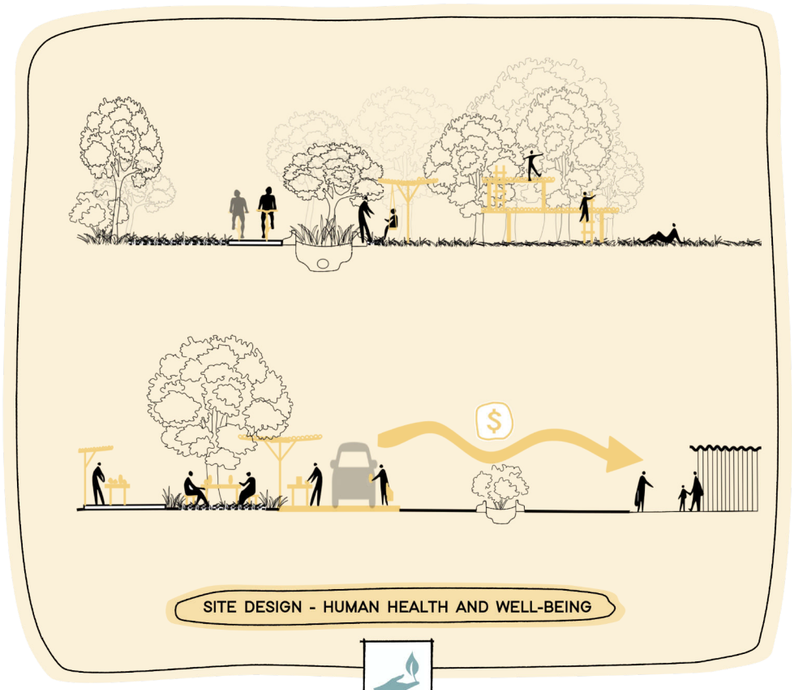
provide optimum site accessibility, safety and way finding
promote equitable site use
support mental restoration
support physical activity
provide on site food production
encourage fuel efficient and multi-modal transportation
support local economy

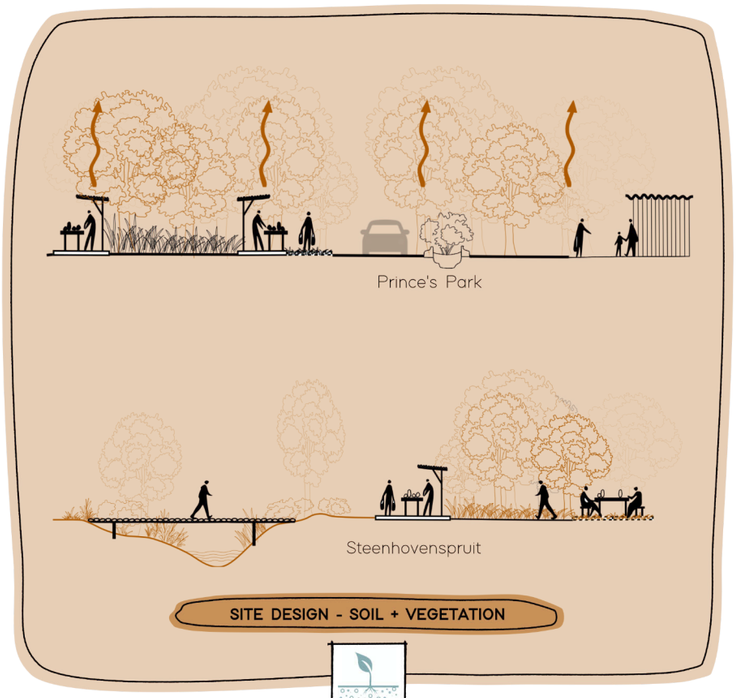
control and manage invasive plants
use appropriate plants
conserve healthy soils and appropriate vegetation
conserve and restore native plant communities
reduce urban heat island effect

CRITERIA SELECTION

CONCEPT AND DESIGN ITERATIONS PER CRITERIA







captured water retention
flood mitigation
rainwater harvesting
water filtration system
groundwater recharge
SUDS at city scale

activated safe public spaces
physical activity zones
community and get together zones
food preparation and sales
multi purpose waste picker, vendor delivery and bicycle lane
job creation during and after construction

rehabilitated terraced riverbed ecosystems
implementation of native plant communities
managed invasive species
conserved existing native tree species
soft scaping and urban tree networks for micro and macro climate control

SITES ES FRAMEWORK RELEVANCE

SITES ECOSYSTEM SERVICES

For Sustainable Land Design and Development

Global climate regulation
Local climate regulation
Air and water cleansing
Water supply retention
Cultural benefits
Hazard mitigation
Habitat functions

EXISTING CONDITIONS + DURING PROJECT DEVELOPMENT + FUTURE CONDITIONS

CRITERIA SELECTION

How can nature based solutions form infrastructure frameworks for small economies in the urban domain towards a resilient urban environment for stronger human-nature relationships?

RESEARCH QUESTION

1

Urban Challenge 1

degrading river channel infrastructure

river access and safety

unmanaged water runoff

invasive specie domination

2

Urban Challenge 2

rising urban heat

weather-exposed produce sale tables

vulnerable infrastructure and homes

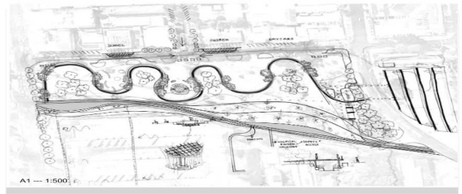
3

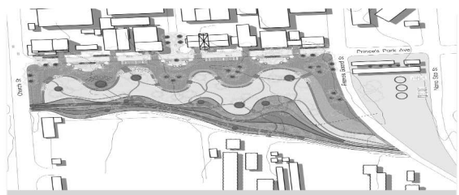
Urban Challenge 3

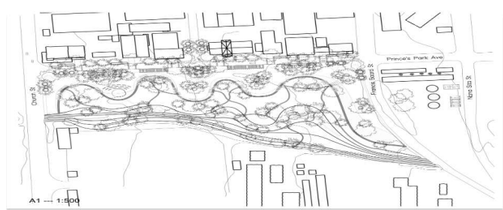
temporary gazebo vendor stalls

vulnerability of trolley vendors on streets

limited accessibility of existing vendor stalls







PROBLEM: zoning single use spaces

PROPOSAL: where can zones **meet** and **support each other**

PROBLEM: river/ access to nature disconnected to the urban social space

PROPOSAL: **weave** human activity and programmes into nature

PROBLEM: how to get **feet** to the park

PROPOSAL: **activate** street **nodes** along park border - food!

PROBLEM: can you rehabilitate a river that is constantly **fed with polluted** city scale **water**

PROPOSAL: develop **city wide implementations** and rehabilitate parts of the river **ecosystem** (riverbanks)

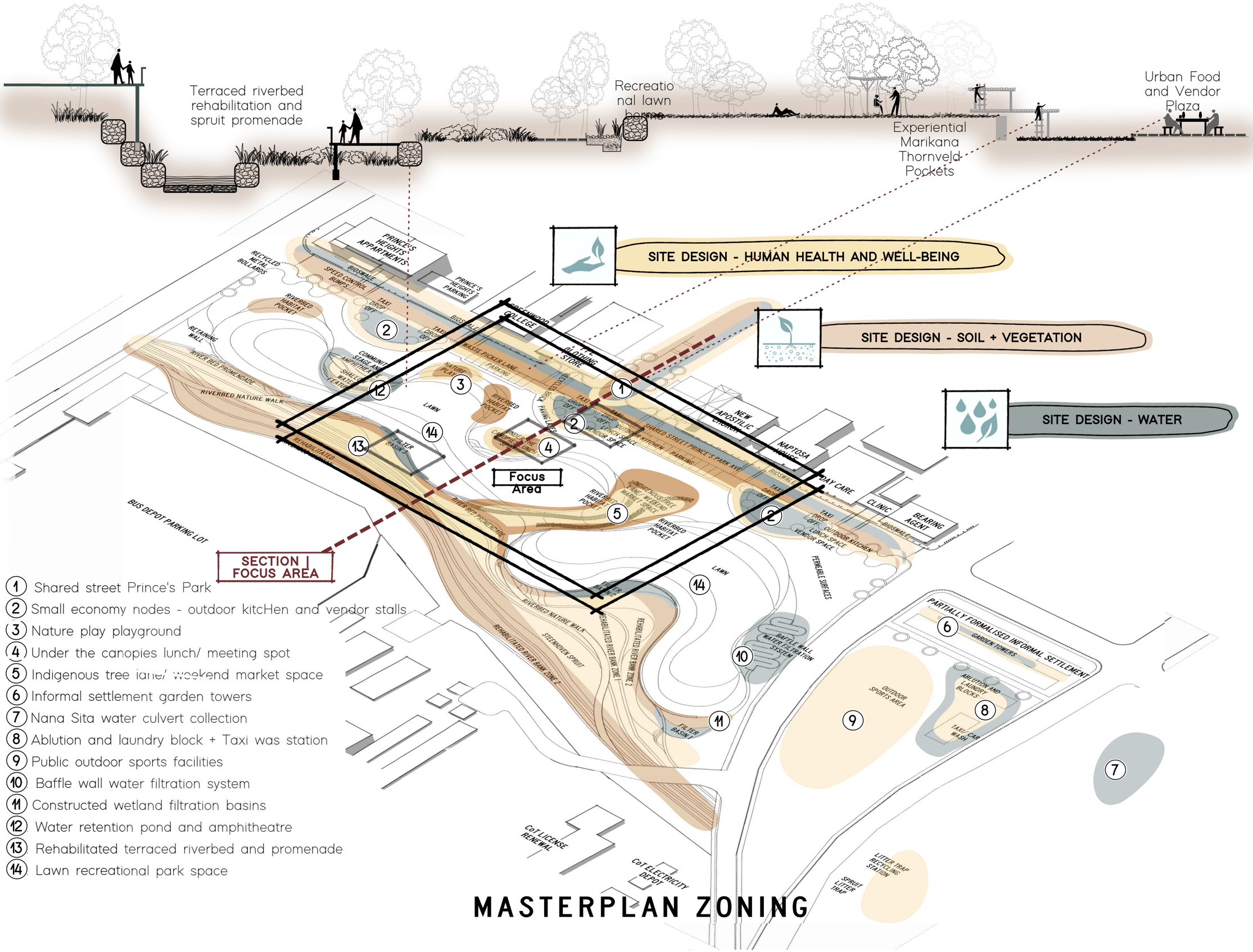
PROBLEM: lack of connection and **accesibility** of park neighbours

PROPOSAL: implement shared street to allow for a **community integrated** public space

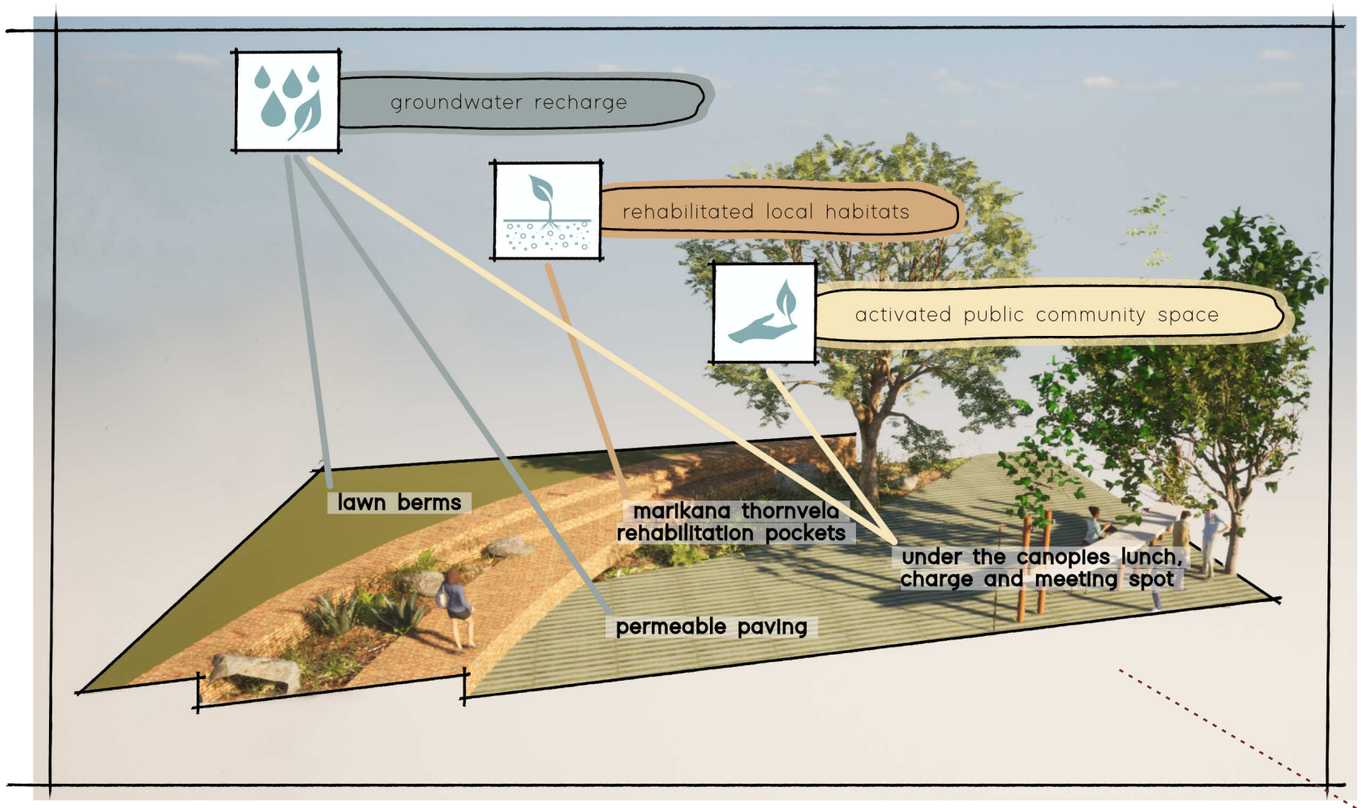
PROBLEM: still very **static** design

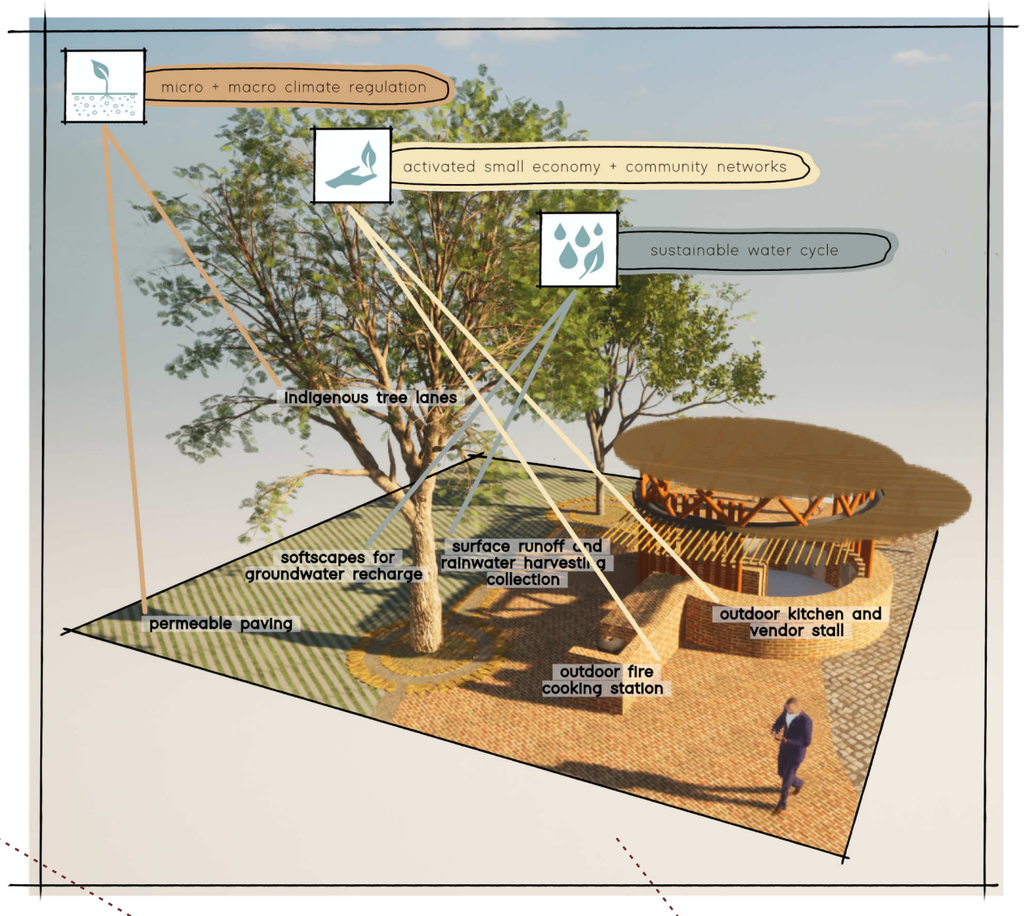
PROPOSAL: implement **interactive** spatial elements, break berm for clear axis

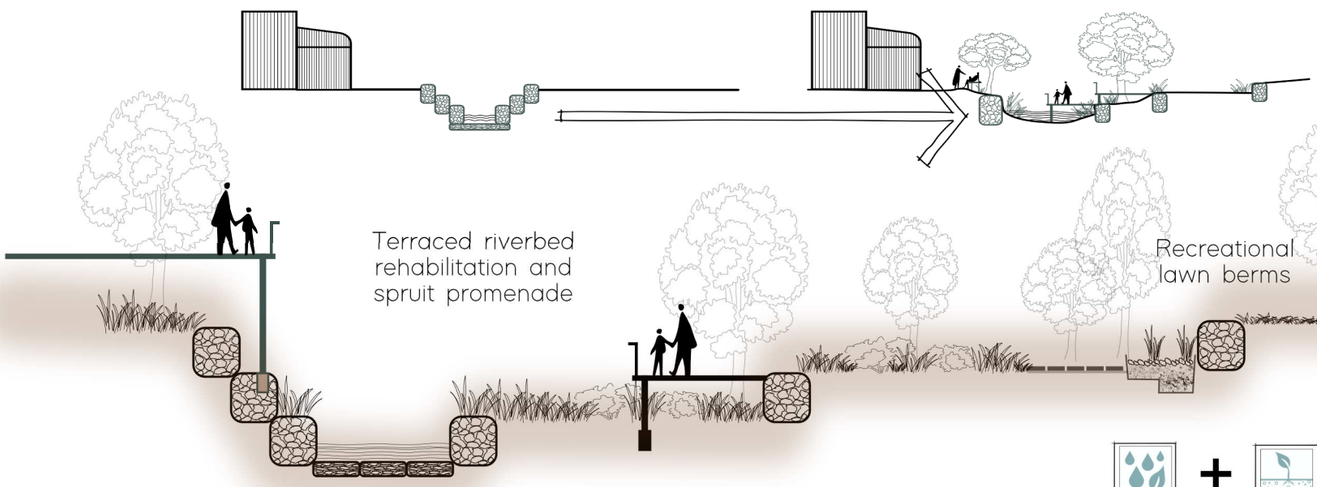
MASTERPLAN DEVELOPMENT



MASTERPLAN ZONING







How can nature based solutions form infrastructure frameworks for small economies in the urban domain towards a resilient urban environment for stronger human-nature relationships?

RESEARCH QUESTION

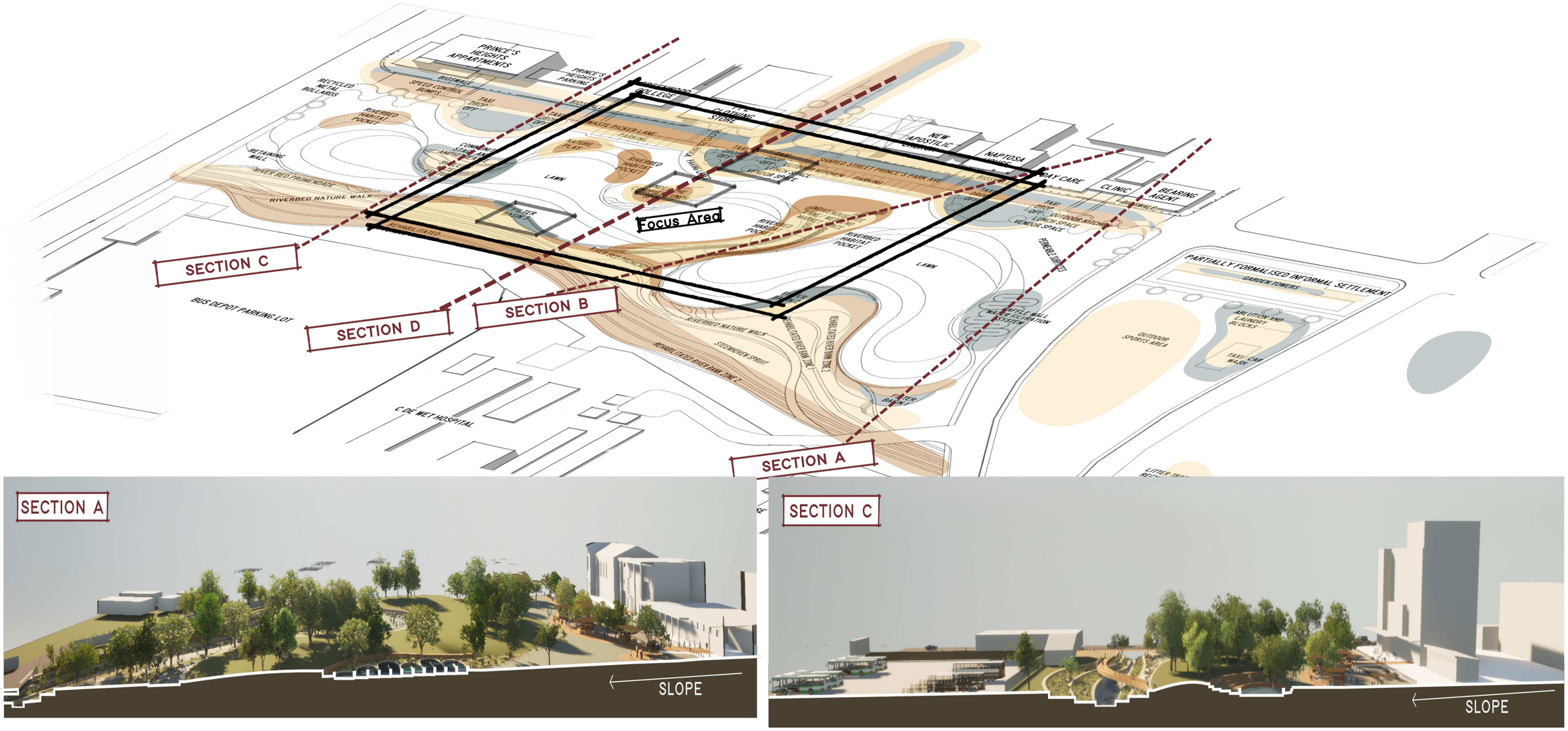
HOW?

PRETORIA CED JUNCTION: RESILIENT URBAN ENVIRONMENTS WITH STRONG HUMAN-NATURE RELATIONSHIPS

WHY?

The selected focus area best represents the project's appraoch on resilient urban environments dirven by small economies and human-nature relationships at SITES standards.

SPATIAL DEVELOPMENT



LEVEL DEVELOPMENT