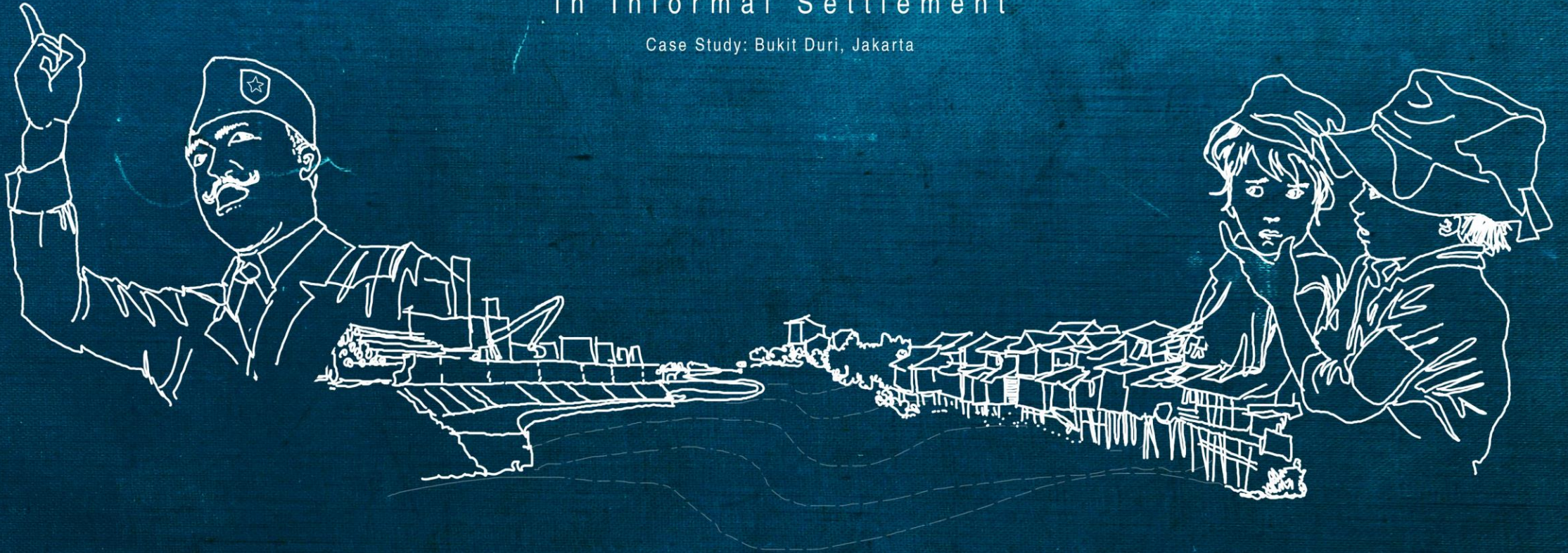


# TRANSFORMATIVE RESILIENCE

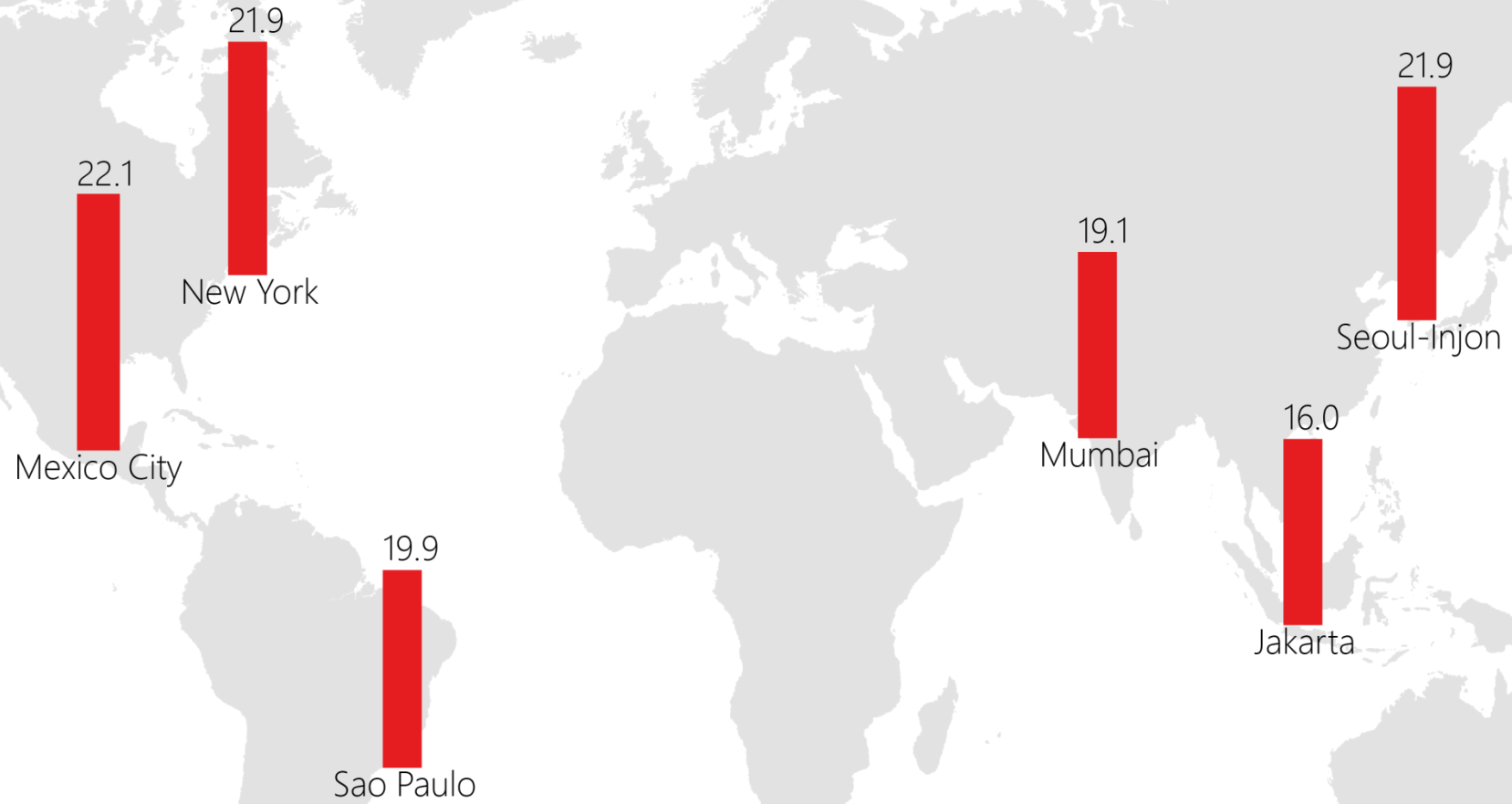
A Study of Derivative Form of Resilience  
in Informal Settlement

Case Study: Bukit Duri, Jakarta

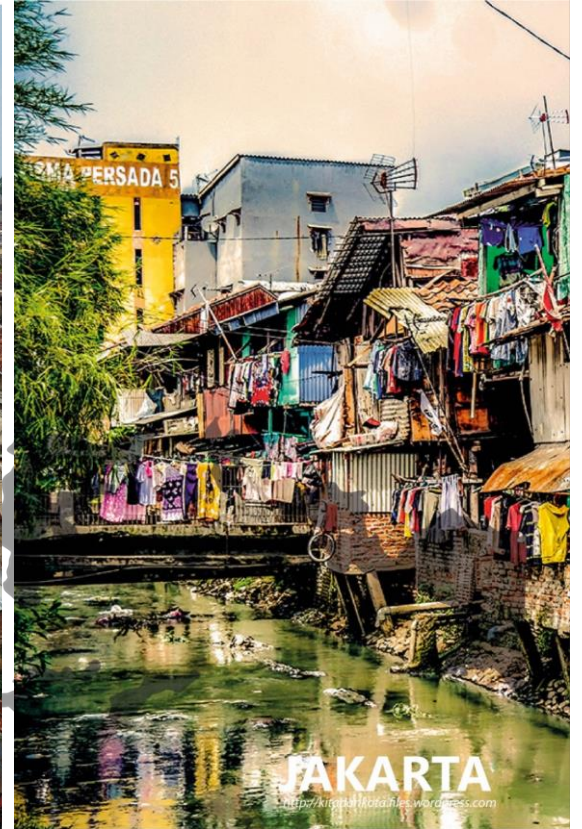
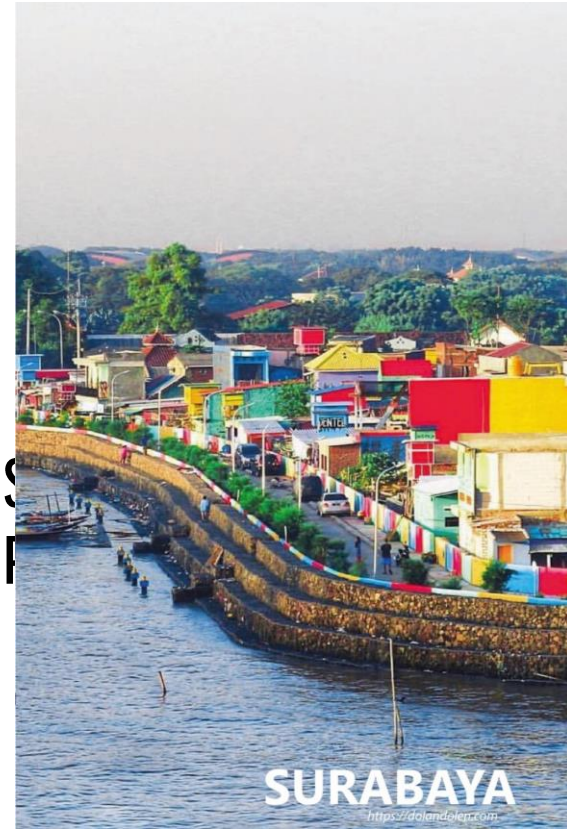




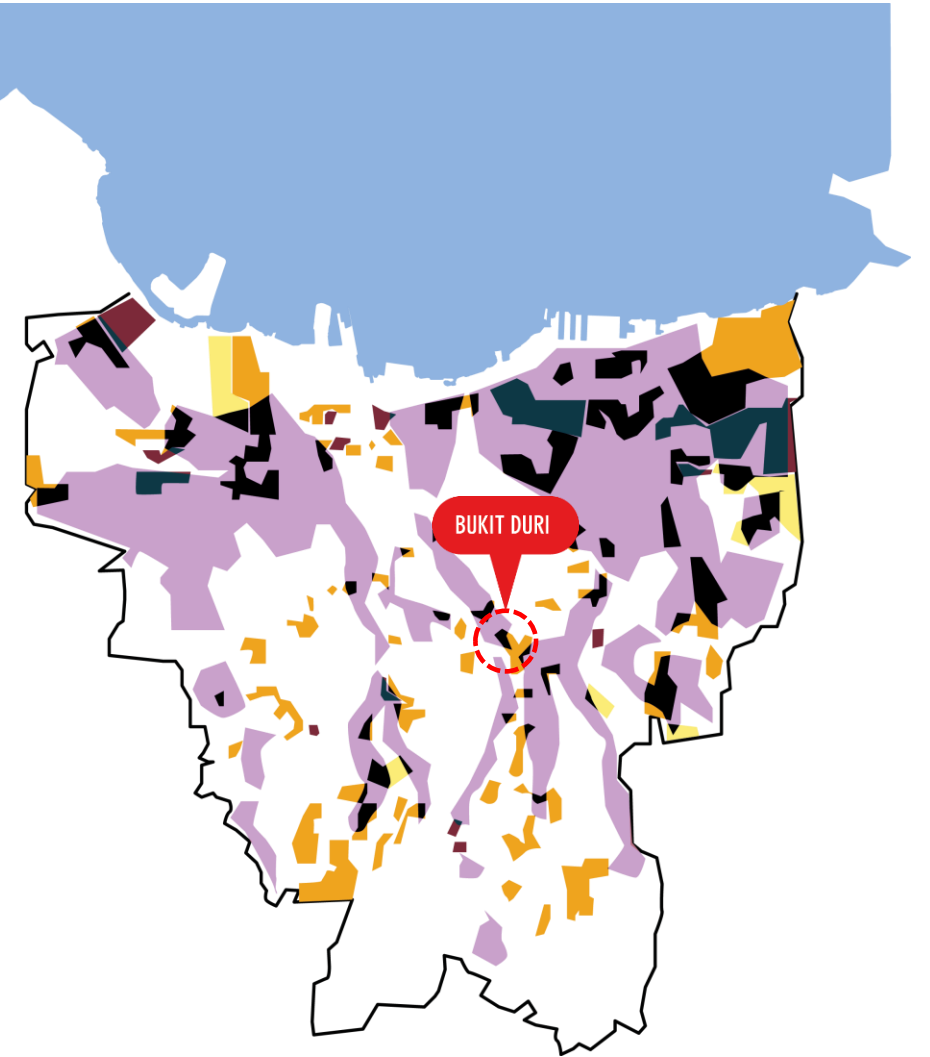
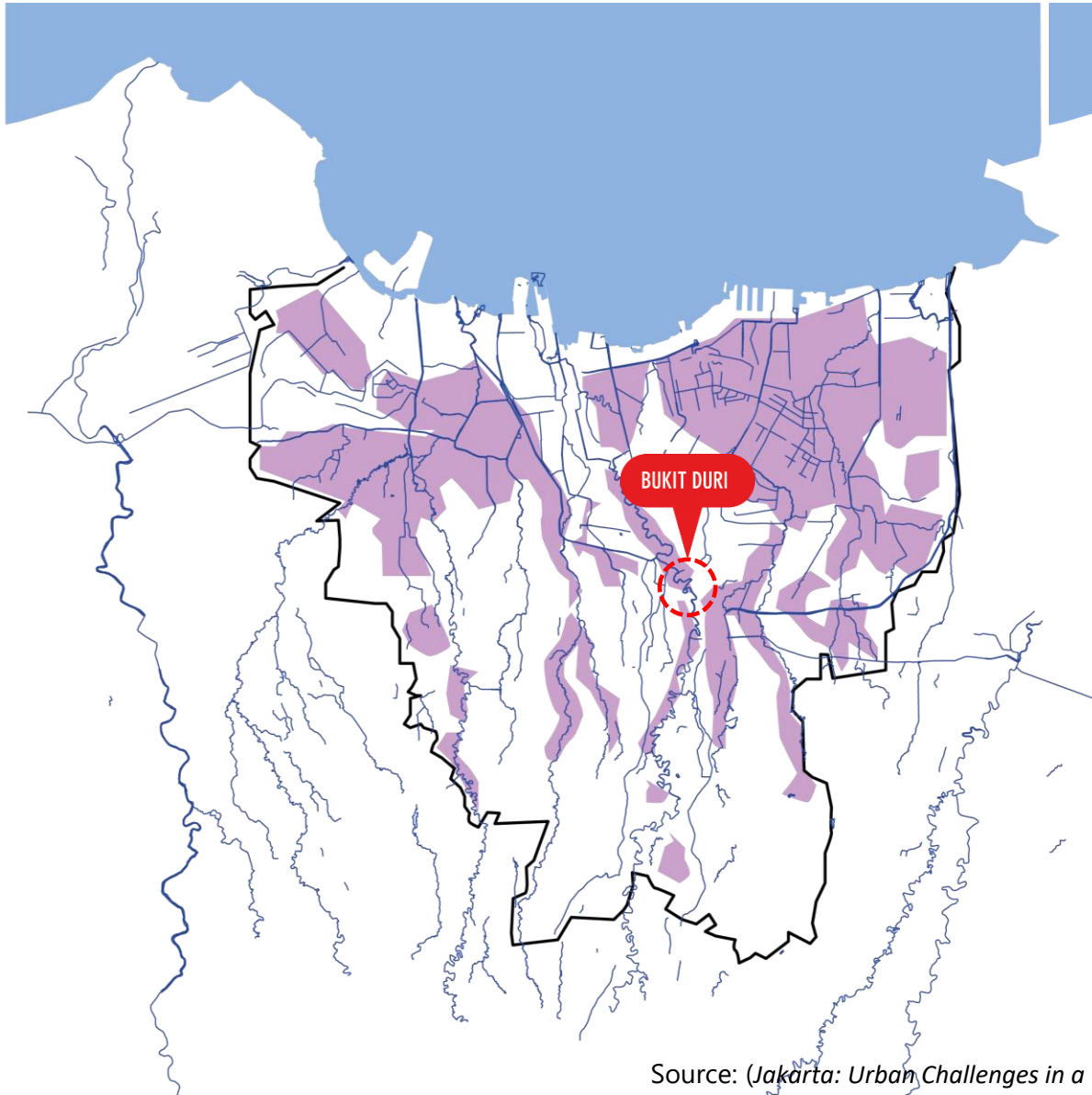
<b><i>Introduction</i></b>	<b><i>Vision</i></b>	<b><i>Statement</i></b>	<b><i>Project Proposal</i></b>	<b><i>Design Details</i></b>	<b><i>Conclusion</i></b>
<i>Background Problems</i>	<i>Vision of the Project</i>	<i>Synthesis</i>	<i>Stakeholder reconfiguration</i>	<i>Design Pattern</i>	<i>Proposed Resilience capacity</i>
<i>Motivation</i>	<i>Background Framework</i>	<i>Hypothesis</i>	<i>Design Framework</i>	<i>Programs</i>	<i>Relation to SDGs</i>
<i>Problem Field</i>				<i>Pilot Project</i>	
				<i>Project timeline</i>	
				<i>Stakeholder clustering</i>	



*The population (in millions) of the world megacities. (Davis, 2006)*







Source: (Jakarta: Urban Challenges in a Changing Climate Change. 2010)





tears of Bukit Duri



# Introduction

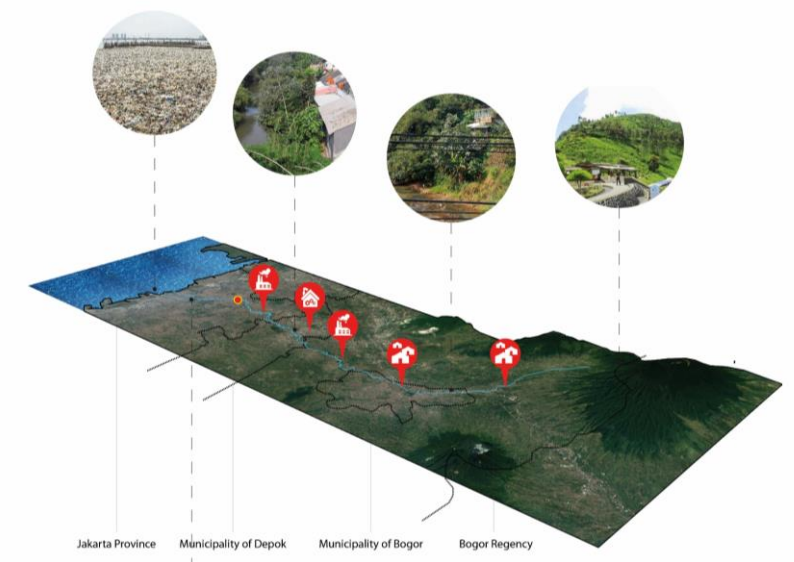
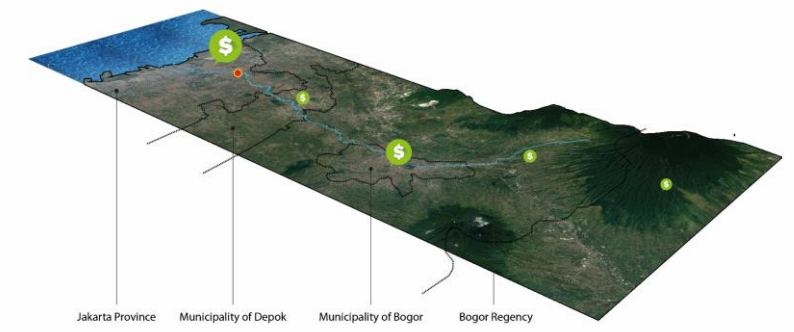
## Vision

## Statement

## Project Proposal

## Design Details

## Conclusion





## Introduction

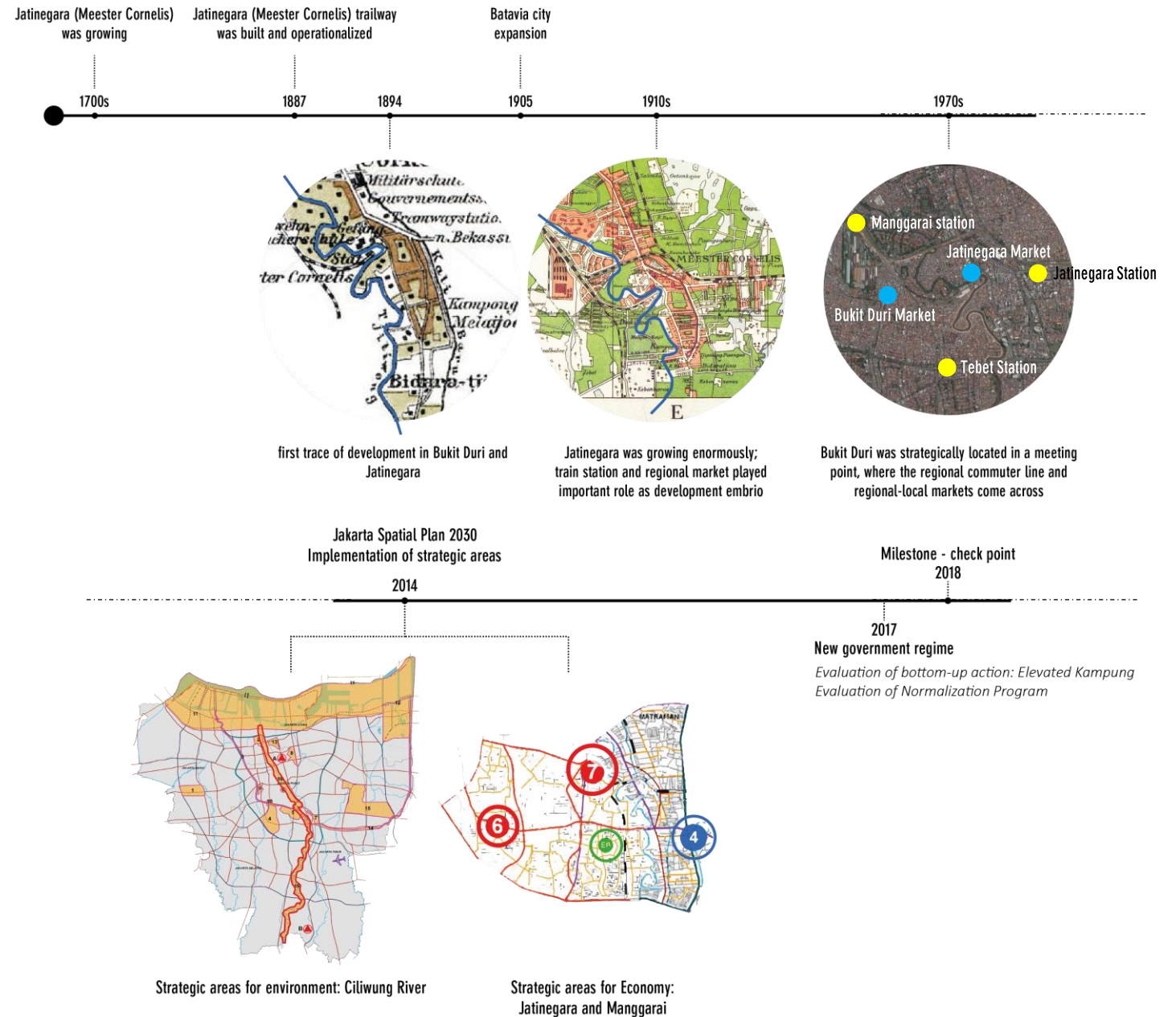
## Vision

### Statement

## Project Proposal

## Design Details

## Conclusion





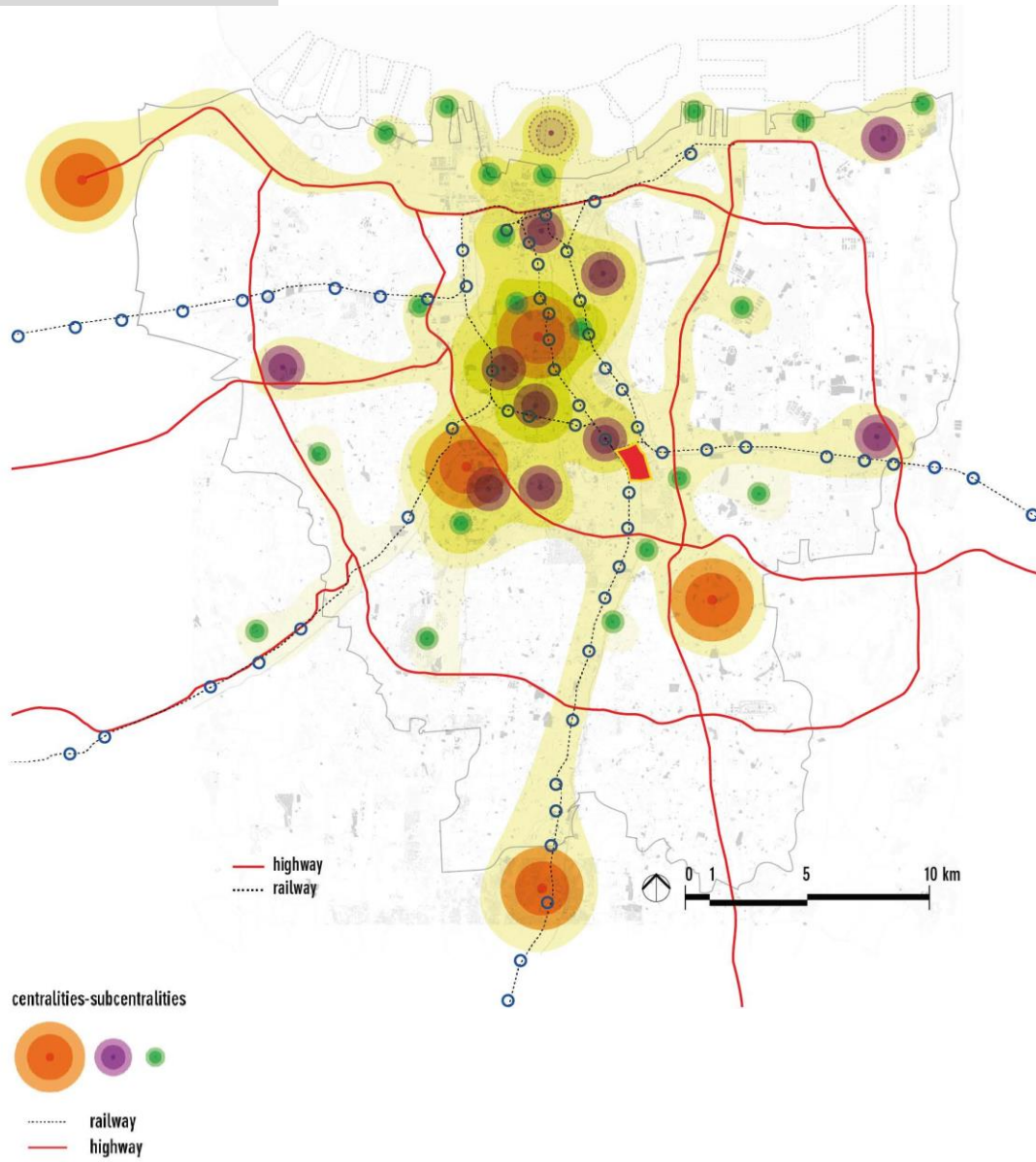


*Live under poverty and lack of basic infrastructure provision has characterized the livelihood of Bukit Duri*

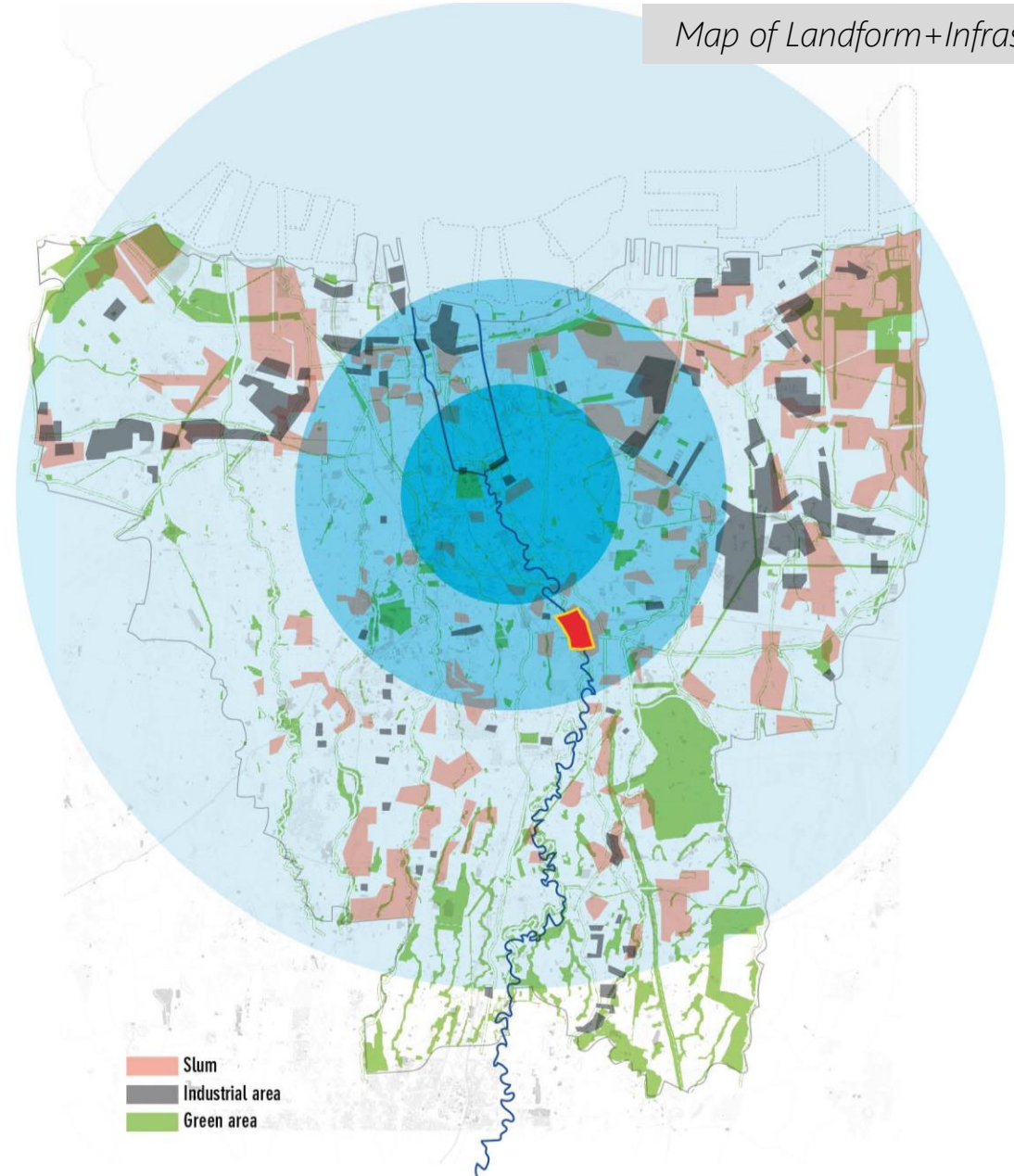
*Source: (jakartaglobe.id; kumparan.com )*



Map of Centralities

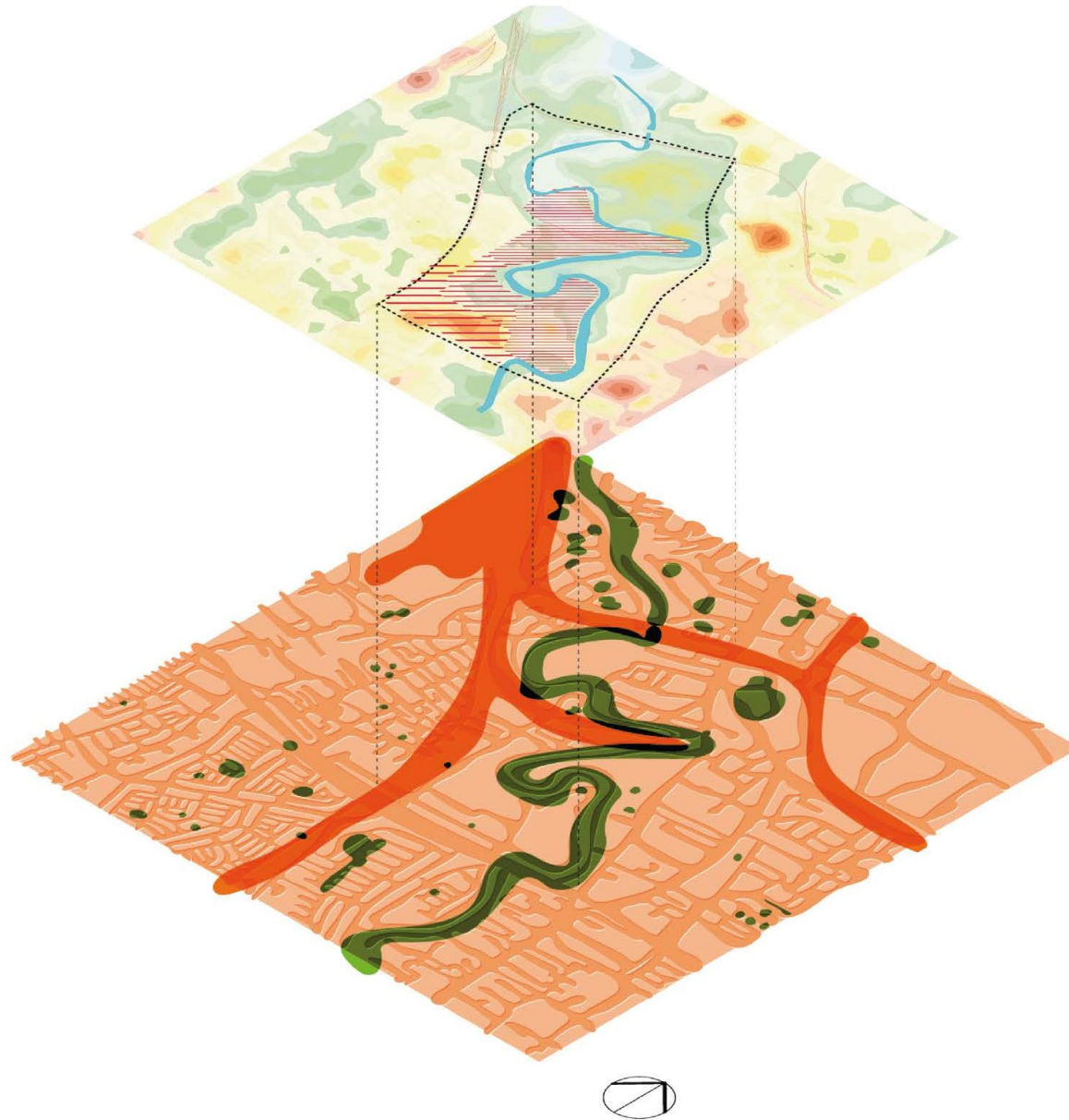


Map of Landform+Infrastructure





*Existing Human-nature relation*





*Informal utilization of space for local business*







*Living under the threat of flooding, Bukit Duri has been suffering a devastated impact of the disaster*





*Government proposed to solve the problems, yet it suggests partial and fragmented intervention*

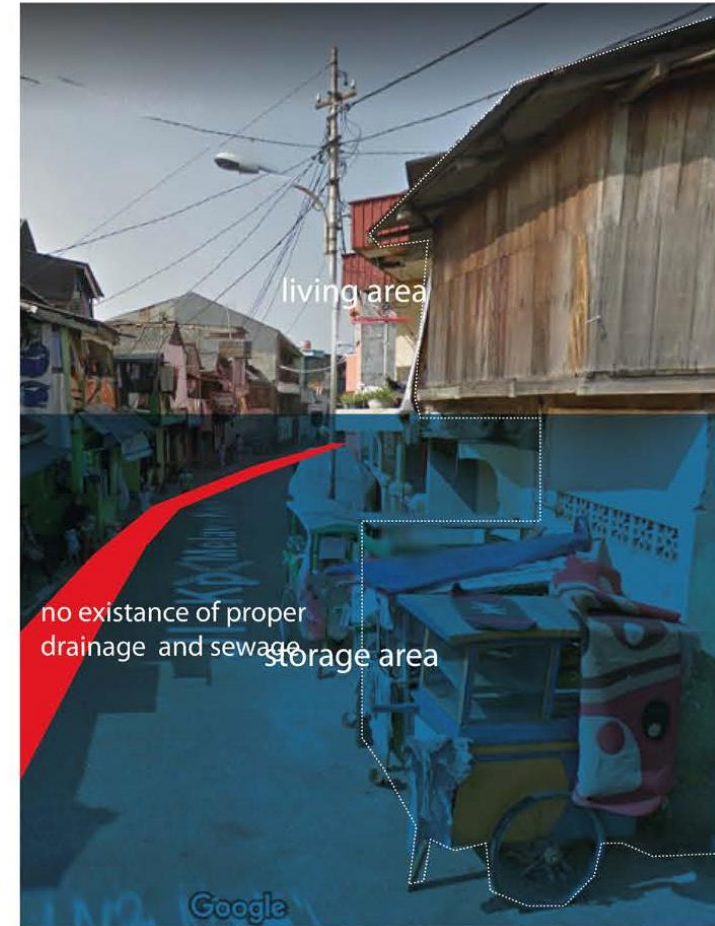
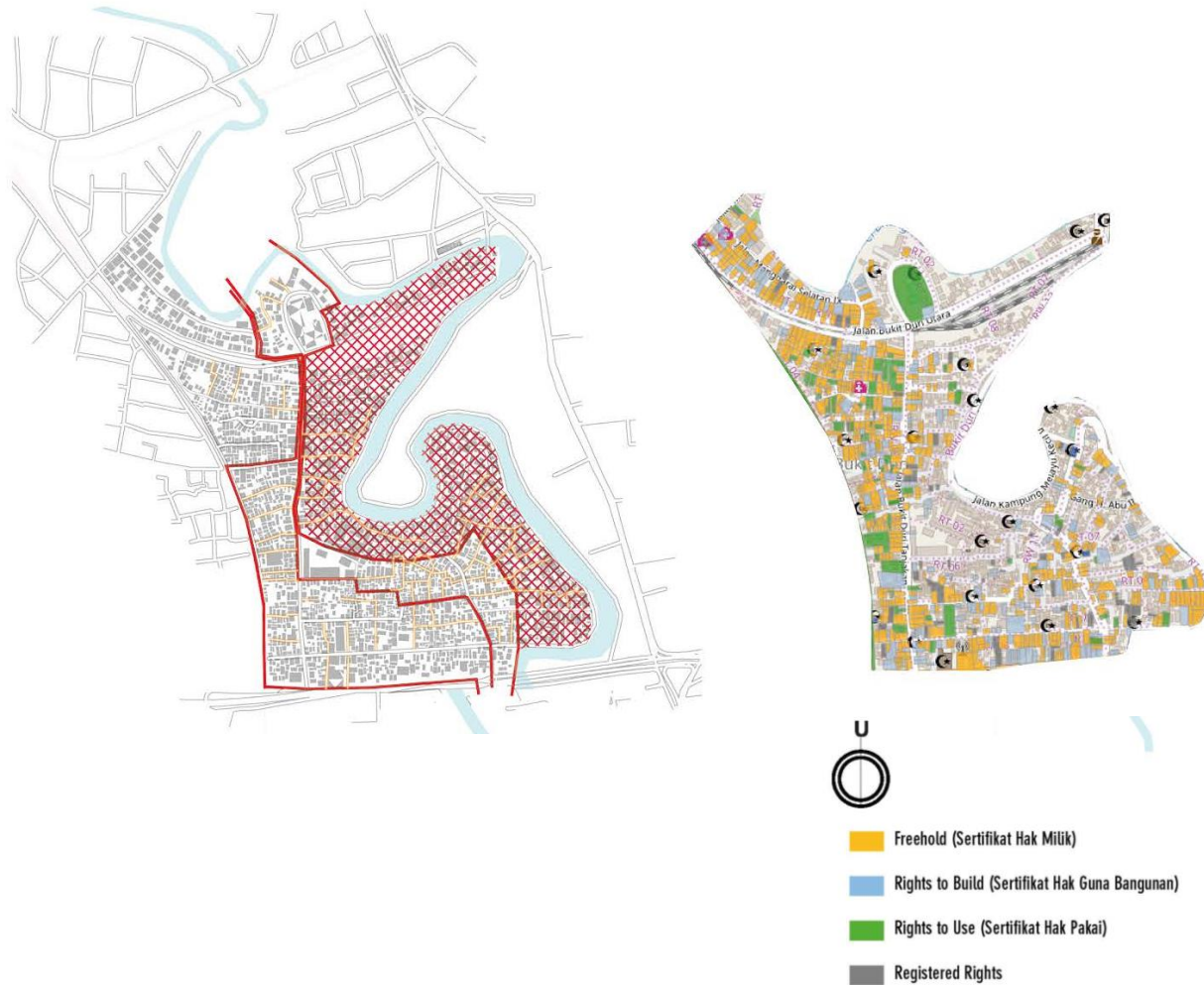




*Lack of proper infrastructure performance has fragmentedly disconnect the neighborhood from broader network*



## Existing land tenure configuration





*#1 Exclusive planning process*



<http://www.kbknews.id>

*#2 Tecnocratic solution to flooding*



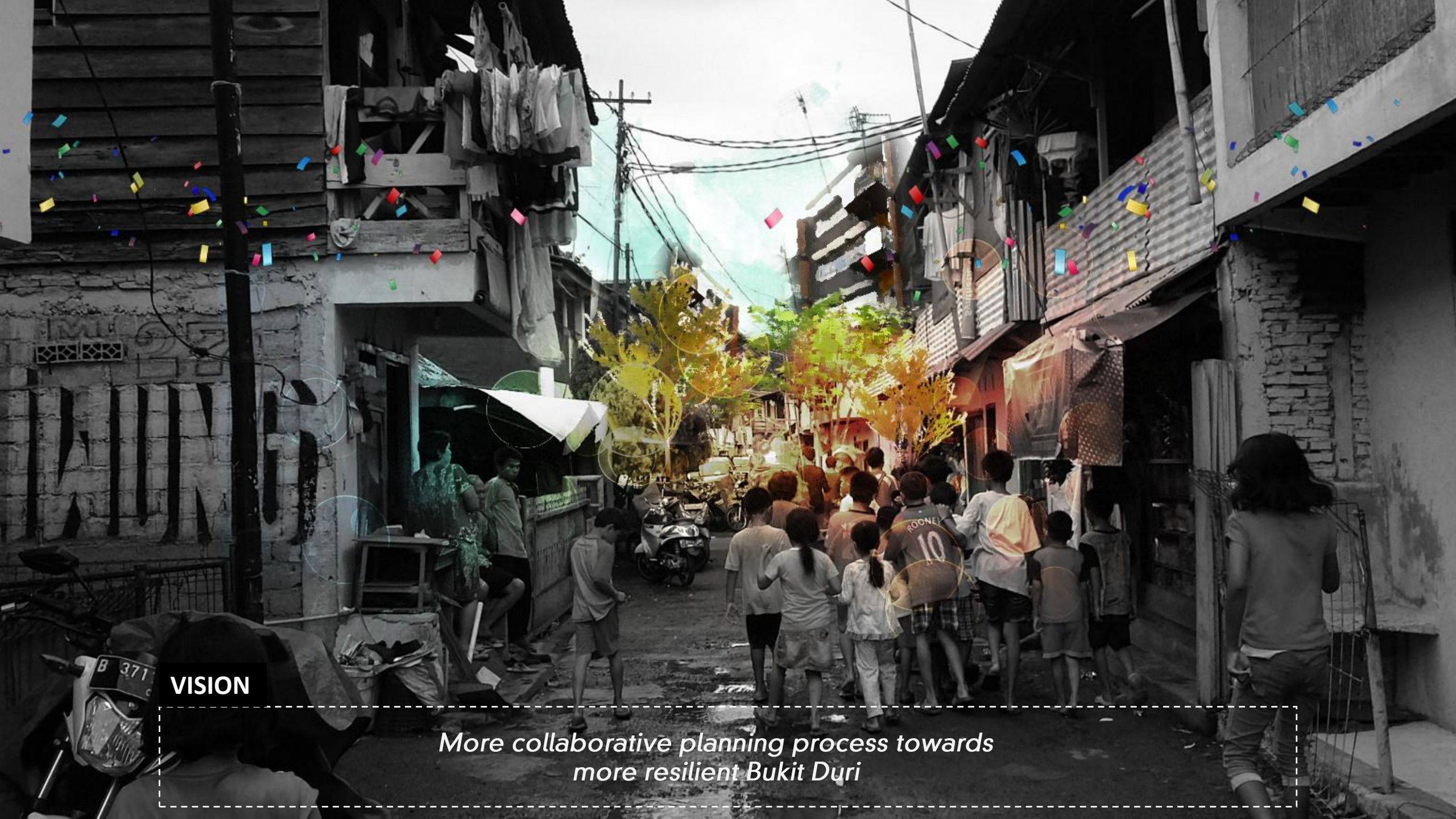
<http://www.aktual.com>

*#3 Inadequate livelihood*



<http://news.metrotvnews.com>





## VISION

*More collaborative planning process towards  
more resilient Bukit Duri*



**RESEARCH QUESTION**

How can inclusive planning strategy  
*promote*  
multi-state resilience-to-flooding  
*to create*  
more livable and sustainable thriving community  
*in the*  
informal settlement?

*Case study: Bukit Duri, Jakarta*

*tools*

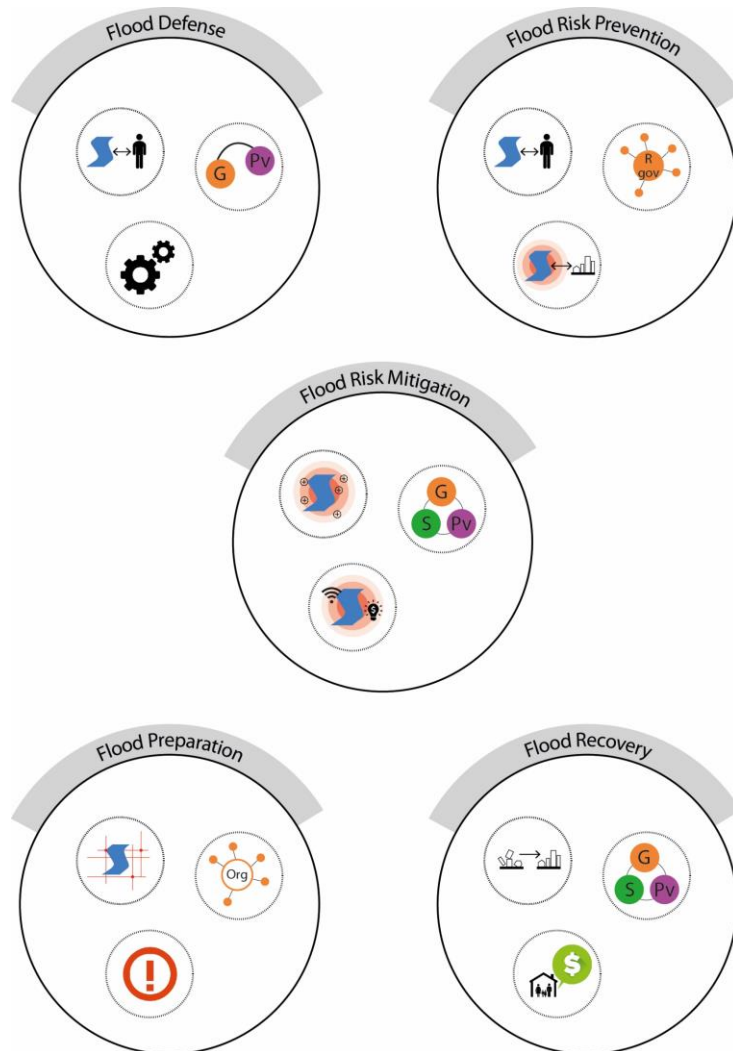
*method*

*goals*

*context*



## Framework of Flood-risk Governance

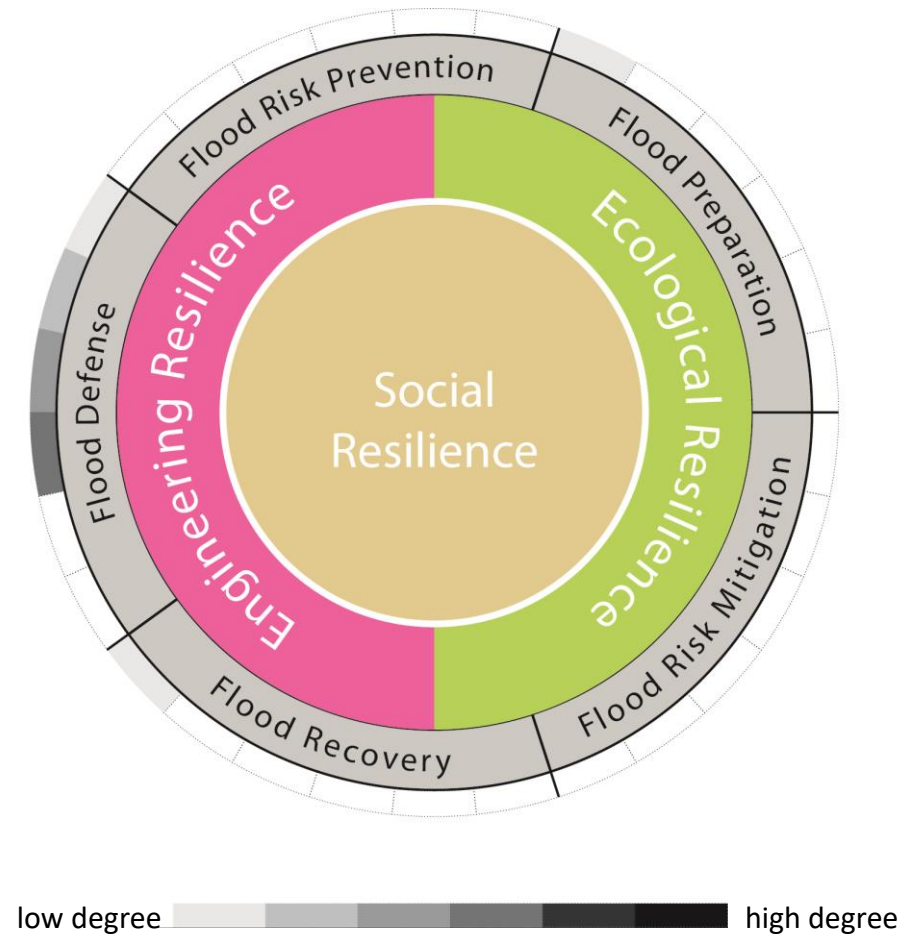


(Hegger et al., 2014)

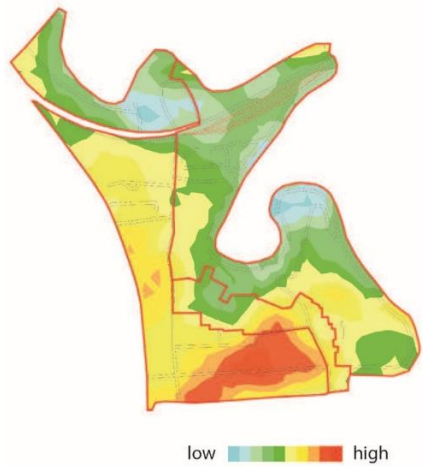
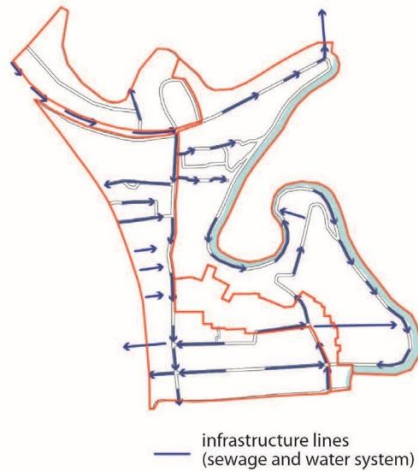
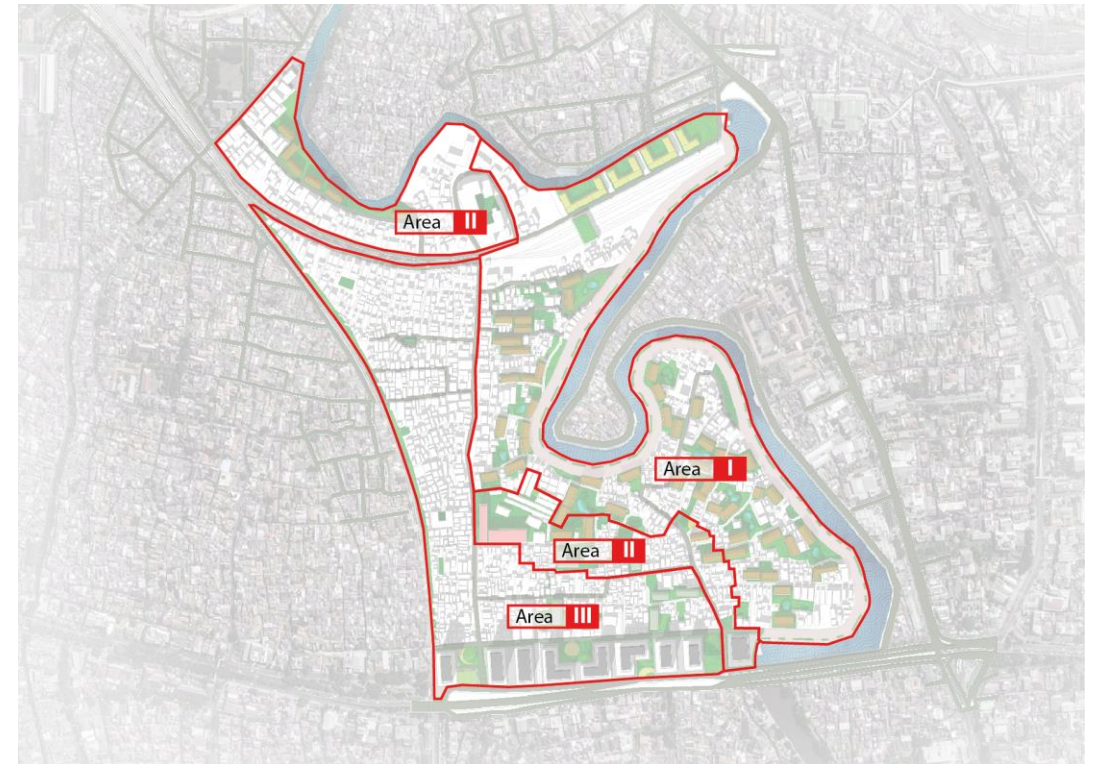


## Elaborated working framework

Existing capacity of resilience

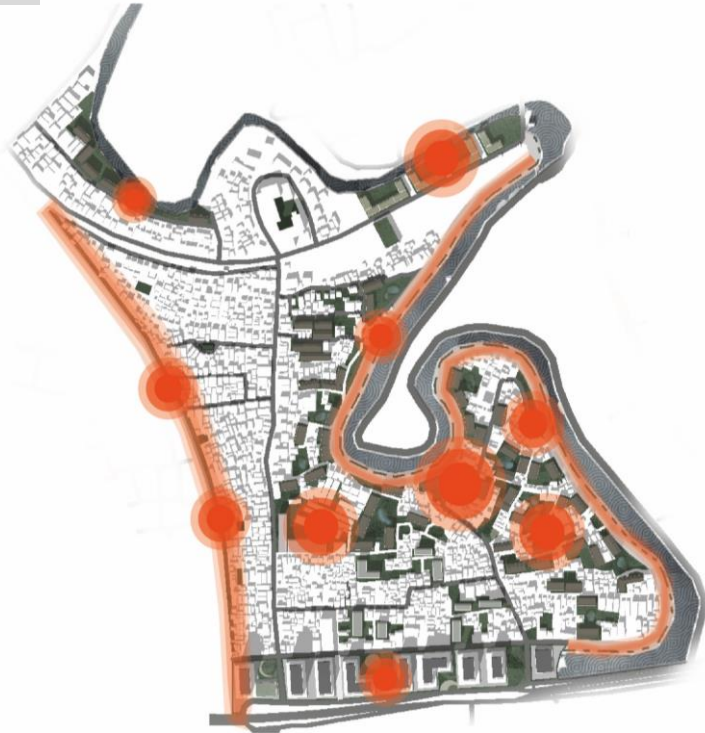




*Spatial vulnerability assessment***Geographical altitude****Infrastructure connection****Legality*****Identified vulnerable area***



Located problems

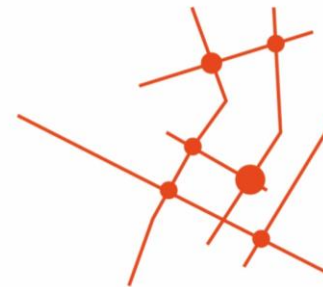


Fabrics



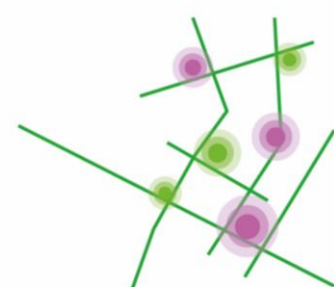
Buildings  
Open-space  
Green (natural space)

Infrastructure

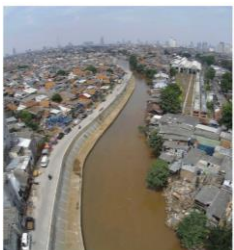


Basic infrastructure  
Flooding infrastructure

Activities



Economic activities  
Social activities



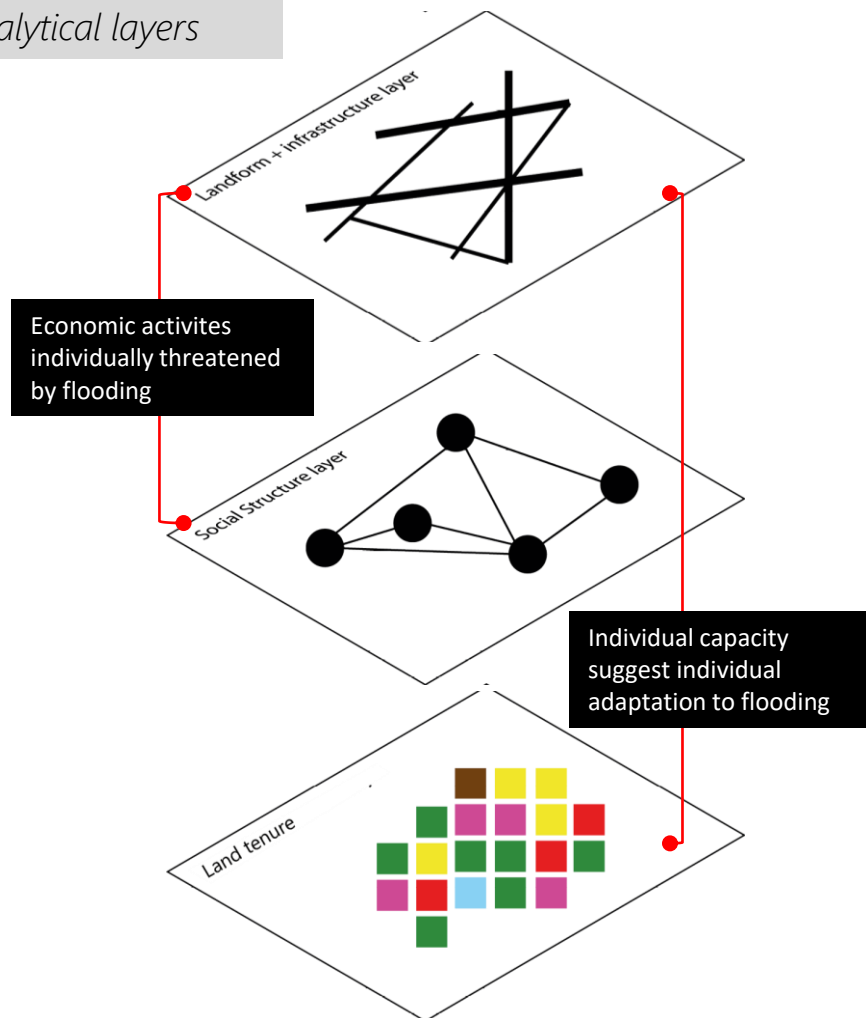


## Design hypothesis

***Zone-defined intervention suggests more tailor-made and specific treatment/solution to mitigate the flooding***

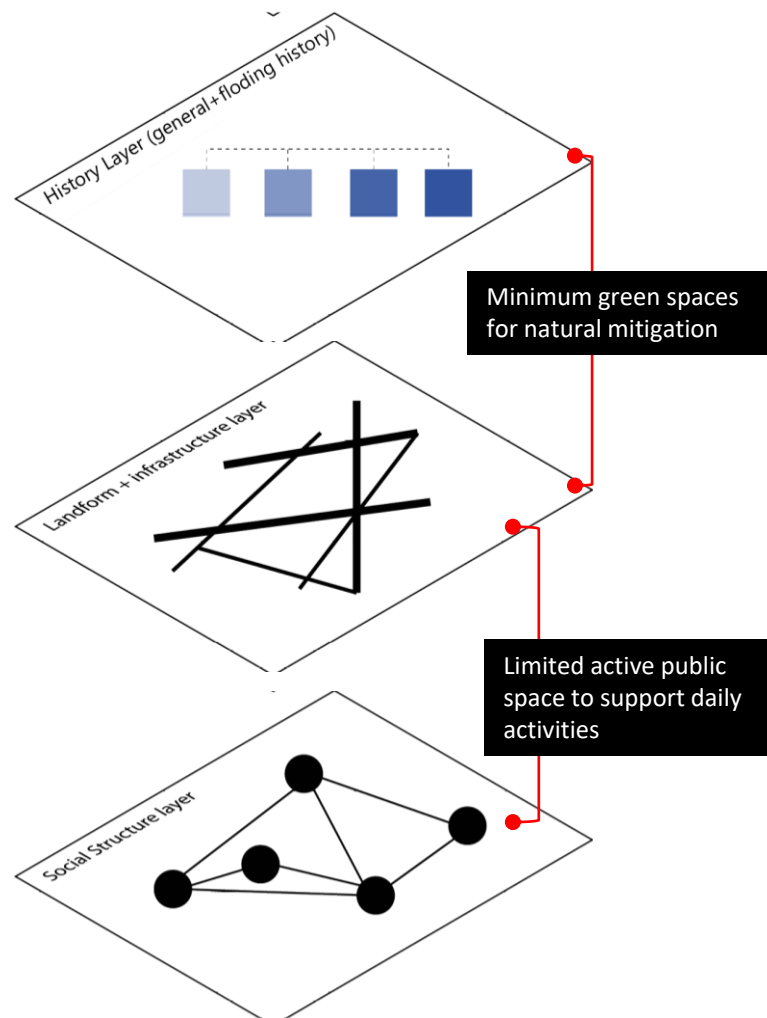


## Analytical layers

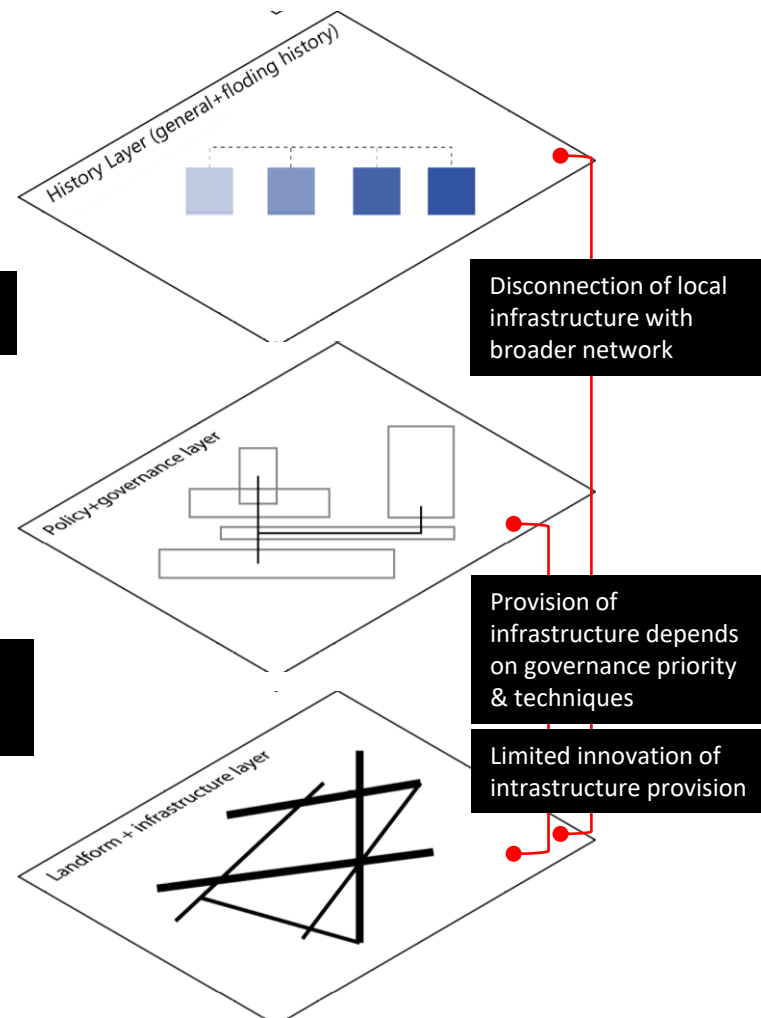


Design Approach

development transformation



human-nature engagement



infrastructure performance

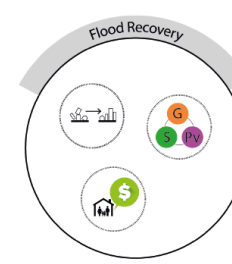
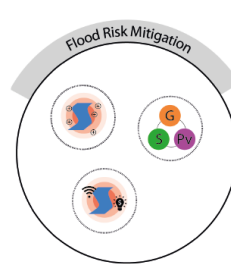
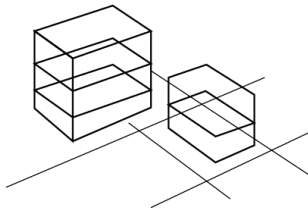


## Design principles

*flood-risk governance  
increasing capacity*

*PRINCIPLES*

**development  
transformation**

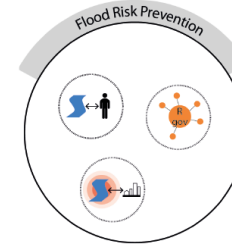
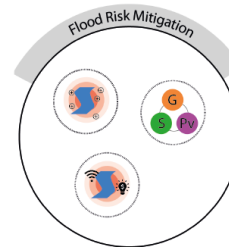


*smart design in flood-prone area*

*building support inside vulnerable area*

*fast-recovery*

**human-nature  
engagement**

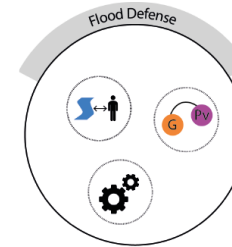
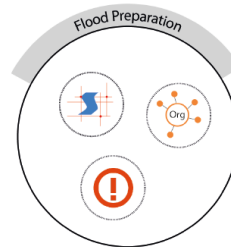
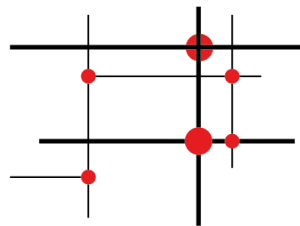


*retain/store water inside flood-prone area*

*natural infrastructure measurement*

*discourage development in flood-prone*

**infrastructure  
performance**



*increasing infrastructure capacity*

*flood-warning system*

*evacuation plan*



## Introduction

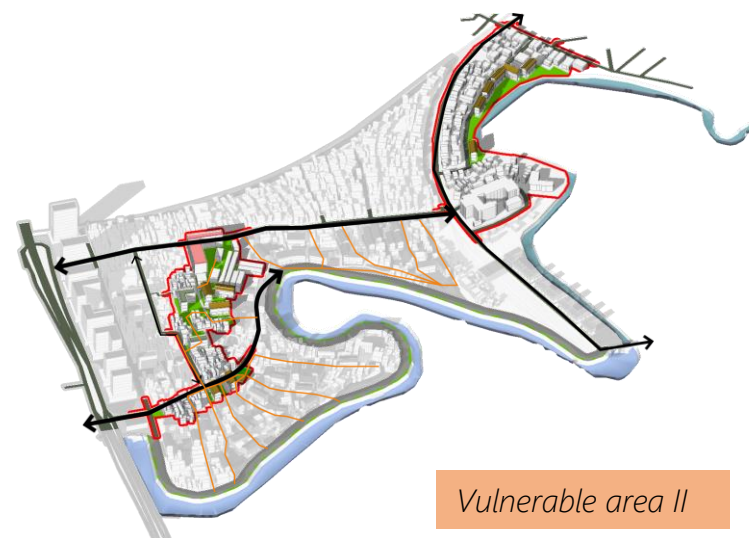
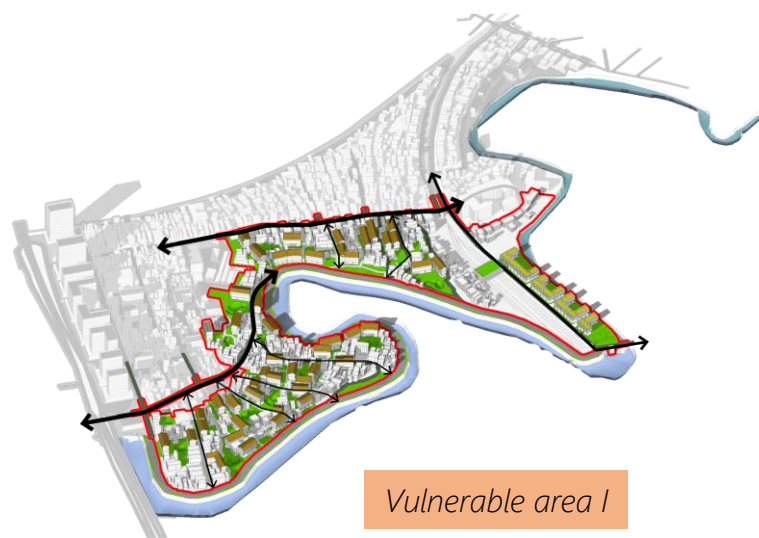
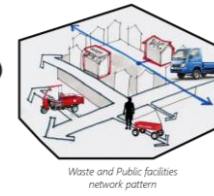
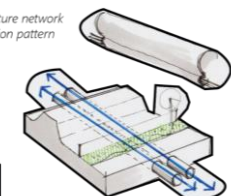
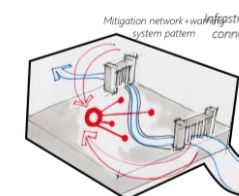
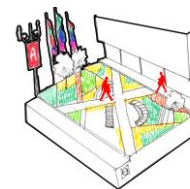
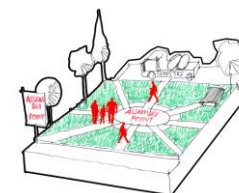
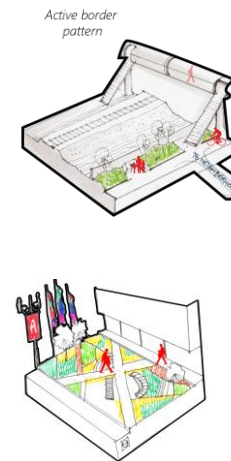
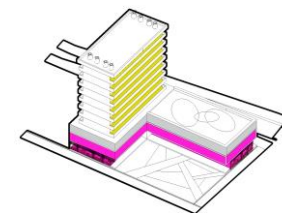
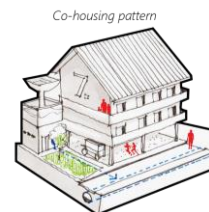
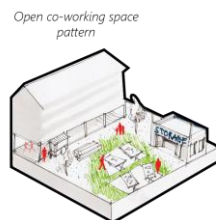
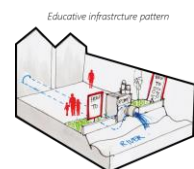
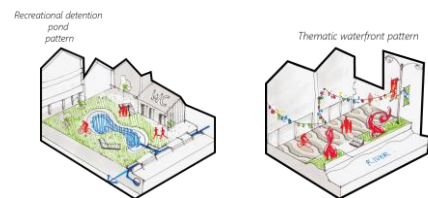
## Vision

## Statement

## Project Proposal

## Design Details

## Conclusion





# Introduction

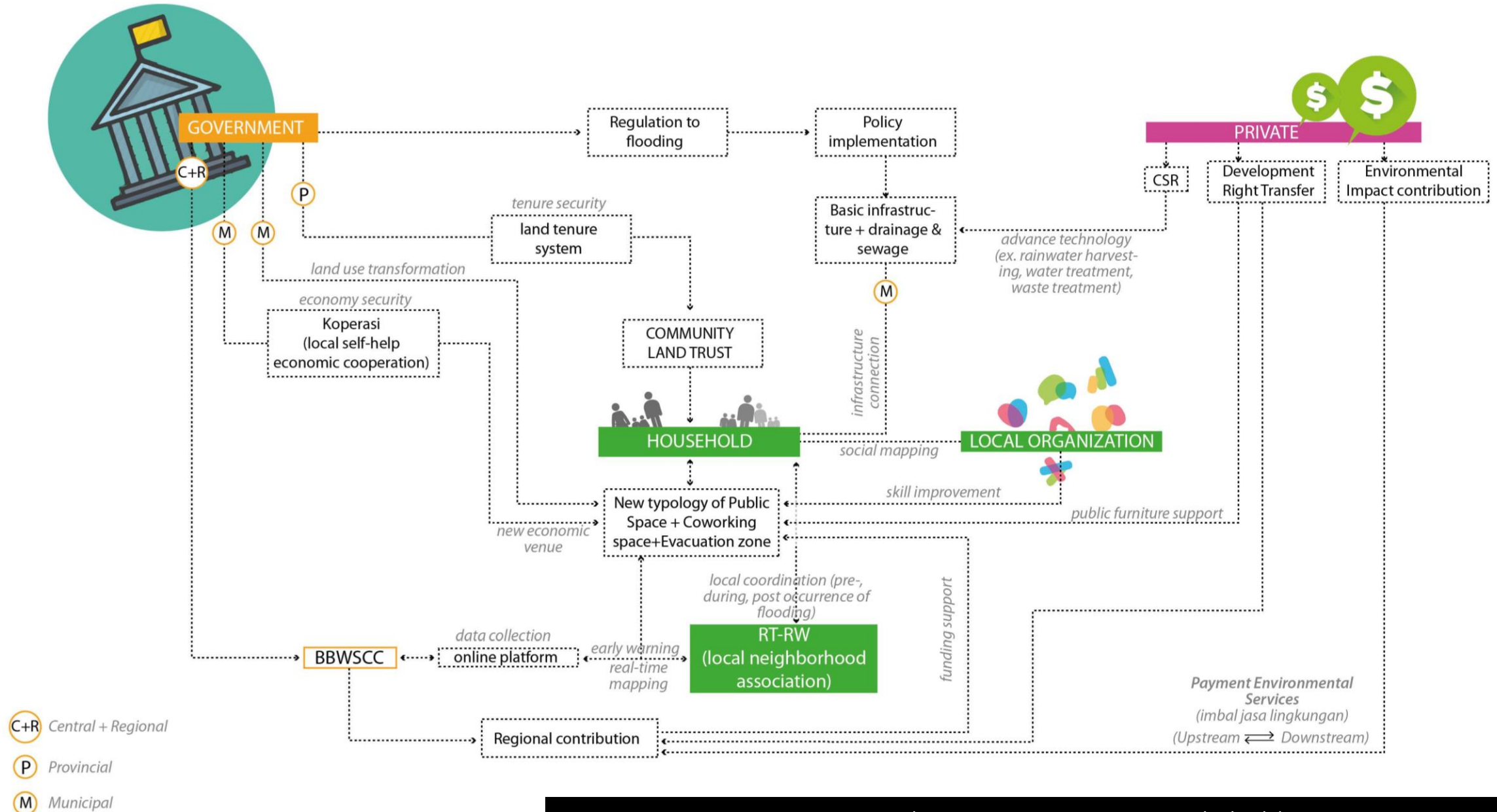
# Vision

# Statement

# Project Proposal

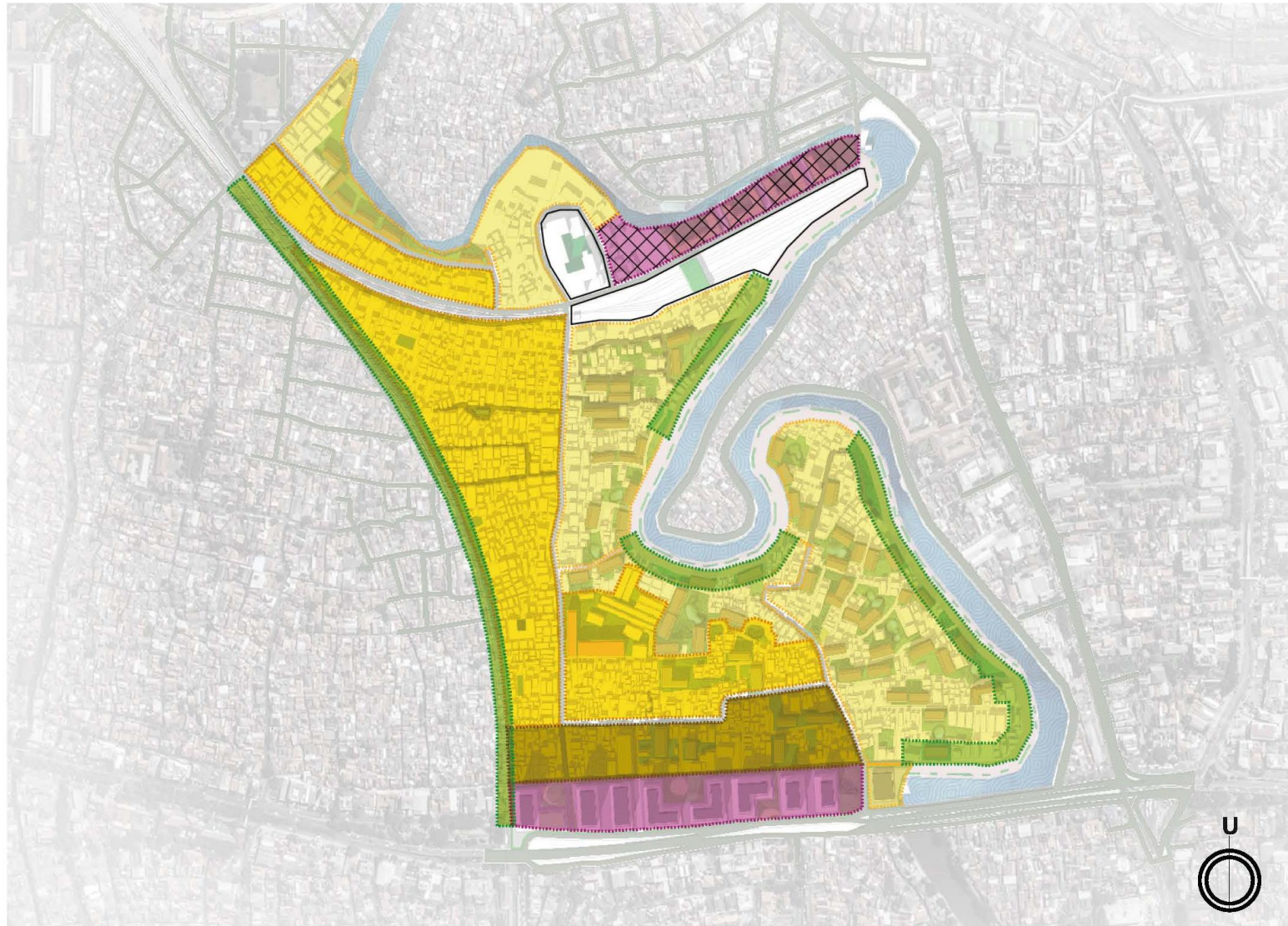
# Design Details

# Conclusion



Proposed interaction among stakeholders





Development framework map  
(source: author)

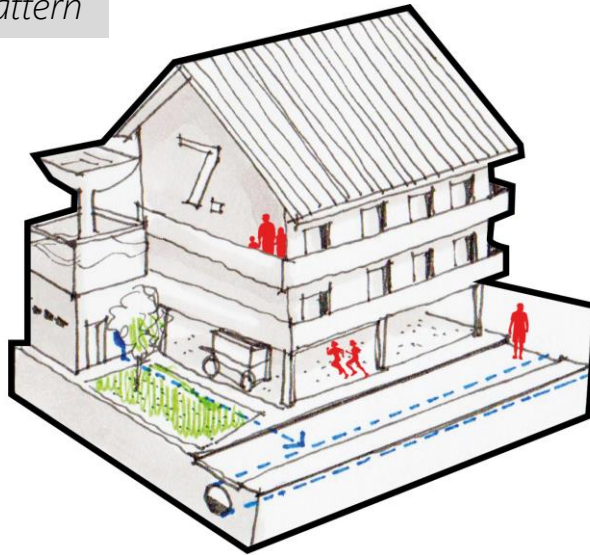


### Development framework

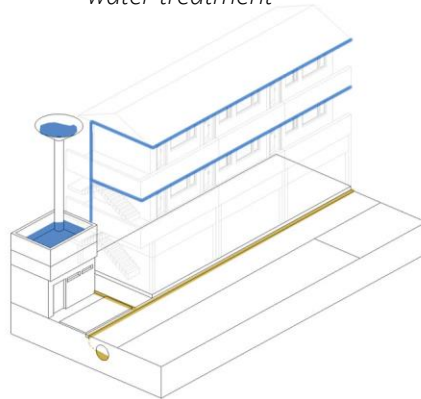
	water frontage development
	low density development (60% greenspace)
	medium density development (40% greenspace)
	high density development (20% greenspace)
	high density commercial zone
	local economy cluster - woodcrafting
	infrastructure boundary transformation zone
	government area



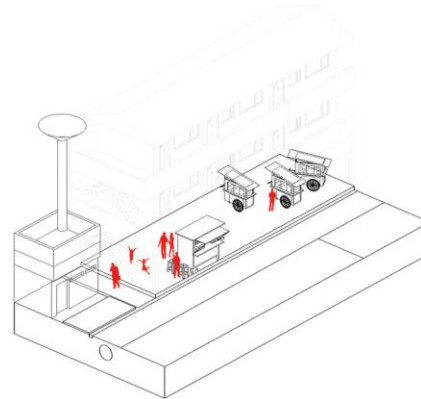
## Community housing pattern



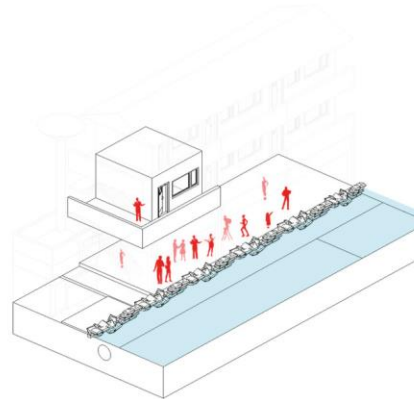
Rainwater harvesting and water treatment



Storage space



Communal self defense



## PROGRAM

## co-housing typology



communal maintenance



rainwater harvesting



communal self-defense



storage



community land TRUST



Gotong Royong-Kerja Bakti



social engagement







*Illustration: space between co-housing buildings*



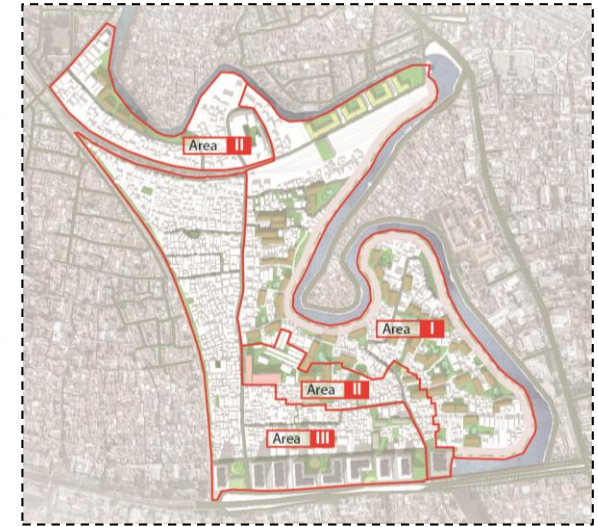


*Illustration: communal self defense perform by group of households*





Open-space framework map  
(source: author)



### ***Public-open space framework***

- waterfront cafes+groceries
- neighborhood groceries
- green public spaces
- community meeting point
- local workshop+showroom
- high-scale commercial



## Introduction

## Vision

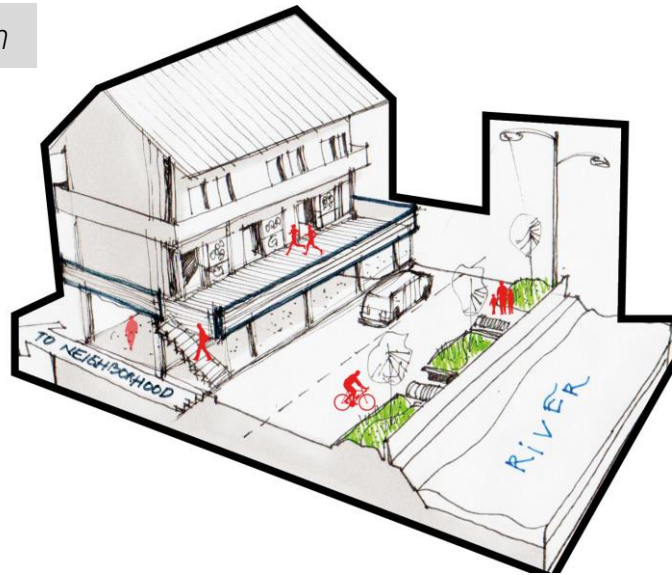
## Statement

## Project Proposal

## Design Details

## Conclusion

Active waterfront pattern



active  
promenade



groceries and/or  
cafeterias



groundfloor public  
space



new type of public activities



local economy empowerment



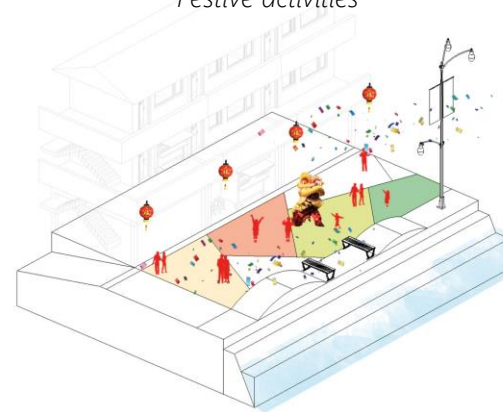
Groundfloor activation



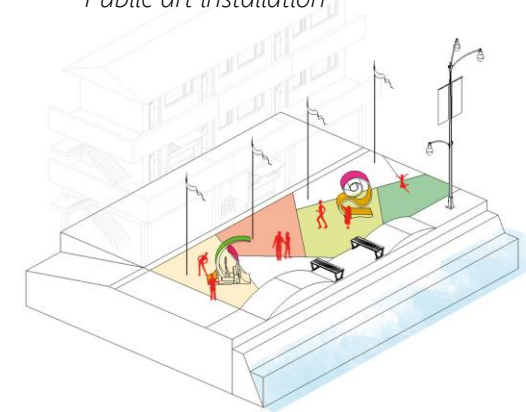
Anchor activities initiation



Festive activities



Public art installation



2020

2025

2030

2035

2040 | **TIMELINE (years)**

Waterfrontage development

Waterfront activation





*Active promenade as an attraction to bring relation of human and nature*

## Introduction

## Vision

## Statement

## Project Proposal

## Design Details

## Conclusion

### Floodproof workshop pattern



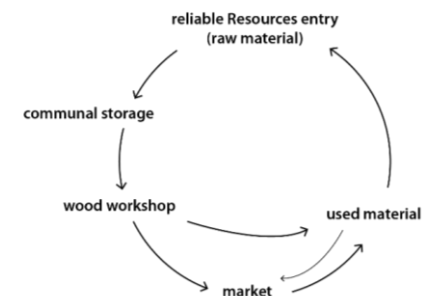
open workshop



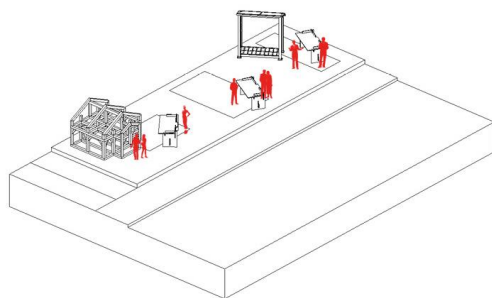
showroom



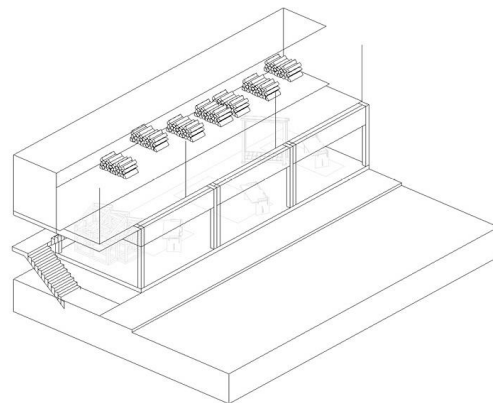
communal storage and resources



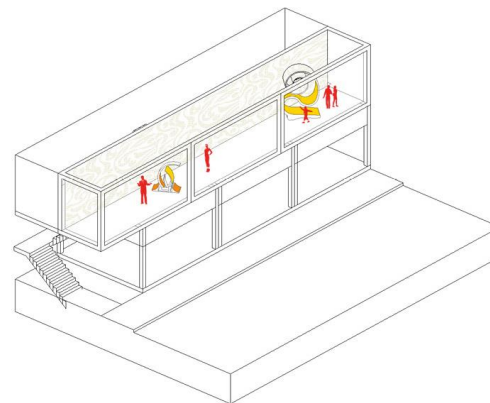
Shared workshop space



Shared storage



Communal showroom



2020

2025

2030

2035

2040 | **TIMELINE (years)**

Land consolidation

tenure system reconfiguration

assesment+review

assesment+review

Flood-proof wood workshop

construction

Bukit Duri market+festival

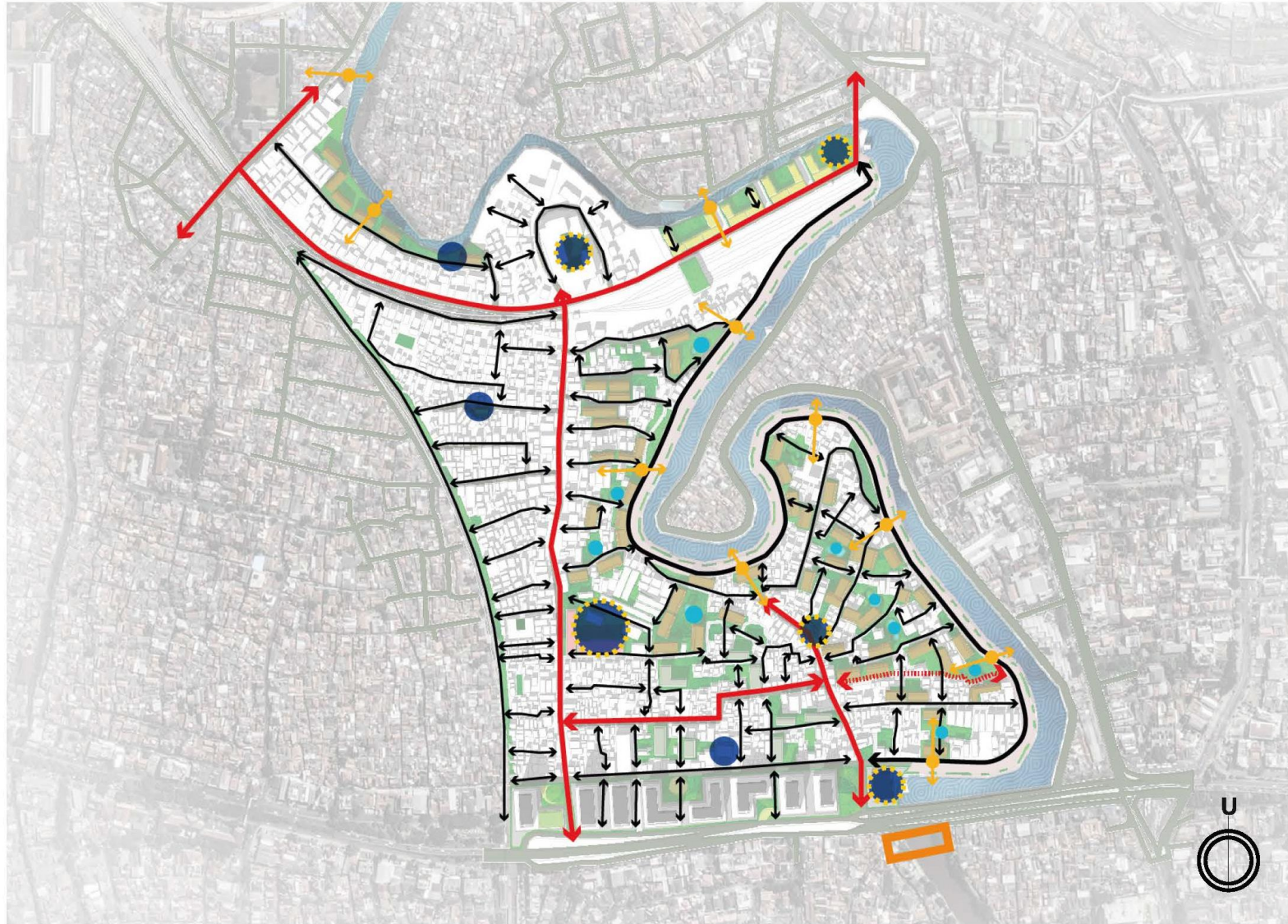
waterfont festival



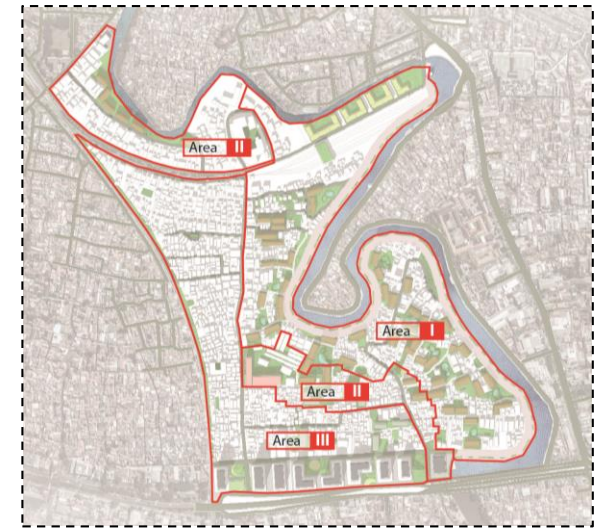


*Illustration: New typology of woodcrafting workshop*





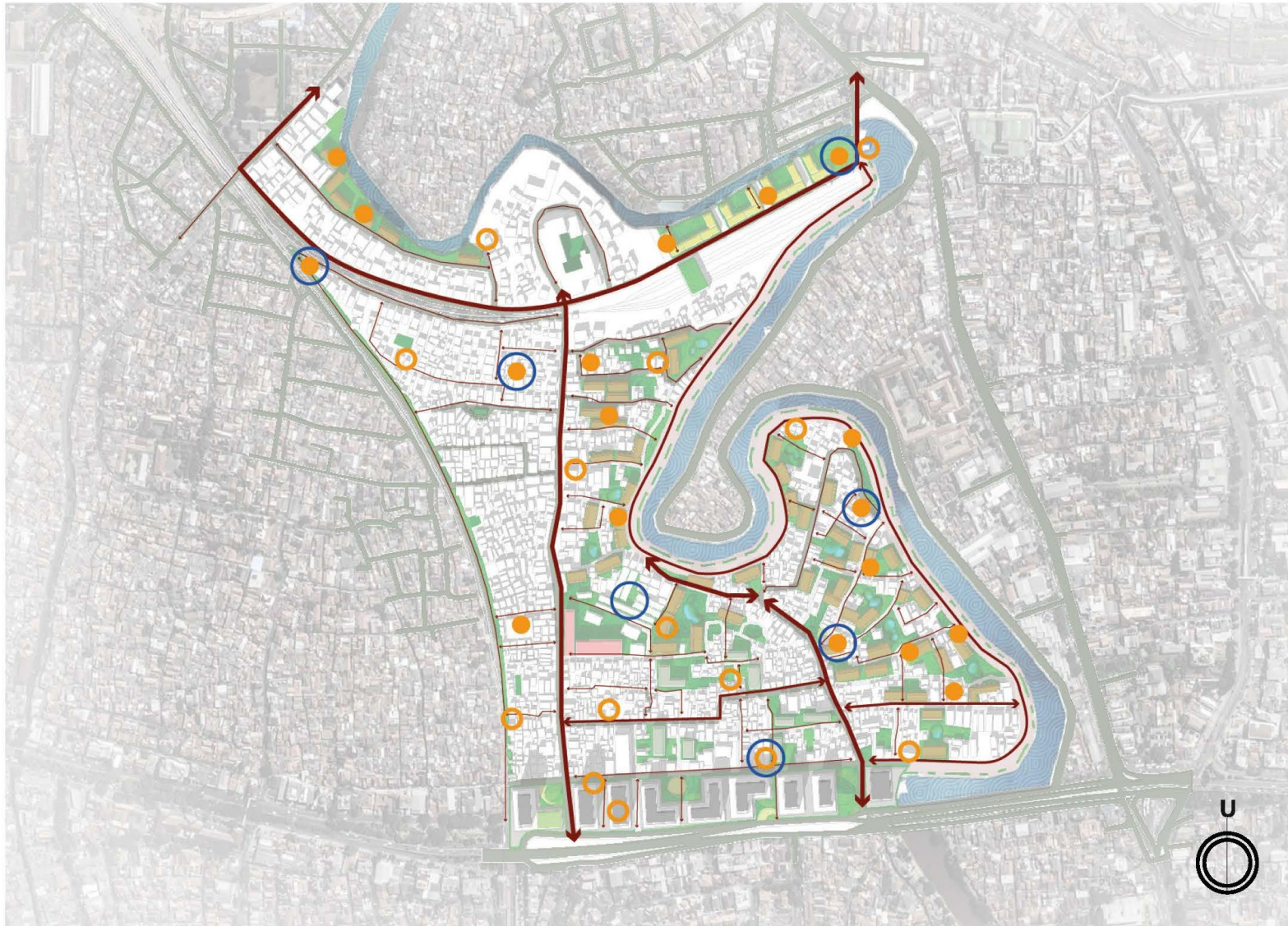
Flood infrastructure framework map  
(source: author)



### ***Flood infrastructure framework***

- Infrastructure backbone
- proposed evacuation points
- existing evacuation points
- ▭ proposed new floodgates
- water detention point
- flood pump location





Basic infrastructure framework map  
(source: author)

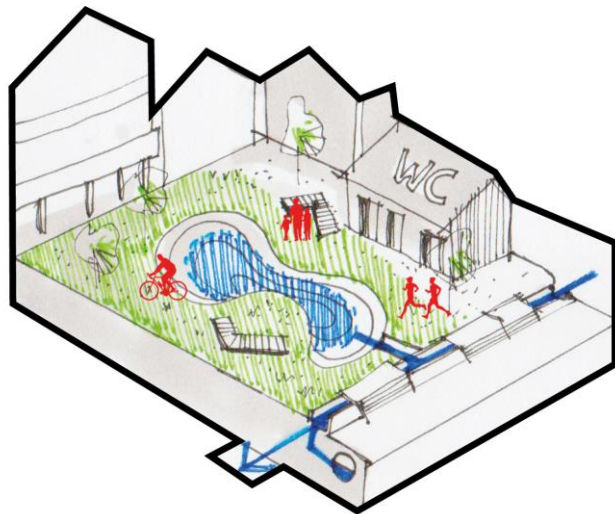


### **Basic infrastructure framework**

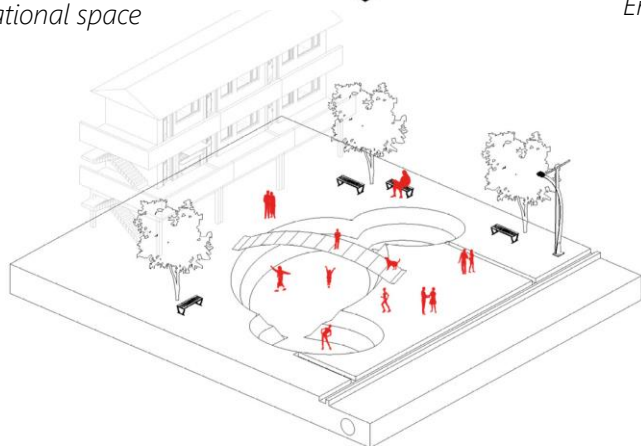
- existing facilities (public bathroom)
- proposed facilities (public bathroom)
- proposed facilities (waste collection point)
- carrier line



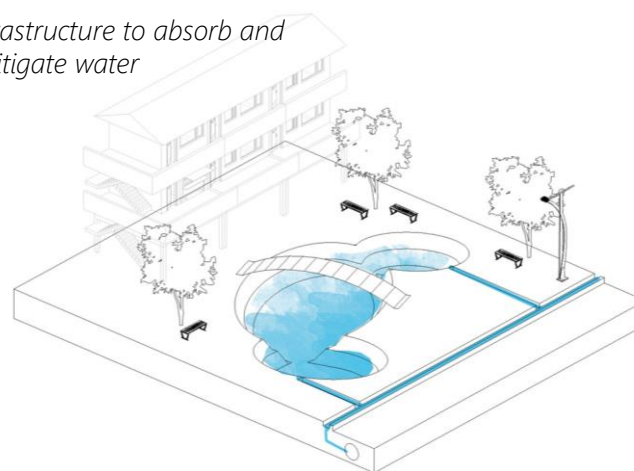
## Recreational detention pond



Recreational space



Engineered infrastructure to absorb and mitigate water



flood retention pool



local public space



urban farming



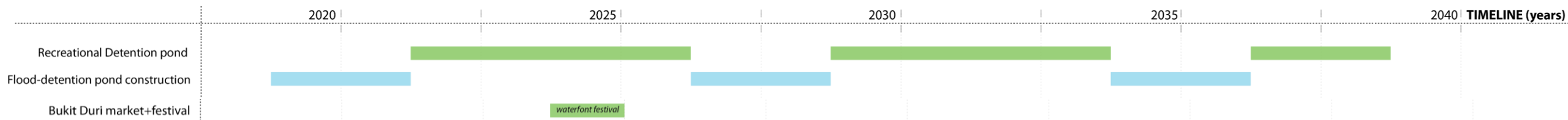
ecological infrastructure



the reborn of local market



community economy empowerment







*New typology of public space brings element of nature to the neighborhood*





*Accommodation of local authentic festival which gives sense of the place*





## Proposed Masterplan

- a main evacuation zone
- b community headquarter
- c school building - alternative evacuation zone
- d wood workshop zone
- e alternative evacuation zone
- f evacuation and resettlement zone
- g community center
- h thematic waterfront zone
- i mixed-use building (rental housing-office-commercial use)
- j train depot
- vulnerable area I - permeable area
- vulnerable area II - evacuation zone
- vulnerable area III - future development

vulnerable area III

vulnerable area II

vulnerable area I

mixed-use  
activitycentralized waste  
collectionpublic  
workshop

evacuation center

flood detention  
poollocal  
public space

directive path

communal  
self-defenseactive  
promenadeflood water  
pump



Reviving the spaces





Communal mitigation to flooding

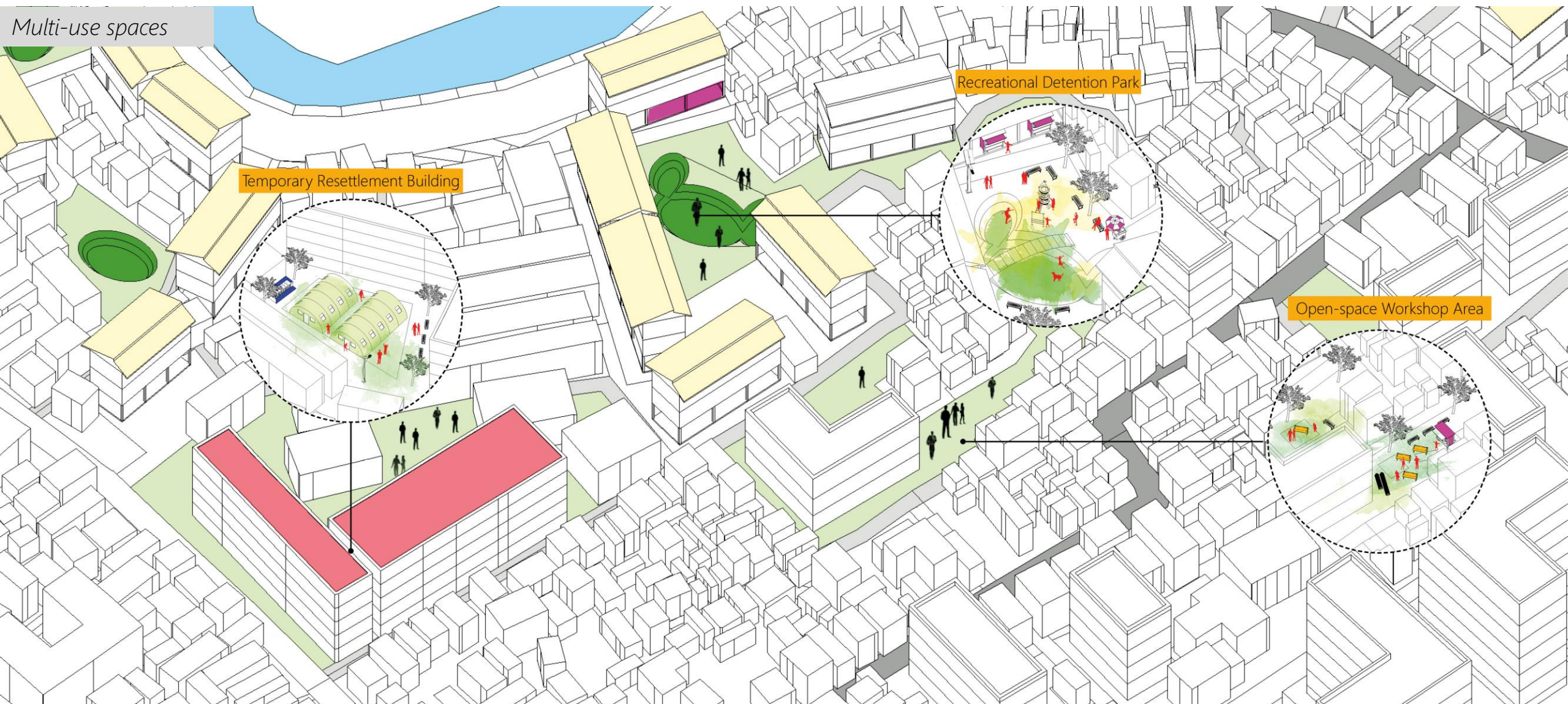


Assembly Point+  
Logistic Center

Communal Self Defense

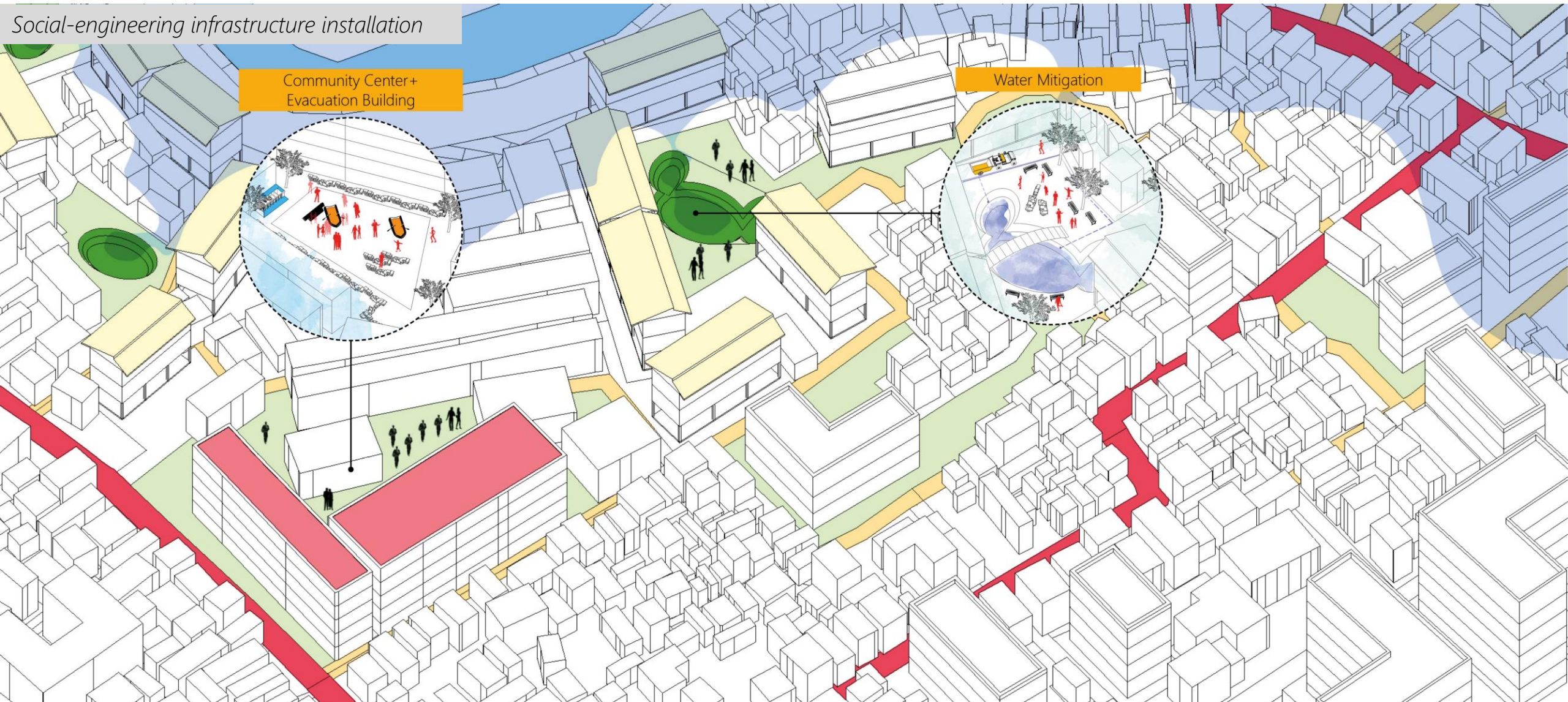


Multi-use spaces



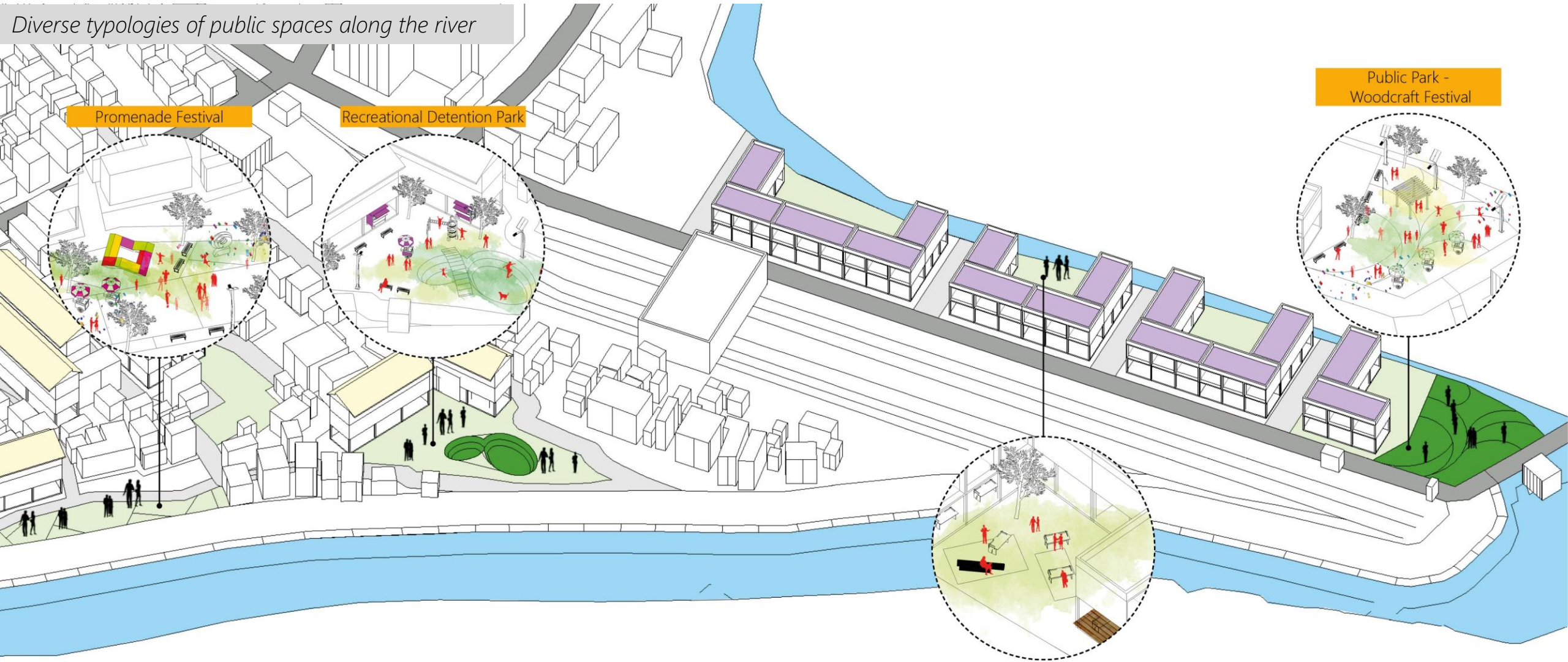


Social-engineering infrastructure installation



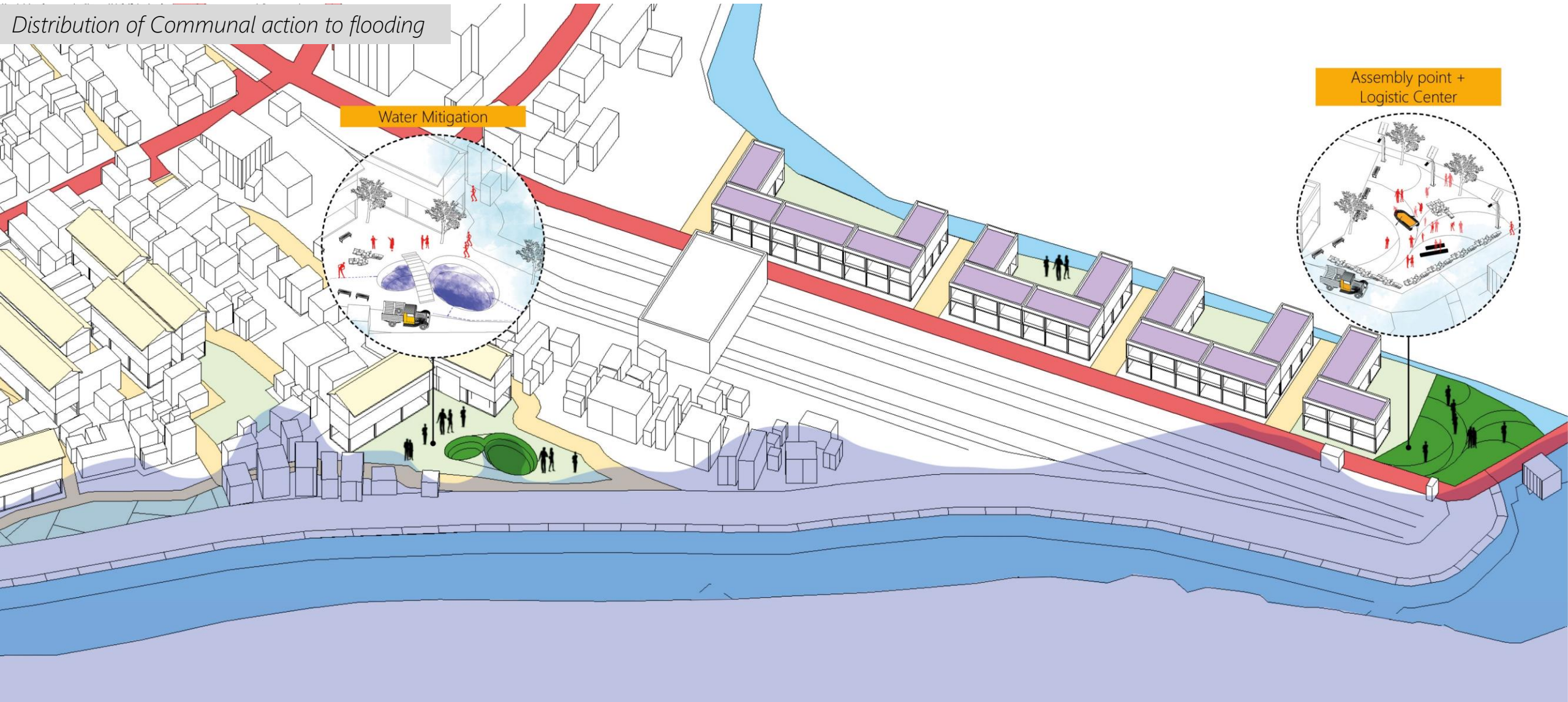


Diverse typologies of public spaces along the river





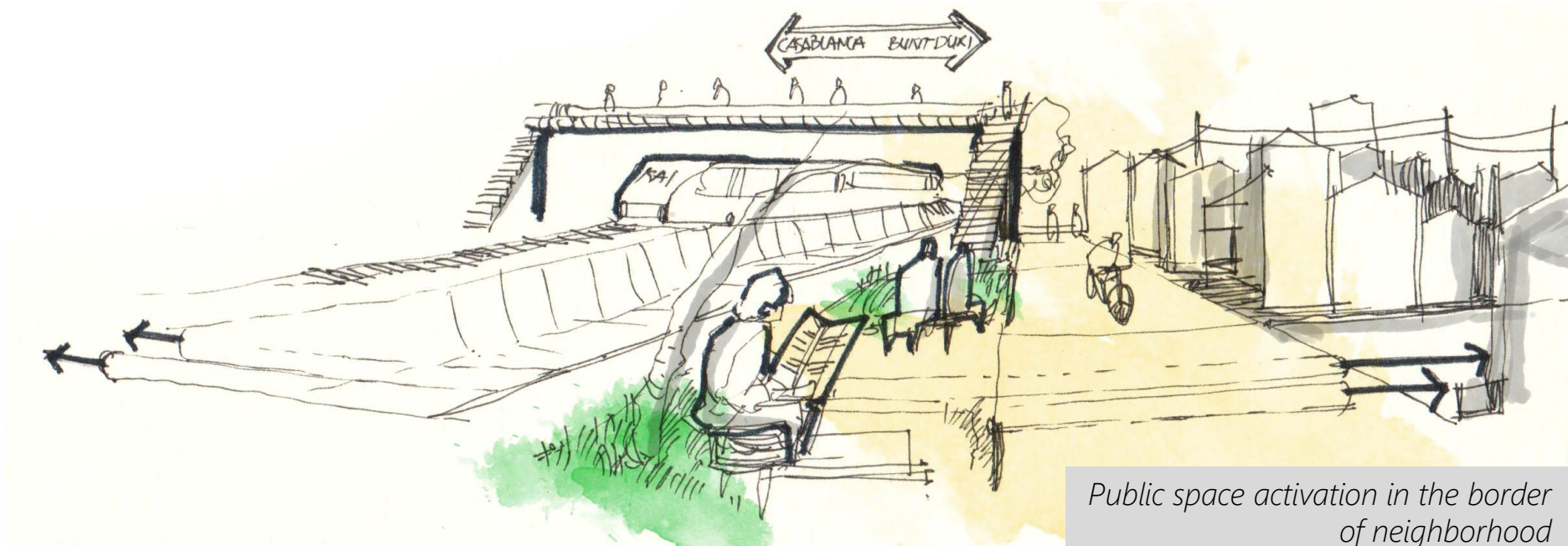
*Distribution of Communal action to flooding*



Water Mitigation

Assembly point +  
Logistic Center





*Public space activation in the border of neighborhood*



*Adaptive reused of decayed building for temporary resettlement*



## Introduction

## Vision

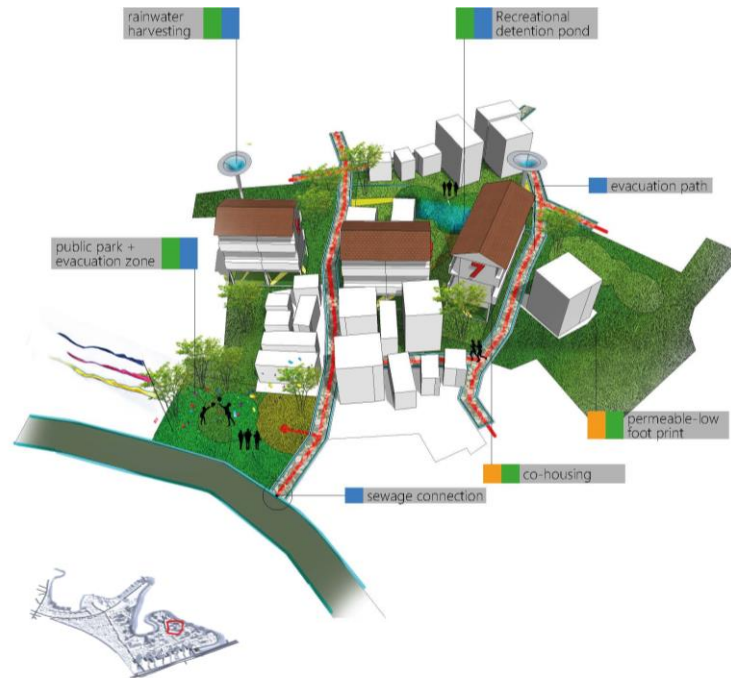
## Statement

## Project Proposal

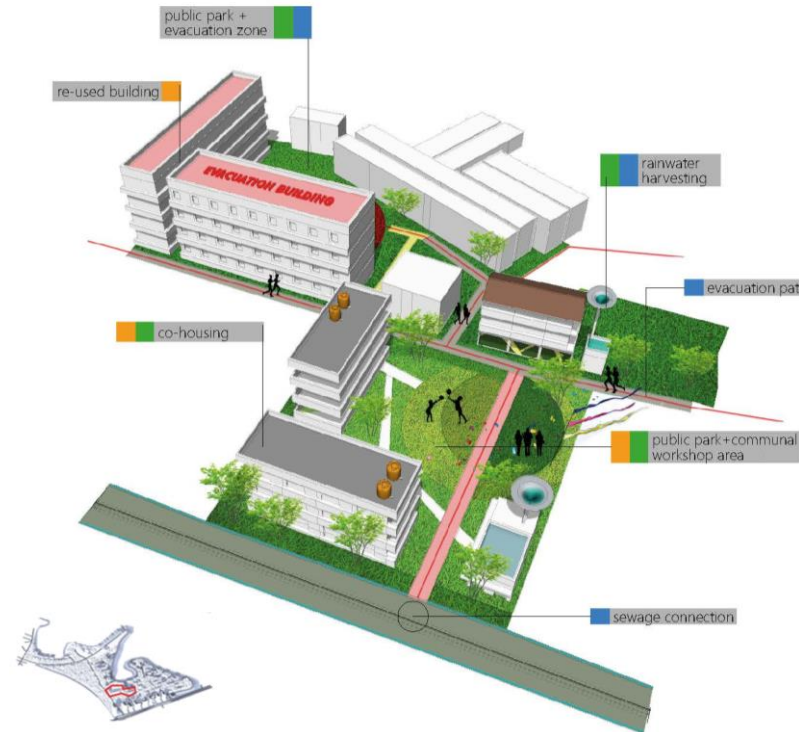
## Design Details

## Conclusion

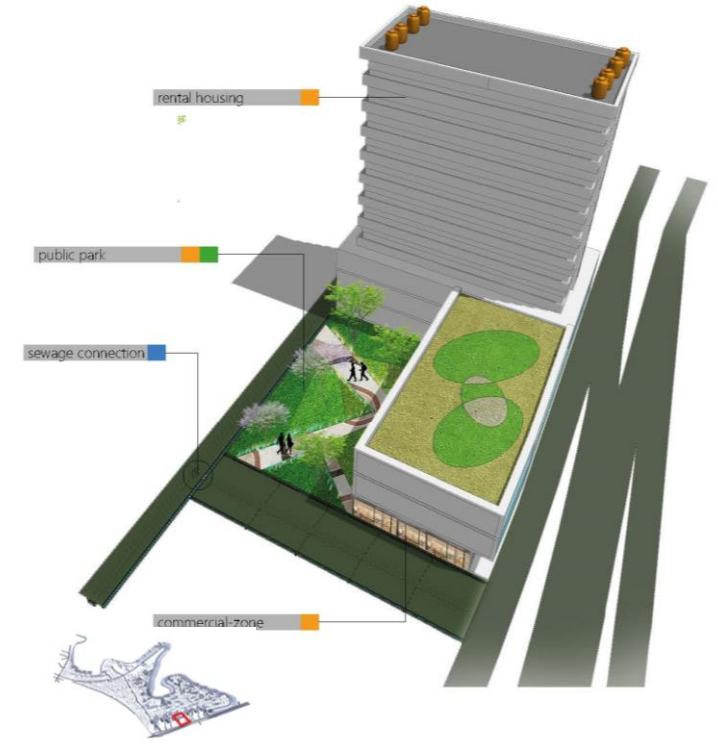
### Pilot Project



Total Area	1,716 m2
Green Space area	773 m2 (40%)
Proposed flood infrastructure	<ul style="list-style-type: none"> <li>1 Detention pond</li> <li>1 Evacuation zone</li> </ul>
Transformed Households	28 households
Co-Housing allocation	3 two-stories buildings



Total Area	3,675 m2
Green Space area	514 m2 (15%)
Proposed flood infrastructure	<ul style="list-style-type: none"> <li>1 Detention pond</li> <li>1 Public park+communal workshop area</li> <li>2 Evacuation buildings</li> </ul>
Transformed Households	59 households
Co-Housing allocation	<ul style="list-style-type: none"> <li>2 three-stories buildings</li> <li>1 two-stories building</li> </ul>



Total Area	1,306 m2
Green Space area	417 m2 (30%)
Proposed flood infrastructure	<ul style="list-style-type: none"> <li>1 Detention pond</li> <li>1 Evacuation zone</li> </ul>
Transformed Buildings	41 buildings
Mixed-use allocation	<ul style="list-style-type: none"> <li>8 stories of 308 m2 rental housing</li> <li>2 stories of 874 m2 office area</li> <li>2 stories of 787 m2 commercial area</li> </ul>



## Introduction

## Vision

## Statement

## Project Proposal

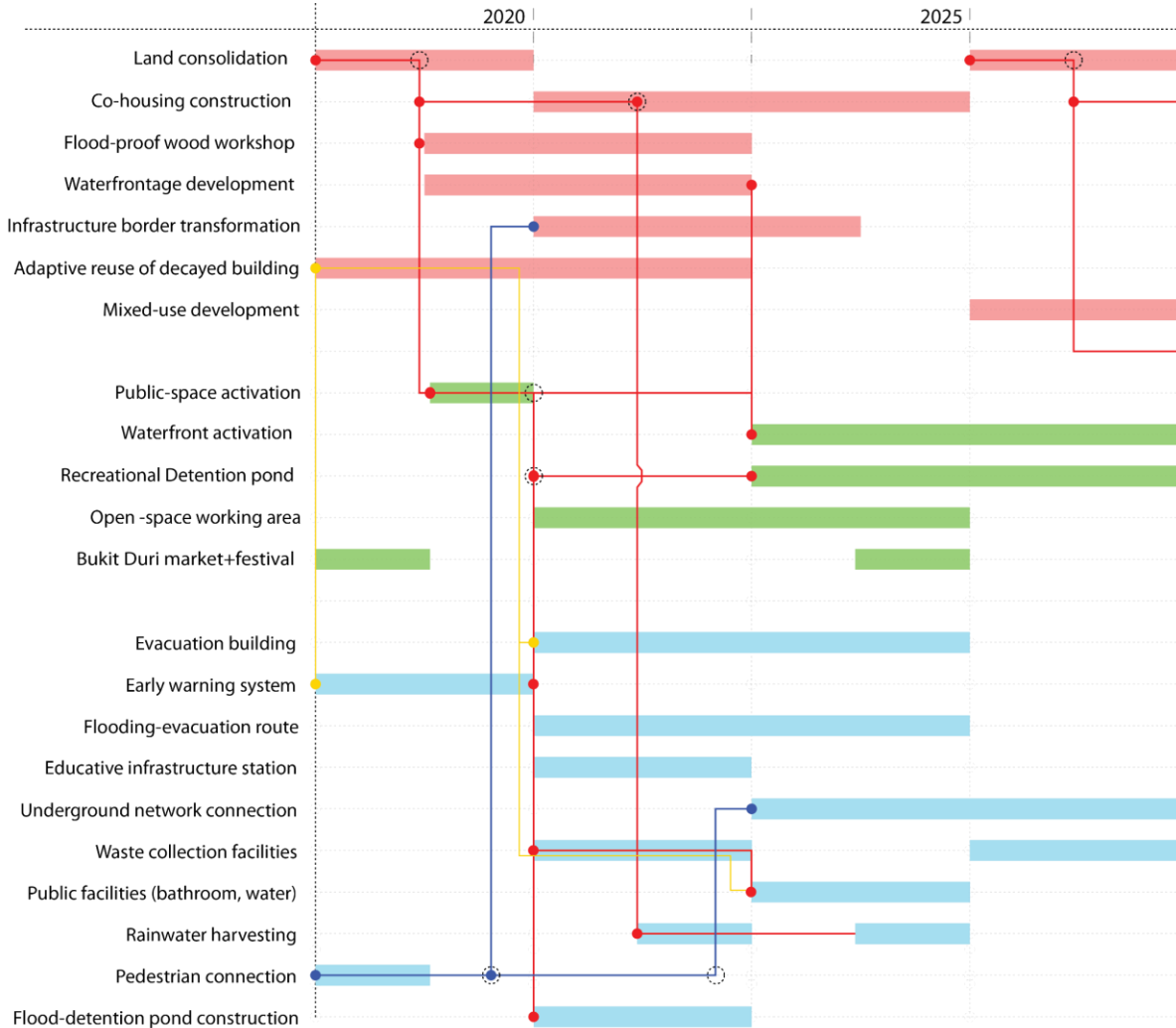
## Design Details

## Conclusion

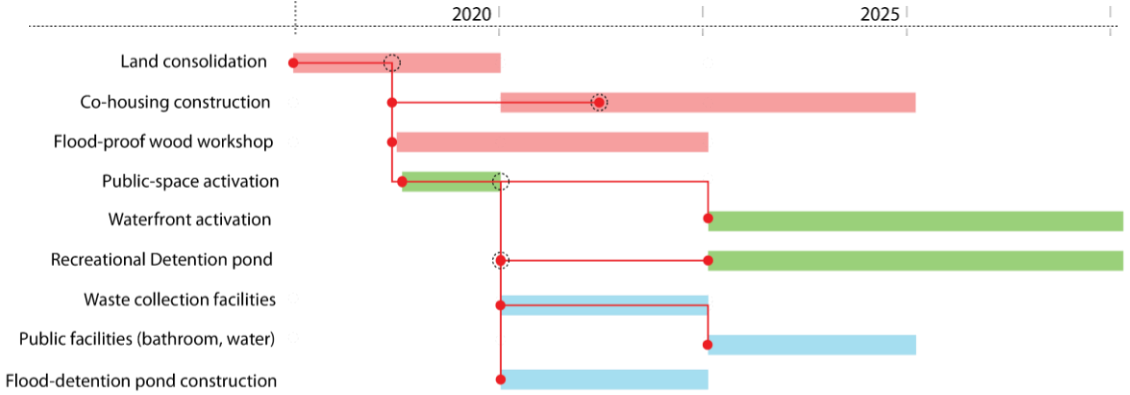
DEVELOPMENT TRANSFORMATION

HUMAN-NATURE ENGAGEMENT

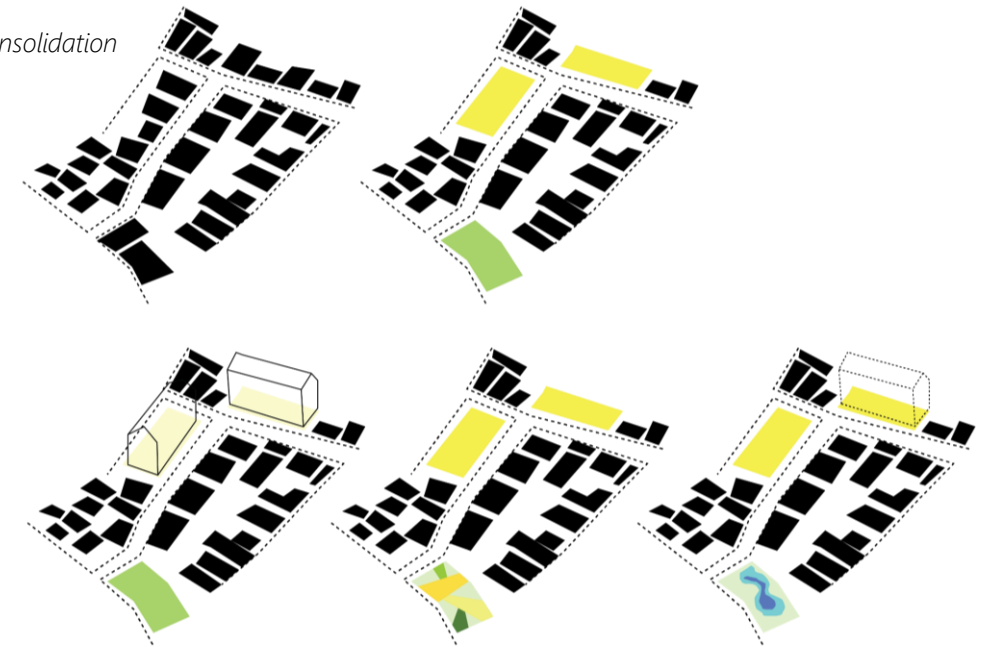
INFRASTRUCTURE PERFORMANCE



Key



Land consolidation



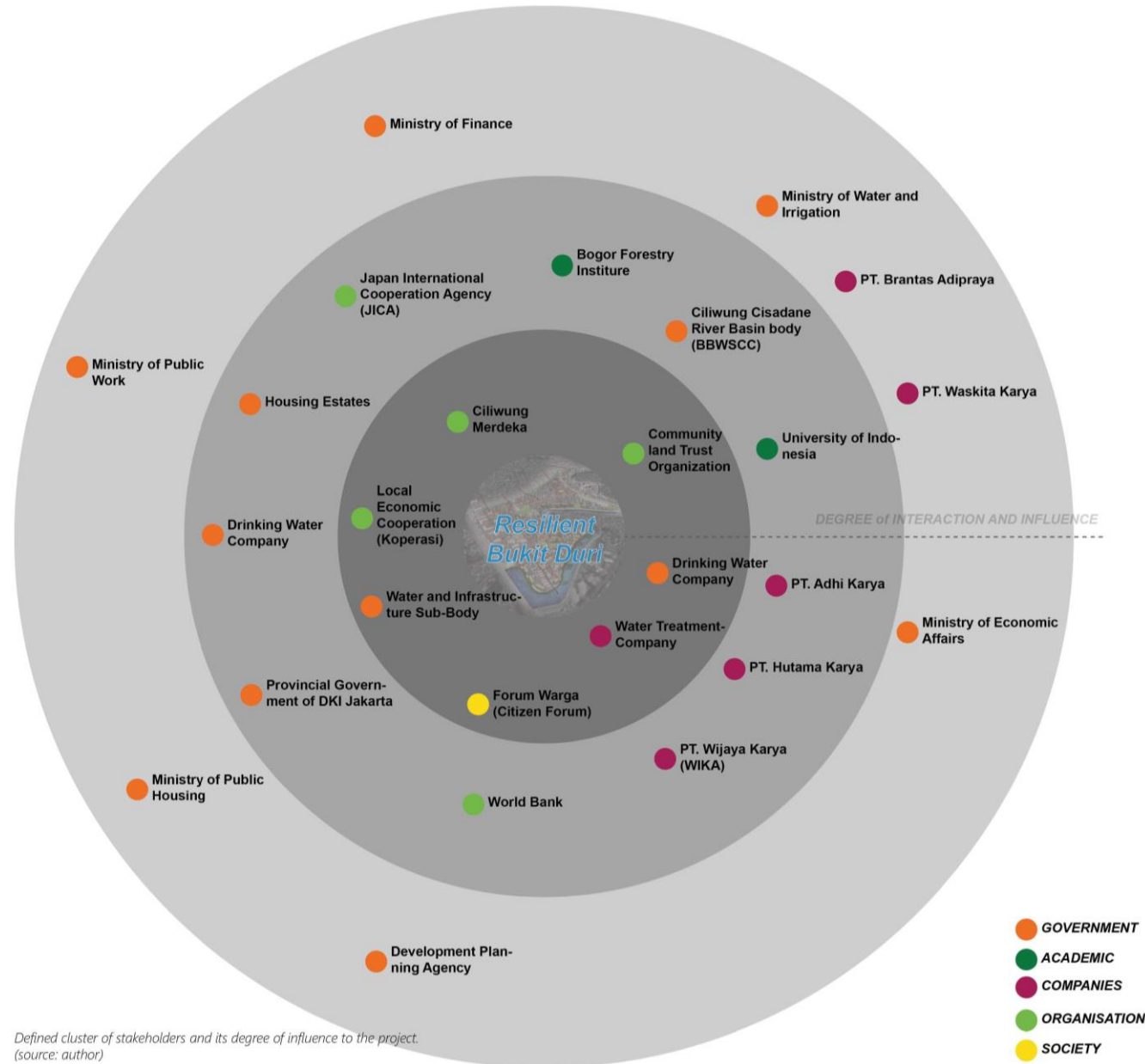
Scenario 1

Scenario 2

Scenario 3

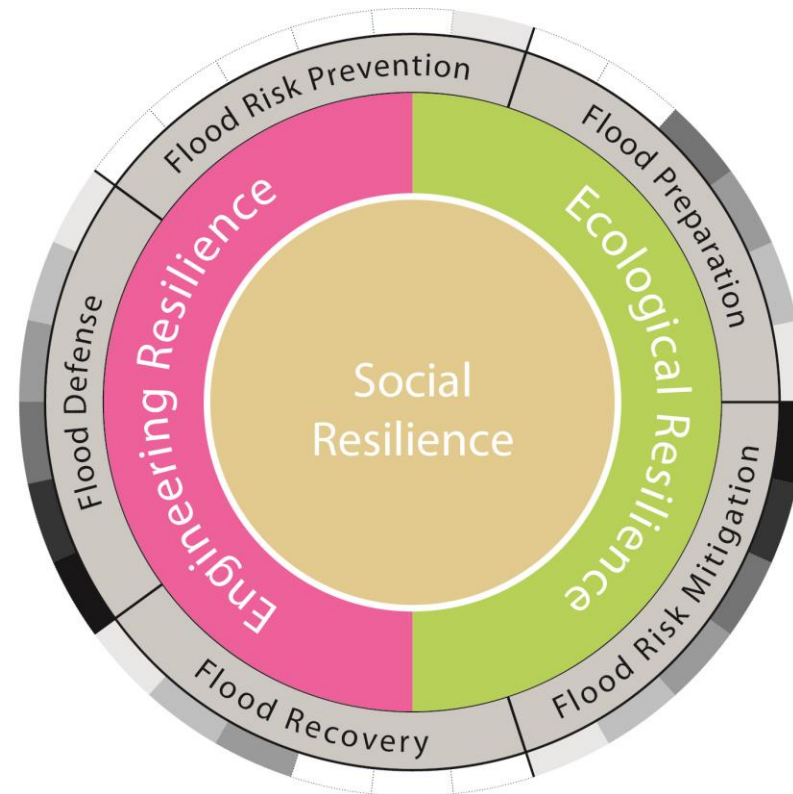
Implementation of adaptive-pathway approach in project phasing





Defined cluster of stakeholders and its degree of influence to the project.  
(source: author)



Existing capacity of  
ResilienceProposed capacity of  
Resiliencelow degree  high degree*Contribution to resilience capacity improvement*



## Introduction

## Vision

## Statement

## Project Proposal

## Design Details

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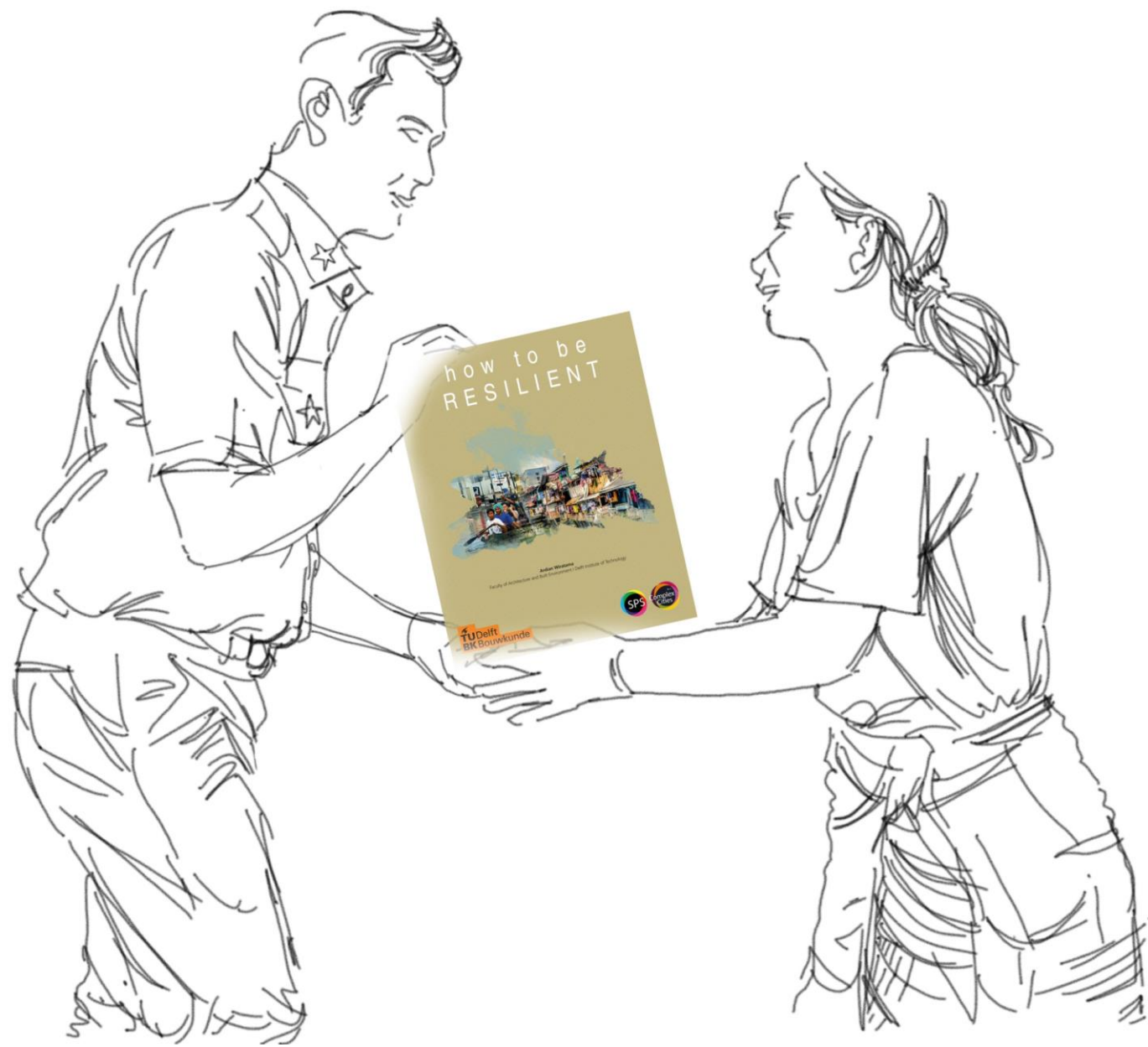


*Contribution to recent conceptual framework*













Thank you!