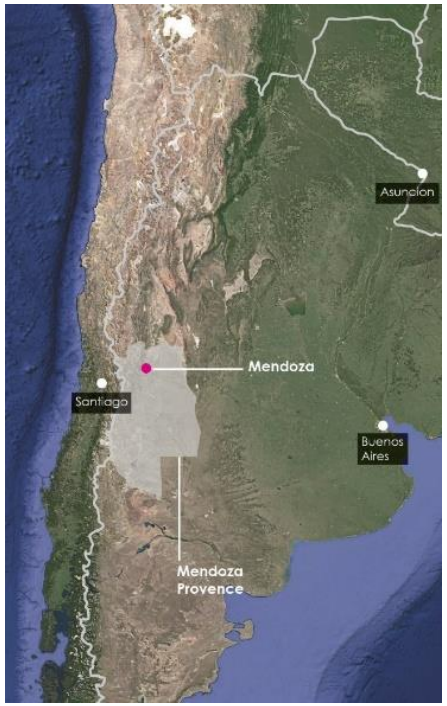
Session 5: Presentation of City Action Plans

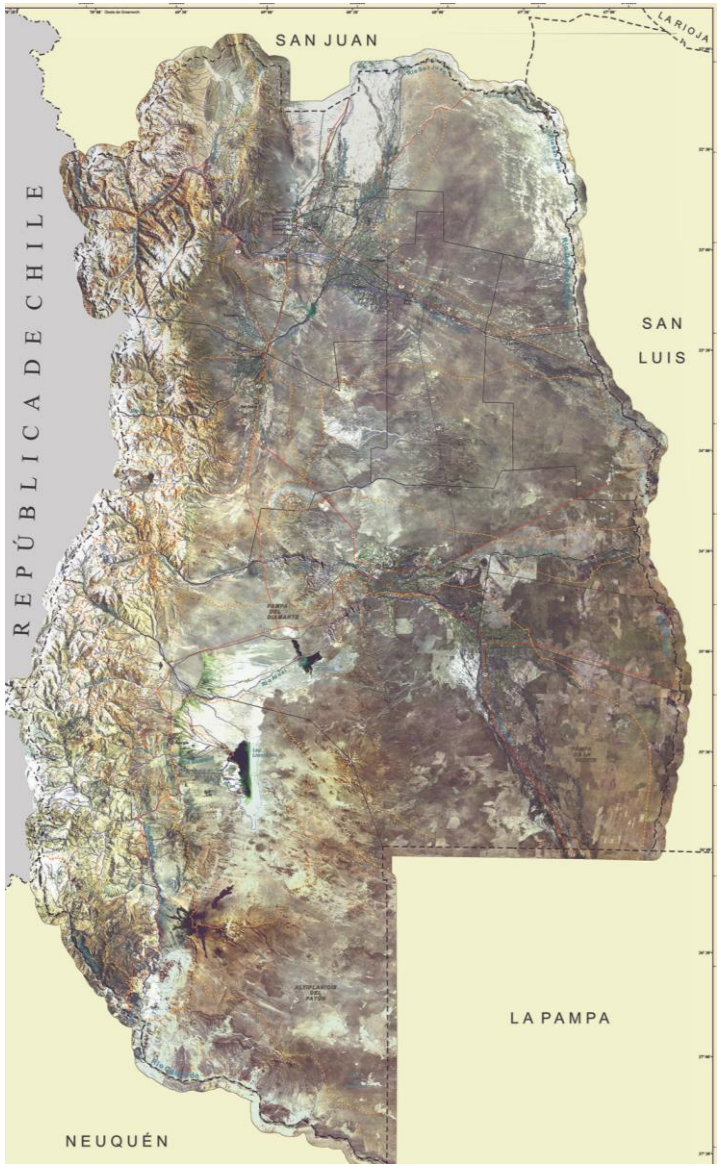
- *Mendoza, Argentina*
- *Ningbo, China*
- *Anápolis, Brazil*
- *Kigali, Rwanda*

Action Plan
Natural Capital Accounting (NCA)
MENDOZA CITY _ ARGENTINA

María Marta Ontanilla

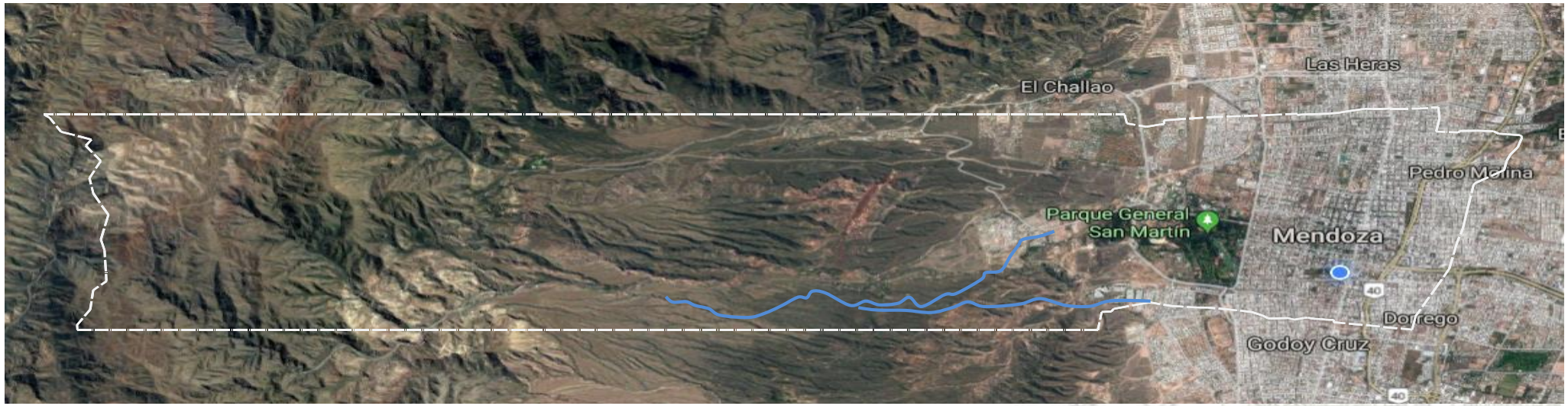
Introduction to the city





LOCATION

Introduction to the city

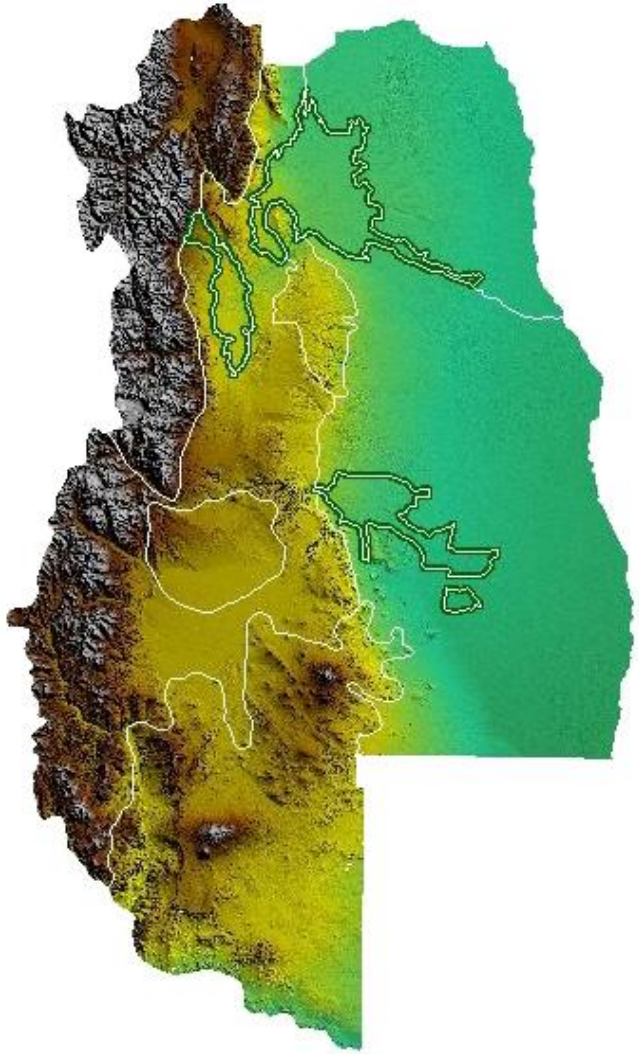


LOCATION

CITY OF MENDOZA

Introduction to the citv

Mendoza Province



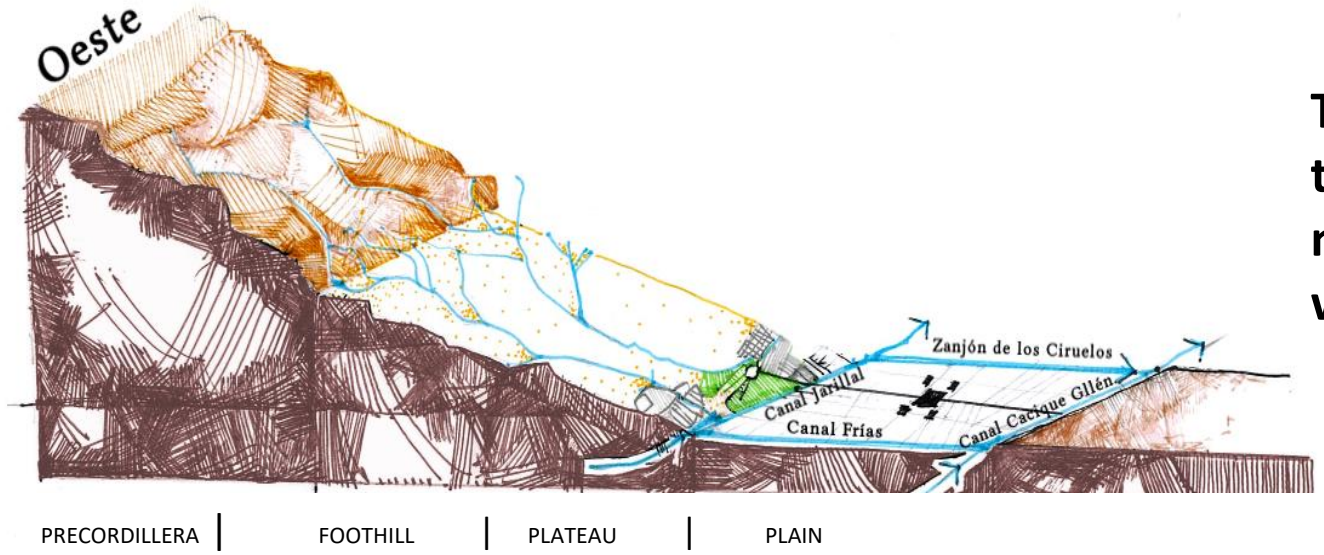
City of Mendoza

THREE GEOMORPHOLOGICAL UNITS

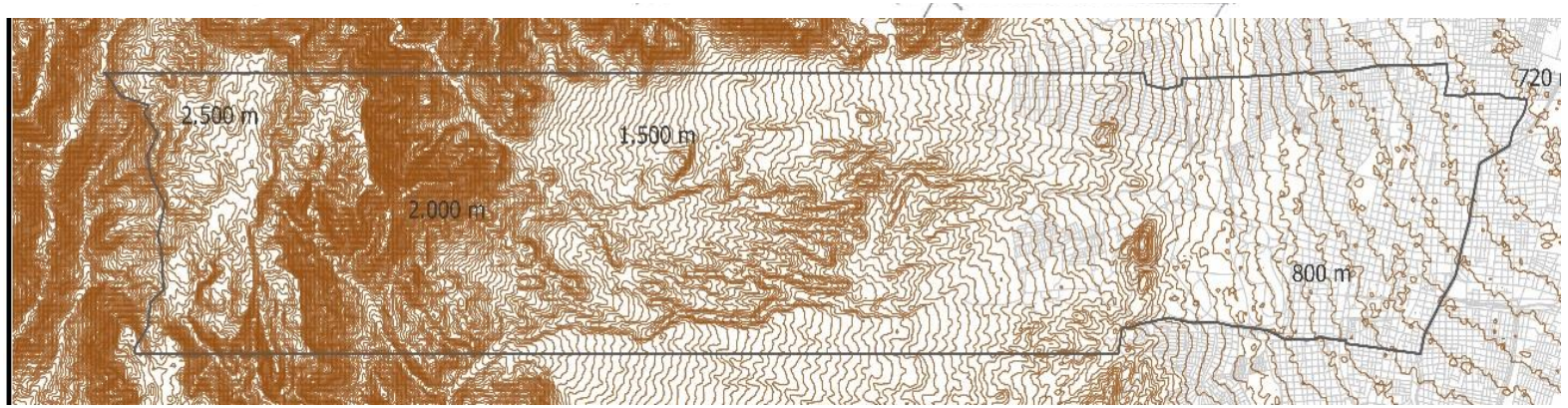
- **Precordillera**
- **Foothill (Piedemonte)**
- **Plateau**

GEOGRAPHY

Introduction to the city



The foothill (piedemonte) is a transition unit between the mountain range and the plateau with an eastern slope.

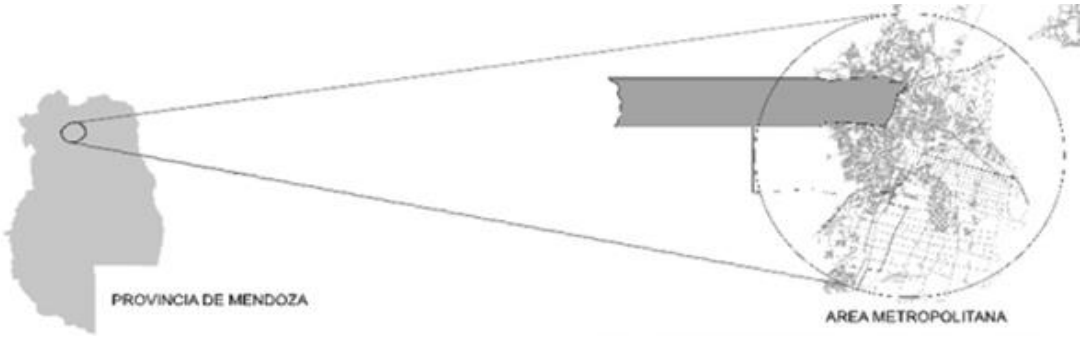


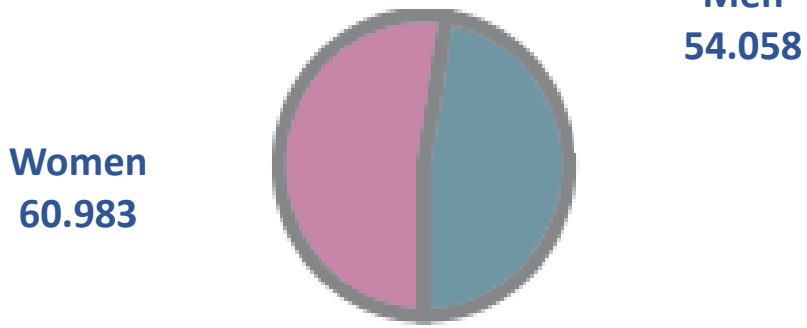
The City urban area settles among the foothil (piedemonte) and the plateau towards East.

GEOMORPHOLOGY

Introduction to the city

Mendoza Province has the biggest urban cluster in the Cuyo region





Mendoza Province Population
1.738.929 inhabitants in 148.827 sq.km with a density of 11,7 inhabitants per sq.km

City of Mendoza
115.041 inhabitants in 106,07 sq.km with a density of 1,085 inhabitants per sq.km

POPULATION

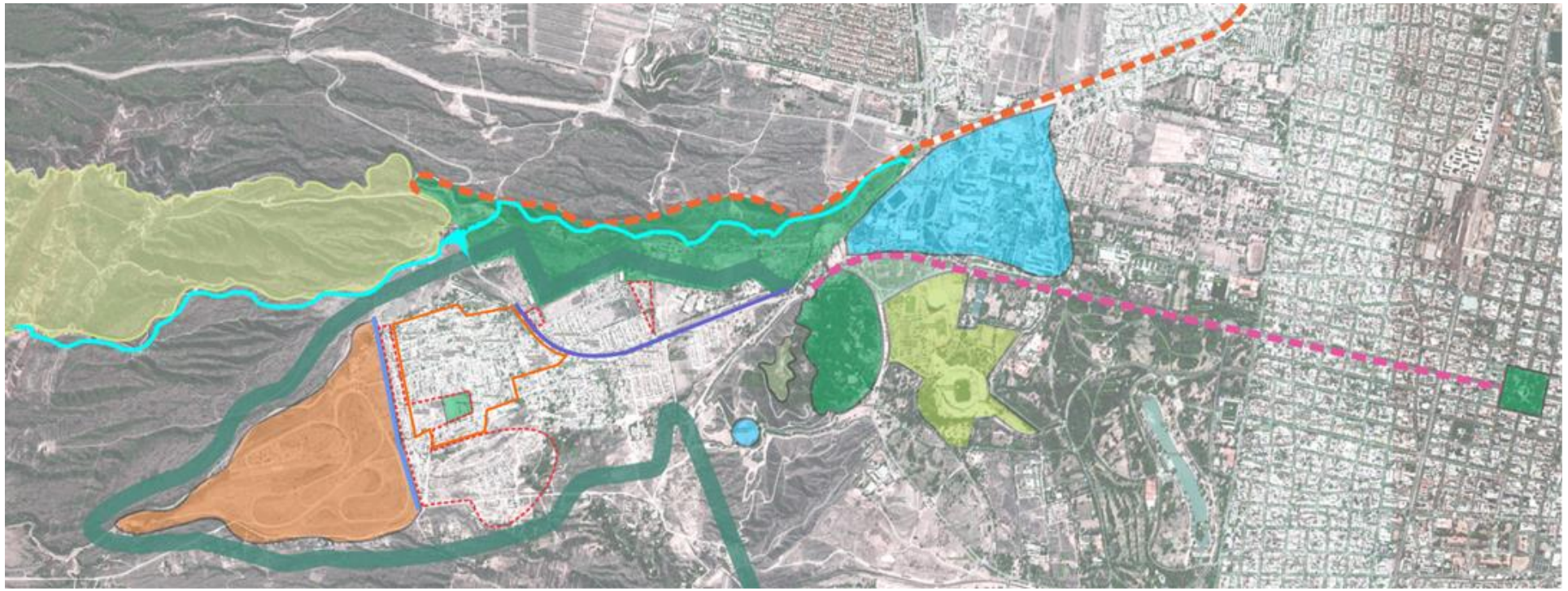
Vision and strategy of the city

Overall city vision

35 sq/m per inhabitant

Vision and strategy of the city / Project

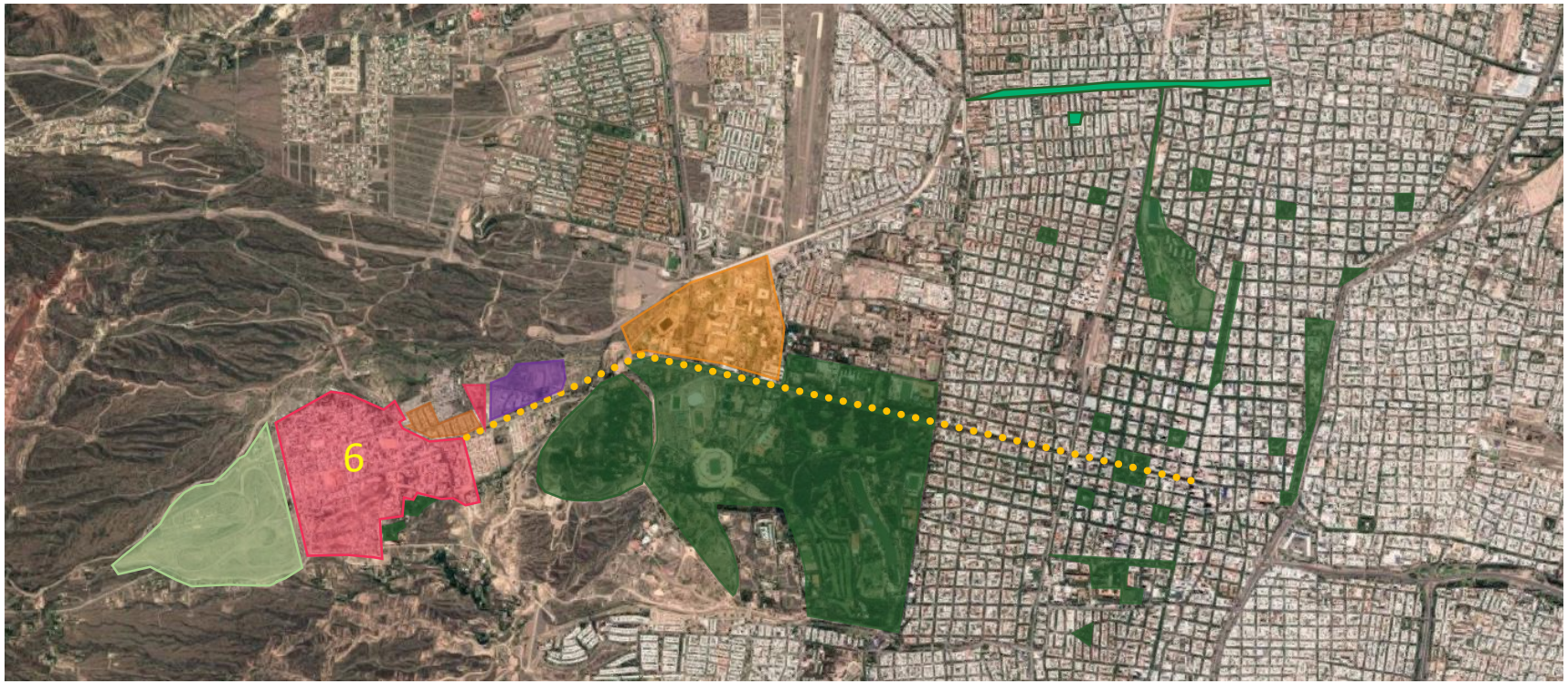
- **Preserve piedmont territory in order to become useful to tourists and recreation for local resident**
- **Preserve regulating services by making a greenbelt**



Vision and strategy of the city / PIEDMONT

Vision and strategy of the city / Problems

- **Expansion of informal settelments**
- **Informal urbanization blocks access to piedmont**
- **Poor infrastructure (working with World Bank)**



Binding axis

Grean Spaces

UNCuyo’s Campus

“La Favorita” District

Racetrack

City Hall

Vision and strategy of the city

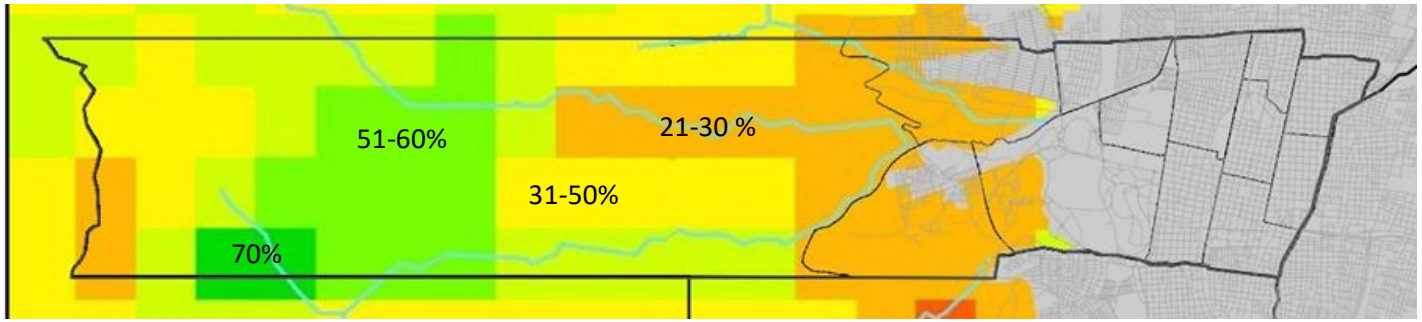
- **Green strategy**
- **Bring concept of ‘oasis city’ to piedmont but in a climate-resilient way**

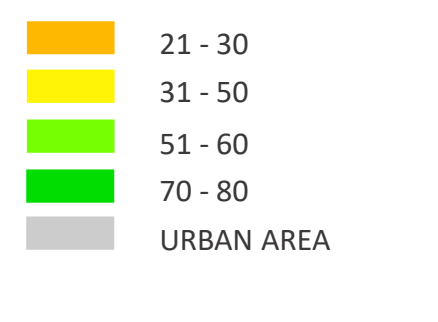


- **Land use planning process**
- **Territorial Plan – 2019-2030**

Natural assets in Piedmont projects

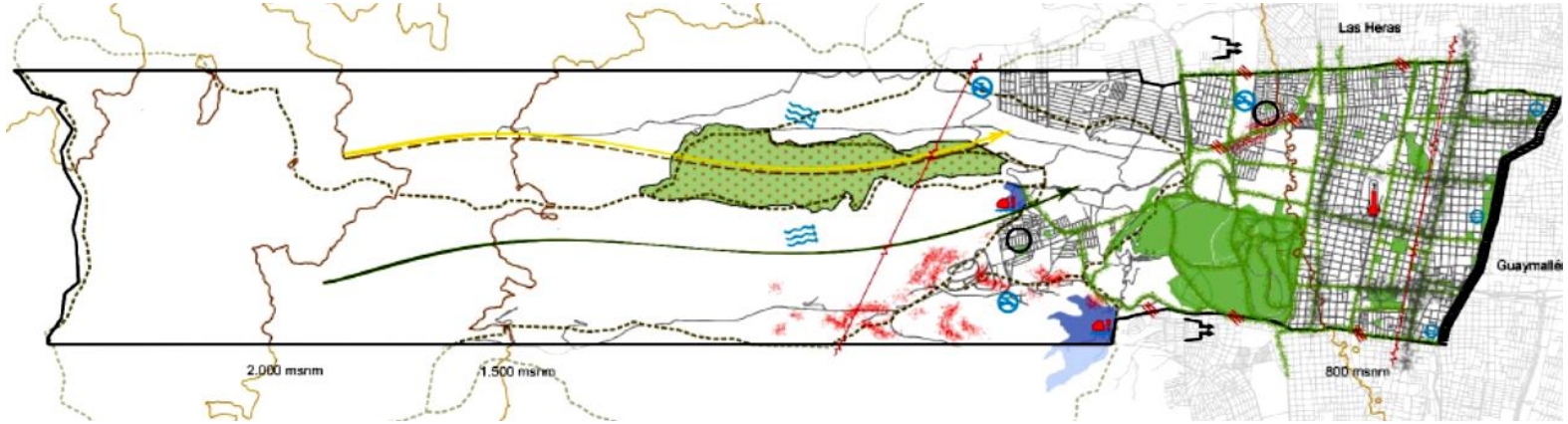
1. Piedmont – native flora





2. Water - Canals stemming from Mendoza River though the Mountains

Ecosystem Services



Seismic faults
Settlements on riverbeds
Public green spaces
Heat island
No watering
Obstructed alluvium collector
Landfills
Vulnerable housing

Atmospheric pollution
Native groundcover
Desertification
Alluvium risk
Flood risk
"Divisadero Largo" Preservation Area
Basin's limits
Contour

- Irrigation of trees
- Tourism
- Recreation,jogging and cycling

Threats to services

- Main threat is informal urbanization

- Flood risk: the land phelps to absorbió the water that comes for the mountain and the storm. (Natural Mitigation)
- Water: possible contamination, climate change
- Unlock access to piedmont for tourism, Recreation and sport activities like ciclyng
- Inability to visit nature reserve and connection with other sites in city.

Benefits and purposes for the city to undertake NCA

1. Map services provided by piedmont
2. Construct urbanization scenarios

a. ‘unsustainable’ scenario: if informal settlement happen on piedmont
b. Sustainable: if We can stop the expansión of informal settlements and improve infrastructure to existing informal

3. Compare costs and benefits

- Benefits: look at tourism values / bring in tourists to piedmont /potential to create jobs
- Costs : compare with other policies of providing clean water supply/ better infrastructure (roads) to informal residents that also has extra environmental benefits and unlocks access

Constraints and challenges to undertake NCA

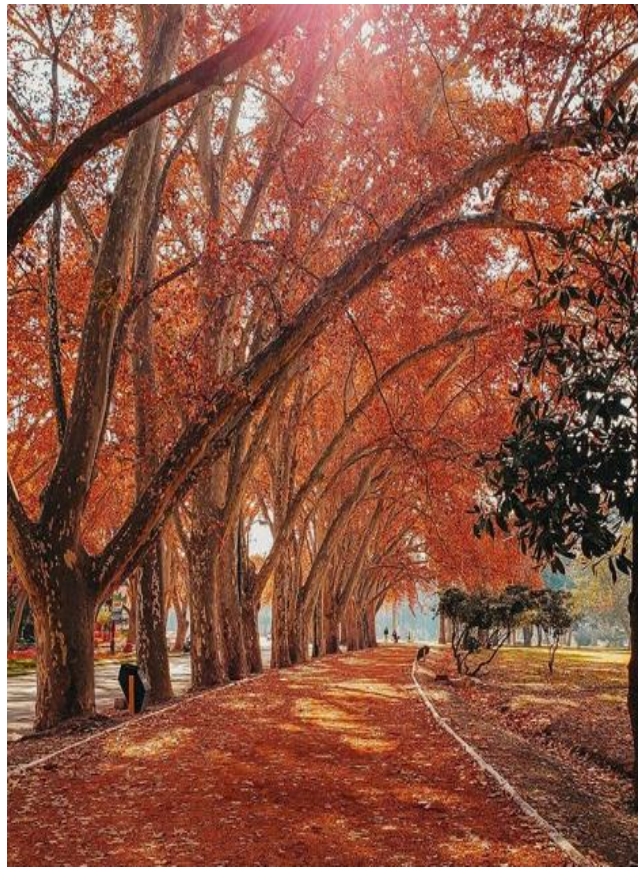
1. Lack of experience in modelling ecosystem services (currently have land use map to define natural assets, but can’t go next step in modelling environmental benefits)
2. Lack experience in valuing environmental benefits.

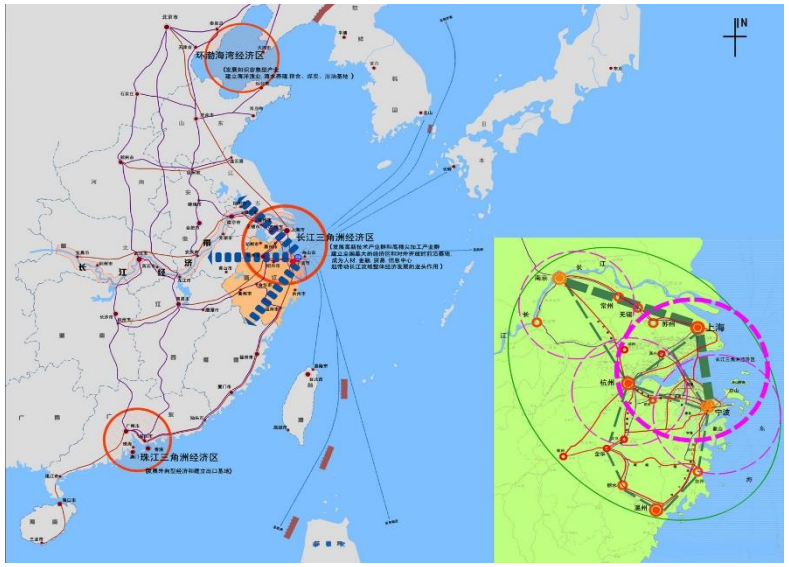
Actions to be taken to conduct NCA

- Learn from other cities best practice /Investigate of other cities who have implemented similar policies.
- Acquire technical experience in environmental modelling and economic modelling
- Work with the comunity.

Leveraging NCA to support green urban development

- With the support of local and provincial and National Government
- Working with experts in diferente science but interdisciplinary
- Using Land planning process
- Incorporating this concepts at the begining of all the projects
- Territorial Plan – 2019-2030 - NCA could help make better economic case for plan



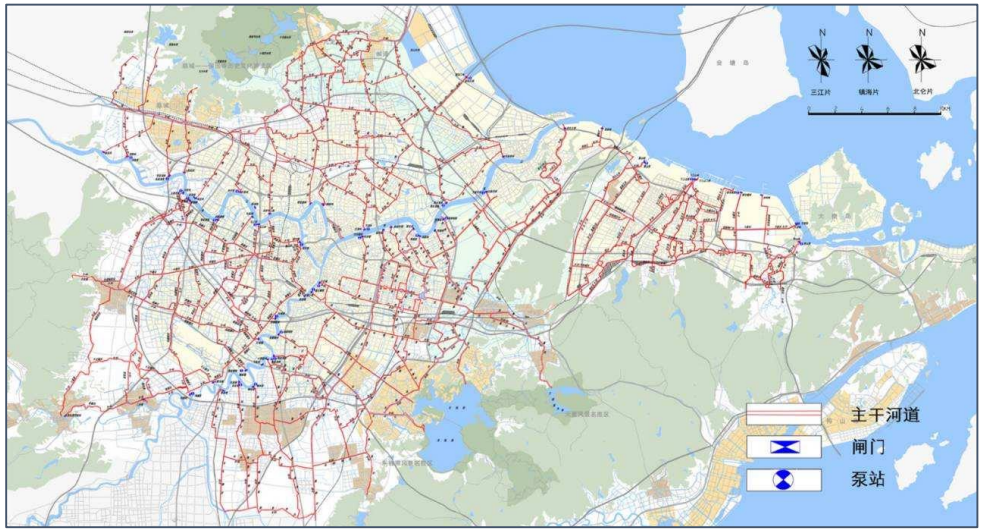


Ningbo City, CHINA

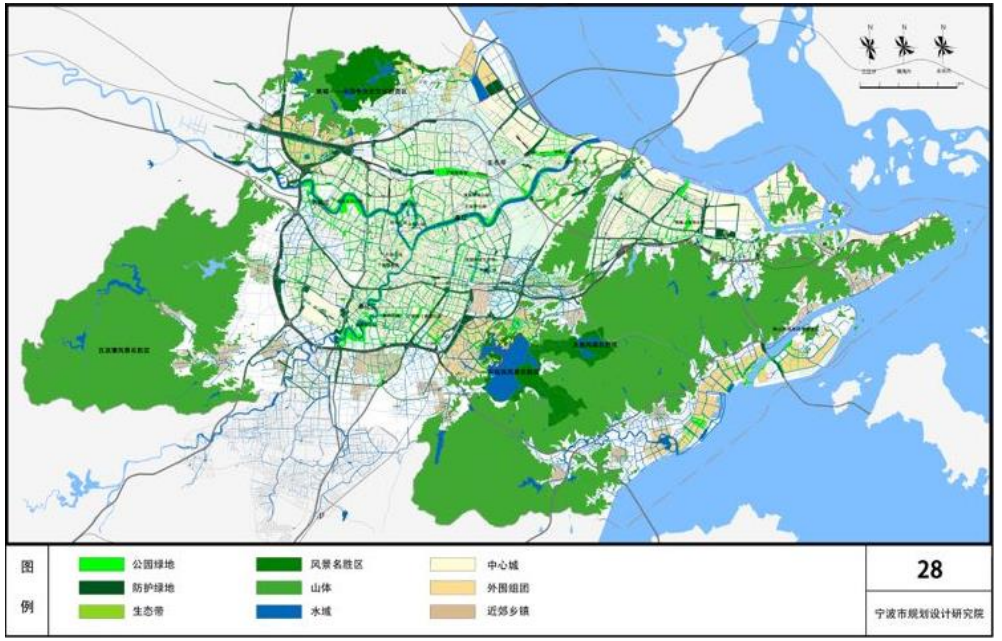
Action Plan: Natural Capital Accounting (NCA)

Huining ZHOU senior officer
Ningbo Housing and Urban-rural Development Bureau

James Patterson-Waterson
Head of Cities and Infrastructure
Vivid Economics



Layout of river network in the urban area



Green spaces in urban area

Drivers for economic growth:

Private economy and foreign trade

population	8.20 million
Land area	9365.58 km^2
Sea area	8355.8 km^2
Mountain area	4811.92 km^2
Water area	598.82 km^2
Length of the river	16,366.78 km
Built up area	524 km^2
Urbanization rate	72.9%
Percent of green space	36.5%

Case study 1.

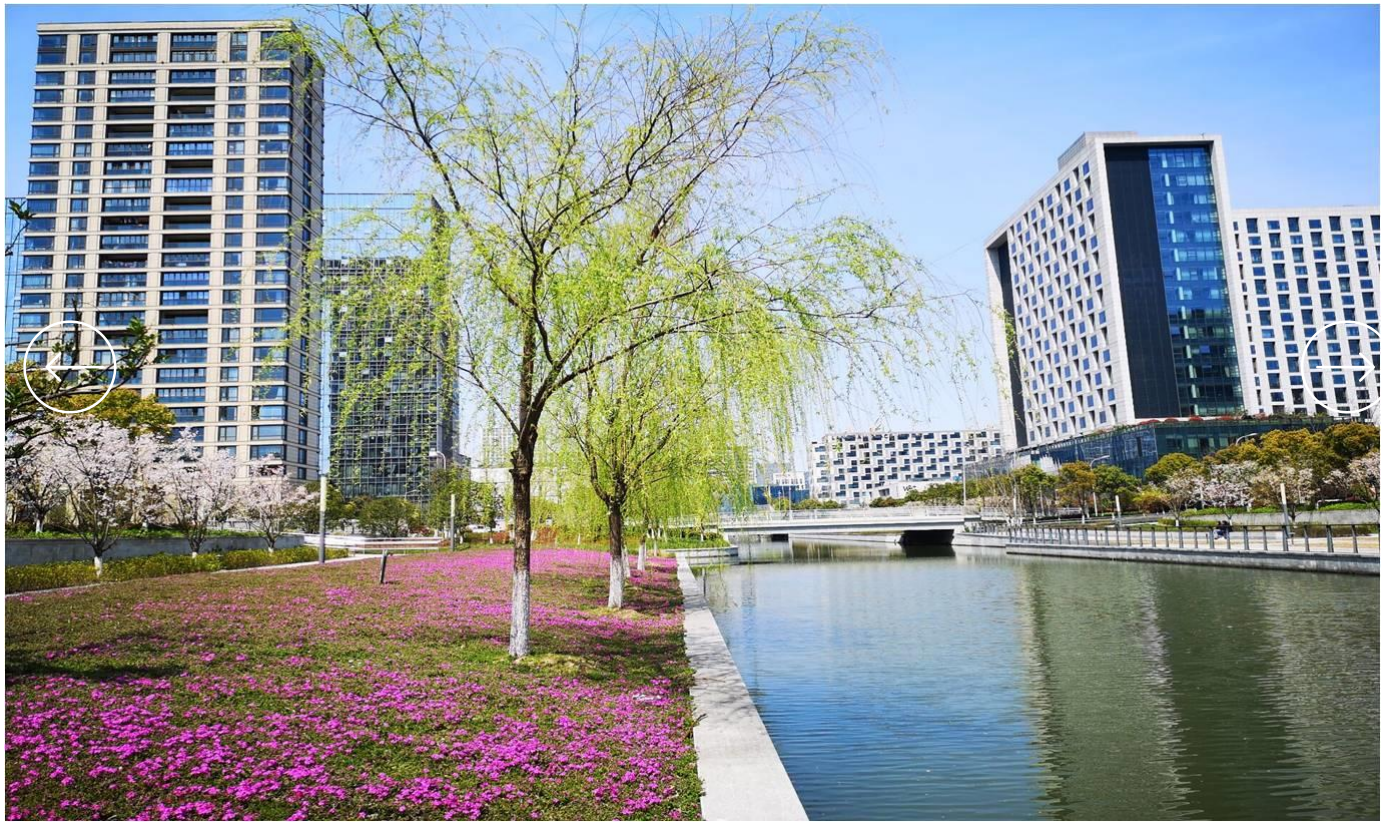
Greenery option with high maintenance

IN SUMMER

IN WINTER

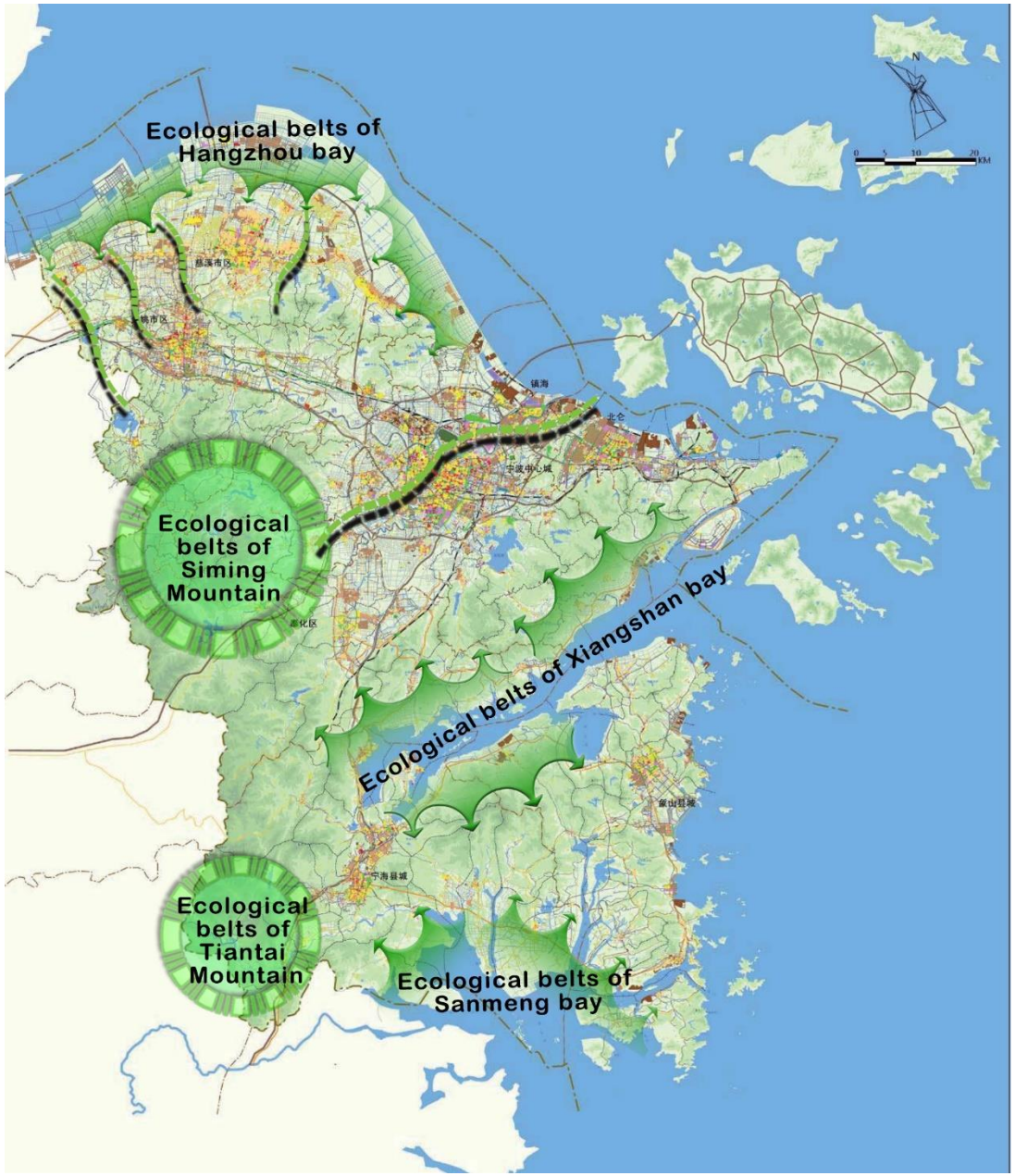
Case study 2.

Greenery planning with space to improve



compared to Singapore‘s ABC water programme

- ? **A-active**
- ✓ **B-beautiful**
- ? **C-clean**



VISION AND GREEN STRATEGY

A global gateway city that is open, innovative and livable

1. To thick plant ecological basis, anchoring ecological framework of “two mountains, three bays and multiple corridors”.
2. To shift from passive protection to active use by developing 8 regional parks, 9 urban country parks and 10 wetland parks.
3. To replenish urban green space and establish an intensive green space system.

What we have done?

Green roof

Buildings

Nature-based solution

China sponge cities Ningbo pilot

Greenways

Habitat corridor

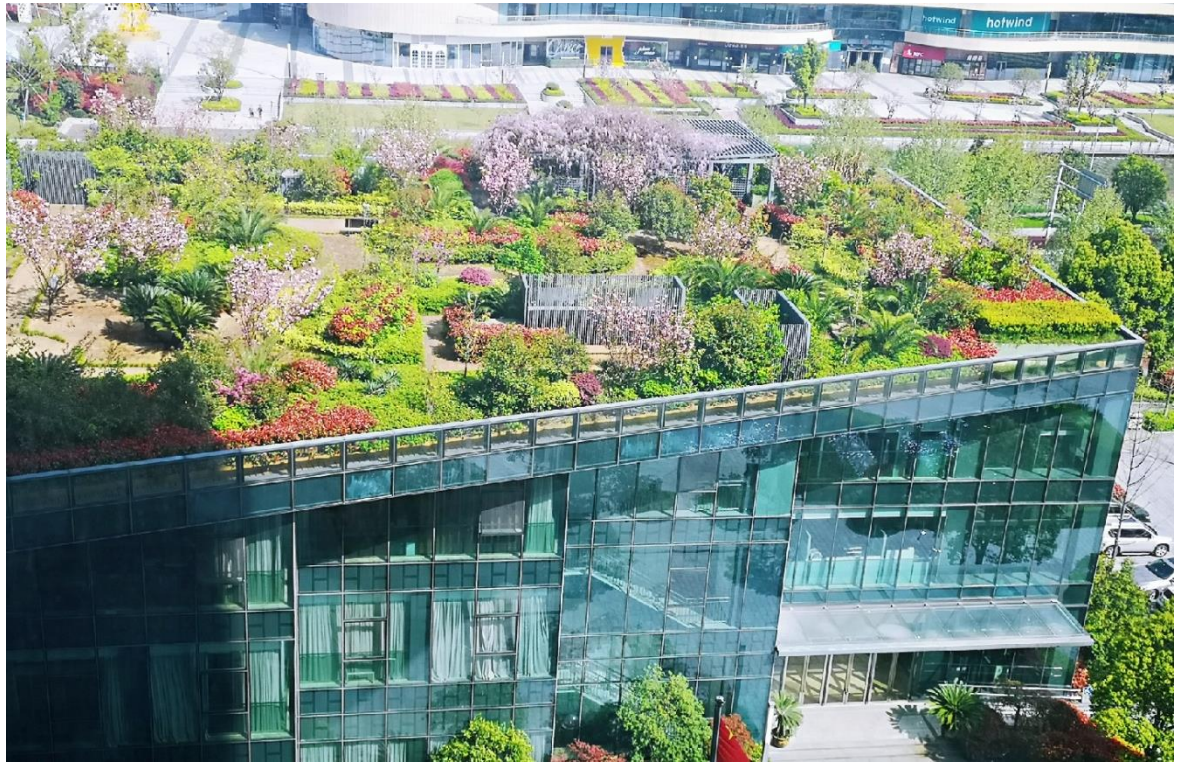
Nature

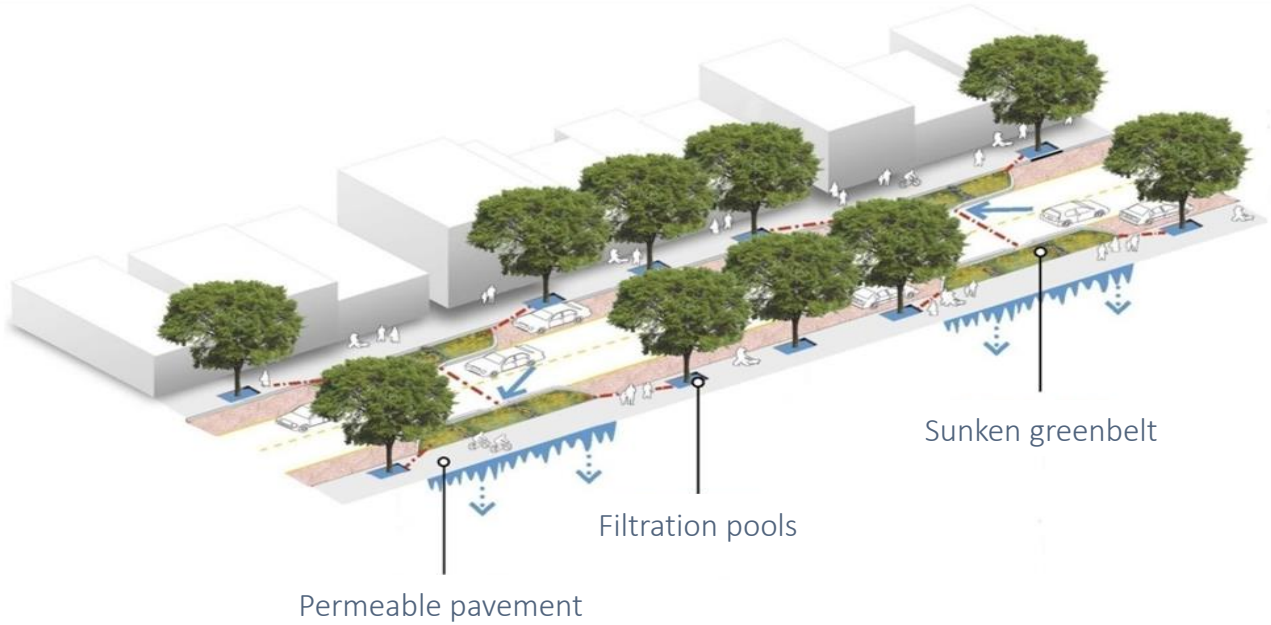
Natural capital accountin g

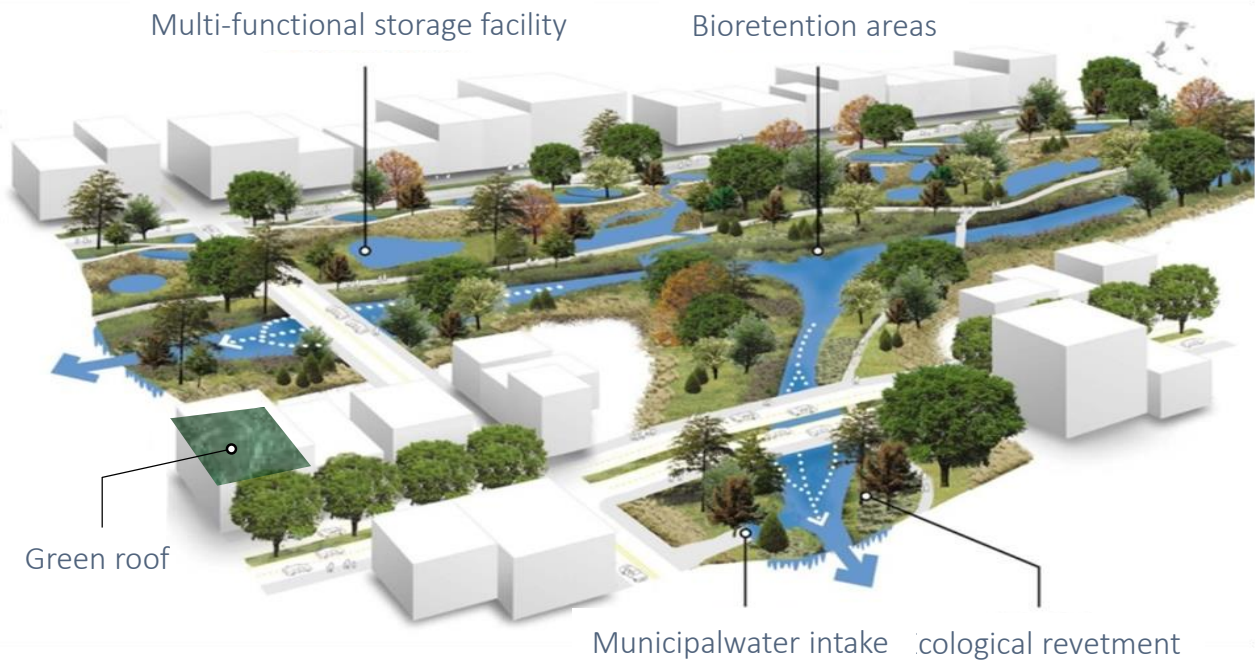
Green roof

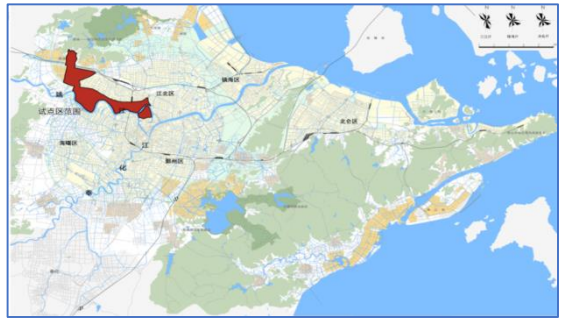
- Save land area and increase urban greening rate
- Cost effective with significant energy saving
- Absorb and purify rainwater

Since 2017, all new public buildings below 50 meters in Ningbo must be constructed with green roofs.









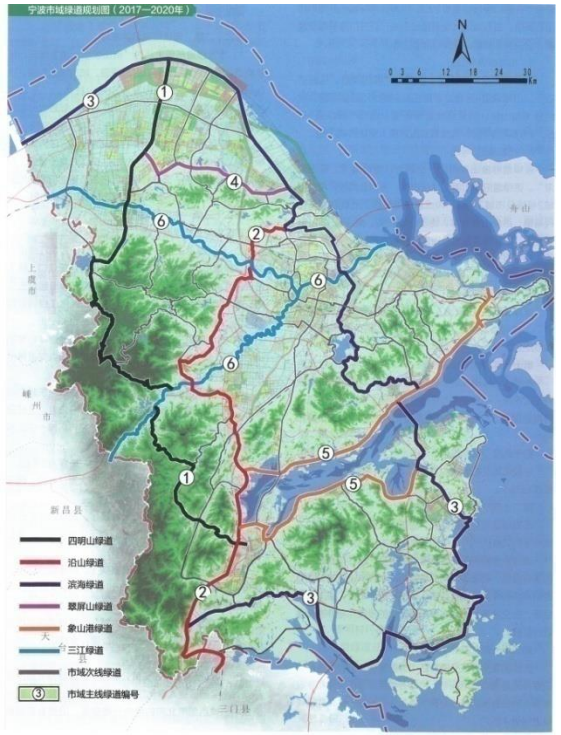
Pilot scope： Buildings, communities, roads, plazas, parks, green spaces, river networks and water systems

China’s Sponge Cities-Ningbo Pilot

Water Resources + Water Environment + Water Ecology + Water Safety

- By 2030, 80% of built area will serve as a “sponge“
- Capturing 70% of storm water runoff

NINGBO GREENWAY
宁波绿道



Ningbo Greenways

1. Forming a "three vertical, three rivers, two rings" greenways network in the whole city
2. Versatile, tailored to local conditions
3. High public participation

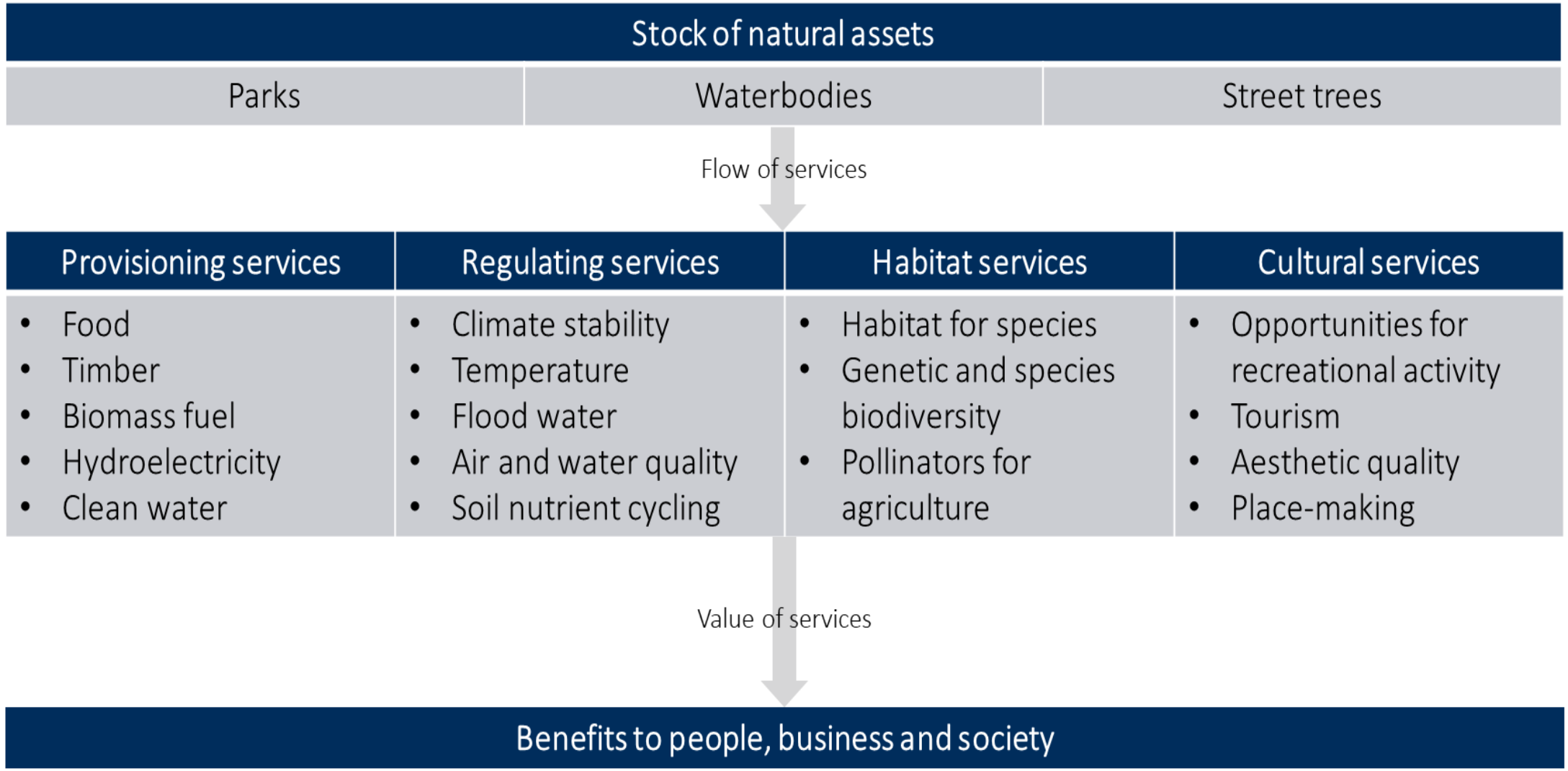
By the end of 2018, a total of 1,000 kilometers of greenways were built.

Diversity conservation and natural capital accounting

1. An ecological protection red line of biodiversity conservation was delineated in the citywide.
2. Three districts and counties completed the preparation of the 2016 natural balance sheet

Key natural assets and ecosystem services essential for Ningbo city

- **Small-built features:** green roof/wall, green corridors, street trees, greenspace, water features;
- **Medium spaces**: public/ domestic gardens;
- **Urban parks**: local parks, regional or national parks;
- **Natural areas:** wetlands, rivers, lakes and woodlands.


Stock of natural assets
Parks
Waterbodies
Street trees
Flow of services
Provisioning services
Food
Timber
Biomass fuel
Hydroelectricity
Clean water
Regulating services
Climate stability
Temperature
Flood water
Air and water quality
Soil nutrient cycling
Habitat services
Habitat for species
Genetic and species biodiversity
Pollinators for agriculture
Cultural services
Opportunities for recreational activity
Tourism
Aesthetic quality
Place-making
Value of services
Benefits to people, business and society

Threats to these key assets and ecosystem services

1. Ningbo population is estimated to grow with 3 million in 2049. This can be both a threat and opportunity and it depends on the growth pattern Ningbo will choose;
2. Ningbo faces extreme weather including flooding and urban heat wave;
3. How to create city’s harmony and improve wellbeing of Ningbo citizens.

What are the benefits and purpose for cities to undertake Natural Capital Accounting (NCA)

1. Integrate multiple GEF interventions in Ningbo as an overall approach (measure the impact in individual project level and government performance level);
2. Establish the baseline data to enable informed decision making;
3. Raise the awareness for the value of green space and promote education for citizens and developers

Constraints and challenges to undertake NCA

1. People have insufficient understanding of the importance of natural capital accounting;
2. Data collection of natural assets is difficult, and data held by various departments is not uniform;
3. At present, the natural capital accounting that Ningbo is carrying out is only for the physical quantity measurement of wild nature, and the value quantity lacks a common standard.
4. The property rights and accountability system of natural assets are difficult to determine

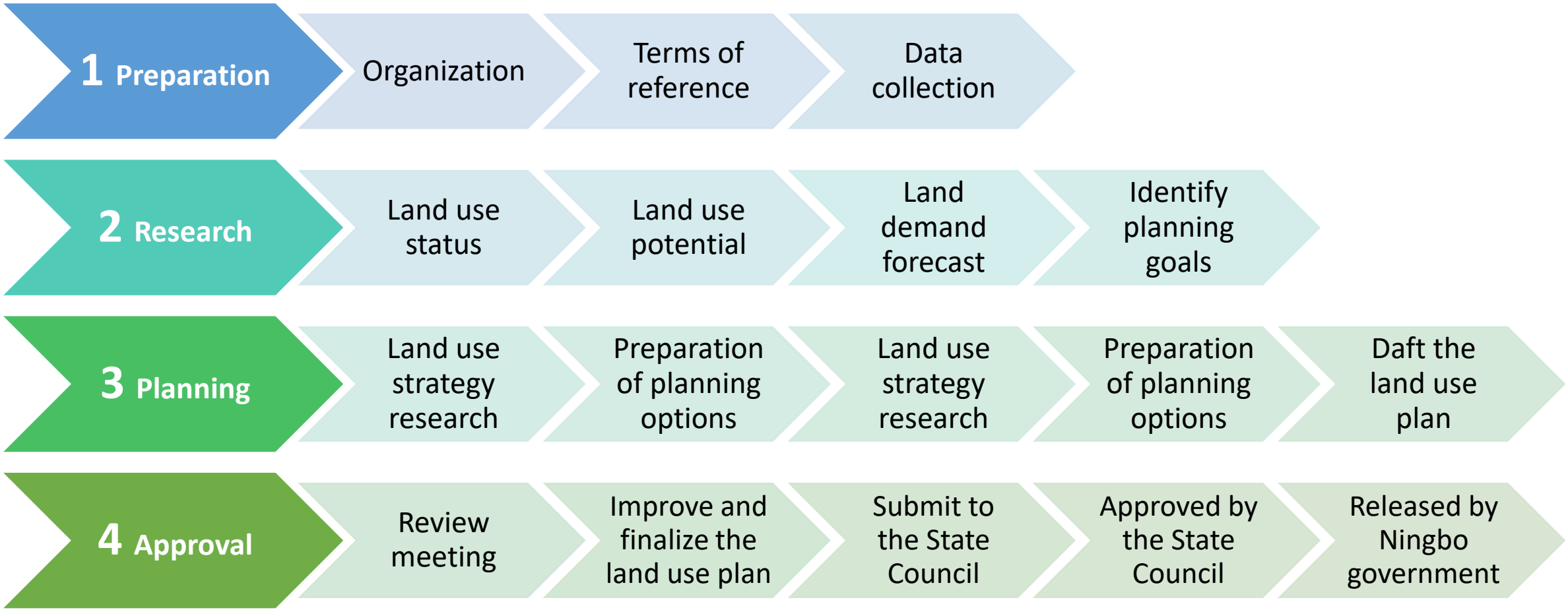
What are the actions needed to be taken to conduct NCA?
How can we leverage NCA to support green urban?

1. Identify the needs from asset list;
2. Establish data inventory
3. Collect missing data and ‘hotspots’ – areas of special interest/biodiversity;
4. Conduct NCA and create optimized scenario
5. Diagnose the underutilized assets (and identify attributes of high performance) and enhance the efficiency of land use.

How to use the results of NCA for city?

1. Protecting natural assets within the ecological red line;
2. Extend the city in an orderly manner in the form of GOD (green-oriented development);
3. To enhance city's natural assets and ecosystem service through the greening of infrastructure and management in the built area;
4. Help influence a revised planning guidance document and development requirements
5. Develop a baseline to monitor future performance

Land use planning process of Ningbo City



THANK YOU

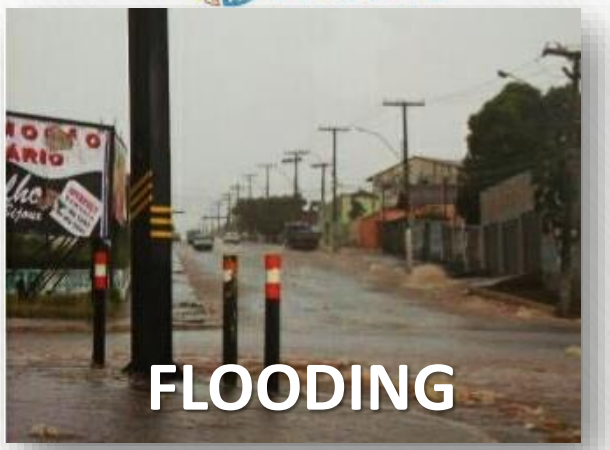
PROJETO

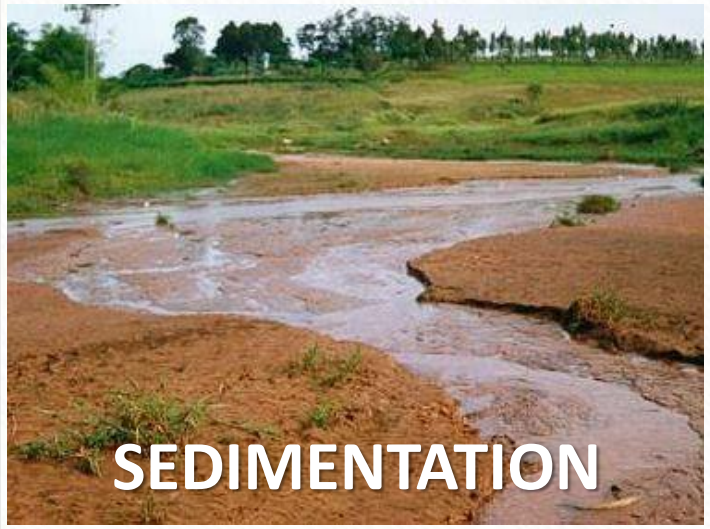
PRÓ ÁGUA

ANÁPOLIS
PLANEJAMENTO E AÇÃO

Andes, Amazon and Pantanal in one beautiful foto (*Decolonial Atlas*).

PROJETO PRÓ ÁGUA

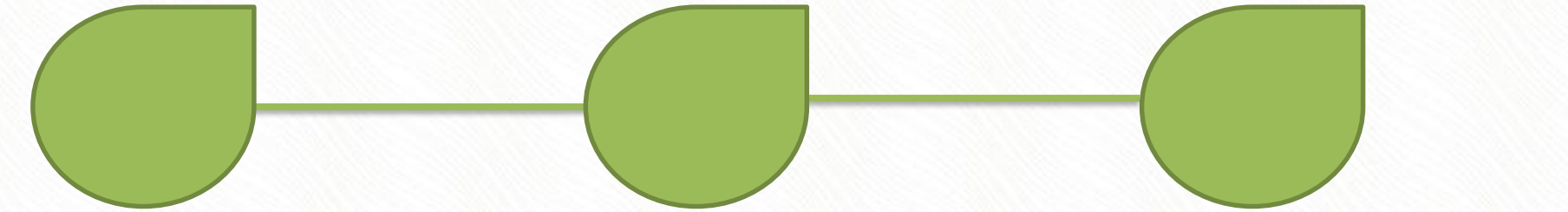




Realização:
SECRETARIA MUNICIPAL DE MEIO AMBIENTE, HABITAÇÃO E PLANEJAMENTO URBANO
ANÁPOLIS PLANEJAMENTO E AÇÃO

Systems

Partnerships with enterprises and communities



PROJETO PRÓ ÁGUA

Realização:
SECRETARIA MUNICIPAL DE MEIO AMBIENTE, HABITAÇÃO E PLANEJAMENTO URBANO
ANÁPOLIS PLANEJAMENTO E AÇÃO

250.000 trees planted in total.

123 springs and ciliary forests restored.

Production in partnerships of 450.000 seedlings.

Tertiary treatment of municipal sewage.

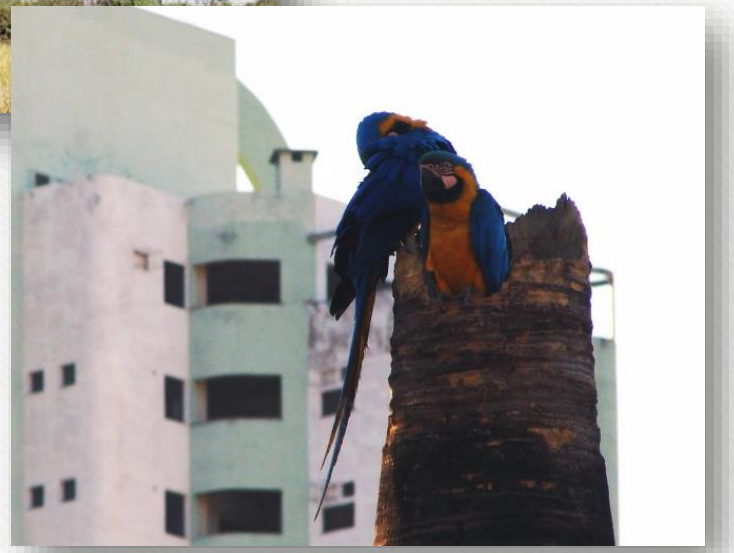
Prediction of new basic plan of sanitation with percolative drenage.

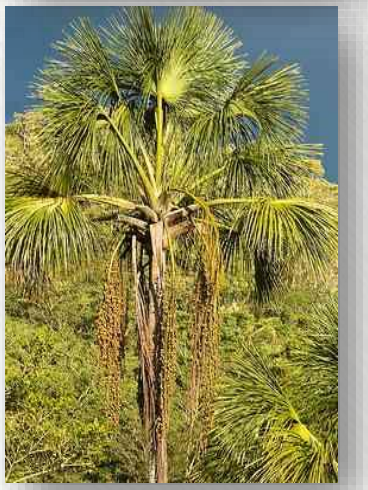
Creation of the protection area in the s´ring that supplies the city.

NBS – Technics of rural & urban infiltration

European Garden
“Little Brazilian leafs”

Urban and rural diversity





Realização:
SECRETARIA MUNICIPAL DE MEIO AMBIENTE, HABITAÇÃO E PLANEJAMENTO URBANO
ANÁPOLIS PLANEJAMENTO E AÇÃO

A strong strategical partnership

PROJETO PRÓ ÁGUA

&

ANDUS

APOIO À AGENDA NACIONAL
DE DESENVOLVIMENTO URBANO
SUSTENTÁVEL NO BRASIL

Mais informações:

https://www.giz.de/en/worldwide/72977.html

Pilot projects in local level

5 municipalities

ANDUS

SUPPORT TO THE BRAZILIAN NATIONAL AGENDA FOR SUSTAINABLE URBAN DEVELOPMENT

City’s goals and priorities

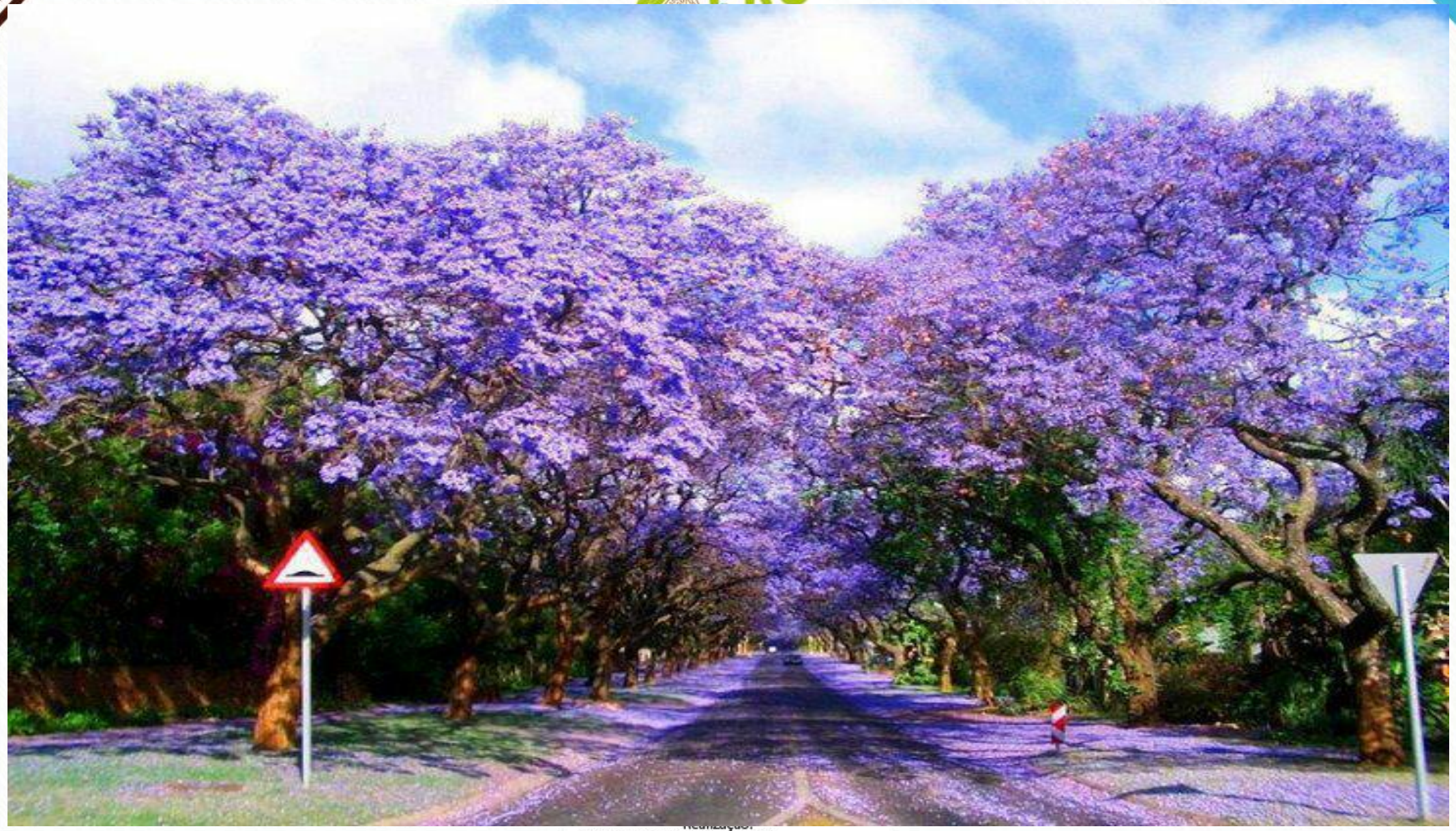
- Consideration of urban expansion with green infrastructure
- Sustainable flood water drainage
- Plant 1 million trees for residents benefits in 2 years
- Encourage native fruits production within the city
- Encourage environmental education in the community
- Encourage biodiversity in the city
- Encourage community engagement and civic harmony

Action Plan

Actions to be undertaken in the next year before the mayoral elections:

- **Action 1:** Collection of baseline data on natural assets
- **Action 2:** Bring together all stakeholders (mayor, air force, businesses, universities, businesses, religious institutions, judiciary)
- **Action 3:** Create a list of policies with the stakeholders using baseline data for the urban and rural areas
- **Action 4:** Create a business plan for policy implementation (timeline, funding, stakeholders, monitoring)
- **Action 5:** Legislate and integrate into the city master plan
- **Action 6:** Celebrate!!!

PROJETO PRÓ



Realização:

SECRETARIA MUNICIPAL DE MEIO AMBIENTE, HABITAÇÃO E PLANEJAMENTO URBANO

ANÁPOLIS PLANEJAMENTO E AÇÃO

Thank you for your attention!

PROJETO PRÓ ÁGUA

Realização:

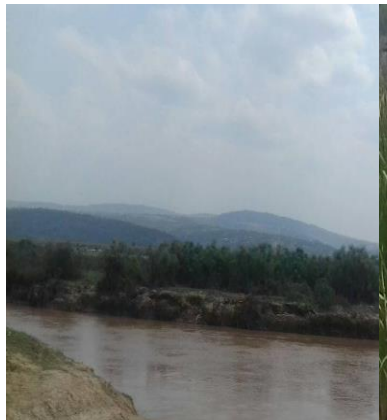
SECRETARIA MUNICIPAL DE MEIO AMBIENTE, HABITAÇÃO E PLANEJAMENTO URBANO

ANÁPOLIS PLANEJAMENTO E AÇÃO

Kigali Biodiversity and Natural Capital assets

By
John KALISA

Kigali, Rwanda




Kigali Profile vs Rwanda

"Kigali City, a green, clean and secure City in Africa"

Rwanda	Kigali
Area: 26,338 km^2	• Area: 730 Km^2
Population: 12M	• Population: 1,3M
Density: 435/Km^2 (29th and 1st in Africa)	• 3 Districts into 35 Sectors, 161 Cells
History: Genocide against Tutsi of 1994	• 70% rural while ¾ of its population are urban dwellers.
Economy: GDP 2012: $7.103 billion, $ 619 per capita	• Growth rate of city is 10.7%

Kigali Overview

- **The goal of the City of Kigali is to be:**

✓ **A City of character, vibrant economy and diversity**

✓ **A City of green transport**

✓ **A City of affordable homes**

✓ **A City of enchanting nature & biodiversity**

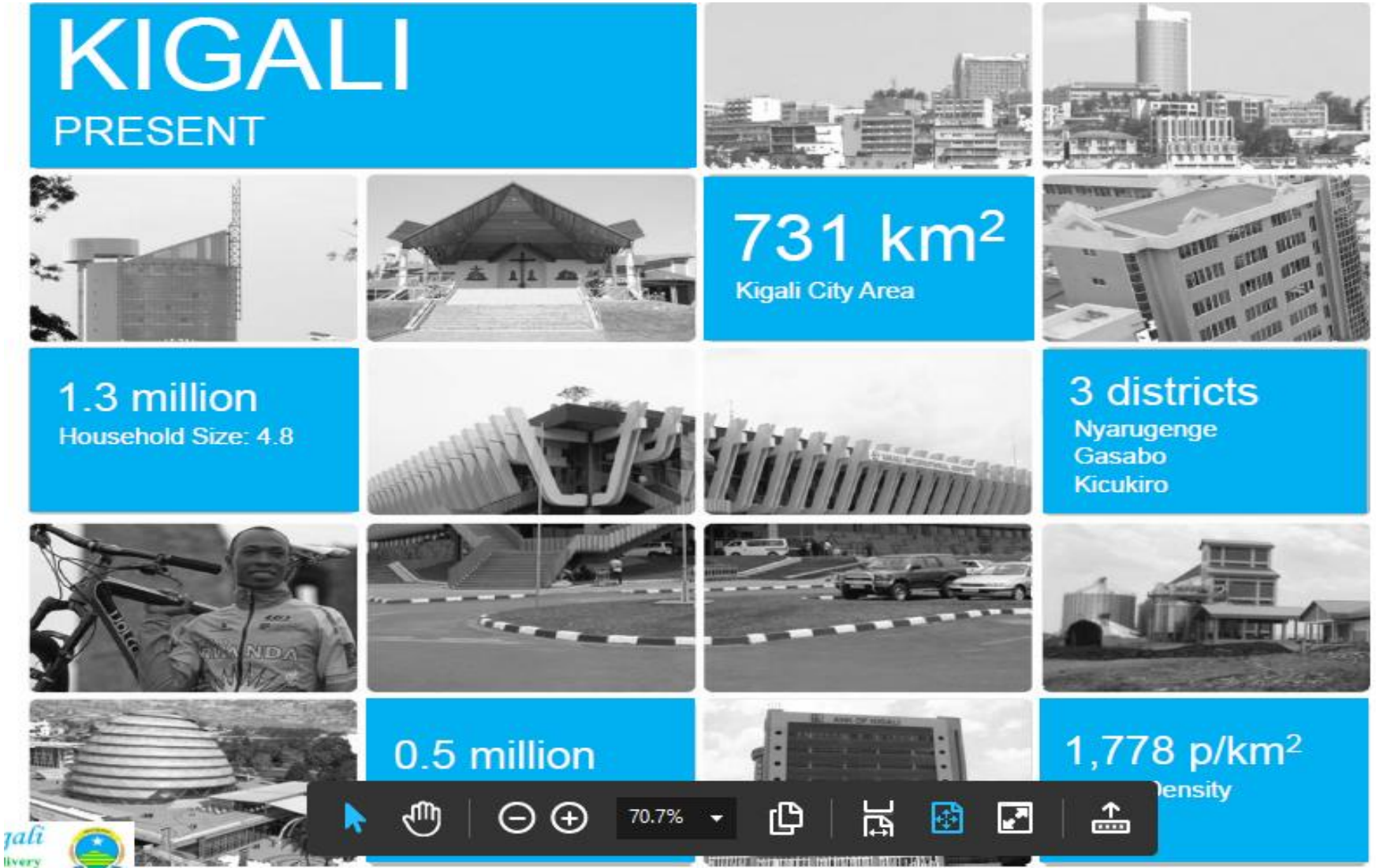
✓ **A City of sustainable resource management**

✓ **A City of Endearing character & unique local identity**

Kigali Location

Kigali Development

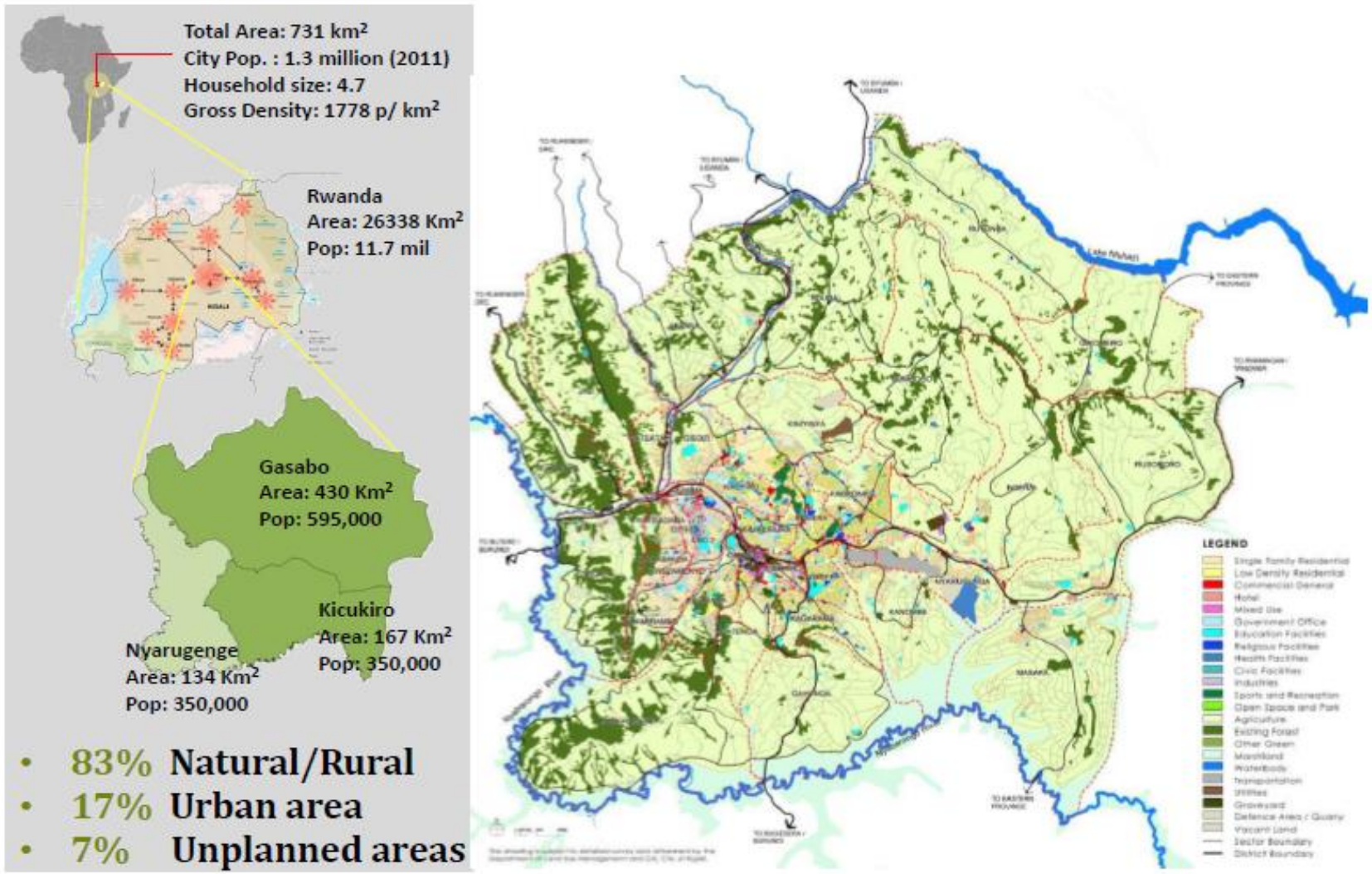
Current Kigali Assets



Kigali Development Process

KIGALI CONCEPTUAL MASTER PLAN

Kigali Facts and Figures

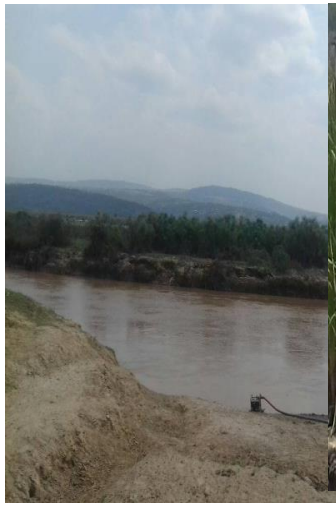


Kigali Biodiversity and Capital assets

- ✓ Kigali Urban wetlands covers 10.6% , from reduction of 14% in Kigali Master Plan 2013.
- ✓ 50% of Kigali Wetlands have lost their ecological character
- ✓ Kigali City wetlands Potential areas for agriculture is 12.5%
- ✓ High Population desinty put pressure on Agriculture productivity and Urban wetlands wise use

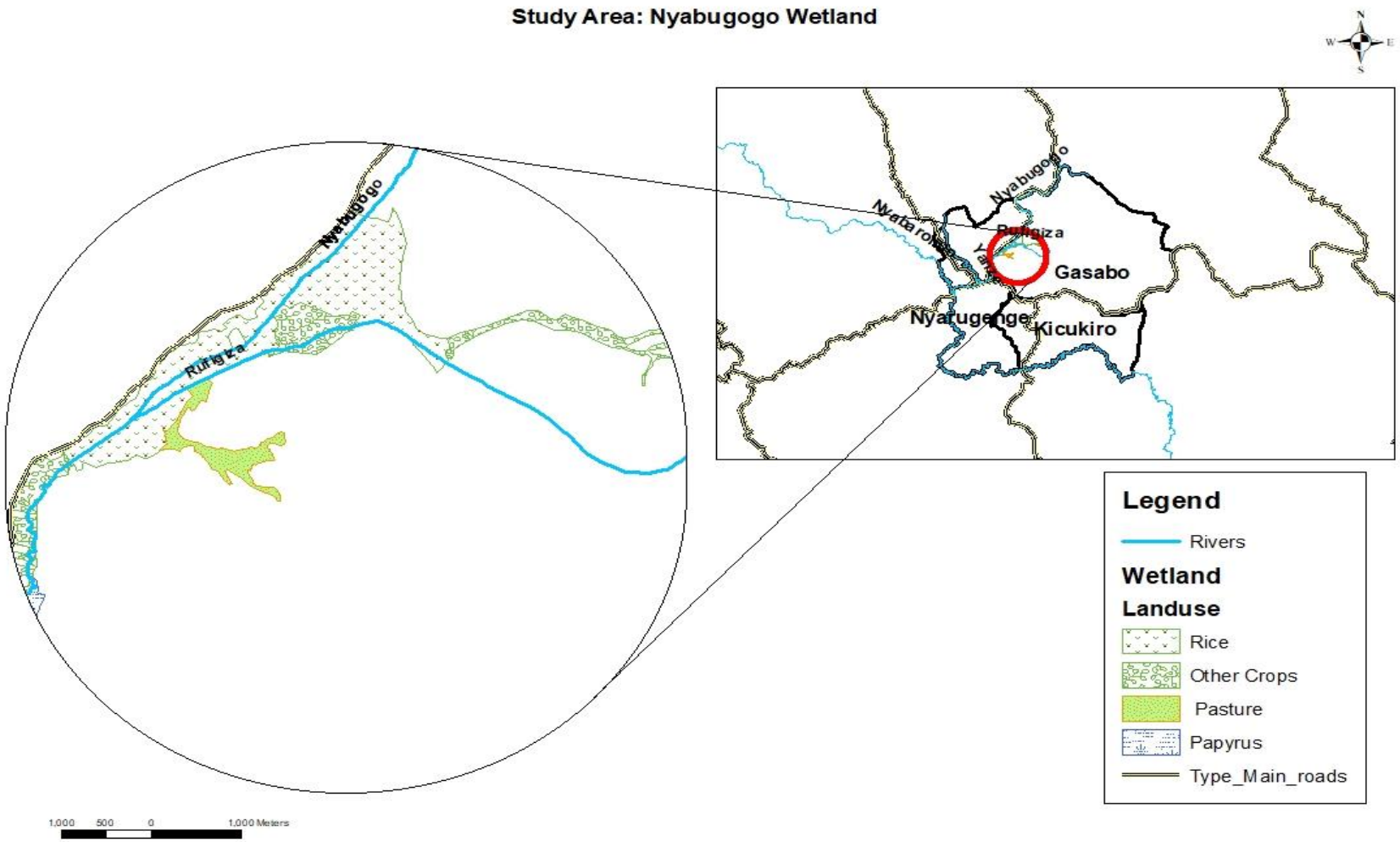
Kigali Bio vs Natural Activities

S/N	Land use type	Perimeter (km)	Area (Ha)	Proportion (%)
1	Built-up area	2	9.06	3.3
2	Cash crop (Rice – Sugar cane - green house agriculture)	12.7	82.50	29.7
3	Natural vegetation (Shrub+Papyrus)	6.3	117.80	42.4
4	Mixed crop (Perennial+ Seasonal)	8.5	41.44	14.9
5	Cattle farming	2.6	10.00	3.6
6	Perennial crop	2.3	3.69	1.3
7	Recreation Zone	1.5	13.34	4.8
Total			278	100.0

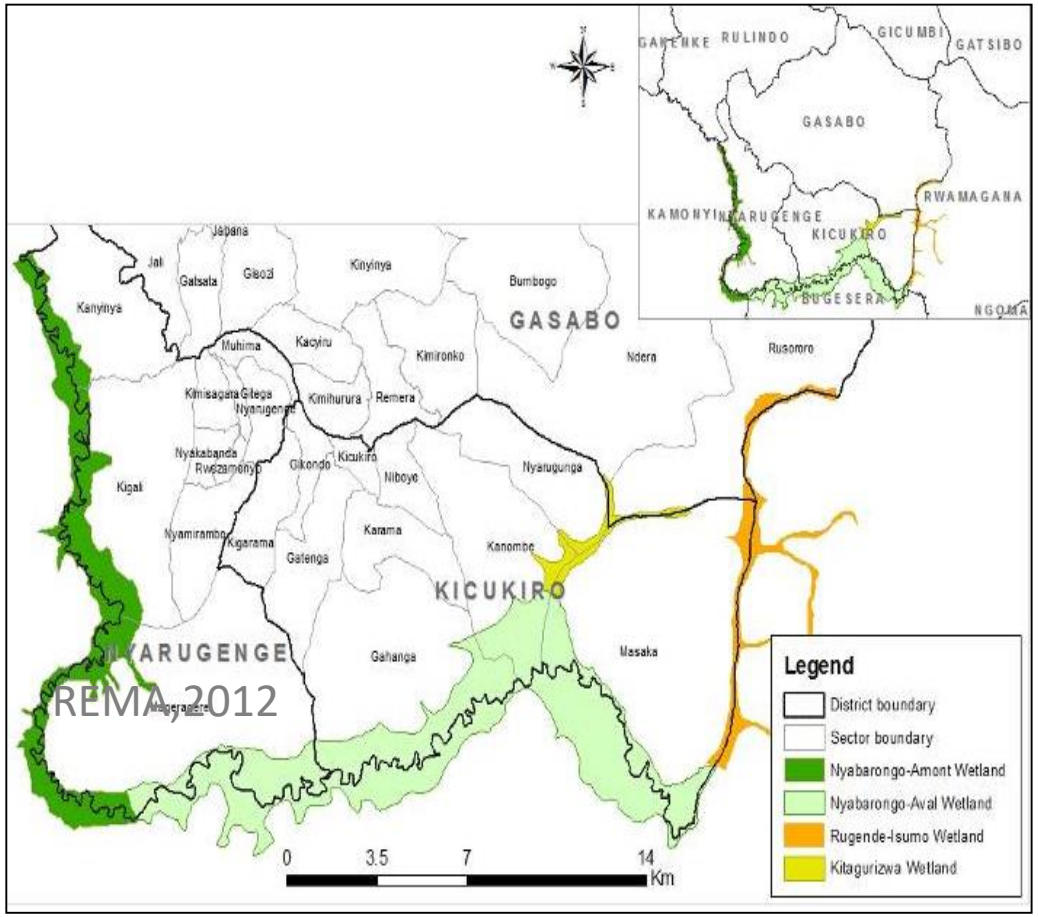


Case Study areas

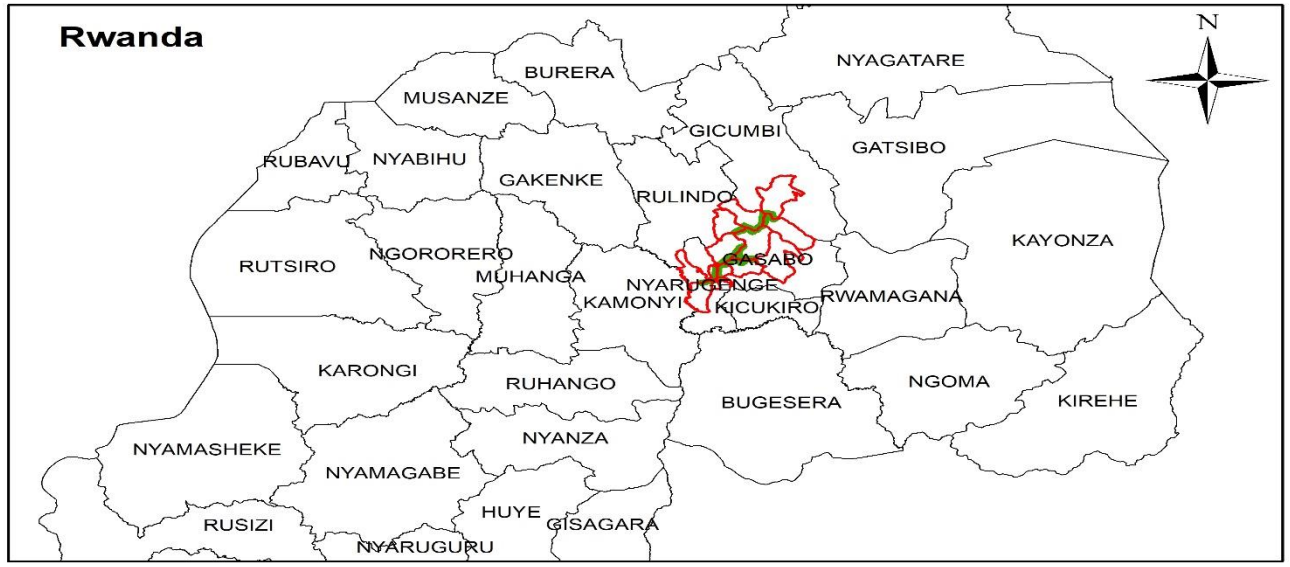
Case study

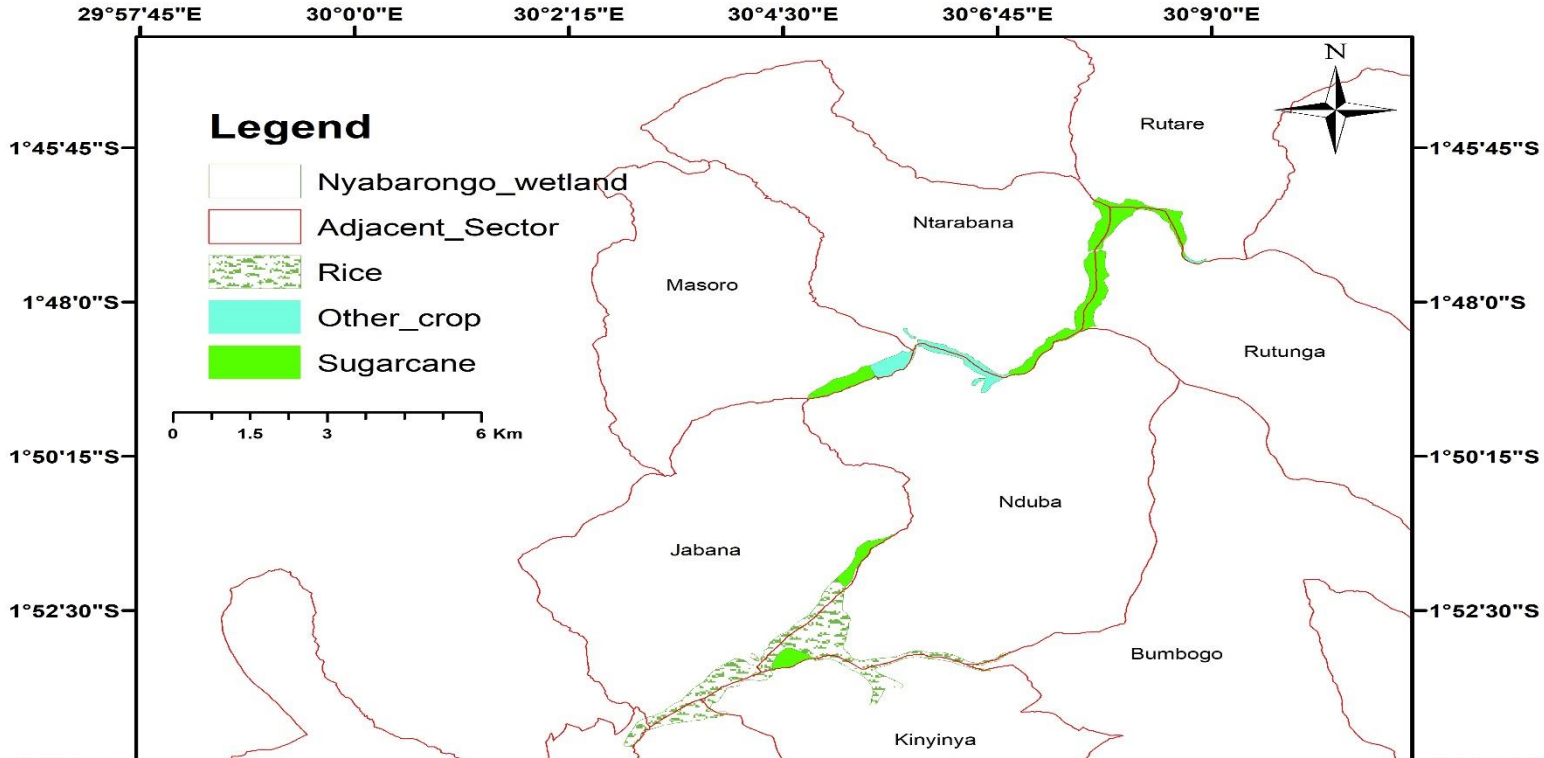


Study area description



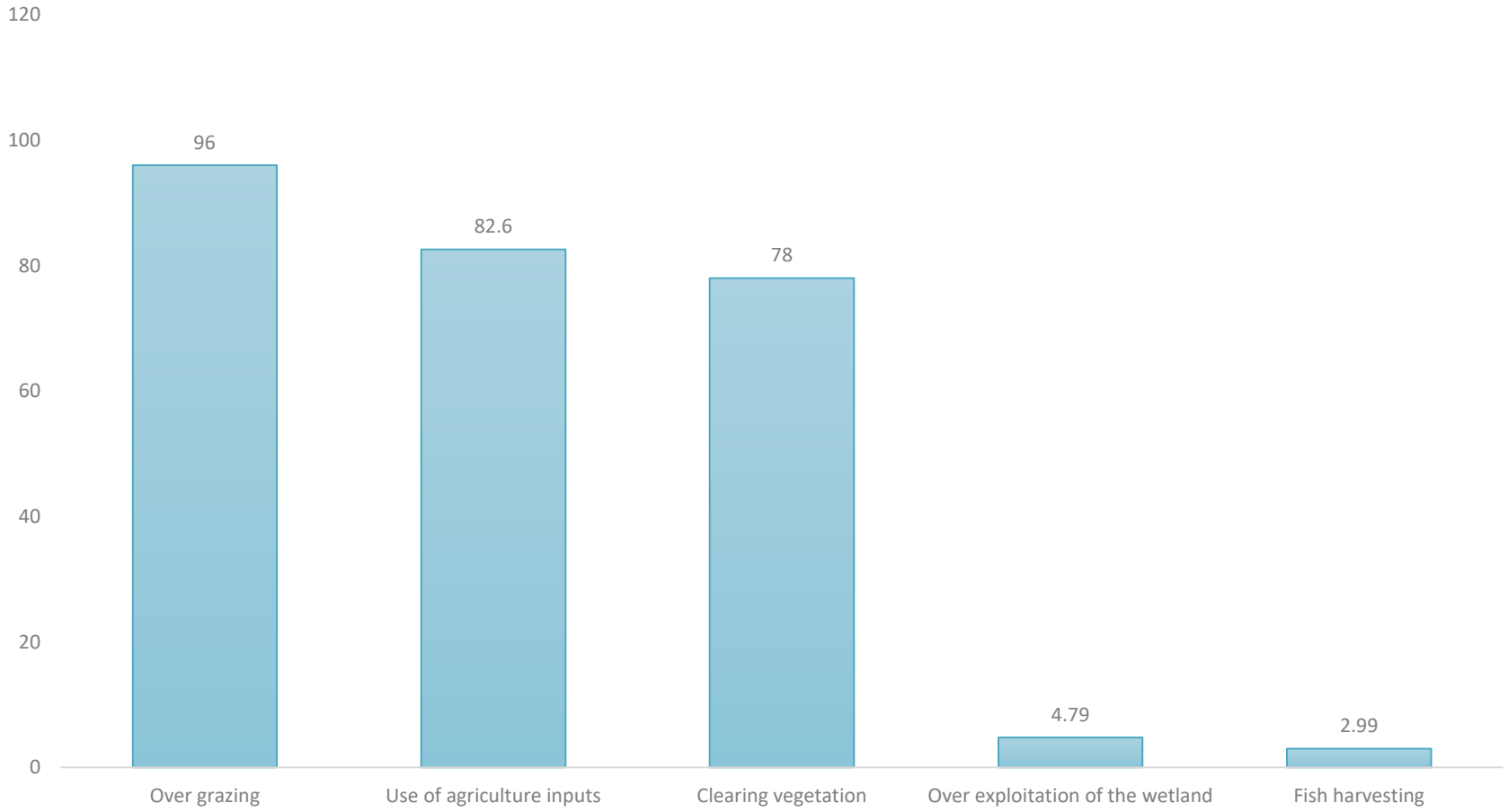
- The region is bordered by the great marshy Nyabarongo River to the west and south and the Lake Muhazi to the north;
- The eastern boundary of the Kigali is marked by a series of streams including the Rugende, Isumo and Rusasa that drain into the Nyabarongo;
- The Kigali City region is mainly drained by the Nyabugogo River, a main tributary of the Nyabarongo, which is fed by the Lake Muhazi outflow, the Kaguhu and several smaller streams;
- The Nyabugogo River begins at the confluence of the Lake Muhazi outflow and the Kaguhu stream in the north-east of the study area;
- The Nyabugogo flows south to the Kigali main city area where it is joined by other smaller streams and turns south-west to join the Nyabarongo River.
- The river skirts the Kigali main city area marking the southern boundary of the study area, eventually turning south joining with the Akanyaru River to form the great Akagera River that flows into Lake Victoria.


Rwanda
N
BURERA
NYAGATARE
MUSANZE
GICUMBI
GATSIBO
RUBAVU
NYABIHU
GAKENKE
RULINDO
KAYONZA
RUTSIRO
NGORORERO
GASABO
MUHANGA
NYARUGENGE
KAMONYI
KICUKIRO
RWAMAGANA
KARONGI
RUHANGO
NGOMA
BUGESERA
KIREHE
NYANZA
NYAMASHEKE
NYAMAGABE
HUYE
RUSIZI
GISAGARA
NYARUGURU

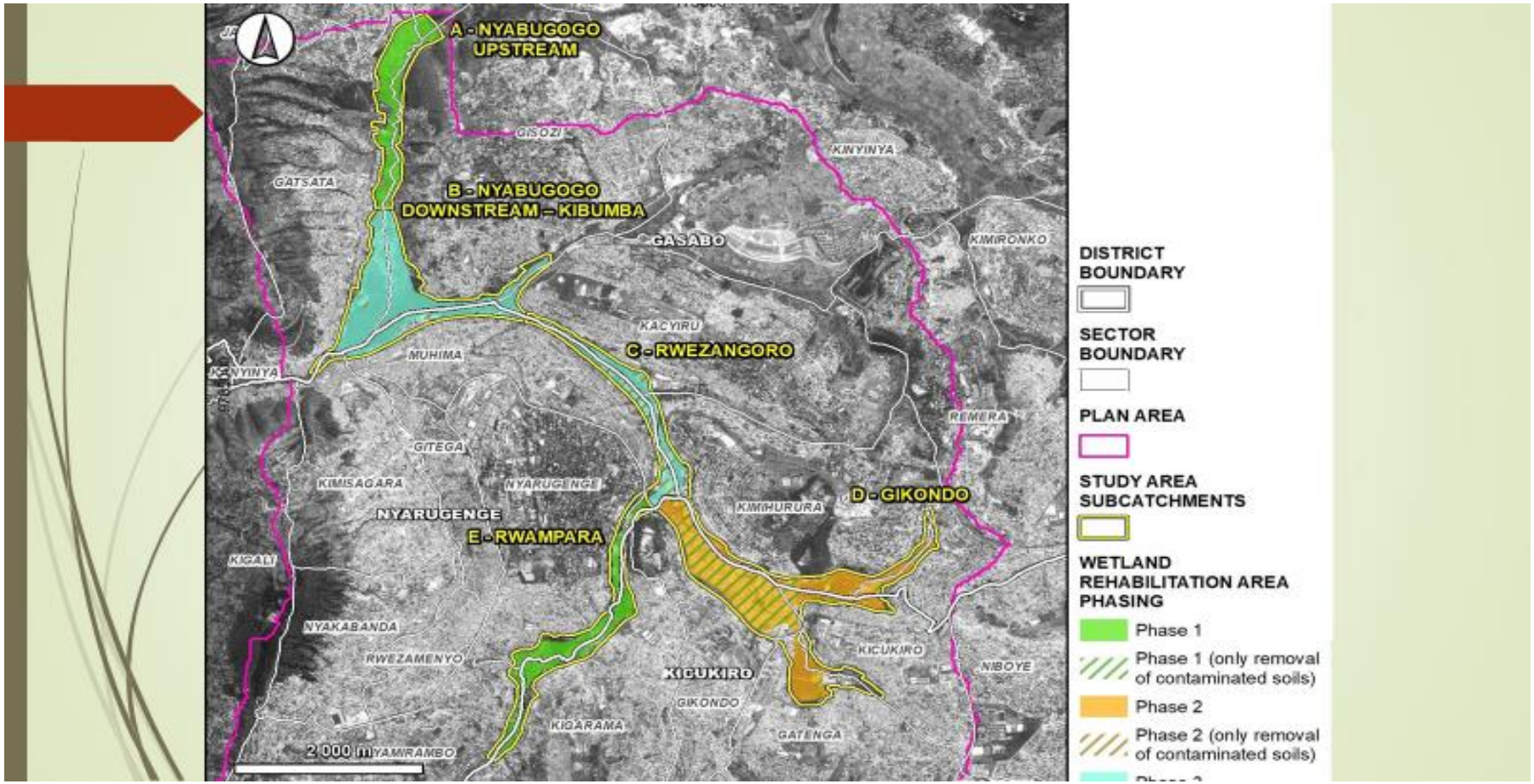

29°57'45"E
30°0'0"E
30°2'15"E
30°4'30"E
30°6'45"E
30°9'0"E
1°45'45"S
1°48'0"S
1°50'15"S
1°52'30"S
N
Legend
Nyabarongo_wetland
Adjacent_Sector
Rice
Other_crop
Sugarcane
0
1.5
3
6 Km
Rutare
Ntarabana
Masoro
Rutunga
Nduba
Jabana
Bumbogo
Kinyinya

Urban wetlands use

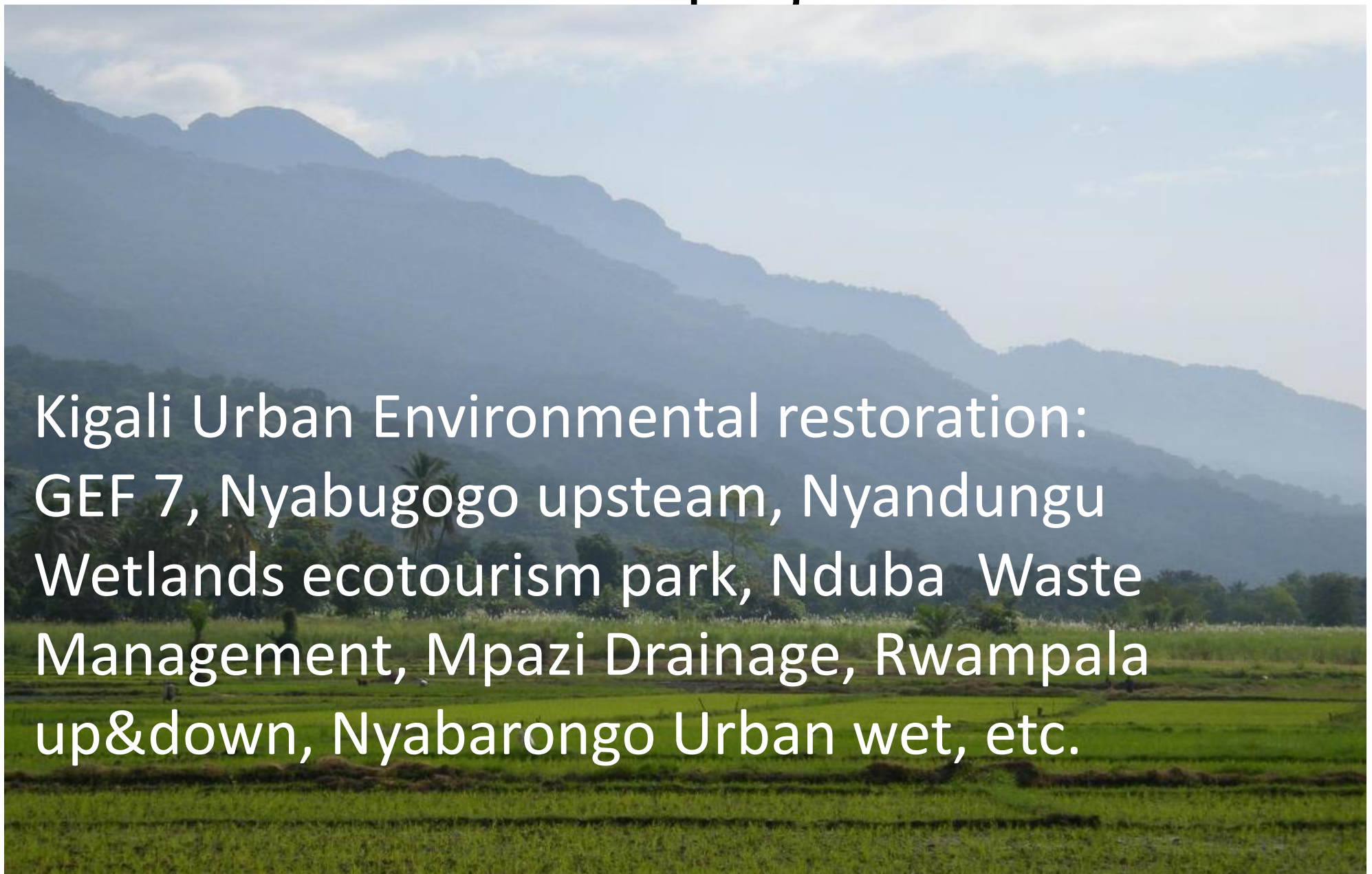
- Fig 2



Urban wetlands- NBS Projects



Potential projects



Kinyinya Green City Develop

Nyandungu Urban Wetland Ecotourism park

NCA Head up

National Level

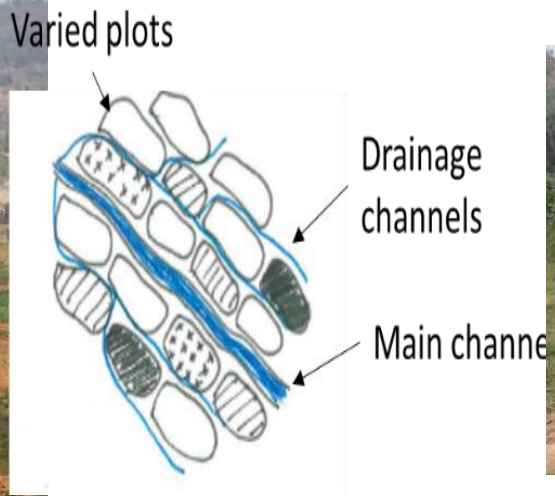
- Land Account
- Water Account
- Mineral Account
- Ecosystems Services

- Energy?
- Current Status

Leading Institutions

- Ministry responsible for Natural resources and environment (Land, Water, Forest, Mining)
- Ministry responsible for Finance and Economic Planning
- Statistics Bureau

Agricultural Land -Use categories in Wetlands



Challenges and Gaps in Urban Wetlands Governance

Challenges

- Conflicting policies and laws(Weak institutions)
- Weak enforcement tools
- Lack of compliance at local level

Gaps

- Weak coordination and cooperation
- Low institutional capacity
- Political interference

Drivers for changes and balance- Rwanda

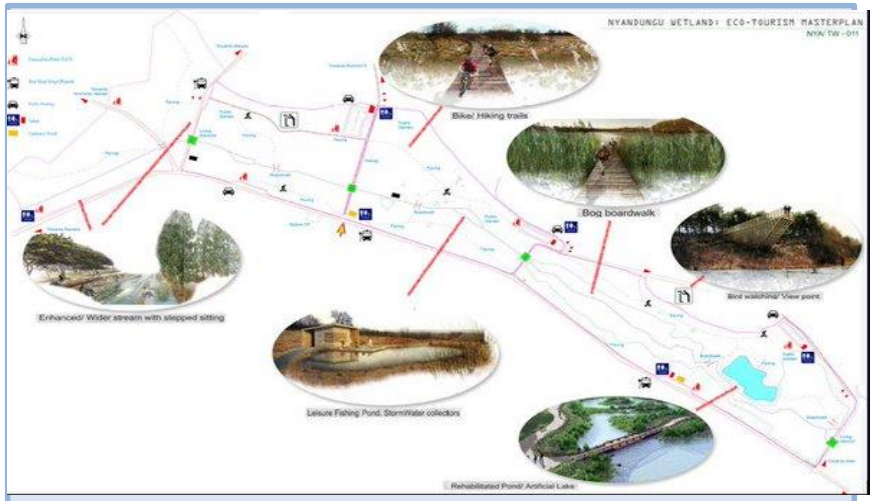
- **Political commitment**
- **Strong institutional set up:**

Natural resources Authority in 3: (Forest&Water, Land Management &Mining Board- then Water B)

- ***Natural Resource Ministry in 2 (Aug. 2017), then in 1(Nov. 2018):***

✓ Water and Wetlands hanging.....then Board establishment (Nov. 2018);

✓ Organic law are being repealed: Conflict between environment and development: Irrigation vs conservation?



Challenges ahead

Drivers for Urban wetlands Wise use

- **Political Interest**
- ***National Interest***
- ***Geo-politics and Geo-economics*** (Regional &International Intergration)- Regional Water conservation: Think locally and react globally (Funding)!
- ***Dealing with Inconsistance-Incoherence-inefficiency***
- ***Promoting wise use of wetlands through nature based solutions***

Next steps- Decentralizing the concept

AHSANTE SANA!