

# Urban Resilience Intensive Training

July 2021



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# Acknowledgements

# Urban Resilience Intensive Training

# 2021

19 - 30 July | ONLINE

**CALL FOR PARTICIPATION**

International Urban Resilience Academy



Target groups

- > Policymakers
- > Practitioners
- > Researchers

The training aims at expanding the participants' knowledge on policies, tools, strategic and action planning for resilient urban transition, responding to the need for systemic change in tackling global challenges, for a just and green transition, with a specific focus on COVID-19 recovery and climate change interplay.

**DEADLINE FOR APPLICATION  
15 May 2021**

Fee: 1.200€

Fee reductions/scholarships are available for applicants from the Global South

<https://tinyurl.com/yj22l6t5>

Copenhagen, 2021

Coordinator:

Dr. Nicola Tollin, Professor wsr in Urban Resilience, University of Southern Denmark.

Organizers:

University of Southern Denmark, Civil and Architectural Engineering.

Intensive Training Contributors:

Alberto Innocenti, Katarzyna Alicja Wieszczyńska, Maria Pizzorni, Eleonora Orsetti, Vittore Negretto, Jungwoo Chun

A special thanks to Lecturers: Saleem Huq, Jennifer Lenhart, Ombretta Caldarice, Grazia Brunetta, Maria Manz Costa, Emanuel Raju, Roberto Rocco, Jordi Morato, Francesco Musco, Marcus Mayr, Esteban Leon.



University of  
Southern Denmark

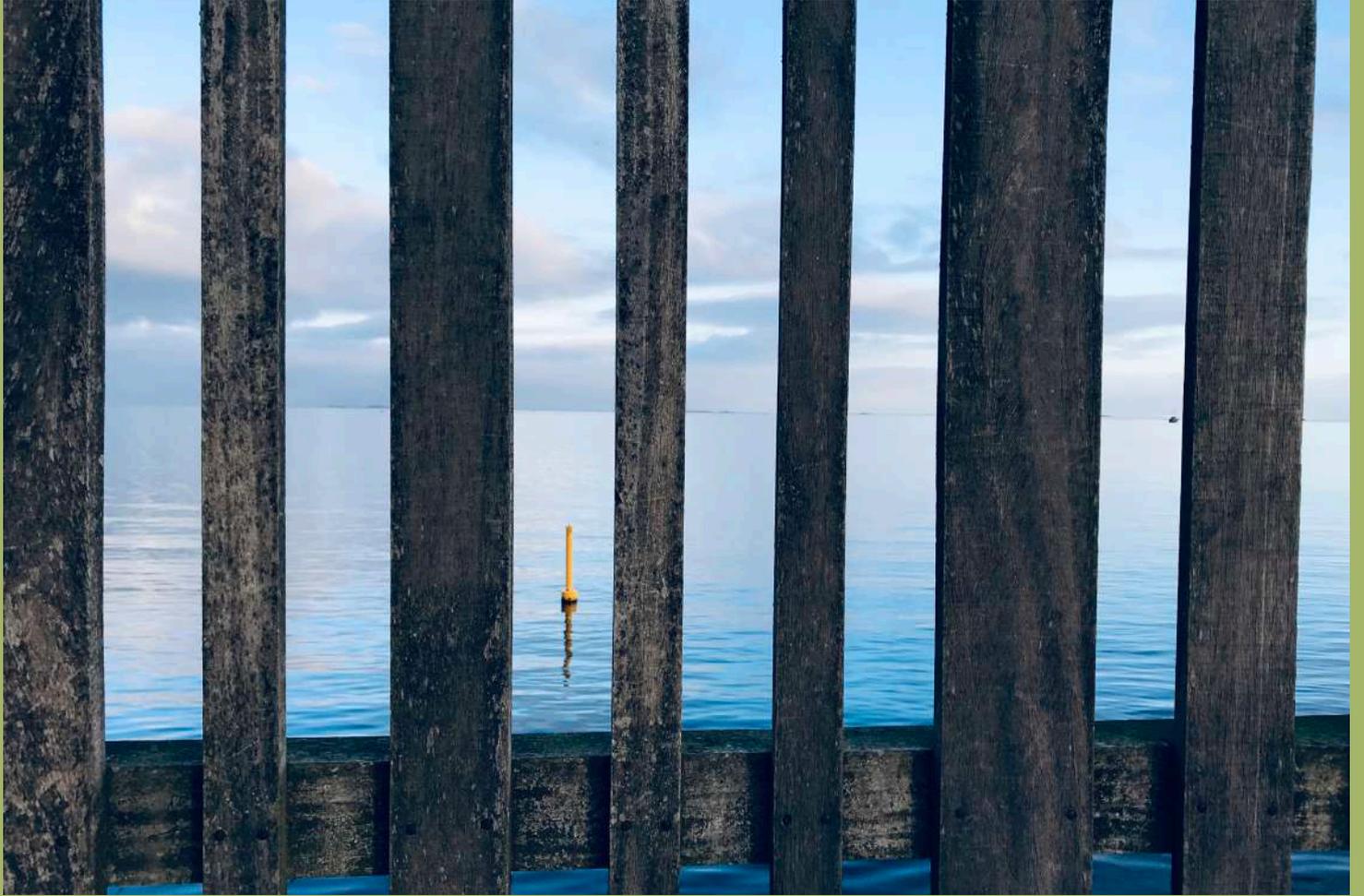
The SDU.Resilience Research Group would like to express its gratitude to all Partners, organizations and individuals that participate in the Urban Resilience Intensive Training 2021. The generous contribution of the Partners and the consultations with the Experts committee were essential in developing the training summarized in this booklet.

24 organizations and more than 30 experts, practitioners and researchers contributed to the training. SDU.Resilience is grateful for the valuable inputs received from the following organizations and institutions: Aalborg University (AAU), United Nations Human Settlements Programme (UN-Habitat), United Nations Office for Disaster Risk Reduction (UNDRR), ICLEI – Local Governments for Sustainability, WWF, Recycling the City Network – RECNET, The Resilience Shift, Nordic Urban Resilience Institute, Imperial College London, Adapt Chile, ARUP, TU Delft University, International Organization of Migration (IOM), African Development Bank (AFDB), BLOXHUB, Càtedra UNESCO de Sostenibilitat (Universitat Politècnica de Catalunya), UNESCO Intergovernmental Hydrological Programme, Climate Service Center Germany – GERICS, UN Climate Technology Centre & Network (CTCN), International Centre for Climate Change and Development (ICCAD), Responsible Risk Resilience Centre (R3C) Politecnico di Torino, IUAV University of Venice, Asian Disaster Preparedness Center (ADPC), Resalliance.

Thanks are also due to the following individuals for their feedback and suggestions: Alexandros Makarigakis, Ashley Carl, Carina Borgström Hansson, Christian Barthelt, Cristobal Reveco, Dražen Kučan, Esteban Leon, Federico Villatico Campbell, Felix Döhler, Francesco Musco, Grazia Brunetta, Ho-Sik Chon, Jennifer Lenhart, Jordi Morato, Koko Warner, Magnus Qvant, Marcus Mayr, Maria Máñez Costa, Maryke van Staden, Mathias Garschagen, Ombretta Caldarice, Pasquale Capizzi, Roberto Rocco, Saleemul Huq, Sanjaya Bhatia, Sara Candiracci, Sarder Shafiqul Alam, Sergio La Motta, Seth Schultz, Silvia Haslinger Olsson, Simone Sandholz.

A special thanks to the lecturers: Saleem Huq, Jennifer Lenhart, Ombretta Caldarice, Grazia Brunetta, Maria Manz Costa, Emanuel Raju, Roberto Rocco, Jordi Morato, Francesco Musco, Marcus Mayr, Esteban Leon.

Thanks are also due to the Intensive Training contributors and team for the hard work: Alberto Innocenti, Katarzyna Alicja Wieszczyńska, Maria Pizzorni, Eleonora Orsetti, Vittore Negretto, Jungwoo Chun.



# Organizing Committee



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**Esteban Leon**

Head of the City Resilience Global Programme of UN-Habitat.



**Jordi Morato**

Leader-member of the group and Director of the UNESCO Chair of Sustainability, at the university polytechnica of catalunya (UPC).



# Foreword

Urban Resilience Intensive Training 2022 was the third edition of training that we are hosting, responding to the Cities-IPCC call to foster dialogue between practitioners, policymakers, and researchers; developing and promoting peer-to-peer learning across regions, sectors, and disciplines and supporting the development climate actions.

This year's training brought 27 participants, policymakers, researchers and practitioners from 21 countries, 4 continents. This year, participants focused on a challenge of just and green transition in the frame of COVID-19 recovery and climate change and how to enhance urban resilience through transformative strategies and actions. Leading experts and scholars provided the fundamentals of urban resilience, climate adaptation, disaster risk reduction, and cross-sectoral topics such as finance, multi-level governance, planning, nature-based solutions and planning.

This year through group work for a problem-based challenge, the participants were

working on various issues as resilient water community, nature-based sanitation, mobility and accessibility, decent and affordable housing, zero-waste community in informal settlements choosing Beira (Mozambique), Cuttack (India), Port of Spain (Trinidad and Tobago) Nairobi (Kenia), Metro Manila (Philippines) as case studies. The participants' mix of various disciplinary backgrounds and professional roles revealed the difficulty of working together on cross-disciplinary and cross-silos challenges, maximising the opportunity for multi-perspective, developing co-benefits and synergies for the strategies and actions.

The participants' contribution inspired us, not only for the insightful and cross-sectoral analysis of the diverse urban system, bold & visionary ideas, tackling organisational, management and physical challenges, and developing informed strategies and plans. More importantly, the course became a continuous and insightful discussion and exchange of different understanding, experiences and practices, critical views

on various context shaping challenges, brainstorming the novel ways for adjusting, planning for future resilient cities. Further, we are glad to continue the learnings and collaboration with the participants from all past training through the Urban Resilience Community of Practice.

I would like to congratulate the alumni of the intensive training for an impressive outcome and compliment them on their wholehearted effort, collaborative skills, openness throughout the entire process, and the online time spent together. I would like to thank our partner organisations sincerely, the members of the Expert's Committee and the organising committee for their dedication, support and work that made possible the organisation of the summer school in challenging times.

I look forward to continued collaboration towards 2022 and onwards!

Nicola Tollin

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# Rationale Urban Resilience



Today over 50% of the world population lives in urban areas, and cities account for 60-80% of global energy consumption and the same level of greenhouse gases emissions, producing 50% of global waste, consuming 75% of natural resources and producing 80% of global GDP.

Cities and their populations are vulnerable and increasingly exposed to rapid and slow on-setting climate and environmental disasters, which frequency and intensity are growing exponentially. Yet, cities are also major centres of economic activity, social life and culture, innovation and knowledge-creation.

Urban resilience aims to increase the ability of urban systems to respond systemically and dynamically to present and future shocks and stresses related to major global challenges: unsustainable development patterns, rapid and unplanned urbanisation, climate change mitigation, and adaptation.

Urban resilience is instrumental in addressing both causes and effects of these major global challenges, re-thinking how cities are designed, planned and managed, and fostering innovation. The scientific research on urban resilience has been exponentially growing in the last decade, parallely a growing number of cities worldwide started developing resilience-related plans and actions, following the recommendations and prescriptions national and international policies international policies, as: Sustainable Development Goals, Paris Agreement, New Urban Agenda and Sendai Framework for Disaster Risk Reduction.

The key challenge for urban resilience is to co-develop and harmonise scientific and practice-led knowledge to support informed and science-based decision and policymaking, to enable our cities to evolve and innovate.

COVID-19 is the first global crisis that affected our cities worldwide; it gives us the opportunity to analyse how cities can respond and adapt to tackle all challenges of the pandemic. It is clear that cities, both in the Global South and North, will need to re-think how they are designed, planned, managed and lived. However, many lessons can already be distilled and can be used to strengthen the adaptive capacities of cities to face multiple and even concurrent global crises.

# Course description

The training built the core skills and competencies for urban resilient transition, including fundamentals of urban resilience in research, climate science, international and national policies, and resilience in action. In addition, the participants acquired core competencies in system thinking, system dynamic, transition theory and transformative strategies/actions.

The training adopted a process design methodology, through which the participants learnt about the use of methods for: system and stakeholders' analysis, future scenarios (forecasting, visioning and back-casting), strategic and action planning.

The training was funded on problem-based learning, and the participants, divided into small groups, responded to a specific challenge, applying specific tools and methods through a system thinking approach.

This year's challenge was focusing on just and green transition in the frame of COVID-19 recovery and climate change and how to enhance urban resilience through transformative strategies and actions.

The training also focused on key cross-sectoral issues, such as: mul-

ti-level governance, nature-based solutions, finance, appropriate technology, participatory processes and stakeholder's involvement, generation of co-benefits, urban metabolism, circular economy.

The training was highly participatory and designed for applied learning, aiming to foster peer-to-peer learning among policymakers, practitioners, and scientists, including both participants and lecturers/tutors.

The training included live and pre-recorded lectures delivered by recognized professionals from our partner organizations, group work and social session.



The key challenge for urban resilience is to co-develop and harmonize scientific and practice led knowledge to support informed and science-based decision and policy making, to enable our cities to evolve and innovate.

The global pandemic of COVI-19 exposed the vulnerability of cities and human settlements worldwide, facing and responding to the pandemic. The whole urban system has been affected, including:

Urbs

The physical structures and infrastructures;

Polis

The policy and the decision making processes

Civitas

The social fabric and the human relations

Oikos

The ecological fabric, the environment and the natural resources

The economy, as the good management of resources and the economic activities

# Challenge

**OBJECTIVE.** The general objective of the Urban resilience Intensive Training was to understand and boost the resilience of cities that are facing global crises. The aim was to extend the participants' knowledge on policies, tools, strategic and action planning for resilient urban transition, responding to the need for systemic change in tackling global challenges, for a just and green transition, with a specific focus on COVID-19 recovery and climate change interplay.

**CHALLENGE.** The Challenge was to define a strategic and action plan for the just and green recovery of cities in the frame of a resilient transition, leveraging the opportunity of the global post-pandemic recovery efforts and plans.

The Challenge was to promote a radical change and innovation of our cities in a resilient perspective that is dynamically adaptive and systemic, facing multiple crises by enhancing co-benefits and limiting rebound effects.

**PROJECT BACKGROUND.** The COVID-19 crisis highlighted the fragility of cities and urban communities dramatically, in various forms, such as: lack of multi-level governance, an increase of inequalities both globally and locally, limitations of evidence-based and science-based decision making, crises of the globalized economy and the system of pro-

duction and consumption, un-preparedness of emergency response and planning, mainly when concurring disasters are happening.

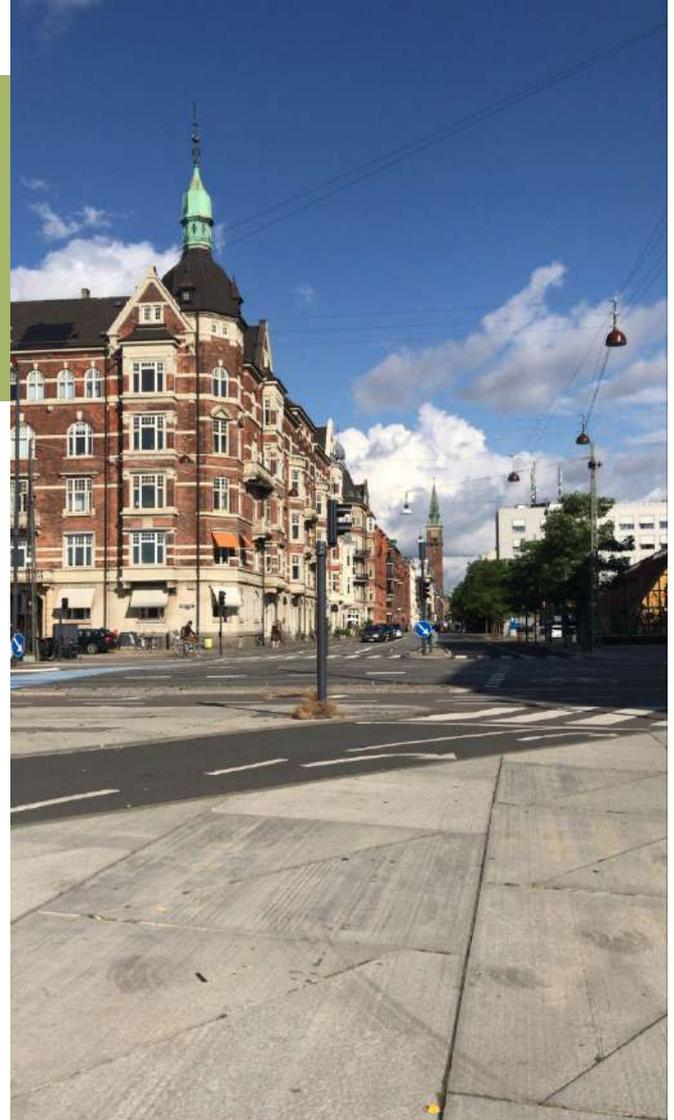
The resources available globally to foster the post-COVID recovery are a unique opportunity to accelerate a resilient transition of cities, based on social and environmental justice criteria, re-thinking radically how we conceive, plan, design, manage, and live our cities in the face of multiple crises and global challenges.

We will need to explore trade-offs and co-benefits of systemic and integrated strategies and action, addressing both the causes and effects of the current urban multi-crisis and defining concrete opportunities to make our cities more resilient, livable and just, by supporting local policies and actions that are evidence-based, inclusive and participatory.

**PROJECT SETTING.** Each group had to select a city they knew and with basic access to general information and data. The groups worked on their cities to respond to the Challenge, defining a strategic and action for the just and resilient transition, through a system thinking approach, by the different phases of the process design, each phase corresponding to an assignment, as follows: Analysis (diagnosis) > Future scenarios (trend/drivers) > Future scenario (visioning & backcasting) > Strategic and action planning.

# UR-Intensive Training GOAL

The training aimed at expanding the participants' knowledge on policies, tools, strategic and action planning, responding to the need for systemic change in tackling global challenges, for a just and green transition, focusing on COVID-19 recovery and climate change. Thus, the training brought together transdisciplinary knowledge and perspectives on urban resilience from science, policy, and practice, building the necessary skills and competencies to respond to the need for a systemic transformation to tackle global challenges relevant for the Global South and North. Through a system thinking approach, the program focuses specifically on core topics such as: resilience analysis and profiling, future scenarios, strategic and action planning, as well as on specific topics such as ecosystem services, multi-level governance, nature-based solutions, stakeholders' analysis and participation.



# Learning objectives

The participants developed their knowledge on:

- The basis of urban resilience and global challenges science, and the development of research in different disciplinary contexts.
- International policies (Sustainable Development Goals, Paris Agreement, New Urban Agenda and Sendai Framework for Disaster Risk Reduction).
- Urban resilience practices with specific case studies from cities worldwide, including strategic plans, action plans, and technological solutions.
- Cross-sectorial and thematic issues.

The participants developed competencies based on system thinking through a process design methodology for urban resilience including:

- System mapping & stakeholders' analysis,
- Analyzing current and future urban trends and drivers, at local and global level,
- Future scenarios methods: visioning and backcasting,
- Strategic and action planning.

# Lectures | Foundations

	#1 LECTURE	#2 LECTURE	#3 LECTURE
Title	Intro Resilience & Just green transition	Social and Economic recovery and just transition	Just and green transition *environmental perspective, with focus on cities and climate change
Speaker	<b>Nicola Tollin</b> Professor wsr in Urban Resilience, CAE Civil and Architectural Engineering , University of Southern Denmark (SDU)	<b>Saleem Huq</b> Director of the International Centre for Climate Change and Development (ICCCAD), Professor at the Independent University Bangladesh (IUB)	<b>Jennifer Lenhart</b> WWF's Global Cities Lead (WWF Sweden)
Date	19th July 2021	20th July 2021	21st July 2021

#### #4 LECTURE

Strengthening the science-policy-practice dialogue for urban resilience in planning. Status and knowledge gaps

#### **Grazia Brunetta**

Full Professor in Urban and Regional Planning (PoliTO, DIST), project manager R3C

#### **Ombretta Caldarice**

Assistant Professor in Urban and Regional Planning at the Politecnico di Torino (DIST)

21st July 2021

#### #5 LECTURE

Green Infrastructures and Nature Based Solutions

#### **Maria Manz Costa**

Director of the International Centre for Climate Change and Development (ICCCAD), Professor at the Independent University Bangladesh (IUB)

22nd July 2021

#### #6 LECTURE

Risk Management

#### **Emanuel Raju**

Director of the Copenhagen Centre for Disaster Research- inter-institutional research center (COPE), Associate Professor at the University of Copenhagen -Disaster Risk Governance.

22nd July 2021

	#7 LECTURE	#8 LECTURE	#9 LECTURE
<b>Title</b>	Social and Economic recovery and just transition	Green Infrastructures and Nature Based Solutions	Spatial Planning
<b>Speaker</b>	<b>Roberto Rocco</b> Associate Professor of Spatial Planning and Strategy, Delft University of Technology (TU Delft)	<b>Jordi Morato</b> Leader-member of the group and Director of the UNESCO Chair of Sustainability, at the university polytecnica of catalunya (UPC)	<b>Francesco Musco</b> Full professor in Urban Planning at the Department of Architecture and Arts – Università luav di Venezia
<b>Date</b>	26th July 2021	27th July 2021	27th July 2021

#10 LECTURE

Finance

**Marcus Mayr**

Urban Planner at Urban Development Division at the African Development Bank (ADB), coordinator of the Urban and Municipal Development Fund (UMDF)

27th July 2021

#11 LECTURE

Just and green recovery and transition

**Esteban Leon**

Head of the City Resilience Global Programme of UN-Habitat.

28th July 2021



# Lectures | Theories and Methods

## #1 LECTURE

System thinking

Cristobal Reveco Umana

Researcher on the human dimensions of climate change at the Climate Service Center Germany - GERICS

## #2 LECTURE

Trends and drivers

Nicola Tollin

Professor wsr in Urban Resilience, CAE Civil and Architectural Engineering , University of Southern Denmark (SDU)

## #3 LECTURE

Visioning + Backcasting

Nicola Tollin

Professor wsr in Urban Resilience, CAE Civil and Architectural Engineering , University of Southern Denmark (SDU)

## #4 LECTURE

Strategy and action planning

Alberti Innocenti

Assistant Professor in Urban Resilience, University of Southern Denmark (SDU)

Vittore Negretto

PhD candidate, IUAV University of Venice

# Assignments

## #1 ASSIGNMENT

Diagnosis. Systems analysis and stakeholders mapping

20th July 2021

## #2 ASSIGNMENT

Trends and drivers

22nd July 2021

## #3 ASSIGNMENT

Visioning + Backcasting

26th July 2021

## #4 ASSIGNMENT

Strategy and action planning

28th July 2021

# SCHOLARSHIP from The Resilience Shift

*“We are delighted to support Cecilia Akyeampong’s participation in the Urban Resilience Intensive Training 2021. Cecilia particularly stood out to us as an urban planning professional with a passion for introducing resilience improvements to her work in Accra, Ghana. As well as bringing a wealth of relevant experience across numerous sectors to contribute this year’s cohort of students, we are certain Cecilia will be able to apply what she learns on the course directly to her evident interest in enhancing systemic urban resilience and make a real impact to her city.”*

- The Resilience Shift -





Cecilia Akeyeampong

Head of Physical Planning Department for  
Ablekuma West Municipal Assembly in  
Accra (Ghana)

SDU.Resilience is thankful to The Resilience Shift for granting Cecilia Akeyeampong a scholarship to participate in the Urban Resilience Intensive Training 2021.

# Participants

27 people, 4 regions, 21 countries  
practitioners, policy-makers, scientists and researchers

Bangladesh, Colombia, Czechia,  
Denmark, Ecuador, France, Ghana,  
Hungary, India, Kenya, Mexico,  
Mozambique, Netherlands, Nicaragua,  
Palestine, Philippines, Slovenia, Trinidad  
and Tobago, Uganda, United Kingdom,  
Vietnam.





REGION

GENDER

POSITION TYPE

5 Africa

16 Female

8 Practitioner

6 Americas

11 Male

4 Policy-makers

7 Asia and Pacific

10 Scientists and researchers

9 Europe

3 Practitioner/Scientists and researchers

2 Policy maker Practitioner



India Researcher

**Vidhee Kiran Avashia**  
post-doctoral researcher at the Indian Institute of Management, Ahmedabad (India)



Czechia Researcher

**Licia Felicioni**  
Junior researcher, Czech Technical University in Prague and University Centre for Energy Efficient Building



Denmark Practitioner

**Ramin Ebrahimnejad**  
Project manager, an event organizer, and a board member at the Association for Vertical Farming (AVF)



Researcher  
France Practitioner

**Robin Elizabeth Tivy**  
Sustainable Urban Development Planner, Consultant, University Lecturer



Ecuador Researcher

**Myriam Margoth Jacome Guerra**  
Lecturer and researcher at the Pontifical Catholic University of Ecuador (PUCE).



India Practitioner

**Renelle Sarjeant**  
Urban Planner and Urban Designer based in Trinidad and Tobago



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**Naftaly Mose**  
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Practitioner  
Mozambique Policy maker

**Abdul Rachid Afande**  
National Project Officer at ILO – CO LUSAKA - Mozrabalha Project – EIP component (Mozambique)



India Practitioner Researcher

**Zeenat Niaz**  
Vice president, Development Alternatives Group (India)



Policy maker United Kingdom

**Helen Katharine Civil**  
Head of Communications The Resilience Shift (United Kingdom)



Researcher  
Kenya Practitioner

**Beatrice Hati**  
Urban Resilience Researcher, Centre for Frugal Innovations in Africa (CFIA) - Kenya Hub



Researcher Slovenia

**Martin Valinger Sluga**  
Young Researcher, teaching assistant, and doctoral student at the Faculty of Architecture, University of Ljubljana



Ghana Policy maker

**Cecilia Akyeampong**  
Head of Physical Planning Department for Ablekuma West Municipal Assembly in Accra (Ghana)



Nicaragua Policy maker

**Emma Run**  
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India Practitioner

**Keya Kunte**  
Co-convenor, Habitat Forum (INHAF)



Researcher Slovenia

**Samah Aljabari**  
Assistant Professor at Palestine Polytechnic University. Expert and highly qualified researcher in the field of water security and risk assessment.



Practitioner  
Hungary Policy maker

**Martin Fisher**  
Humanitarian Affairs Officer/ Operations Manager, OCHA ASP, IFRC Surge and risk management professional



**Cristóbal Lopez**  
MCR2030 Consultant at UNDRR  
ROAMC



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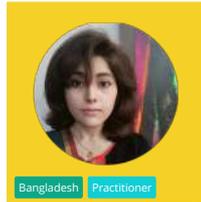
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Kerala, India.



**Beau Warbroek**  
Post-doc researcher at the  
University of Twente at the Civil  
Engineering Department



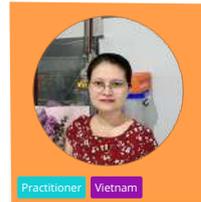
**Reynaldo Perez Ramos**  
Associate Professor at the  
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(Philippines)



**Sumaiyah Binte Mamun**  
Architect, Research consultant  
and Lecturer (on Leave),  
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**Nicolas ZIV**  
Chief of Operation at Resallience



**Ngoc Anh, Nguyen Thi**  
Project coordinator for the  
Support to Vietnam for the  
Implementation of Paris  
Agreement Project in Quang Binh  
province



**Ross Mc Donald**  
Architect and urban analyst on  
the Urban Recovery Framework  
for Syria

Urban Resilience Intensive Training 2021 targeted at middle and senior practitioners, scientists, and researchers with different disciplinary backgrounds including engineering, architecture, planning, environmental, economic and social sciences

- Practitioners from private and public sector, including also non-profit organizations.

- Policymakers from national and subnational governments and from international and intergovernmental organizations.
- Scientists and Researchers from universities and research organizations including PhD candidates, researchers and lecturers

Recording... [Pause] [Stop]

View

 Alberto Innocenti	 Katarzyna Alicja Wieszczyzn...	 Ramin Ebrahimnejad	 Licia Felicioni	 Valinger, Martin
 A.R. Afande	 Nicola Tollin SDU	 Kasia Wieszczyznaska	 Vidhee Avashia (IIMA)	 ROBIN TIVY
 Vittore Negretto	 Beau Warbroek	 Helen Civil, Resilience Shift	 Renelle Sarjeant	 Jung
 Nicolas ZIV	 Cristobal Lopez Maciel	 Emma Grün	 Zeenat Niazi	 Juliana Uribe Aguado
 Sumaiyah	 Rey Ramos	 Myriam Jácome	 Keya	 Beatrice Hati

Ask to Unmute ...

1/2

1/2

Unmute Stop Video Security Participants 33 Chat Share Screen Polling Pause/Stop Recording Breakout Rooms Reactions Leave

Recording... || ■ View

 Zeena Niazi	 Maria Pizzorni	 Kasia Wieszczyńska	 Nicola Tollin SDU	 Eleonora Orsetti
 ROBIN TIVY	 Vittore Negretto	 Alberto Innocenti	 Teddy Kisebo	 Licia Felicioni
 Ramin Ebrahimnejad	 Keya Kunte	 Valinger, Martin	 Vidhee Avashia (IIMA)	 Beau Warbroek
 Beatrice Hazi	 Julliana Uribe	 Ross Mc Donald	 Emma Grün	Renelle Sarjeant
 Jung	 Rey Ramos	 Martin Fisher	 Sumaiyah	 Samah Jabari

Unmute Stop Video Security Participants 32 Chat Share Screen Polling Pause/Stop Recording Breakout Rooms Reactions End

# Group composition

## GROUP1 POSEIDON



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**Abdul Rachid Afande**  
National Project Officer at ILO - CO LUSAKA - Mozambique Project - EIP component (Mozambique)



**Ramin Ebrahimnejad**  
Project manager, an event organizer, and a board member at the Association for Vertical Farming (AVF)



**Martin Valinger Sluga**  
Young Researcher, teaching assistant, and doctoral student at the Faculty of Architecture, Municipal Assembly in Accra (Ghana)



**Cecilia Akyeampong**  
Head of Physical Planning Department for Ablekuma West Municipal Assembly in Accra (Ghana)

## GROUP2 JUGAAD RESILIENCE



**Robin Elizabeth Tivy**  
Sustainable Urban Development Planner, Consultant, University Lecturer



**Martin Fisher**  
Humanitarian Affairs Officer/ Operations Manager, OCHA ASP, IFRC - Surge and risk management professional



**Beau Warbroek**  
Post-doc researcher at the University of Twente at the Civil Engineering Department



**Samah Aljabarti**  
Assistant Professor at Palestine Polytechnic University. Expert and highly qualified researcher in the field of water security and risk assessment.



**ZIV Nicolas**  
Chief of Operation at Resilience



**Helen Katharine Civi**  
Head of Communications The Resilience Shift (United Kingdom)

## GROUP3 THE TRINIS



**Renella Sarjant**  
Urban Planner and Urban Designer based in Trinidad and Tobago



**Myriam Margoth Jacome Guerra**  
Lecturer and researcher at the Pontifical Catholic University of Ecuador (PUCQ)



**Crisobal Lopez**  
MCR2030 Consultant at UNDRR ROMAC



**Emma Grun**  
Consultant and lecturer on urban development and management, Inter-American Development Bank



**Juliana Uribe Aguado**  
PhD candidate, Universidad de los Andes, Bogotá (Colombia)

## GROUP4 MAKAZI MUKURU



**Nafalyi Nisea**  
Lecturer in Economics, University of Eldoret (Kenya)



**Zarnat Noid**  
Vice president, Development Alternatives Group (India)



**Keya Runte**  
Co-convenor, Habitat Forum (NIGAR)



**Beatrice Hatt**  
Urban Resilience Researcher, Centre for Frugal Innovations in Africa (CFIA) - Kenya Hub



**Ross Mc Donald**  
Architect and urban analyst on the Urban Recovery Framework for Syria

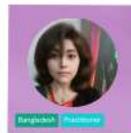


**Teddy Kiamba**  
Urban Researcher in the Urban Action Lab - Geography Department, Makerere University (Uganda)

## GROUP5 THE GREEN TRANSFORMERS



**Keyonido Perez Ramos**  
Associate Professor at the Rombion State University (Philippines)



**Sumaiyah Binte Mamun**  
Architect, Research consultant and lecturer (son leave), Department of Architecture, Shantou Marlam University of Creative Technology, China



**Ngoc Anh Nguyen Thi**  
Project coordinator for the Support to Vietnam for the Implementation of Paris Agreement Project in Quang Binh province



**Vidhee Xiran Avasthi**  
post-doctoral researcher at the Indian Institute of Management, Ahmedabad (India)



**Anshika P**  
PhD candidate, National Institute of Technology, Calicut, Kerala, India

# Process design



**STEP 0**

Define the case study

**STEP 1**

Define primary and secondary elements, and boundaries of the system

**STEP 2**

Define hazards, vulnerabilities and exposures of the system

**STEP 3**

Define the relations among the elements of the system

**STEP 4**

Stakeholder's mapping

**STEP 5**

Define trends and drivers and their impact on the system

**STEP 6**

Explore the relations and the consequences of the trends and drivers

**STEP 7**

Add trends and drivers in the system map

**STEP 8**

Map the complexity and interdependency of the system with Kumu

Indegree and outdegree analyses - Kumu

**STEP 9 | forecasting**

Forecast the trends and drivers in the future to identify most probable futures

**STEP 10 | visioning**

Define future visions for desirable/undesirable futures

**STEP 11 | visioning**

Define the target future (forecasting+visioning)

**STEP 12 | backcasting**

Define milestones

**STEP 13 | backcasting**

Define actions

**STEP 14**

Define the strategy

**STEP 15**

Define the actions

**STEP 16**

Timeline

**STEP 17**

Spatial planning

# Diagnosis

## #1 LECTURE THEORIES AND METHODS

System thinking

Cristobal Reveco Umana

Researcher on the human dimensions  
of climate change at the Climate  
Service Center Germany - GERICS

## #1 ASSIGNMENT

Diagnosis. Systems analysis and  
stakeholders mapping

20th July 2021

### STEP 0

Define the case study

### STEP 1

Define primary and  
secondary elements, and  
boundaries of the system

### STEP 2

Define hazards,  
vulnerabilities and  
exposures of the system

### STEP 3

Define the relations  
among the elements of  
the system

### STEP 4

Stakeholder's mapping

### STEP 0

Define the case study

Group 1, Poseidon

Toward Resilient Water  
System in post-COVID

Recovery - Beira  
(Mozambique)

March 2019



Mismanagement causes 70% of flood and subsequent damage and destroyed 20731 CW.  
The scale of damage caused by cyclone due that to the dependence on of them to rescue and restoring.



Standard situation

status quo: ongoing recovery from 2019 Cyclone Idai

- Opportunities:**
- Implement the forecast system
  - Implement the awareness and alert system (to avoid deaths)
  - Improve the storage food system
  - develop integrated resilience solutions (water, food, infrastructure, informality...)
  - human resource capacity
  - farmlands next to the river Pungwe



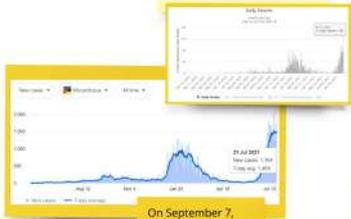
Waves are used by Cyclone Idai (2019) for the destruction of Beira and other coastal cities. Higher dependence on them to rescue and restoring.

14m km2  
y: 533,825 (2017)

Beira is the second largest city (after Maputo) and an important port. It is situated halfway up the coast in Sofala province at the mouth of the Pungwe River.

tropical savanna climate (Köppen). The rainy season runs roughly from November to April.

Climate variability is already affecting Mozambique. Over the past two decades, the country has experienced increased droughts, flooding, and storms, which in some cases have had severe socio-economic implications for the country. [source: USAID]



On September 7, 2020 Mozambique transitioned from a State of Emergency to a State of Public Calamity due to COVID-19.

**Coastal protection:** Sea water levels can be 3 meters higher. The existing system of breakwaters needs to be upgraded.

Drainage: The accelerated urbanization and growth of the city has led to a high density of buildings and other structures, but in other parts of the city, there are no drainage systems. Expansion is needed for the infrastructure to be able to handle water levels from the areas where people live.

Solid waste present: Solid waste present in the city, but no management. During the cyclone, solid waste, in enormous quantities, was visible around the city.

Strength is a factor that requires urgent attention, based to rehabilitate the existing system and expand it in vulnerable areas of the city.

Trucking and settlements were badly affected by the cyclone with approximately 70% of houses destroyed partially or totally.

Beira infrastructure has been severely affected by the cyclone, particularly along the coast where the road has been destroyed by sea waters and by the heavy equipment used to remove fallen trees and debris.

**Climate Change Issues**

- Coastal and rivers floods (fresh floods)
- Tropical Cyclones
- Heavy rain episodes
- Droughts
- Extreme weather - heat waves
- Farmlands destroyed or difficult to cultivate -> no planting and lack of food supplies

# Forecasting Trends and drivers

## #2 LECTURE THEORIES AND METHODS

Trends and drivers

Nicola Tollin  
Professor wsr in Urban Resilience,  
CAE Civil and Architectural  
Engineering , University of Southern  
Denmark (SDU)

## #2 ASSIGNMENT

Trends and drivers

22nd July 2021

### STEP 5

Define trends and drivers  
and their impact on the  
system

### STEP 6

Explore the relations and  
the consequences of the  
trends and drivers

### STEP 7

Add trends and drivers in  
the system map

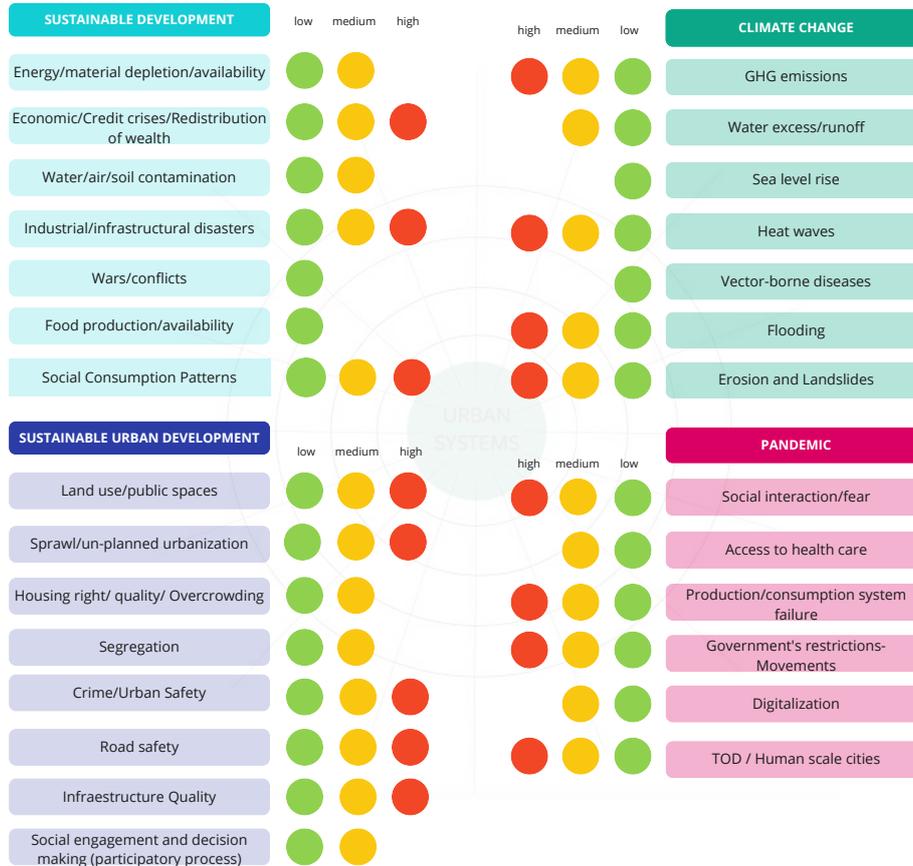
### STEP 8

Map the complexity and  
interdependency of the  
system with Kumu

### STEP 5

Define actions  
Group 3, The trinis

Explore GLOBAL TREND and DRIVERS and DEFINE and rank the risk of URBAN TRENDS and DRIVERS



# Visioning and backcasting

## #3 LECTURE THEORIES AND METHODS

Visioning + Backcasting

Nicola Tollin  
Professor wsr in Urban Resilience,  
CAE Civil and Architectural  
Engineering , University of Southern  
Denmark (SDU)

## #3 ASSIGNMENT

Visioning + Backcasting

26th July 2021



### STEP 9 | forecasting

Forecast the trends and drivers in the future to identify most probable futures

### STEP 10 | visioning

Define future visions for desirable/undesirable futures

### STEP 11 | visioning

Define the target future (forecasting+visioning)

### STEP 12 | backcasting

Define milestones

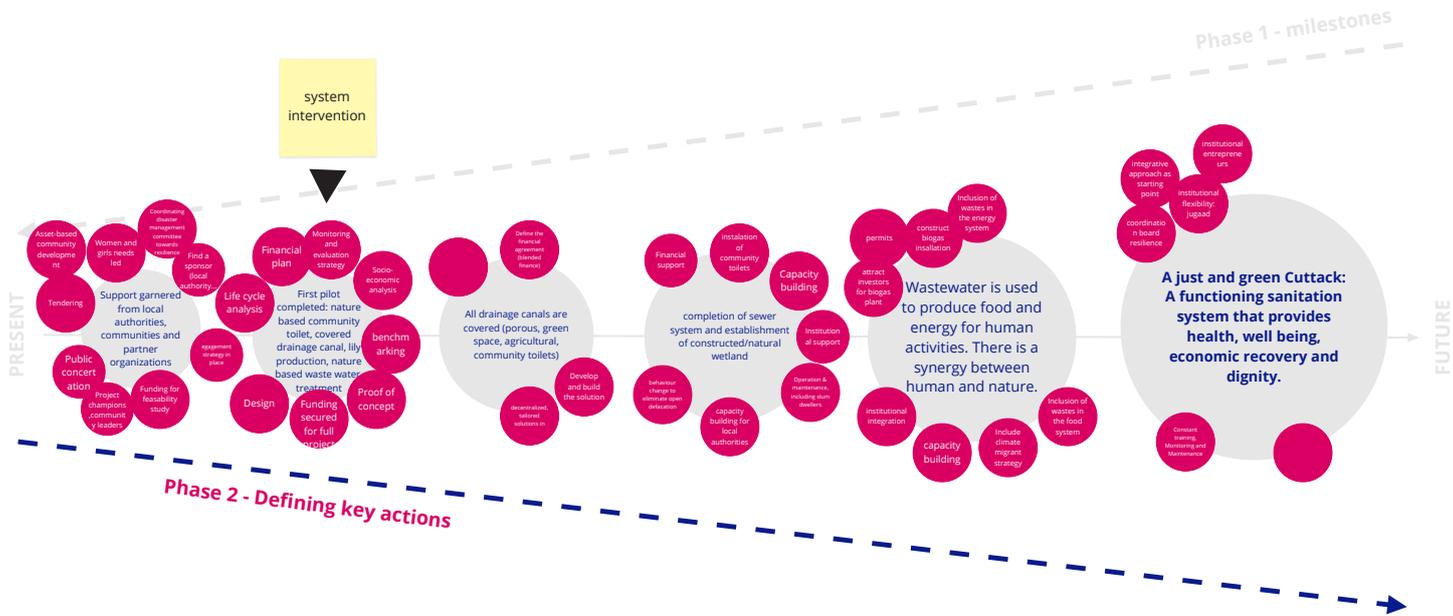
### STEP 13 | backcasting

Define actions

### STEP 13

Define trends and drivers and their impact on the system

Group 2, Jugaad Resilience



# Strategy and Action planning

## #4 LECTURE THEORIES AND METHODS

Strategy and action planning

Alberti Innocenti  
Assistant Professor in Urban  
Resilience (SDU)

Vittore Negretto  
PhD candidate (IUAV)

## #4 ASSIGNMENT

Strategy and action planning

28th July 2021

# 4

### STEP 14

Define the strategy

### STEP 15

Define the actions

### STEP 16

Timeline

### STEP 17

Spatial planning

### STEP 14

Define the strategy

Group 4, MAKazi Mukuru





# Group work

# POSEIDON

# GROUP 1



Licia Felicioni

# SpongeBeira: Towards a water resilient community in Beira, Mozambique



Cecilia Akyeampong



Abdul Rachid Afande



Martin Valinger Sluga



Ramin Ebrahimnejad

# BEIRA MOZAMBIQUE

## CASE STUDY

### THE STORY

Daviz Simango was the mayor of Beira since 2003.

He oversaw an 11-kilometer system of drainage canals and water retention basins from the informal settlements in his city.

This was not enough to save Beira from flooding when cyclones hit the city.

His dream was to protect people from climate change.

Daviz passed away last year due to COVID-19 before seeing his dream becoming a reality.

We were inspired to come up with a plan that can keep his dream alive.



## THE CHALLENGE

The group vision regarding the challenge:

Utilize the Post Pandemic Recovery Plans to Build Better WASH and Disaster Management Systems

Use Innovative, Circular and Decentralized Systems to Better Serve the Informal Settlements

Re-Educate the Fishing Community for a Just Transition

Combine a Set of Nature-Based Solutions with Technical Measures to Create a Diversified Toolbox for Flood Protection

## LOCATION AND HISTORY

Mozambique is a country prone to hazards of human and natural origin.

Beira is Mozambique's second largest city and an important economic hub for the region.



+14m above the sea level



Tropical savanna climate (Köppen).

The rainy season runs roughly from November to April.

Climate variability is already affecting Mozambique. Over the past two decades, the country has experienced increased droughts, flooding, and storms, which in some cases have had severe socio-economic implications for the country.

**Natural Hazards**  
Exacerbate Poverty



**\$773 MILLION**  
DIRECT ECONOMIC LOSSES (in Southeast Africa)  
in buildings, infrastructure, and crops

## HIGH PRIORITY AREAS



## DEVELOPMENT CHALLENGES

Coastal erosion: sea level rise will pose a huge challenge to the city.

Drainage: the reconstructed primary drainage system worked well during the cyclone but it requires rehabilitation and expansion.

Sewage system: has a low coverage and requires urgent action to prevent waterborne diseases.

Roads infrastructure: has been extensively affected by the cyclone.

Housing and settlements: approximately 70% of houses destroyed.

Food security: crop failures due to floods and fish stocks are down

## ENVIRONMENTAL RISKS

The geographical location of Mozambique places the country in a situation of cyclical vulnerability to the impacts of Climate Change. Pressure on natural resources is increasing due to the rapid population growth.

Environmental risks include: Flooding, Cyclones, Torrential rains, Extreme heat, Droughts, Sea-level rise.

### Projected Weather and Climate

Precipitation is anticipated to increase in most parts of the country, particularly during the rainy season. Droughts and floods may become more frequent, and cyclones more intense. Sea level rise in the region is projected to range from 0.18-0.59 m by the 2090s; however, sea levels may increase beyond this range.



## Cyclone IDAI in Mozambique - March 2019

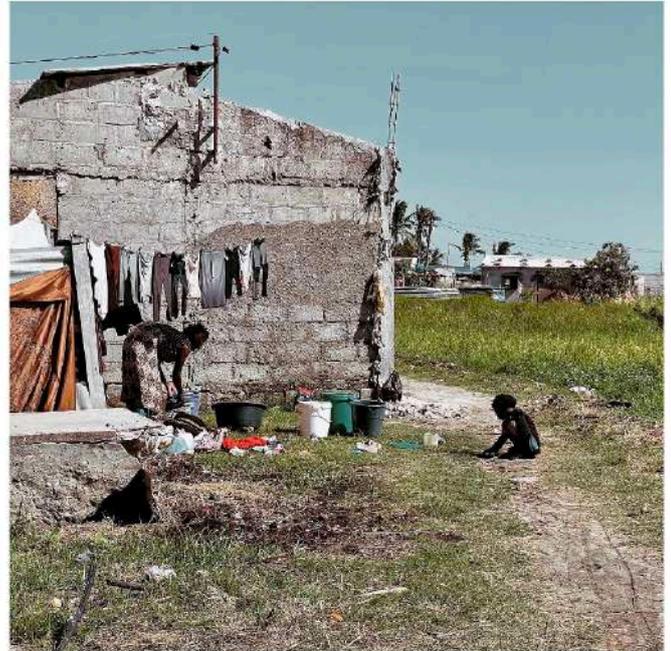
# >600 victims

More than 1600 people injured

solid waste management  
sanitation  
flash flood  
informal settlements  
water-borne diseases  
wash infrastructure  
water security  
damaged agricultural land  
**deaths**  
poverty  
blue infrastructure  
shelters  
water access  
flooding



**2.2 Million**  
People displaced





## Cyclone Eloise in Mozambique - January 2021

# >42000 houses damaged

More than 44000 people displaced

Winds of 120km/h  
Heavy rains of over 200 mm in a 24-hour period



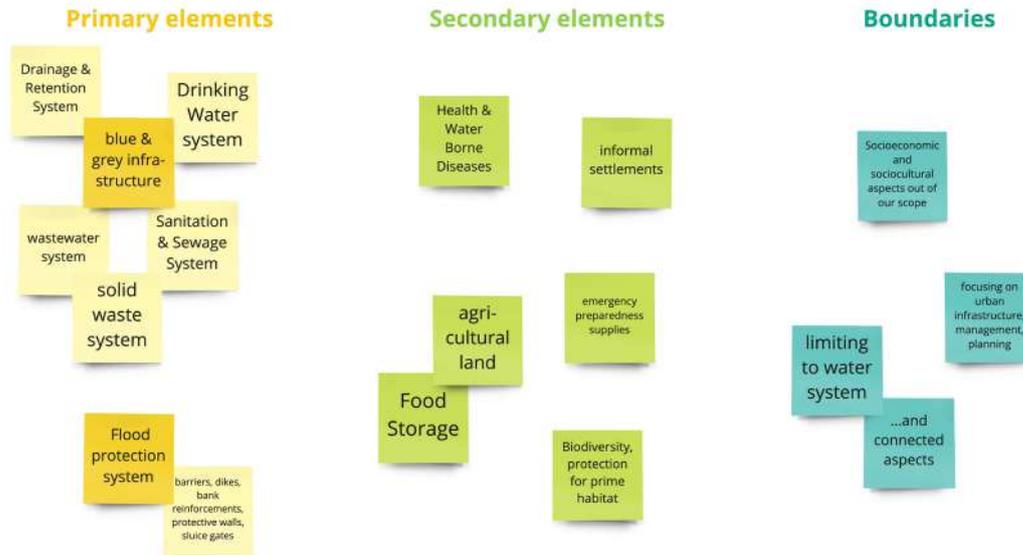
**366,630**

People affected in Sofala



**369**

Health and learning facilities damaged



### Problem and system description

The group will focus on water system/cycle in Beira. The primary elements include blue and grey infrastructure systems (fresh water distribution, drainage & retention, sanitation & sewage, etc.), as well as flood protection systems (barriers, dikes, bank reinforcements, protective walls, sluice gates). The secondary elements include other sub-systems, such as informal settlements, food system and agricultural land, and health related issues. The boundaries of our system are limited to the mitigation of risks to water system and its adaptation in terms of urban infrastructure, planning, and management.

## Hazards



## Vulnerabilities



## Exposures



In Beira, the main problem is the frequency natural hazards, such as cyclones, heavy rains, and droughts. These extreme events have a negative impact on people from every age because the main consequences are destroyed houses in case of floods and damaged farmlands in both cases of a great amount of rain or, on the contrary, in case of water scarcity, that leads to lack of food. Farmlands and biodiversity are impacted as well from these meteorological hazards, leading to a reduced security of food, plants, and a loss of prime habitats. Increased temperatures, droughts, and floods can result in direct and indirect impacts on health; the spread of malaria is of particular concern, with rising temperatures and increased flooding due to a rise in heavy rainfall events.

## HEALTH RISK

In 2016, an estimated 8 million cases and 14,000 malaria deaths occurred in Mozambique.

Just two weeks after the Idai cyclone, Mozambique declared c.a. 4000 cases of cholera in Beira.

On September 7, 2020 Mozambique transitioned from a State of Emergency to a State of Public Calamity due to COVID-19.

## SEWERAGE SYSTEM

2/3 of the city doesn't have access to the sewerage system septic tanks and latrines are the main solution in these areas



**Still lack of basic hand-washing facilities at home**



## FLOODS PREDICTIONS IN THE RAINY SEASON

Flooding

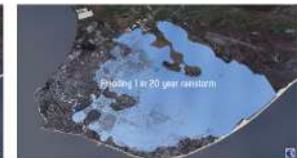
1 in to 2 years rainstorm



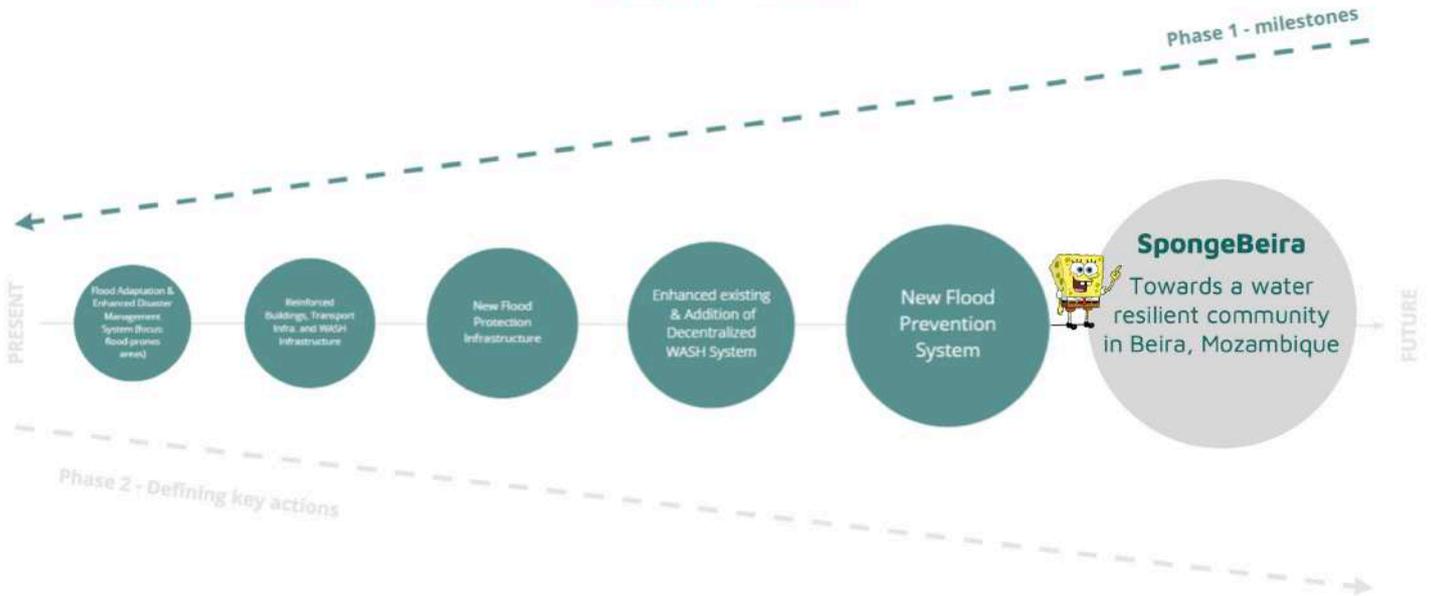
1 in to 10 years rainstorm



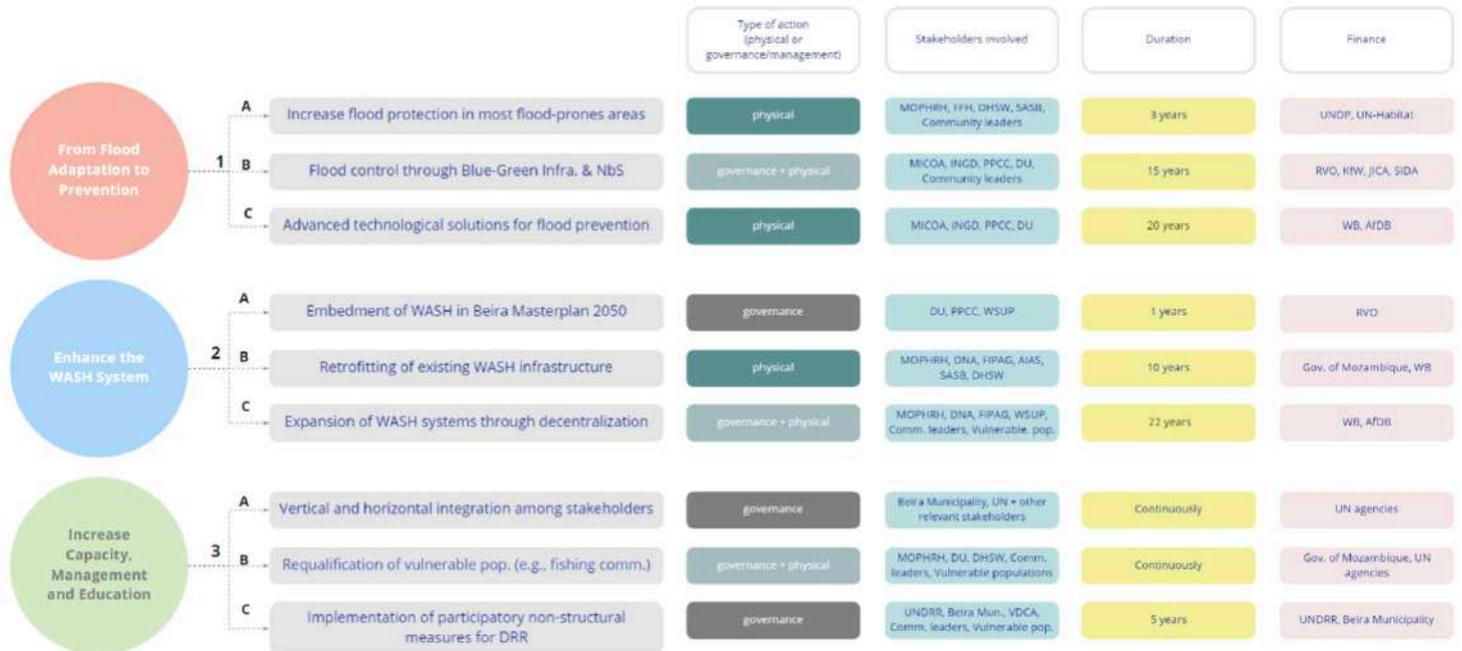
1 in to 20 years rainstorm



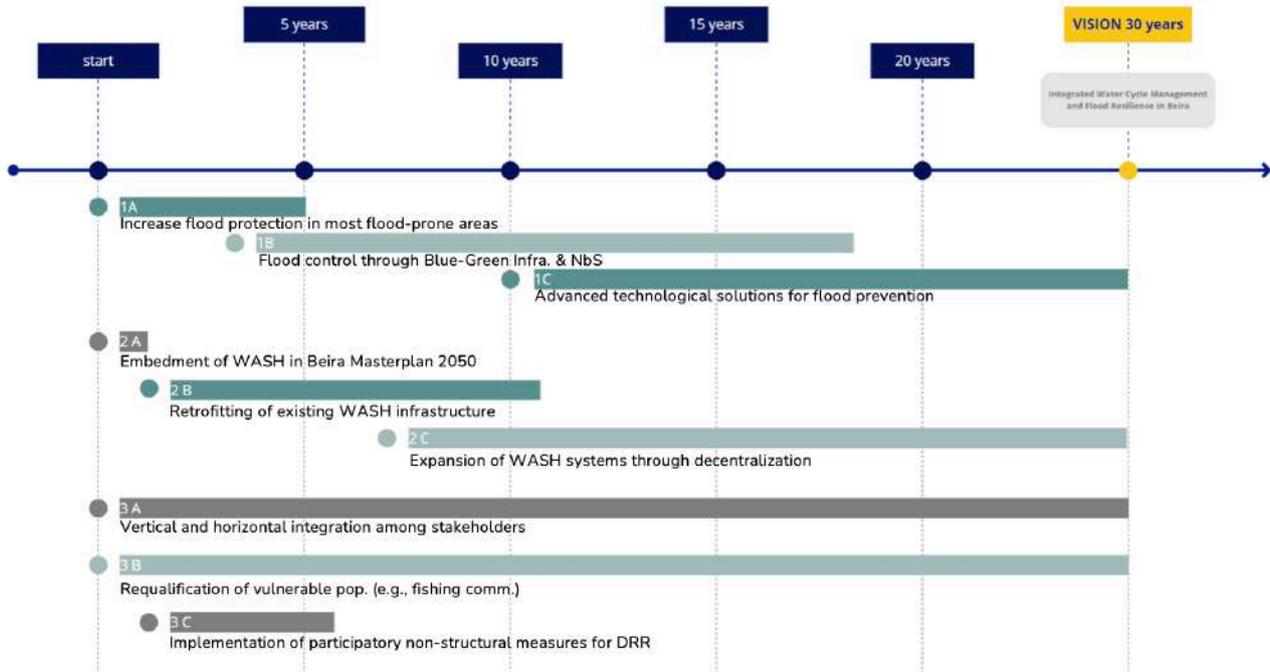
# Target Future

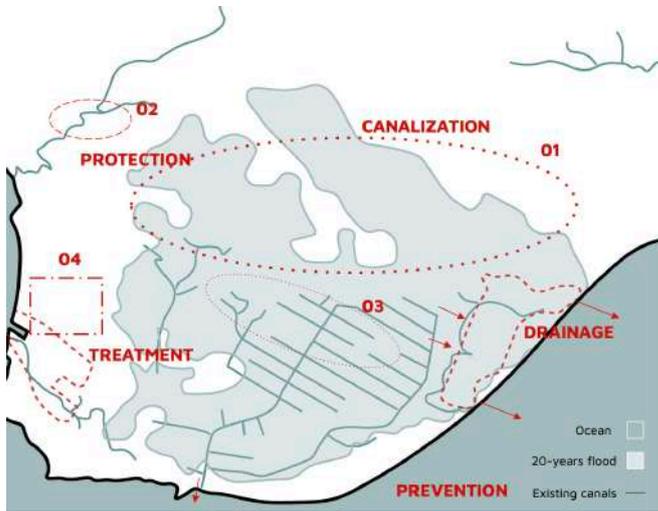


## Action Planning



# Timeline

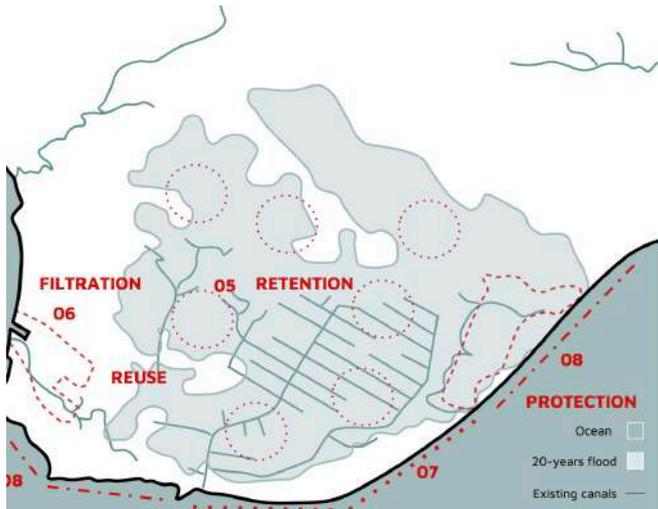




## Measures

Structural

- 01 New Canals 
- 02 Dikes 
- 03 Raised Housing 
- 04 Separate drainage and sewage system 



## Measures

Nature-based Solutions

- 05 Bioswales 
- 06 Rain gardens 
- 07 Prevention of coastal erosion 
- 08 Mangroves forest 

## Measures

Other

- 09 Raising awareness and education 
- 10 Rainwater harvesting 
- 11 Reinvented Public Toilets 
- 12 Transition to agricultural activity 
- 13 Collaborative activities 



<https://storymaps.arcgis.com/stories/2112d5d782004c9ea79069c2de881748>

# JUGAAD RESILIENCE

GROUPS



Beau Warbroek



Helen Katharine Civil

# GREENING THE SILVER CITY: nature-based sanitation for all in Cuttack, India



Robin Elizabeth Tivy



Nicolas ZIV



Martin Fisher



Samah Aljabari

# CUTTACK INDIA

## INDIA

India has 25 of the world's 100 fastest growing cities.

By 2030, an estimated 590 million Indians will live in urban areas.



A growing, vibrant city with rich culture and heritage, attracting business.

# Pressure from migration and growth

Population 1950: 102.505

Population 1990: 445.746

Population 2000: 587.182

Population 2010: 610.189

# Recurrent flooding, barriers to growth

Bounded by two major rivers

Recurrent flooding

Cyclone 2009 1000 deaths

Migration and unplanned development

Salination and drought affecting water supply



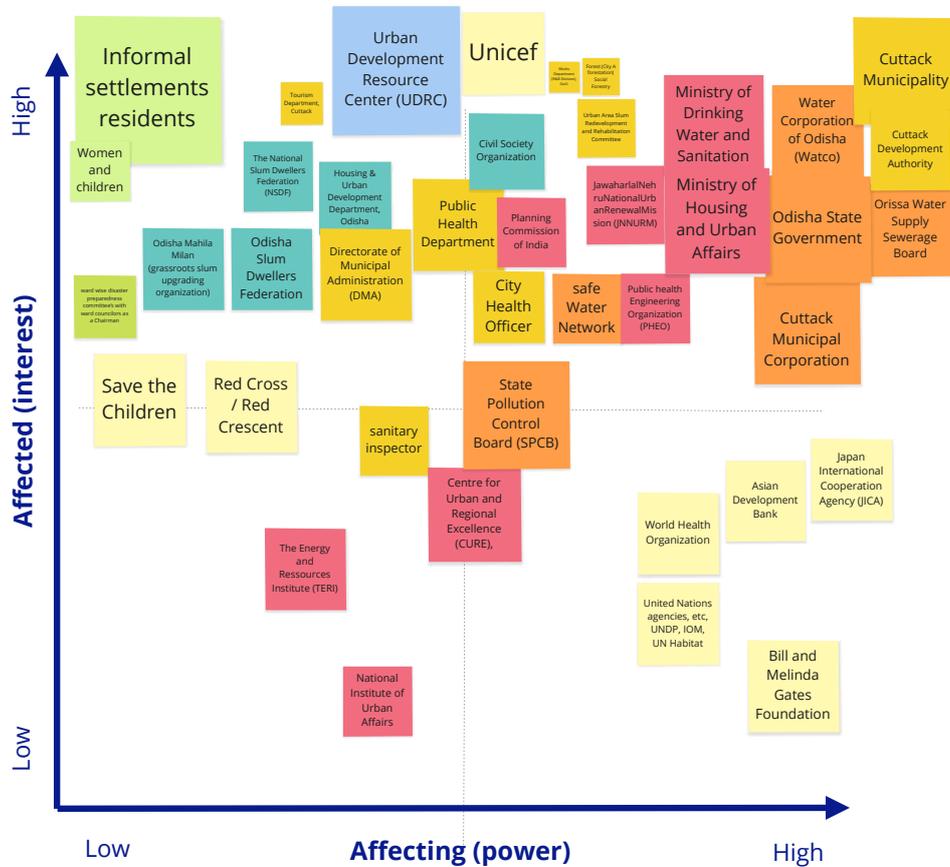
# Exacerbated by COVID-19

# The sanitation system Cuttack, India

## DEFINE THE SYSTEM

1. Badly maintained, insufficient and unsafe community toilets (gender impacts)
2. Open defecation in drainage canals and Mahanadi river is the status quo
3. Contamination and poor quality of drinking water sources
4. When there's flooding: multi-hazard (the flood itself + uncontrolled human waste and garbage, contaminated water coming from open drains)



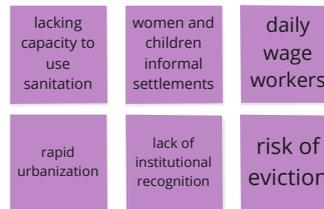


## Vulnerabilities

### Physical vulnerabilities



### human/social vulnerabilities



## Exposures

### Physical exposures



### Human/social exposures





# The challenge of post-COVID recovery

How to enable a just, green and resilient future for Cuttack?

How to promote radical change and systemic innovation that is dynamically adaptive?

How to equip Cuttack City to be resilient to multiple crises while enhancing co-benefits and limiting rebound effects?

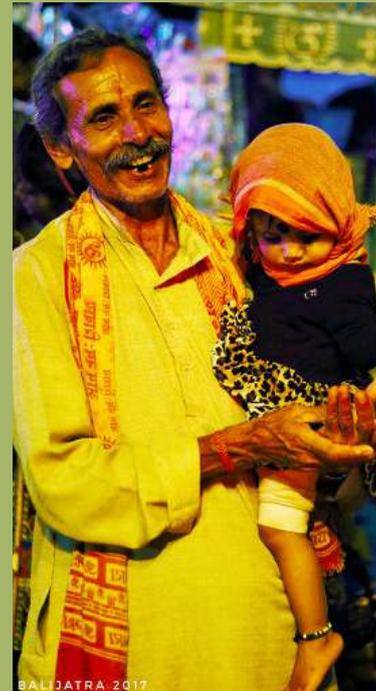
Starting with sanitation, co-benefits can ripple through Cuttack for all

The 2050 vision puts the lives of young Cuttackis like Rupal and her grandfather at the heart of actions for transformation in Cuttack City

Our solution must be adaptable, flexible, and resilient, using jugaad - the hindi word for a necessary fix to foster collaboration and

Locally-led, nature-based solutions that address chronic stresses and mitigate acute shocks related to sanitation.

It can reinvigorate traditional knowledge and approaches to flooding.



# Strategy for transformative change



UN World Conference on  
Disaster Risk Reduction  
2015 Sendai Japan



PARIS2015  
ON CLIMATE CHANGE CONFERENCE  
COP21-CMP11

## THE INCLUSIVE CITY

The improvement of sanitation is locally led, provides opportunities for women's empowerment and local employment. By introducing green spaces and functioning sanitation in the slums of Cuttack, we can curb COVID-19 and foster dignity.

## THE CIRCULAR CITY

By repurposing drainage canals, soak ponds and river banks, the approach breathes circularity. Wastewater is a resource for growing lilies and crops through community led employment schemes.

## THE RESILIENT CITY

Boosting the function of the disaster response committee will help to institutionalize resiliency. By way of jugaad, institutional flexibility is introduced to circumvent siloed responses.



### The Inclusive city

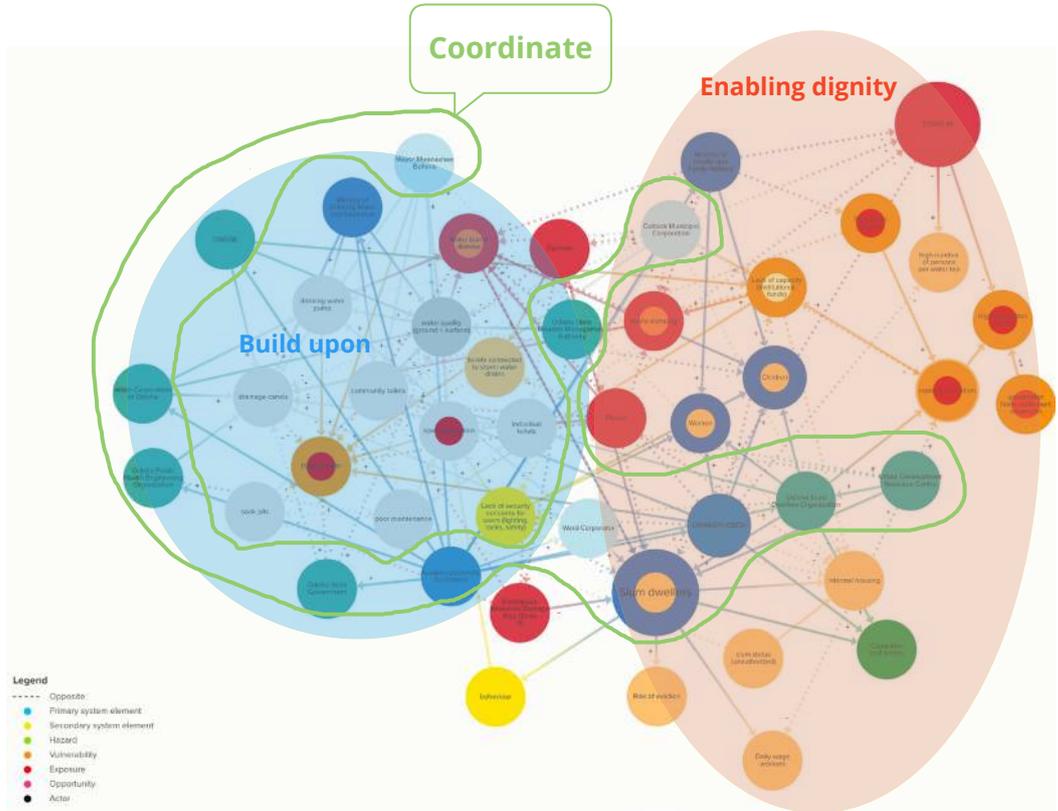
The improvement of the sanitation system is locally led, provides opportunities for women's empowerment and local employment. By introducing green spaces and functioning sanitation in the slums of Cuttack, we can curb COVID-19 and foster dignity.

### The Circular city

By reusing, repurposing and revitalizing drainage canals, soak ponds and river banks, the approach breaths circularity. By reusing waste water for agricultural purposes and sludge for energy production, human waste becomes a resource, instead of a hazard for Cuttack.

### The resilient city

Institutionalizing resiliency is crucial to attain a resilient Cuttack. For this, we boost the function of the disaster response committee to institutionalise resilience across stakeholders. we build on existing capacity through training and promotion of knowledge. By way of Jugaad, institutional flexibility is introduced to circumvent siloed responses.



# Through Rupal's eyes

Action 1: build toilets safe and sanitary in partnership with the community

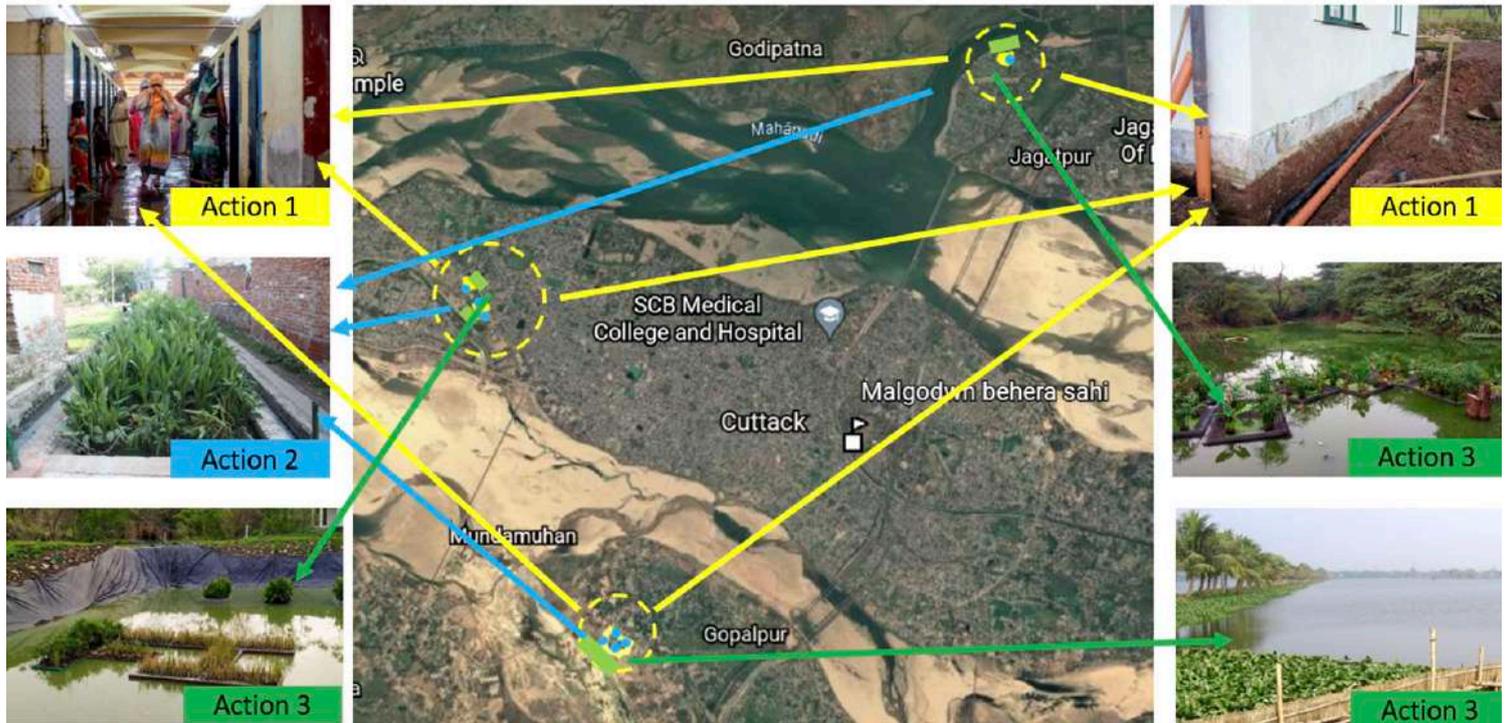
Action 2: closing of drainage canals with green permeable surfaces, nature based solutions (green spaces, breathability and livability)

Action 3: reintroducing traditional soak ponds and introducing treatment wetlands supporting agricultural use (and with the opportunity of future commercial waste for energy production)

Action 4: boosting independent, long term governance that can adapt and convene diverse interests



- Slums
- Local nature based treatment plant sys
- Wetlands



## THE TRINIS

# GROUP 3



Juliana Uribe Aguado

# Behind the Port

## Mobility and accessibility in East Port of Spain's informal settlements



Renelle Sarjeant



Cristobal Lopez



Emma Grun



Myriam Margoth  
Jacome Guerra

# PORT OF SPAIN TRINIDAD AND TOBAGO



## WHERE?

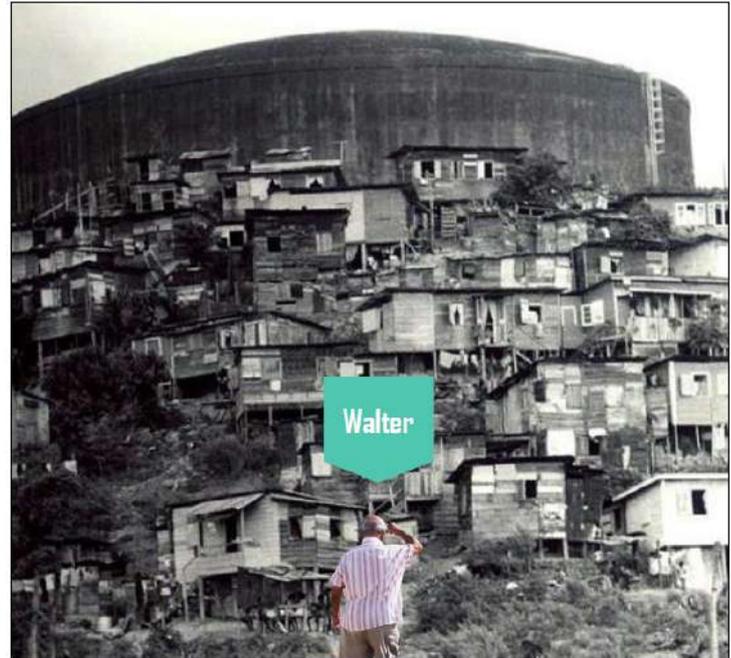


## The urban system persists...

Walter Castle is **dissatisfied** with his regular job in the Laventille slum in East Port of Spain. He lives in a world where the working man must face the **crime and violence** that is destroying the social body. Where the top-down authoritarianism of nationalist politics concentrates wealth for the elites and leaves his community underdeveloped.

As he walks up the **narrow winding** hill each day, he asks himself **what is wrong with this city?** Why is it if you don't have, you don't count"

**While Gods are Falling, 1956**



## The System Boundaries...



# DEFINE THE SYSTEM

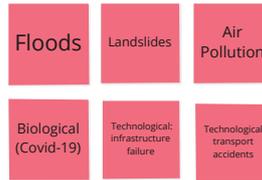
## Primary elements



## Secondary elements



## Hazards



## Vulnerabilities



## Exposures



# Why mobility and accessibility?

Mobility, a basic human behavior, is the “the micro-geographies of everyday life” (Adey 2010).

## EPOS RESIDENT ARCHETYPE

Name | Allison

Age | 30

Residence | Upper Belmont, EPOS,  
Trinidad and Tobago

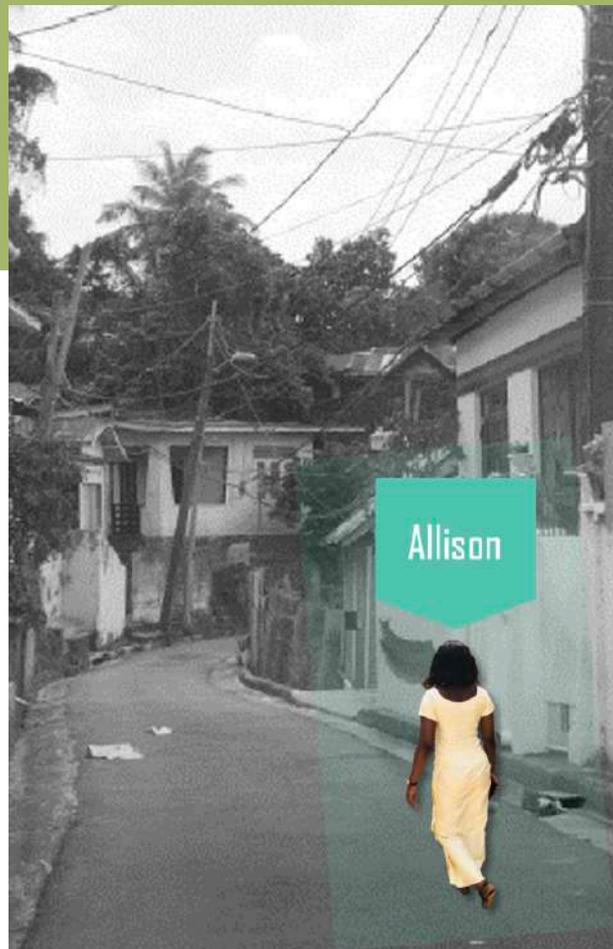
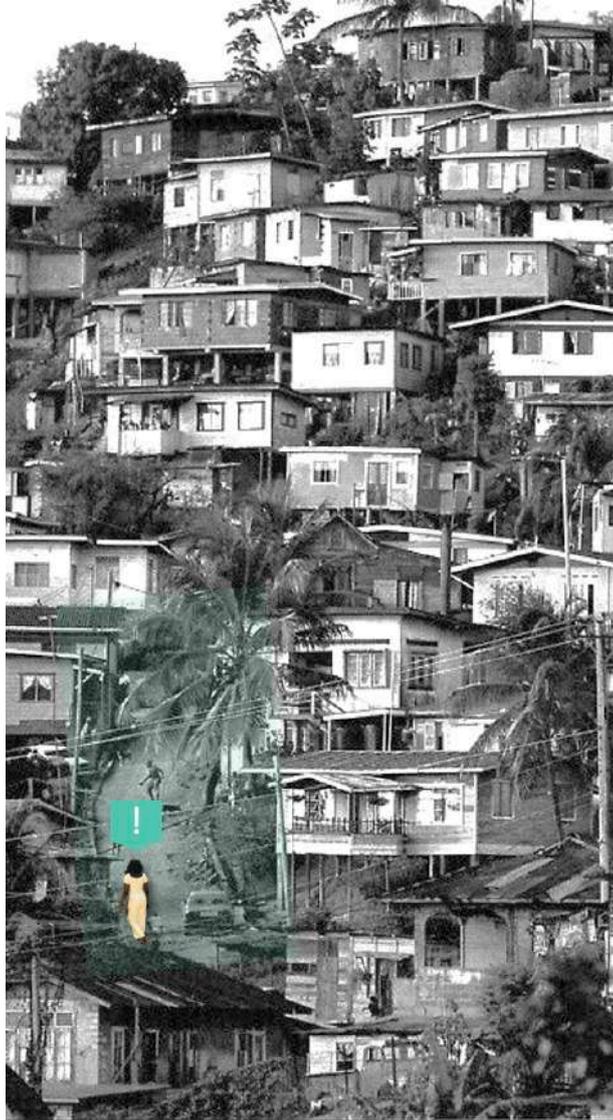
Occupation | Store Clerk at the Long  
Circular Mall

## ALLISON'S MOBILITY PATTERN

Everyday Allison walks 2.5 Km. through long staircases and poor sidewalk conditions, to the closest transportation hub on the priority bus route. From there she must take a crowded maxi-taxi (bus) to the city center, having to transfer 3 times while waiting in long lines. When it rains, she might take a taxi to avoid getting wet, but she prefers not to do this as she doesn't want to spend a big part of her salary on transport. Although at night, after work, she must strive to find a private mode of transportation because the narrow, winding and dark streets of the settlements in EPOS are very unsafe. During lockdown due to the COVID-19 pandemic, she's been working from home tutoring her neighbors' children for a very small fee, as in her community they usually help each other out.

## HAZARDS AND EXPOSURE...

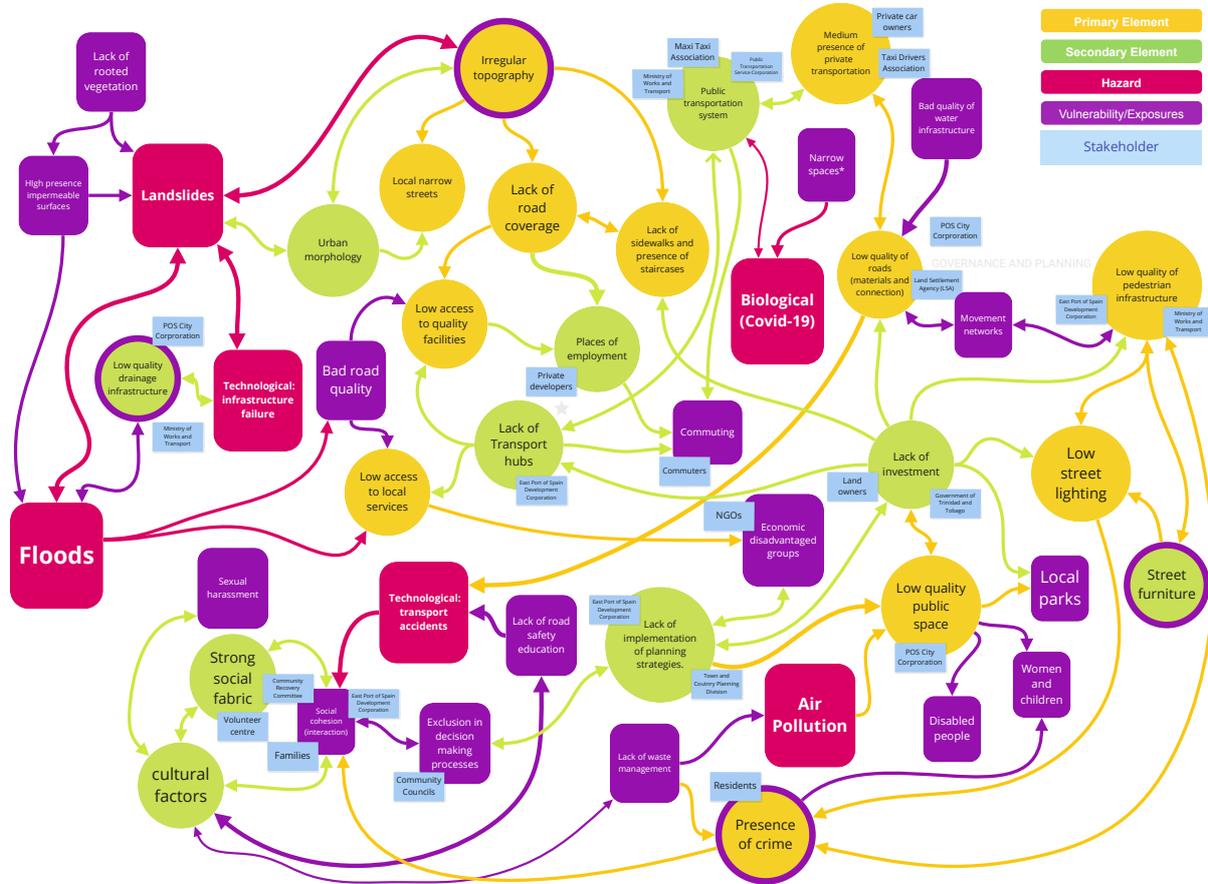
On November 21st of 2019, Alison was walking near Wharton Street after grocery shopping and the road collapsed. The neighbors told her that the damage was associated with a clogged drain that forced the downhill flow of water to find new paths for moving. Her daily commute usually feels exposed to events like this, but mainly by floods after heavy rains, which are now more frequent and intense. But also, after periods of heavy rain, she's scared that a landslide will destroy her house or her neighbors in Upper Belmont. Although she feels integrated in her community, she feels left out because no one seems to care about their problems and has no place to express her worries. The biggest difference she notices is that there is fewer vegetation and trees than when she was growing up and crime is growing at a significant rate.



# The urban mobility system of EPOS...

To read the urban mobility system of EPOS four interdependent dimensions are highlighted:

1. Spatial attributes
2. Organizational attributes
3. Physical attributes
4. Functional attributes



# The urban system persists...

Walter Castle is dissatisfied with his regular job in the Laventille slum in East Port of Spain. He lives in a world where the working man must face the crime and violence that is destroying the social body. Where the top-down authoritarianism of nationalist politics concentrates wealth for the elites and leaves his community underdeveloped. As he walks up the narrow winding hill each day, he asks himself what is wrong with this city? Why is it if you don't have, you don't count"

While Gods are Falling, 1956



**Sustainable Development:** social consumption patterns, economic shocks and distribution of wealth



**Climate Change:** GHG emissions, runoff, heat waves, flooding and landslides.



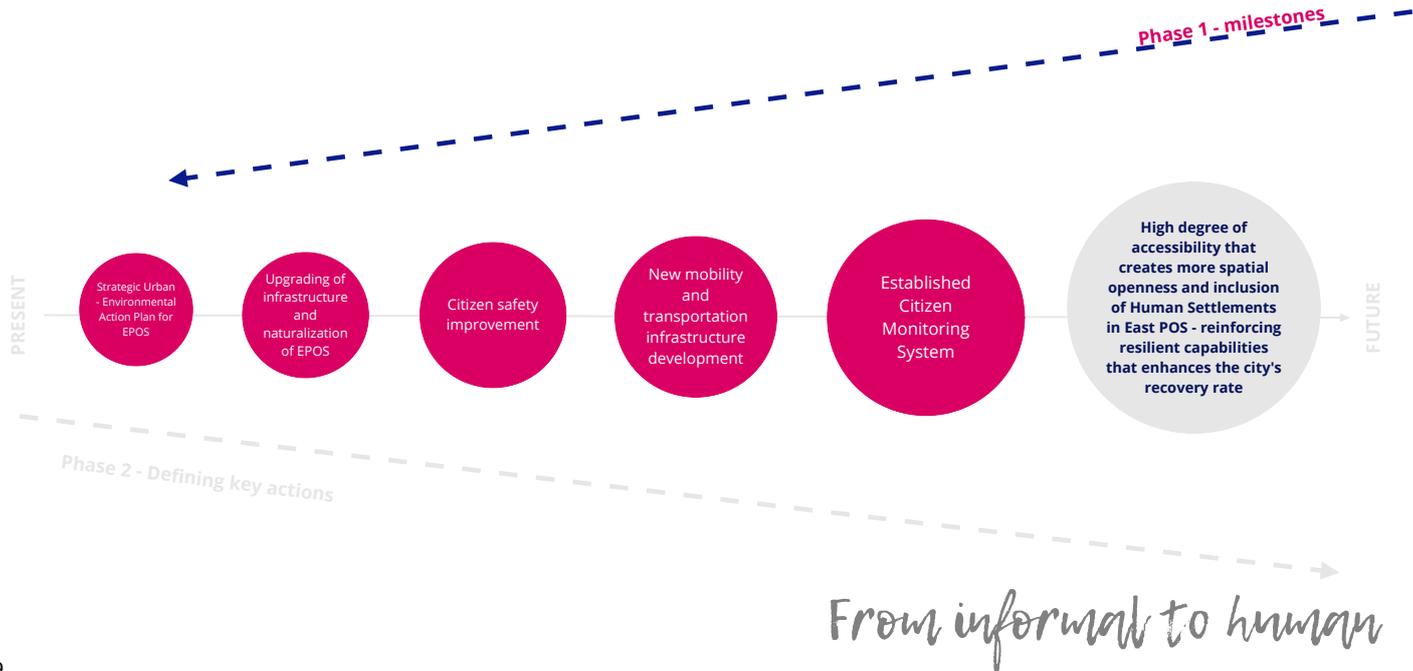
**Sustainable Urban Development:** Infrastructure failure, road safety, crime/urban safety.



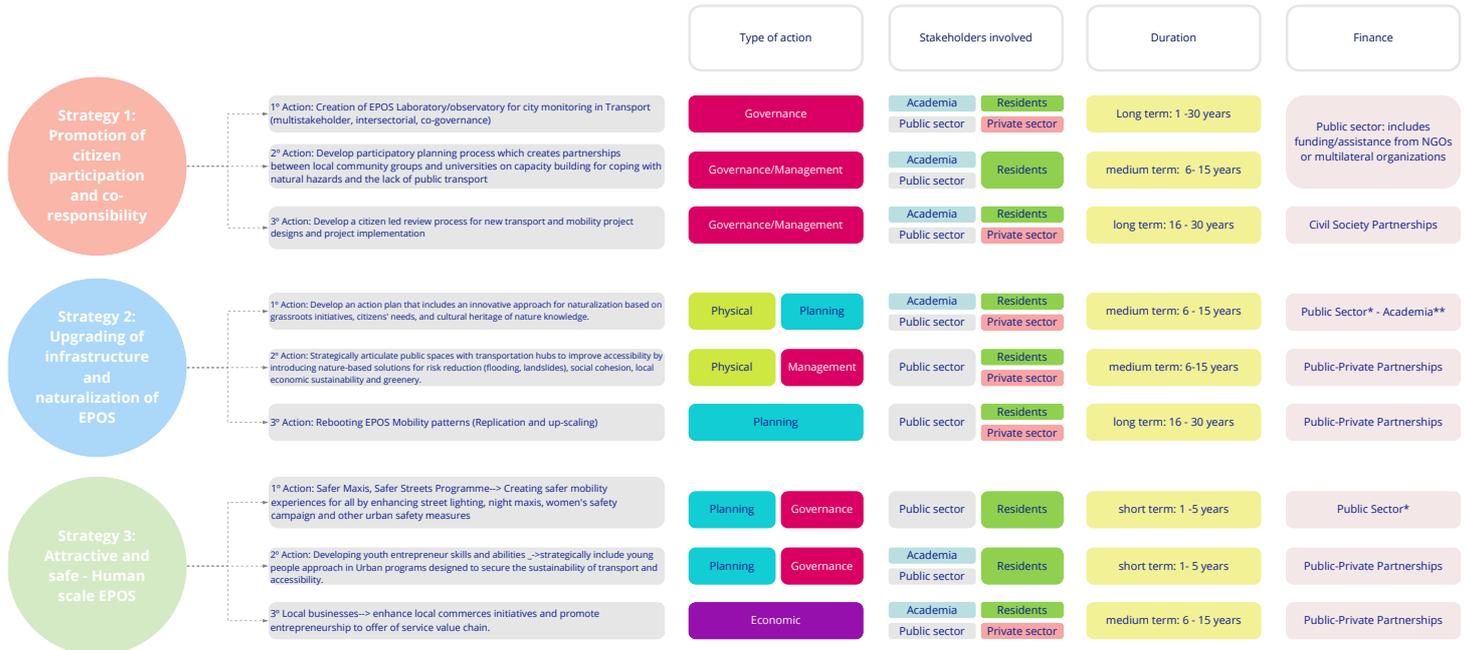
**Pandemic:** Social fear, Government restrictions, and human scale cities.



# Target future and milestones

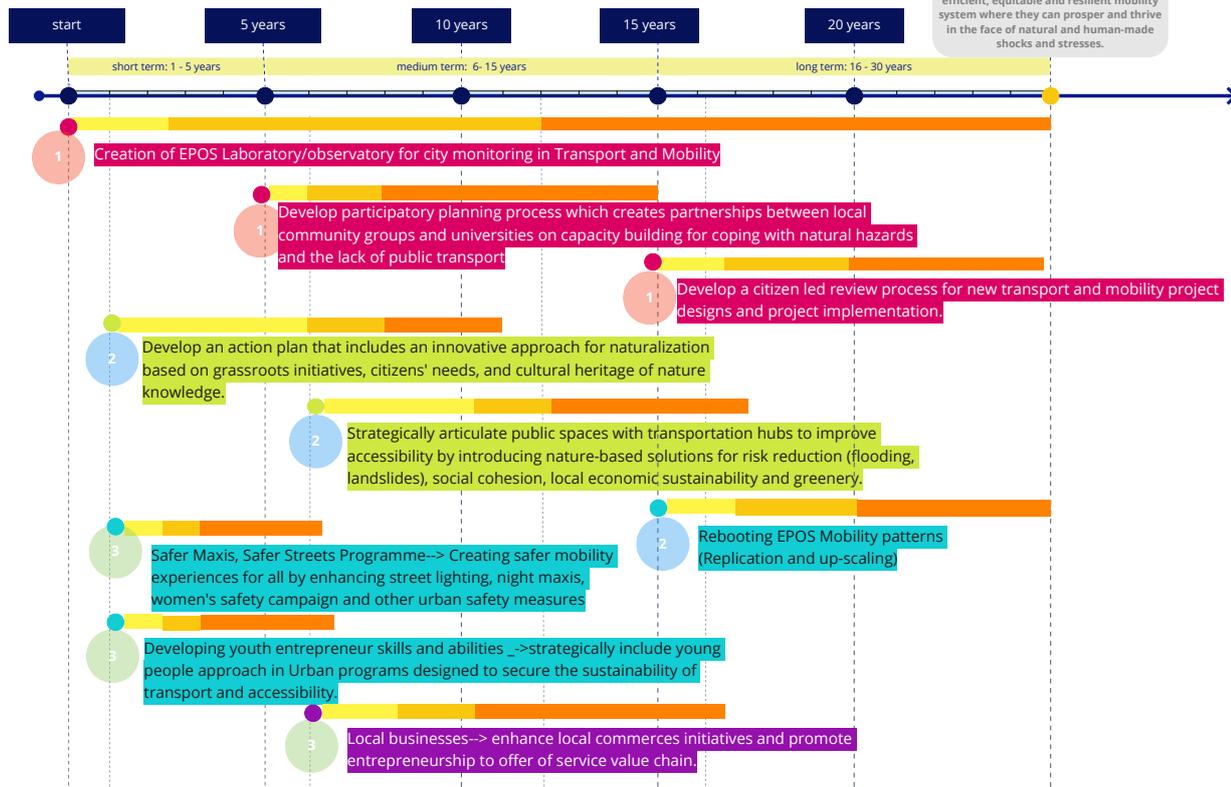


# The strategies



## VISION 30 years

By 2050 EPOS residents live in attractive and safe human settlements, sharing an efficient, equitable and resilient mobility system where they can prosper and thrive in the face of natural and human-made shocks and stresses.



## Legend

### Type of action

- Governance/Management Actions
- Physical Actions
- Planning Actions
- Economic Actions

### Phase of the action

- Preparation / Assessments
- Design / Development
- Implementation

1

Draw strategy and actions in space. You can use the cartographic support and the representations that you prefer.

Strategy 1: Promotion of citizen participation and co-responsibility



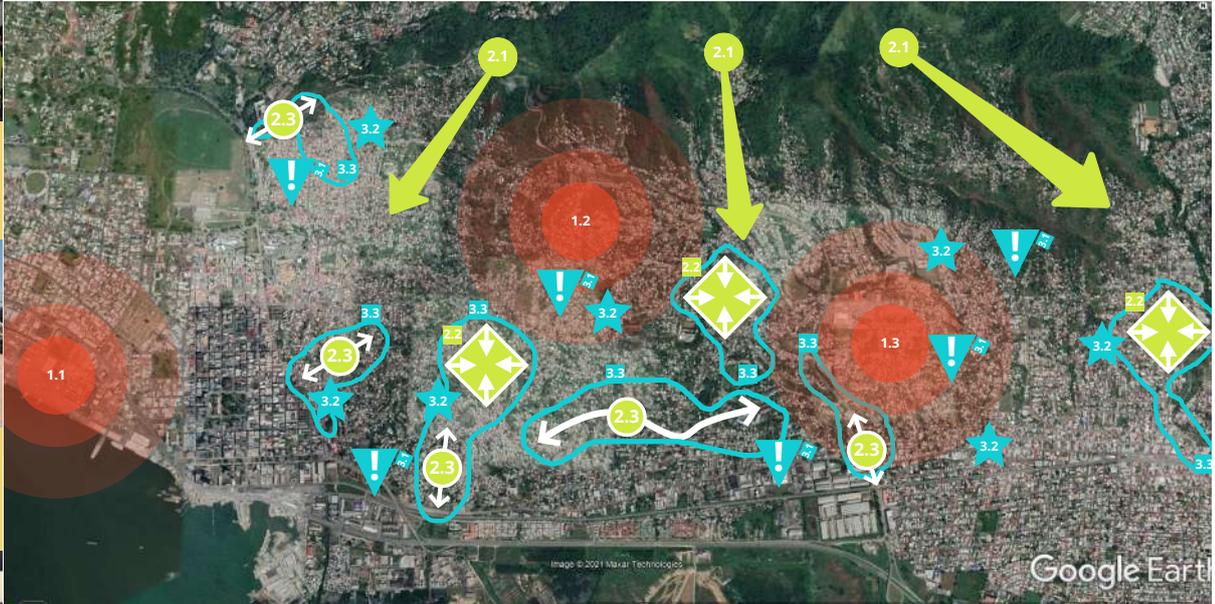
Strategy 2: Upgrading of transport and accessibility infrastructure through the naturalization of



Strategy 3: Concentrate resources for creating an Attractive and safe Human scale EPOS



Urban Resilience Intensive Training



# MAKAZI MUKURU

GROUP 4



Ross Mc Donald



Beatrice Hati

# Makazi Mukuru 2030



Keya Kunte



Zeenat Niazi



Teddy Kisembo



Naftaly Mose

# MUKURU NAIROBI, KENYA

CONTEXT 2019 | NAIROBI, KENYA

Area: 704 Sq.km

Population: 4.39 million (KNBS, 2019)

Population Growth: 3.1% as compared to national (2.28%) and global rates (1.08%)

Economy: 5.7% growth (2015-19)

Slum Area: 18.096 Sq.km

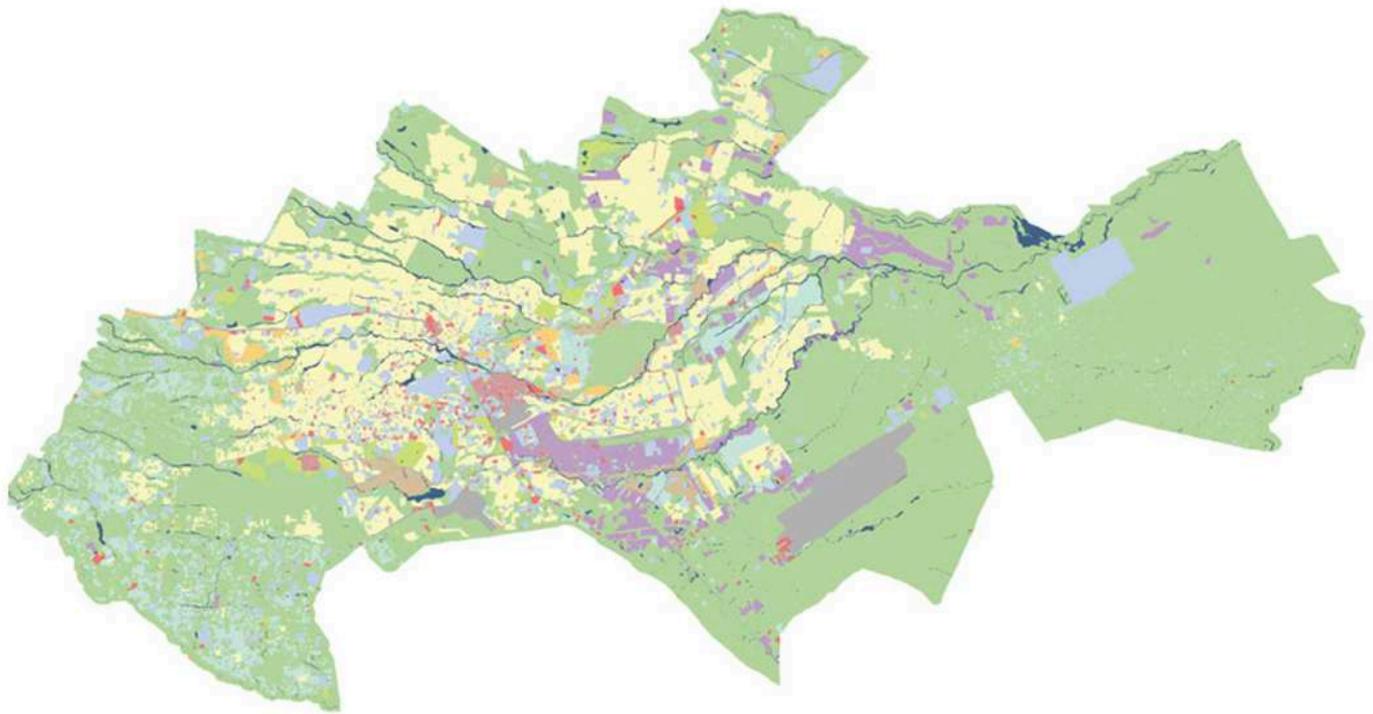
Number: 150 + slums

Slum Population: 60-70% of total population occupying 6% of land

Densities: 63,000/sq.km in slums versus 500/sq.km in higher income areas

CASE STUDY

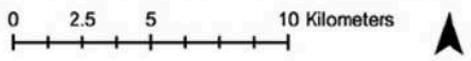




## LANDUSE NAIROBI, KENYA

- |  |  |
|--|--|
| <span style="color: red;">■</span> Commercial                      | <span style="color: lightgreen;">■</span> Recreational |
| <span style="color: purple;">■</span> Industrial                   | <span style="color: brown;">■</span> Res Slum          |
| <span style="color: lightblue;">■</span> Institutional             | <span style="color: yellow;">■</span> Residential      |
| <span style="color: brown;">■</span> Mixed Commercial & Insutrial  | <span style="color: grey;">■</span> Road               |
| <span style="color: orange;">■</span> Mixed Residential Commercial | <span style="color: darkgrey;">■</span> Transportator  |
| <span style="color: lightgrey;">■</span> No Structures             | <span style="color: lightteal;">■</span> Unknown       |
| <span style="color: green;">■</span> Open Space                    | <span style="color: blue;">■</span> Water              |

Source: Toward Open Source Kenya: Creating and Sharing a GIS Database of Nairobi, J. Klopp, 2016



# 2030 MUKURU

Strong community networks that contribute to building housing resilience.

A community land title to secure land

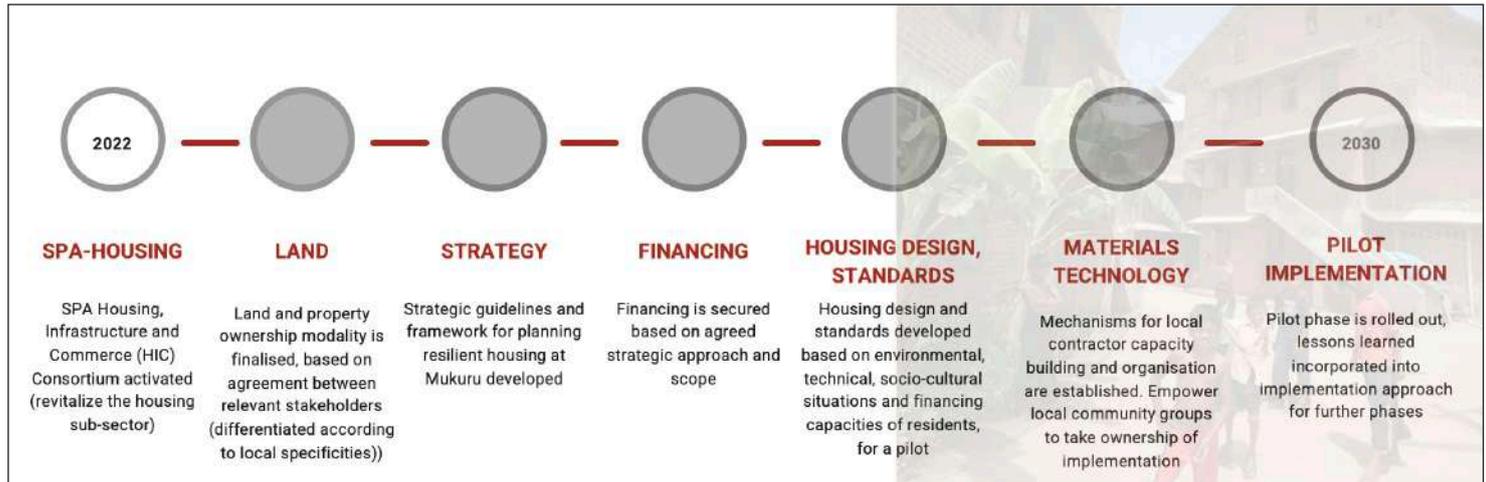
Adequate disaster-proof housing is accessible to residents.

Financing options have allowed a variety of possibilities to unfold- Private-Public partnerships + Community housing cooperatives + Self-upgrading initiatives

Alternative Standards for housing and amenities in line with technical, environmental

and socio-cultural aspects are accepted.

Technical, Financial and Capacity support are available and accessible to Mukuru communities and the SPA.

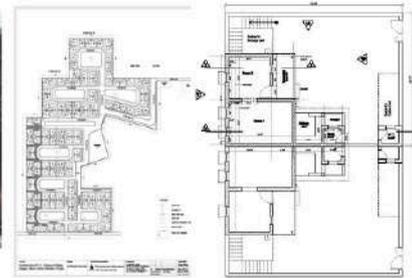




1. Housing, Infrastructure & Commerce
2. Education, Youth Affairs & Culture
3. Health Services
4. Land & Institutional Frameworks
5. Water, Sanitation & Energy
6. Finance
7. Environment and Natural resources
8. Coordination, Community Organization & Communication



The Mukuru SPA's thematic planning consortiums.  
 source: <https://www.muungano.net/browseblogs/2021/4/7/mukuru-spa-update-from-planning-to-implementation-in-2020>



### Community based micro-finance institutions



**Community Development Core Plan**

Service	Location	Frequency	Notes
Water	Water Kiosk	24/7	Water Kiosk
Electricity	Electricity Kiosk	24/7	Electricity Kiosk
Health	Health Centre	24/7	Health Centre
Education	Primary School	8:00 AM - 4:00 PM	Primary School
Market	Market	8:00 AM - 4:00 PM	Market
Police	Police Station	24/7	Police Station
Fire	Fire Station	24/7	Fire Station
Police	Police Station	24/7	Police Station
Fire	Fire Station	24/7	Fire Station
Police	Police Station	24/7	Police Station
Fire	Fire Station	24/7	Fire Station

Note: All pictures are indicative, many sources used only for academic purposes, (sources: <https://www.muungano.net/>, [www.architectural-review.com](http://www.architectural-review.com), [Development Alternatives](http://Development Alternatives))

# COVID-19

First covid-19 case in March 2020.  
Border closers, curfews, quarantining.  
Economy contracts leading to recession.

*"...space is a luxury- and social distancing is nearly impossible, both within the households and on the narrow streets around them. [Alice] tells of an incident that recently transpired where a water boozer [bowser or water tanker] supplying free water in the community, brought hundreds of residents scrambling for access to free water."*

Need for Green and Just transition ?

# OPPORTUNITIES

“Big Four” development priority areas outlined by the President prioritizing manufacturing, universal healthcare, affordable housing, and food security in 2017.

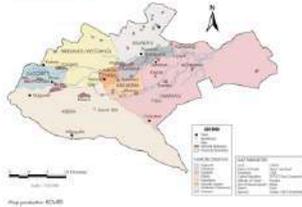
Demarcation of Mukuru as a Special Planning Area in 2017 building on the new constitution (2012) and planning act, unblocking political and bureaucratic hurdles.



Presence of strong community/civil society groups allows for participatory upgrading at scale.

Infrastructure already planned for but not Housing.

## MUKURU 2019 I VULNERABILITIES



Spatial segregation

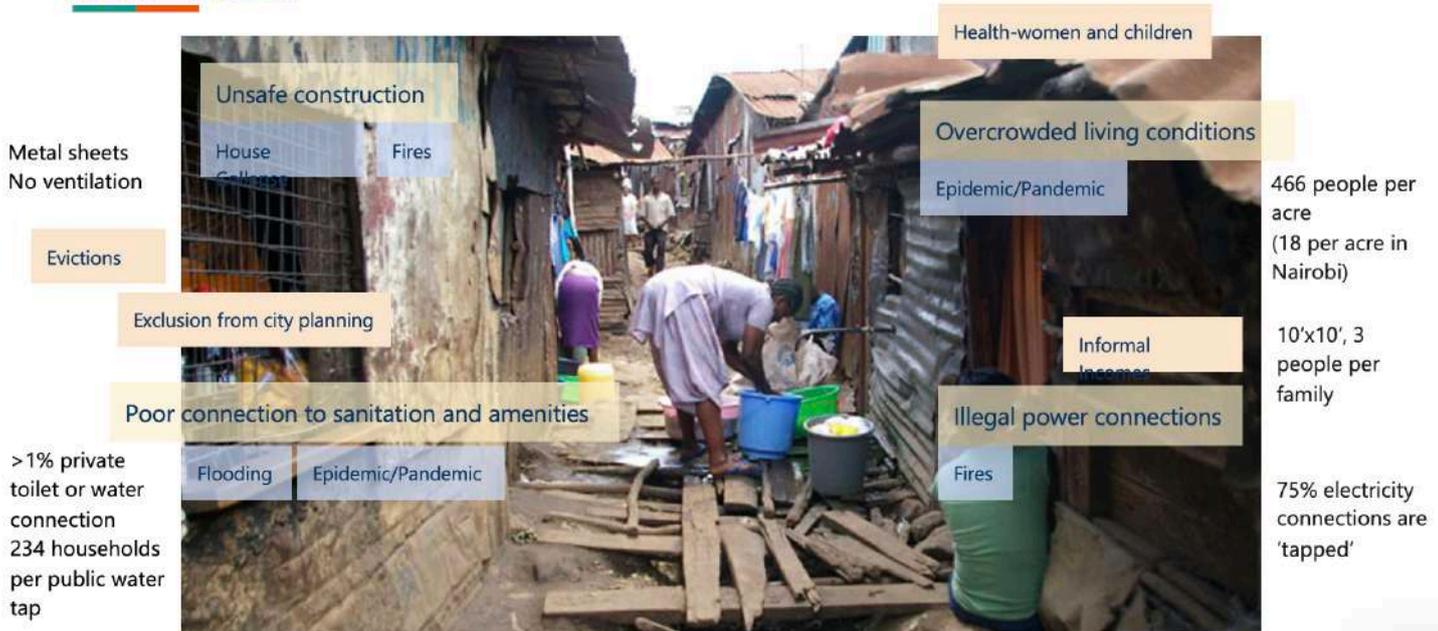
Environmentally untenable location

Over 1000 industrial sites surround Mukuru  
Over 2000 structures at risk of floods in the  
Ngong river riparian. In an extreme event,  
this put 7500 structures at risk.



Source: Mukuru Health Impact Assessment, UBC, 2019

## MUKURU 2019 I VULNERABILITIES



Source: Capital News, 2018



# HOUSING MAKAZI!

## HOUSING SYSTEM IDENTIFICATION & MAPPING: (Indegree Analysis)

### PRIMARY ELEMENTS

Special Planning Area

Insecure Tenancies

Rent and Cost of services

Settlement layout and densities

Housing size, design, quality

Connection to Services

### SECONDARY ELEMENTS

Economic opportunity

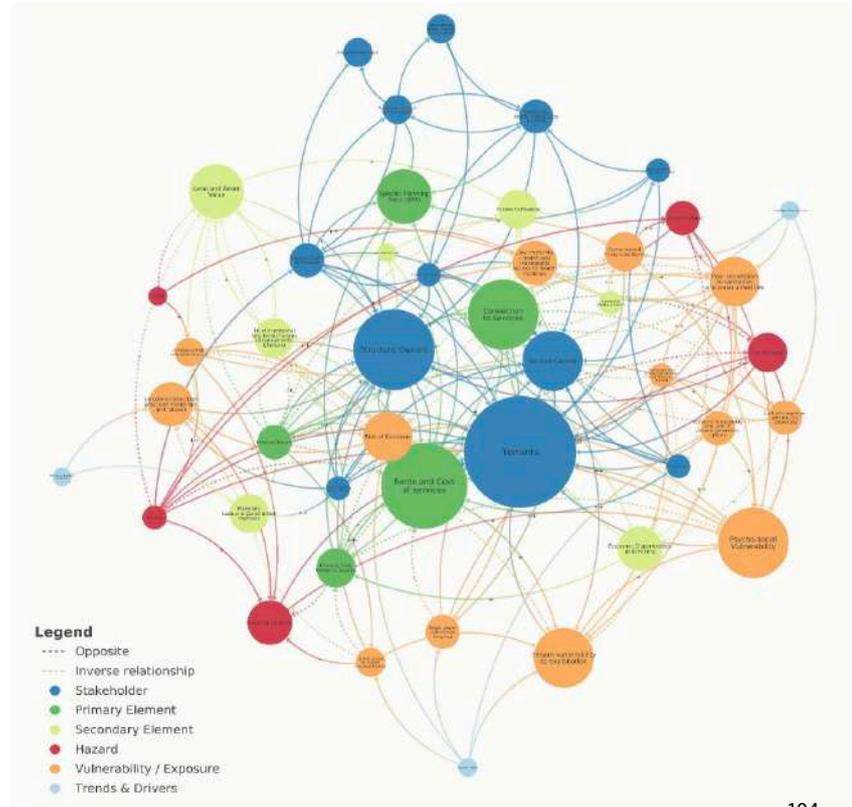
Materials, Labour, Construction

Housing demand

Access to finance

Trust

Land and asset value



Foster Adaptive Governance

Activating the SPA Housing consortium to negotiate and finalize land and property ownership models.

Enable alternate planning and housing guidelines

Develop spatial and technical planning guidelines and standards

Building Knowledge and Capacity

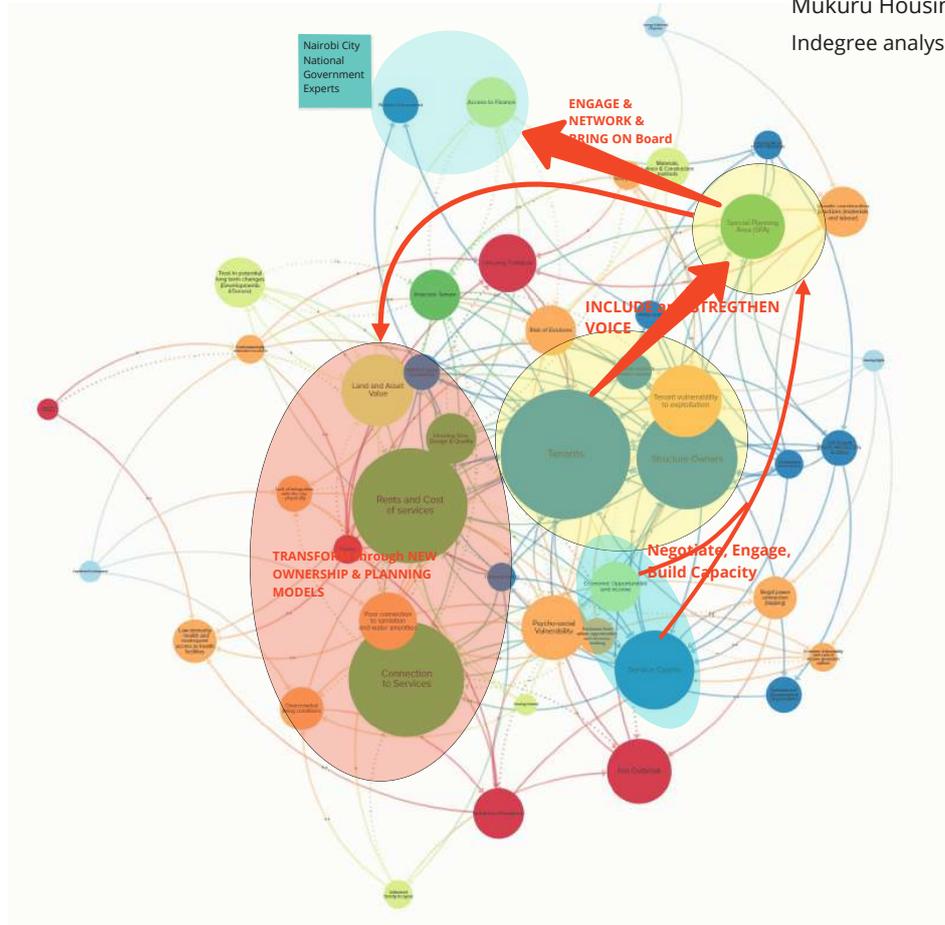
Set up a capacity development process for each stakeholder

Connect to the housing supply chain

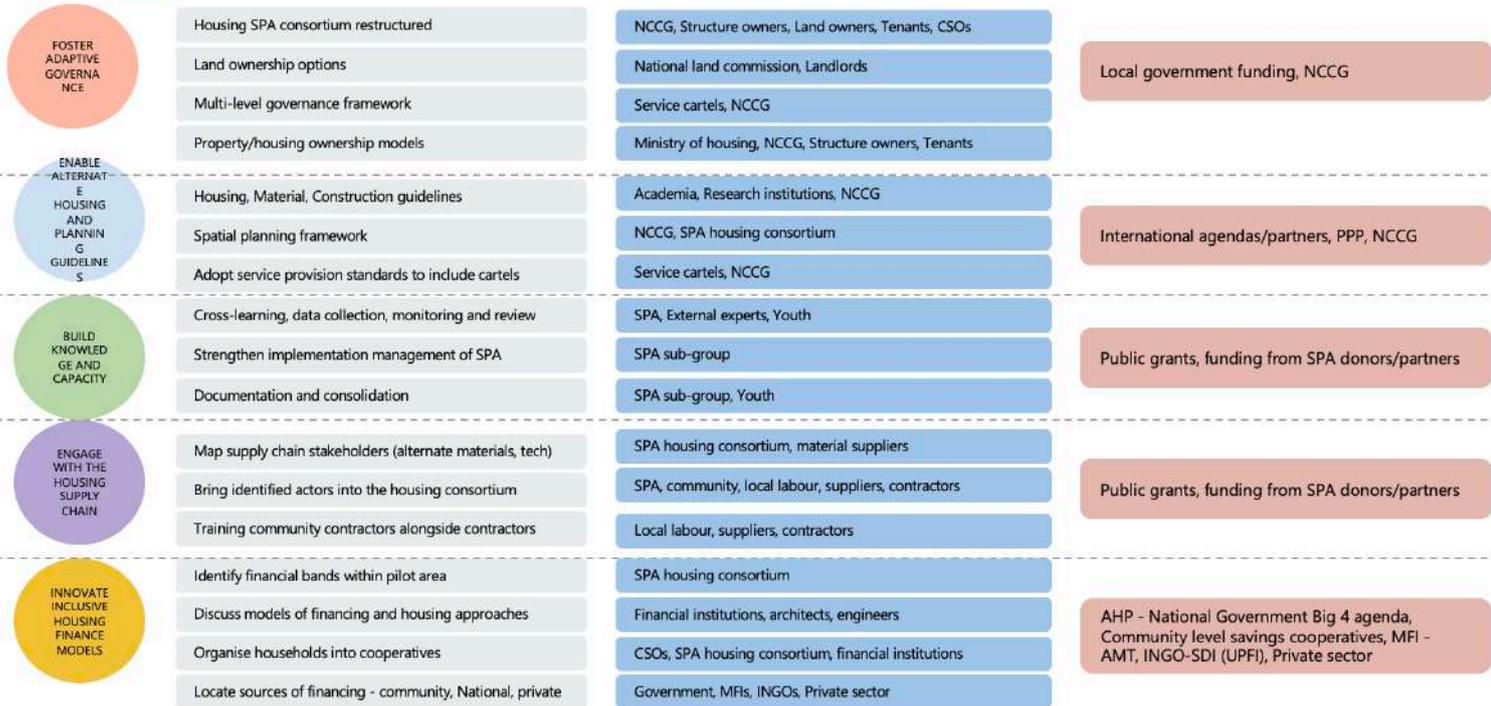
Key housing ecosystem/supply chain actors to participate - smaller contractors, material producers and suppliers

Innovate alternate, inclusive models for housing finance

To develop a variety of financing models including community component considering a blended approach towards housing.

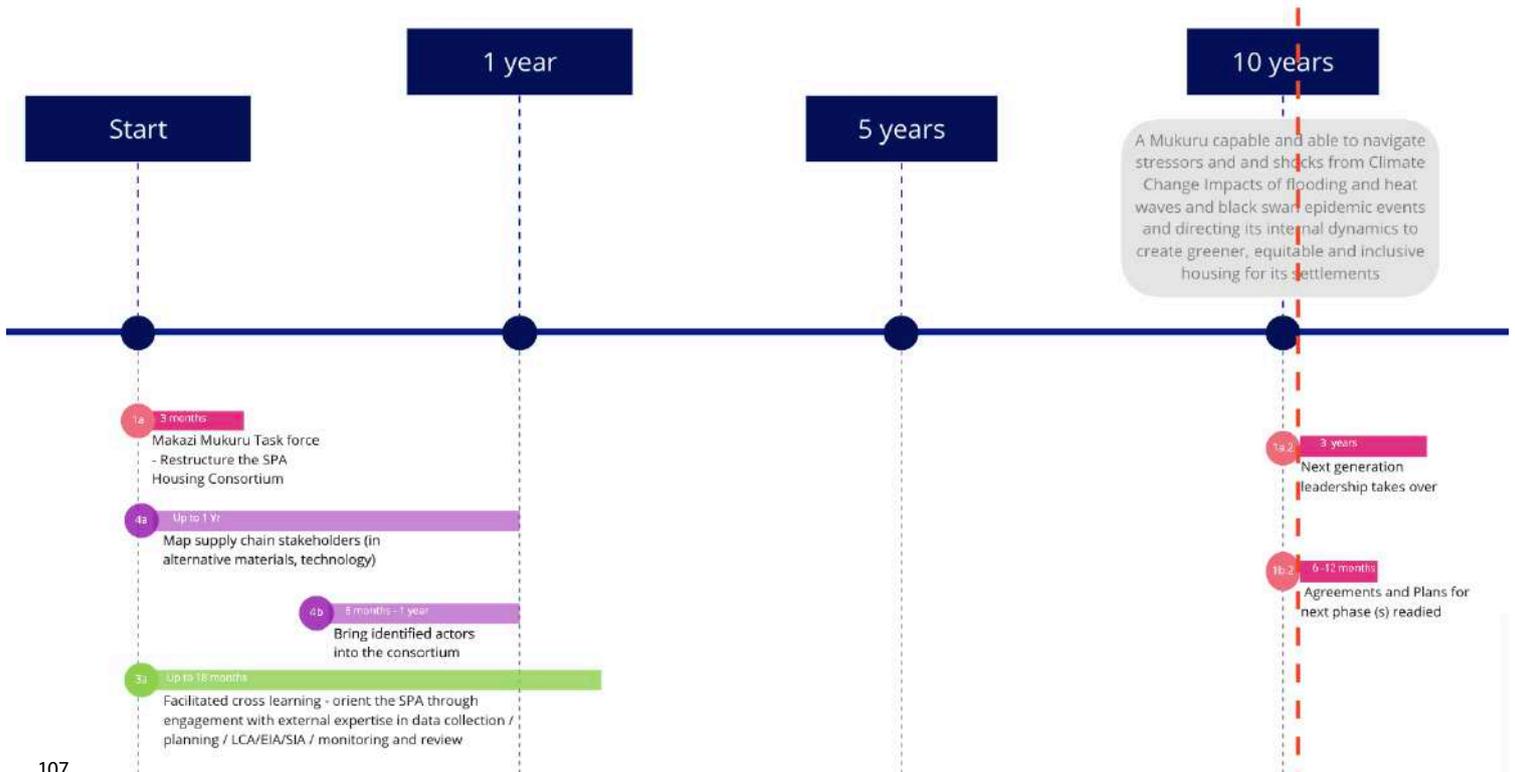


# HOUSING STRATEGY I MUKURU SPECIAL PLANNING AREA



# VISION 2030 AND TIMELINE

“A Mukuru where equitable access to safe, decent and affordable housing with basic services is enabled through governance, institutions and most importantly, community networks”



# Makazi Mukuru 2030



*A Mukuru capable and able to navigate stressors and shocks from Climate Change Impacts of flooding and heat waves and black swan epidemic events, directing its internal dynamics to create greener, equitable and inclusive housing for its residents*

Community based micro-finance institutions

# THE GREEN TRANSFORMERS

# GROUP 5



Sumaiyah Binte Mamun

# Urban Slums in Metro Manila (Philippines): transition towards a zero waste community



Vidhee Kiran Avashia



Reynaldo Perez-Ramos



Ambily P



Ngoc Anh, Nguyen Thi

# BASECO MANILA, PHILIPPINES

## CASE STUDY



# BASECO

## Bataan Shipping and Engineering Company

BASECO Informal Settlement is a:

- reclaimed compound and former shipyard
- located at the mouth of Pasig River & along the Manila Bay (coastal area)
- 54 hectares
- 15-20 families (1964)
- 85,000 households (2019)

Specific Issues and Challenges of BASECO

- Health and sanitation – flooding, drainage clogging due to waste
- Other basic services – security/safety and order, illegal power tapping, health care, and livelihood opportunities
- Proliferation of garbage in waterways and coastal area – absence of unified waste collection and disposal
- Sub-standard septic tanks for sewage collection
- Unsafe and contaminated drinking water
- Inadequate public green spaces



# TRENDS and DRIVERS

Sustainable Development  
Water/air/soil contamination  
Economic/Distribution of wealth

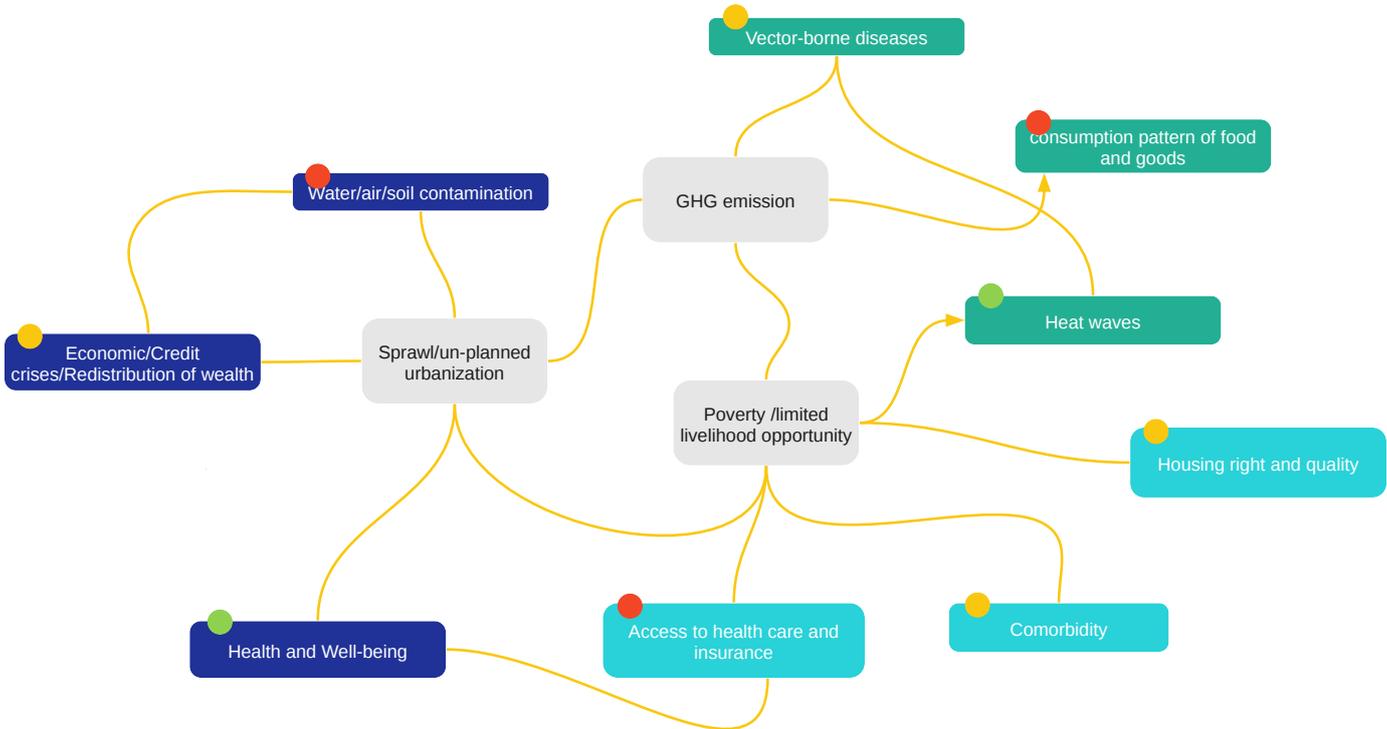
Sustainable Urban Development  
Sprawl/un-planned urbanization  
Housing right and quality

Climate Change  
GHG emission  
Water excess or scarcity  
Consumption pattern

Pandemic  
Access to health care & medical insurance  
Unhealthy living condition/lifestyle



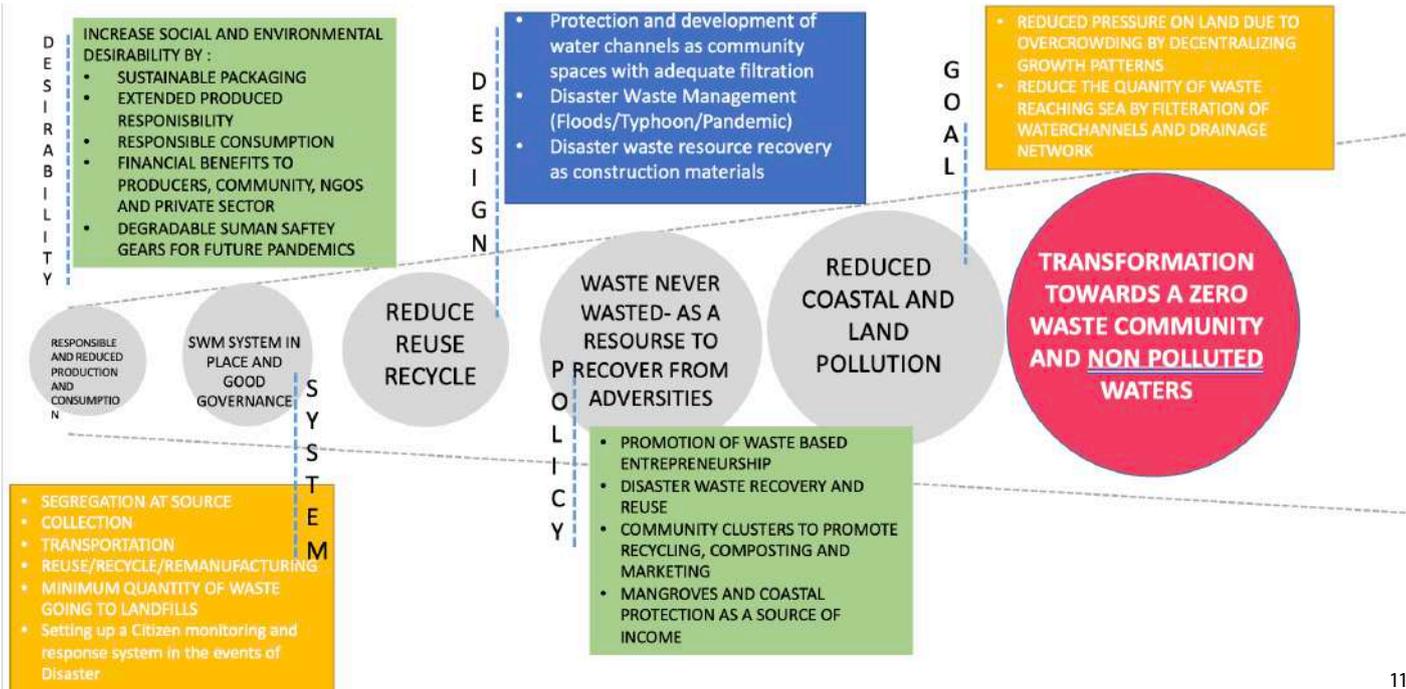
Urban Slums in Metro Manila (Philippines): transition toward community



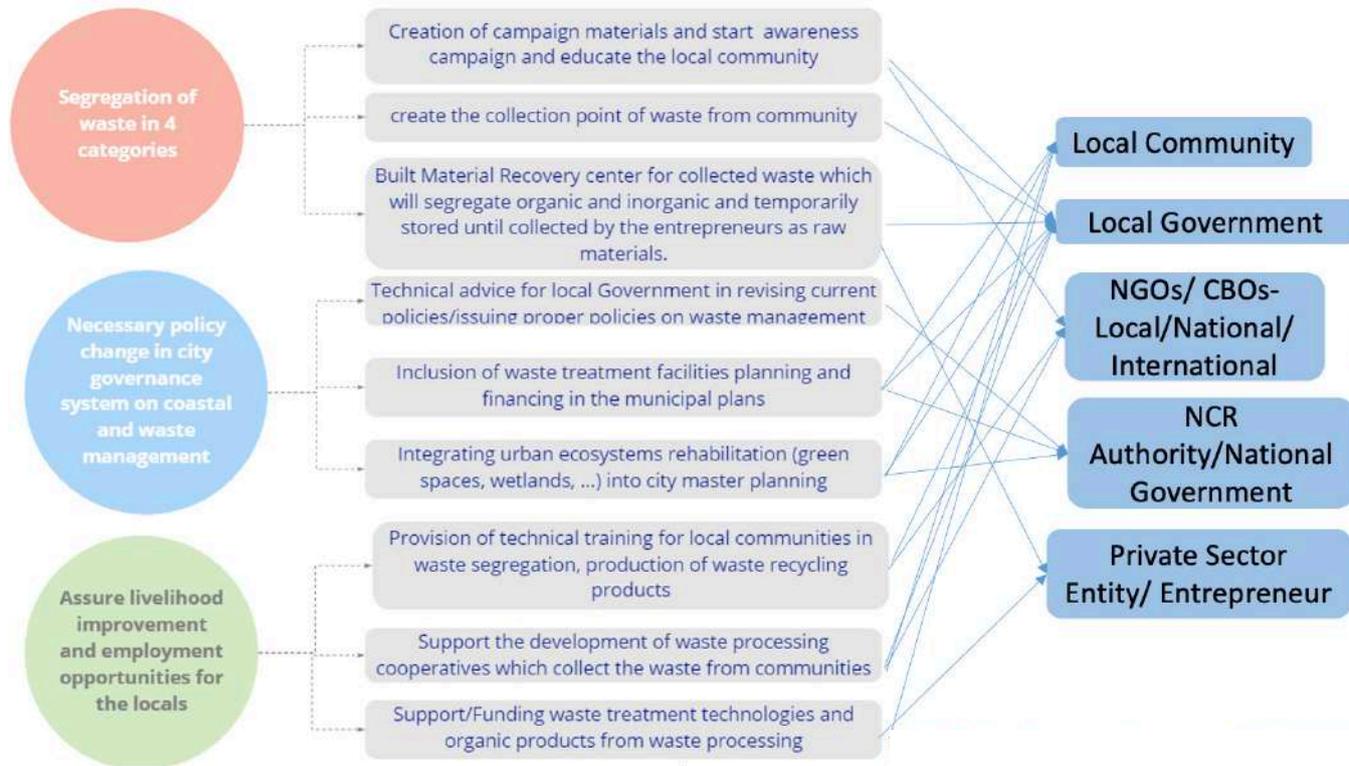
The story of waste



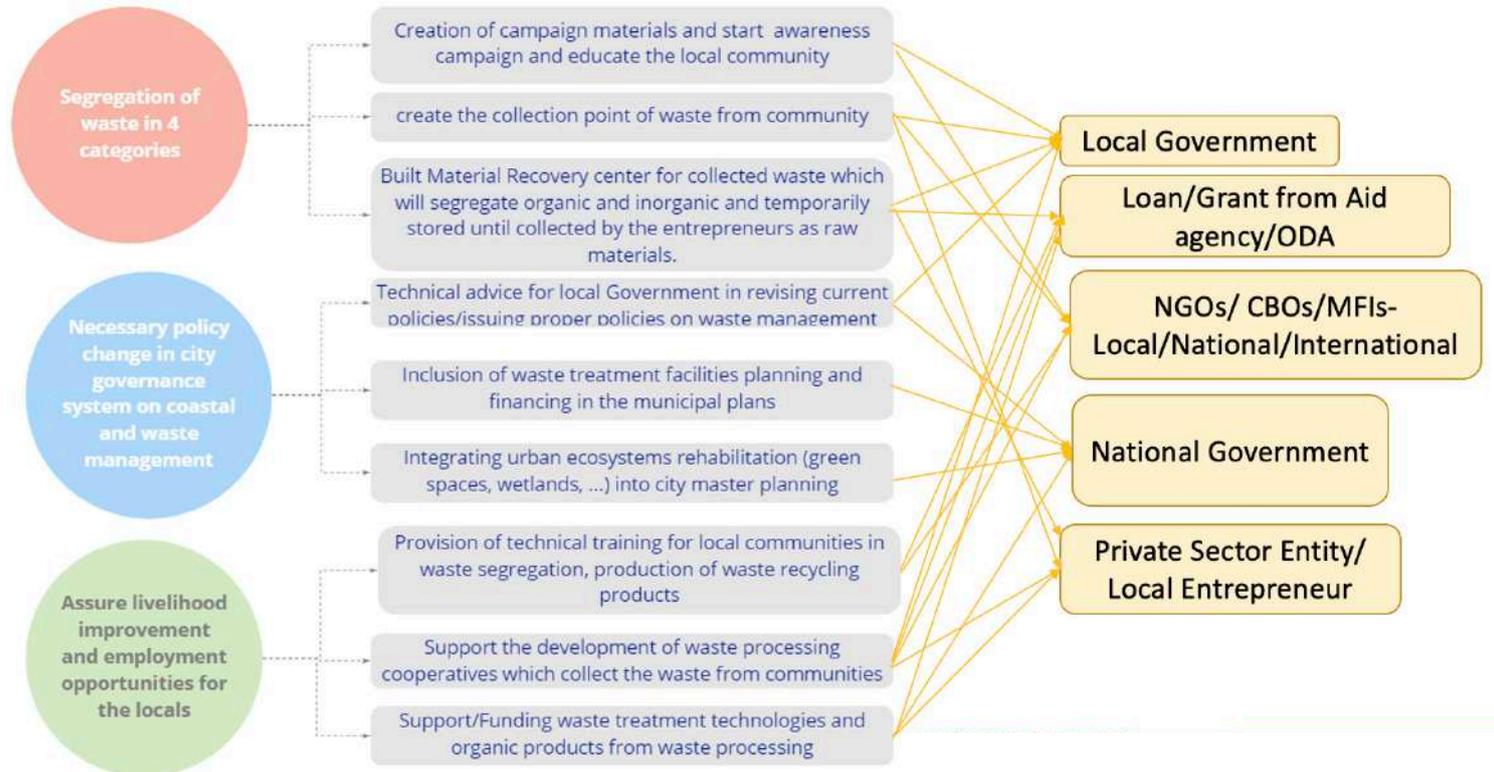
# Target Vision Milestones Action plan



# Relevant stakeholders



# Finance







Mangrove restoration



Waste filtration in water channels



Community based and gender sensitive waste recycling



Urban Slums in Metro Manila (Philippines): transition towards a zero waste community

**STRATEGY 1- SEGREGATION OF WASTE**

- A** CREATING AWARENESS & EDUCATION
- B** CREATING WASTE COLLECTION POINTS (at every 400m distance)
- C** BUILT MATERIAL RECOVERY CENTRE (combining 3 neighborhood scale community)

**STRATEGY 2- POLICY CHANGES AND GOOD GOVERNANCE**

- A** TECHNICAL ADVISE FOR LOCAL GOVERNMENTS
- B** INCLUSION OF WASTE MANAGEMENT IN MUNICIPAL FINANCE
- C** URBAN ECOSYSTEM REHABILITATION IN MASTER PLANNING

**STRATEGY 3- LIVELIHOOD IMPROVEMENT AND EMPLOYMENT OPPORTUNITIES**

- A** LOCAL COMMUNITIES WASTE BASED EMPLOYMENT
- B** WASTE PROCESSING COPERATIVES (with every Material Recovery Center)
- C** SUPPORT AND FUNDING FOR TECHNOLOGY TRANSFER

# Exit survey

121

## General considerations

- Lectures facilitated your understanding of urban resilience: 100% agree
- They learned about best practices and projects worldwide.
- They learned about relevant international policies and efforts (Paris Agreement, New Urban Agenda, and Sendai Framework for Disaster Risk Reduction).
- They learned about systems thinking and systems approaches
- They learned about system mapping & stakeholders' analysis (theoretical and practical way).
- They learned about analyzing current and future urban trends and drivers (theoretical and practical way).
- They learned about future scenarios methods: visioning and back-casting.
- They learned about strategy development and action planning (theoretical and practical way).
- Lectures facilitated the challenge and the group work.
- There were contents relevant for both the Global North and Global South.
- They learned about response ways for green and just transition in the face of COVID 19 and other global challenges, as climate change.

## What concepts, theories or thematic aspects of urban resilience, green and just transition were you challenged by?

- Green and just transition / I was more challenged by the just transition because it is a field that i have never studied nor having experience in.
- Finance / Financing Urban resilience, Resilience in theory
- Resilience vs Sustainability
- The operationalization of urban resilience
- Trends & Drivers at the local scale, Implementation of resilience strategies at city/town level
- Metrics and measurements of resilience / How to measure trade-offs and make the best decisions
- Multilevel governance
- The complexity of cities as systems of systems and the interrelation with institutional path dependency

## What inspired you the most?

- Urban resilience in urban planning
- Team members experiences / The participant mix was very unique
- The kumu tool
- Learning new tools and techniques (especially to do with systems mapping), and discovering ways that resilience thinking/approach could be integrated into my own work and future career.
- Following the process and methodology, and all the different elements that came into this.
- Teaching through empirical evidence (practical)

## What was the most useful instrument (steps of the challenges) or lectures you've experienced?

- System mapping / Systems thinking / Strategic planning
- Stakeholders mapping and resilience strategy methodology
- The use of KUMU and the miro board and the entire steps of the assignment most the trends and drivers and how to link them to each and the entire system
- Urban systems and the systems thinking approach, using the Kumu to measure connections between elements ect.

## If you were to take one thing that you learned during the training and apply it to your work , what would that be ?

- The exercise itself: the methodology to obtain the action plan
- To figure out how to apply the concept to of 'evolutionary resilience" in a real situation
- The systems thinking approach; to always look for the interconnection of all forces.
- Systems Thinking as a method to clearly show and analyze the complexity of the interrelation between elements in a system.
- Miro- Kumu tools and the understanding on the concept of 'Just resilience'

## In which way did the training enhance your interdisciplinary learning experience?

- Collaborating with team members from different backgrounds helped me gain an overarching view of urban systems
- Bringing the spatial aspects, material aspects, economic aspects, finance and social and governance aspects together. but most importantly the continued focus on ecological and physical systems interface.
- Helped me develop an appreciation of the differences between disciplines on how to approach a problem with evidence. Also learned to make connections between ideas and concepts across different disciplinary boundaries.
- Challenging how resilience is portrayed and necessarily included in assessments and action planning.
- Before the training I was focused more on my research area "Flood" and saw it as a completely independent entity with engineering solutions. But the training helped me to consider it in a more comprehensive integrated way.
- Through systemic thinking, I was able to see how different sectors/ disciplines interlink.
- I have learned the financial perspective, which was new to me. As a former architecture background, we never had the finance perspective.



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