

P5 Graduation Thesis Presentation

Wednesday, 25 June 2025

BRIDGING THE HEAT GAP

Enhancing Collaborative Governance for Urban Heat Island Adaptation in Jakarta's Informal Settlements

Amalina Budiati

6037577

Supervisors

Ir. E. H. M. (Ellen) Geurts

Dr. ing. G.A. (Gerard) van Bortel

Stefano Milani

Inclusive Communities graduation lab

Management in the Built Environment track, Faculty of Architecture & the Built Environment, TU Delft

TU Delft
BK Bouwkunde

tpdp

PHILIP-SPANGENBERG
TRAVEL-GRANT



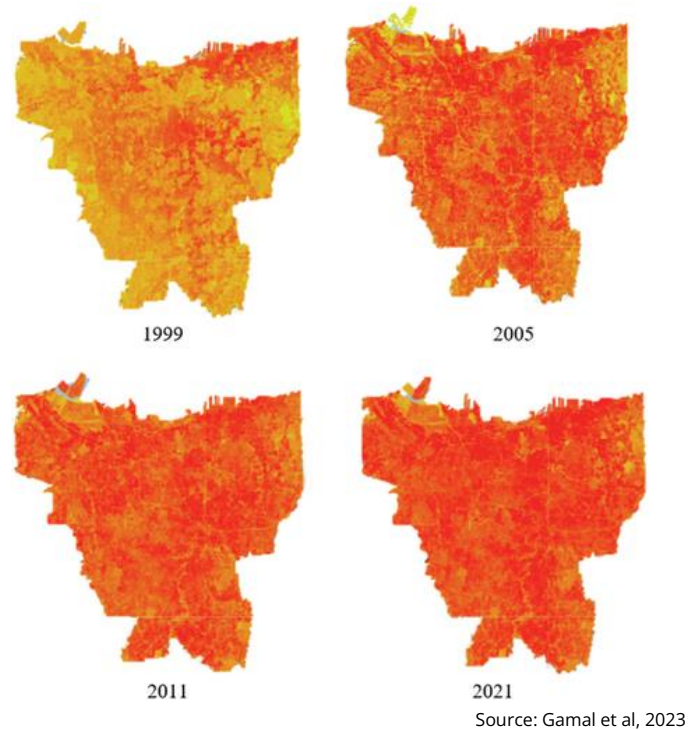
1	DISCOVER
2	DEFINE
3	DEVELOP
4	DELIVER
5	CONCLUSION
6	RECOMMENDATION

1

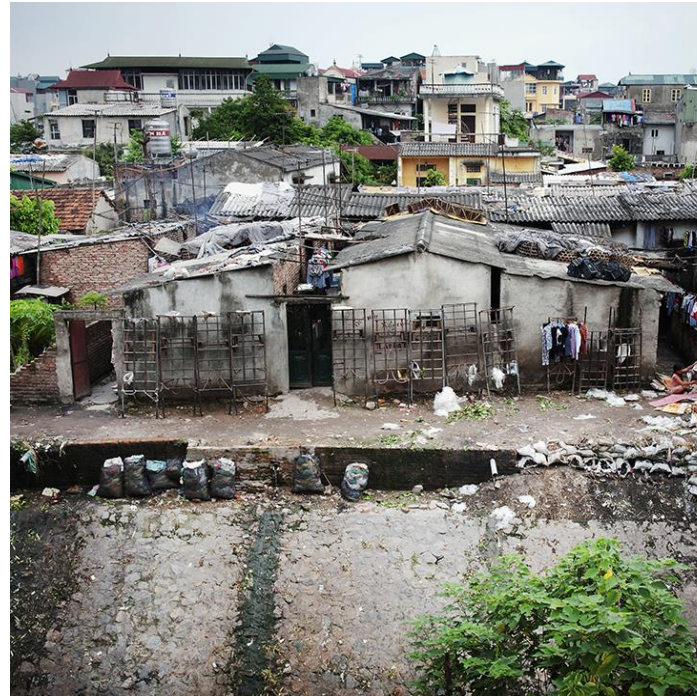
DISCOVER

Problem statement
Literature review

PROBLEM STATEMENT



Rising land temperature in Jakarta



Climate change risks on low-income communities

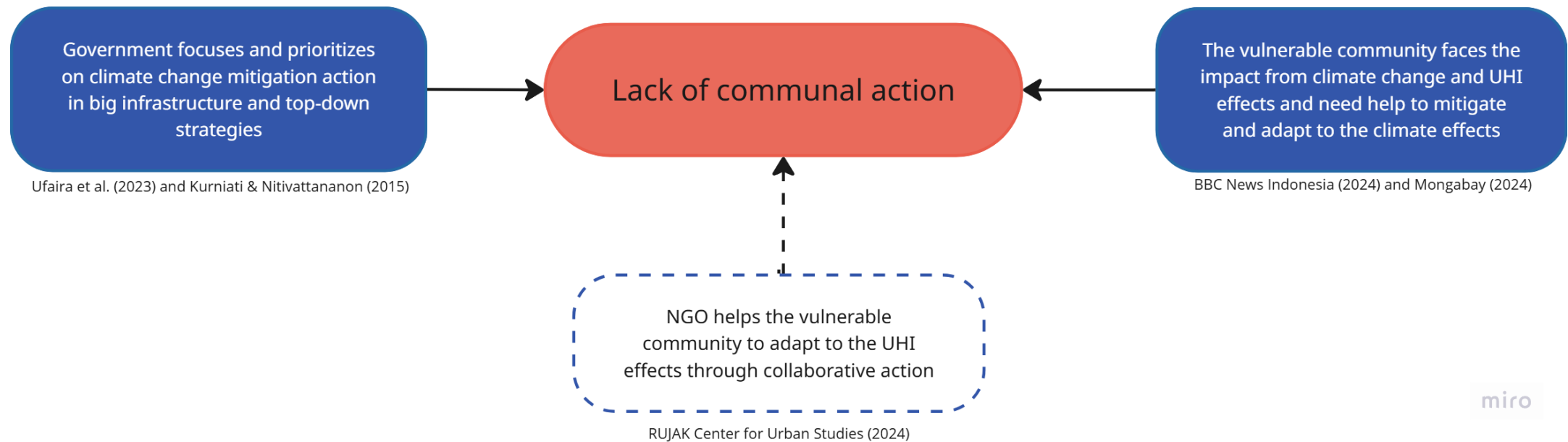
Source: SDG Knowledge Hub, 2019



The government's focus and priorities gap on climate change

Source: Jawa Pos, 2024

PROBLEM STATEMENT



Source: Own work

RESEARCH QUESTION

To what extent can collaborative governance support the adaptation of the Urban Heat Island (UHI) effect in informal settlements in Jakarta, Indonesia?

Sub-research questions

SQ 1

How does the **Urban Heat Island (UHI)** effect impact the **informal settlements** in Jakarta?

SQ 2

How was **collaborative governance implemented** in the Urban Heat Island (UHI) adaptation project in informal settlements in Jakarta?

SQ 3

What strategies can be implemented to **enhance collaborative governance** in adapting the UHI effect in the informal settlement area in Jakarta in the future?

Aims

Source: Based on Marcuse (2009)

SQ 1

Expose the context

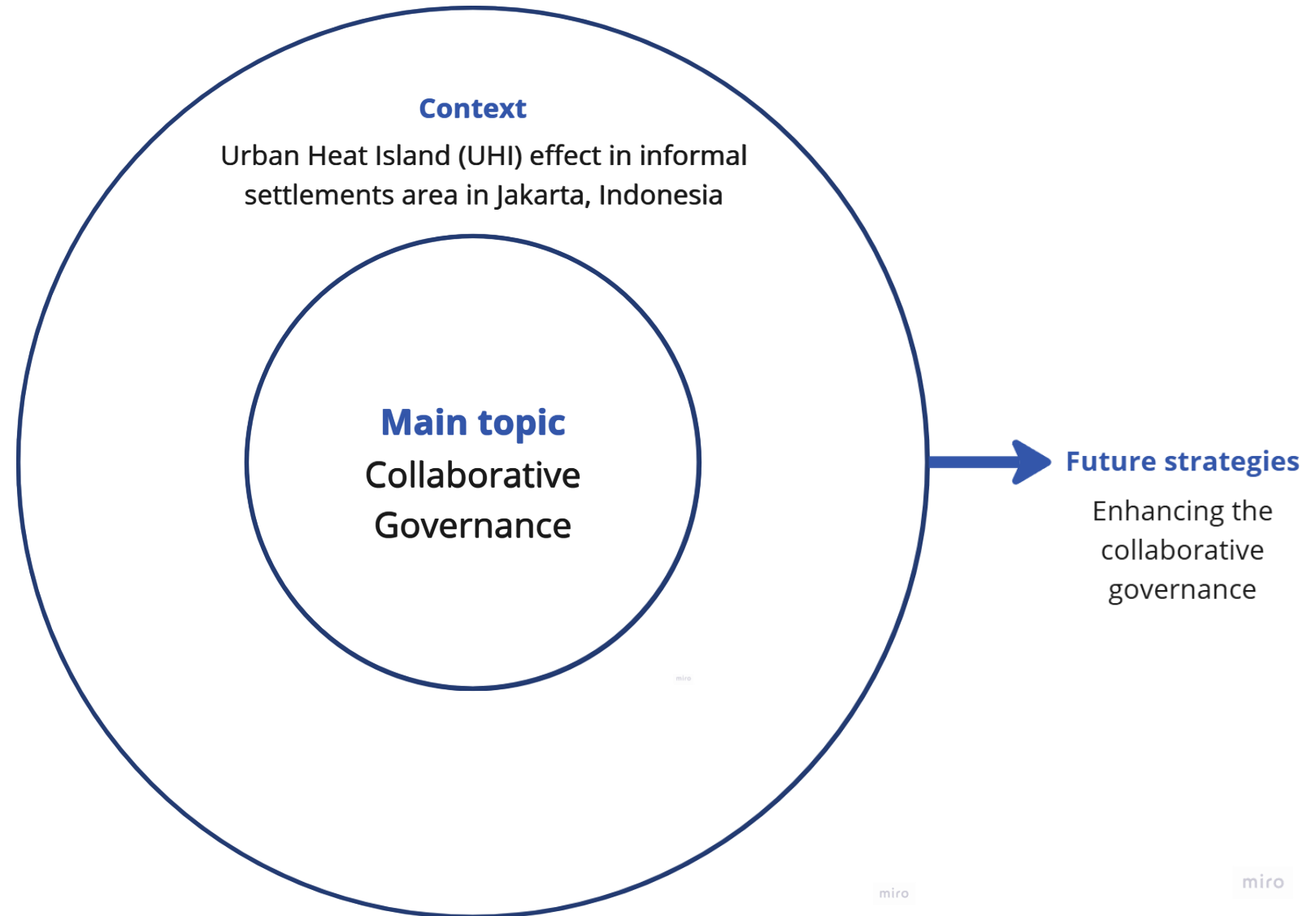
SQ 2

Explore on the case study and stakeholders

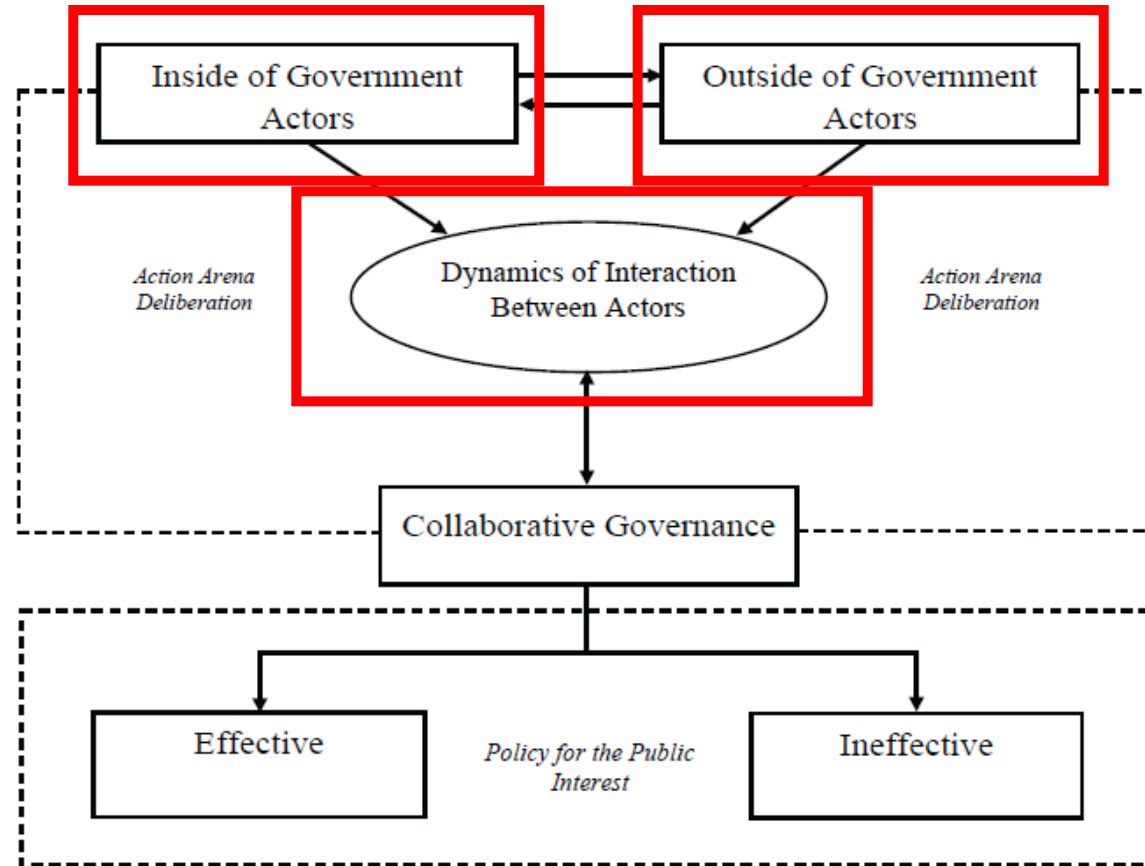
SQ 3

Evaluate the process of the case study

OVERVIEW



COLLABORATIVE GOVERNANCE



Source: Noor et al, 2022

URBAN HEAT ISLAND

'It's like there are seven suns!' – How does hot weather affect poor communities?



GETTY IMAGES
A mother sunbathes her baby in a slum in Jakarta. The recent hot weather has had a major impact on the poor.

May 5, 2024

The fan belonging to Titin Rustinah, 56 years old, a resident of Jembatan Besi In Tambora, West Jakarta, is on non-stop.

Source: BBC, 2024



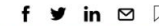
ABOUT READERSBLOG RAINFOREST PHOTO THE FOREST GUARDIANS

To search, type and press enter

Popular

Hot Weather Phenomenon and Impact on Urban Public Health

by Nopri Ismi on November 3, 2024



- Climate change and urbanization are the main causes of increasing temperatures in urban areas, the impact of which is increasingly felt by people who carry out activities outside or even indoors.
- The urban heat phenomenon is expected to continue to occur, along with the growth of large cities in Asia, especially in Indonesia, and the lack of green and blue open spaces.
- The various effects of urban heat contribute to a variety of public health problems, particularly for low-income or other marginalized communities.
- Recent research has shown the importance of trees as a measure to mitigate urban heat. The ambient air temperature can even be 2-5 times hotter than in places with many trees.

by topic	based on location
<ul style="list-style-type: none"> • Coal • Deforestation • Energy • Forest • Palm oil • Ocean • Oranautan 	<ul style="list-style-type: none"> • Bird • Animal World • Feature • Smoke Fog • Conservation • Indigenous Peoples • Law enforcement

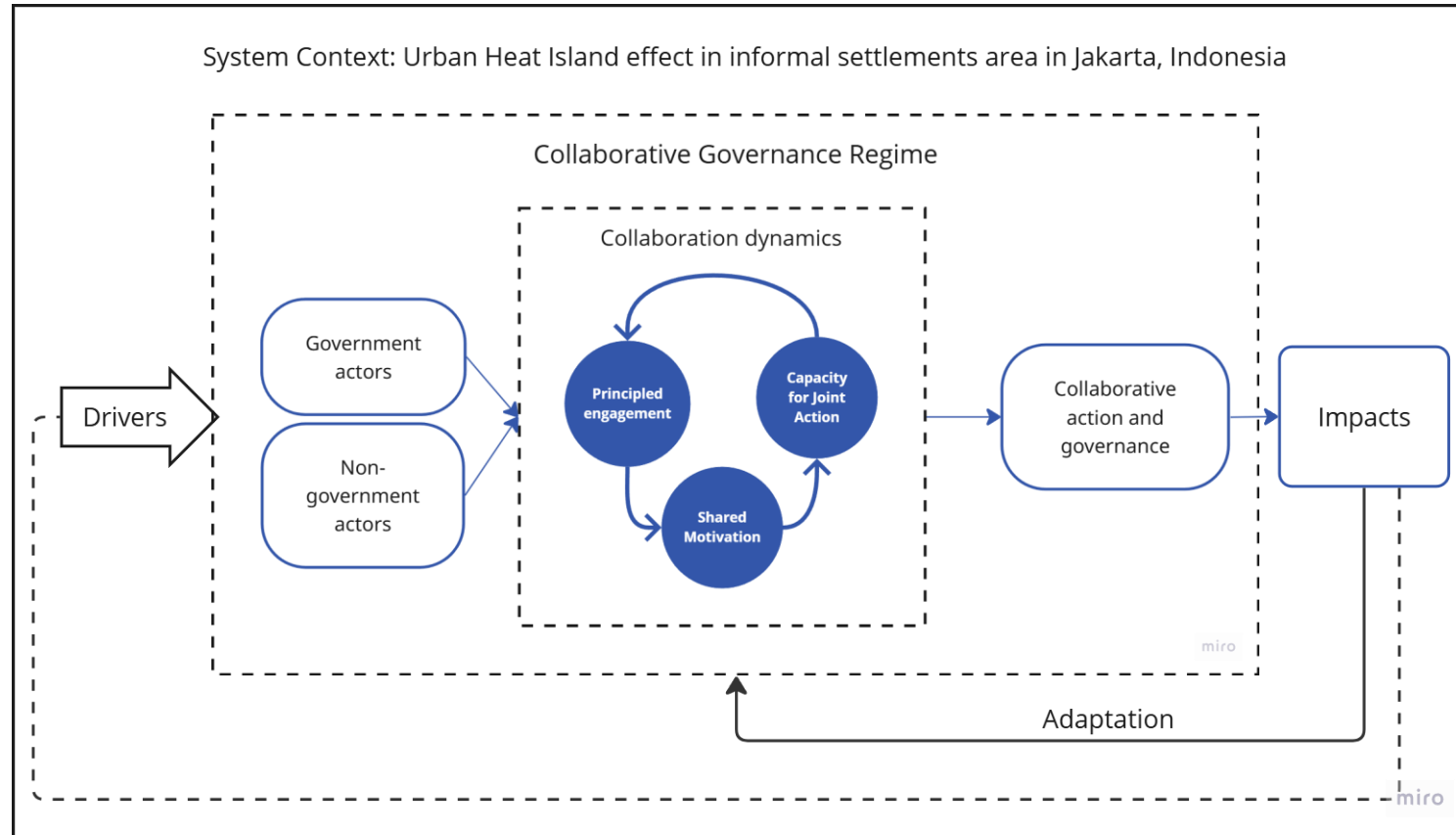
Source: Mongabay, 2024

- Health impacts
- Socio-economic impacts
- Building and environment condition impacts

Source: Basu and Das (2024)

THEORETICAL FRAMEWORK

ADAPTING THE INTEGRATIVE FRAMEWORK FOR COLLABORATIVE GOVERNANCE



Source: Own work, 2024, adapted from Noor et al. (2023) and Emerson et al (2011)

2

DEFINE

Research Method

RESEARCH METHOD

QUALITATIVE

This method is chosen as it focuses on understanding complex social phenomena and analyzes subjective experiences, institutional frameworks, and policy implications, which are central to addressing the research questions

CASE STUDY STRATEGY

To investigate contemporary phenomena within real-life contexts, making it valuable for examining the complex relationships central to this research (Irani et al., 1999).

To identify a suitable case, the researcher will collaborate with an NGO in Jakarta, the RUJAK Center for Urban Studies (RCUS), which has undertaken several collaborative projects with kampungs aimed at mitigating UHI effects.

OPERATIONALIZATION TABLE

SQ	CONCEPT	VARIABLE	SUB-VARIABLE
1	How does the Urban Heat Island (UHI) effect impact the informal settlements in Jakarta? The socio-environmental effects experienced in informal settlements area due to UHI effects (Adapted from Basu & Das, 2024; Arifwidodo et al., 2019; Mahadevia, 2004; and Salsabila et al., 2023)	How does the Urban Heat Island (UHI) effect impact the informal settlements in Jakarta?	
		Health impact	
		Socio-economic impact	
		Building and environment impact	
2	How was collaborative governance implemented in the Urban Heat Island (UHI) adaptation project in informal settlements in Jakarta? Investigating a case study project to understand the stakeholders involvement and the collaborative governance in the project (Adapted from Emerson et al., 2012)	How was collaborative governance implemented in the Urban Heat Island (UHI) adaptation project in informal settlements in Jakarta?	
		Case study selection	
		Collaboration and collaborative governance process in the project	Principled engagement
			Shared motivation
Capacity for Joint Action			
3	What strategies can be implemented to enhance collaborative governance in adapting the UHI effect in the informal settlement area in Jakarta in the future? Proposed actions to strengthen multi-stakeholder collaboration from project participants and external parties such as experts and academia (Adapted from Emerson et al., 2012)	What strategies can be implemented to enhance collaborative governance in adapting the UHI effect in the informal settlement area in Jakarta in the future?	
		Collaboration and collaborative governance process in the project	Enhancing principled engagement
			Enhancing shared motivation
			Enhancing capacity for Joint Action
			Enhancing innovation and scaling

3

DEVELOP

Data collection

DATA COLLECTION

- 1. PROJECT'S REPORT**
- 2. POLICY REVIEW**
- 3. SEMI-STRUCTURED INTERVIEWS**
- 4. OBSERVATION DURING FIELDWORK**

CASE STUDY: KAMPUNG MARLINA, JAKARTA



SELECTING CASE STUDY

Case study criteria

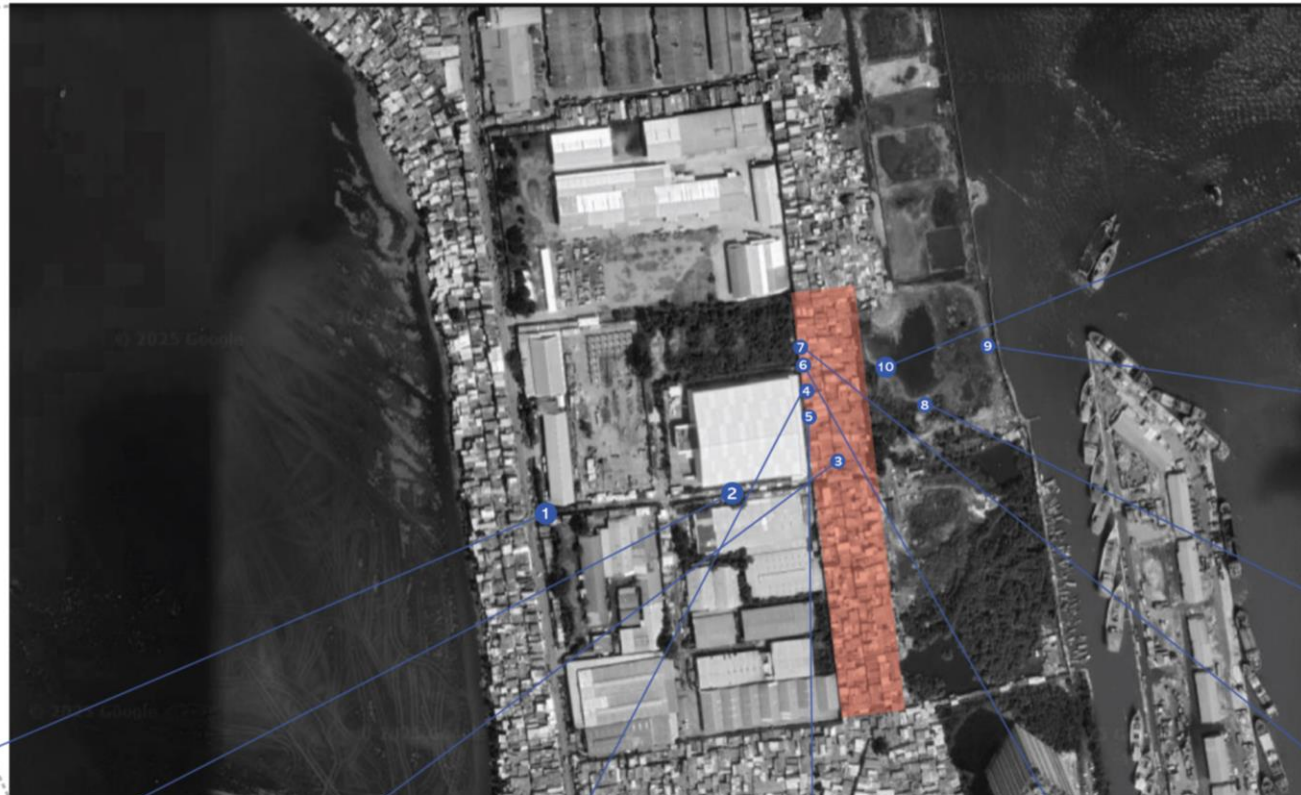
Source: Blatter and Baume, 2008

Studied in context
Selecting the case
A bounded system
In-depth study
Multiple sources of evidence
The case





Map of Jakarta, Indonesia



Location of Kampung Marlina (Source: Google Earth, 2025)

FIELDWORK LOCATION

Kampung Marlina, Penjaringan District, North Jakarta, Jakarta, Indonesia



The surrounding area of Kampung Marlina



The view of coastal area nearby Kampung Marlina



The surrounding area of Kampung Marlina



Main road to enter Kampung Marlina



Entrance of Kampung Marlina



Main aisle in Kampung Marlina



A house condition before joining the renovation project



A house condition before joining the renovation project



A house condition after joining the renovation project



A house condition after joining the renovation project

1. PROJECT'S REPORT

CASE STUDY: KAMPUNG MARLINA, JAKARTA



Small-scale Area Development of Settlement Area and its Environment in Kampung Marlina, Muara Baru



Planning principles

- a. House improvement
- b. Decision-making
- c. Arrangement
- d. Financial transparency
- e. Weekly monitoring
- f. Mutual cooperation
- g. Homeowners' contribution
- h. Clear role distribution
- i. Accommodate homeowners' needs

Design principles

- a. Roof with natural ventilation
- b. Porous walls
- c. Multifunctional terrace

Governance of the project

- a. The initiation of the project
- b. Selection process
- c. Collaborative planning process
- d. Financial framework
- e. Realisation process
- f. Utilisation

1. PROJECT'S REPORT

CASE STUDY: KAMPUNG MARLINA, JAKARTA



Small-scale Area Development of Settlement Area and its Environment in Kampung Marlina, Muara Baru



Actors' role

Actor	Role	Group
National government Ministry of Housing and Settlement Area	Government Actor	Government (G)
Local government Jakarta Provincial Government	Government Actor	
Non-Government Organization RUJAK Center for Urban Studies (RCUS) Urban Poor Consortium (UPC) Asian Coalition for Housing Rights (ACHR)	Non-Government Actor Non-Government Actor Non-Government Actor	
Non-structural Government Agency The National Zakat Board (Badan Amil Zakat Nasional/BAZNAS)	Non-Government Actor	Non-Government Organizations (NG)
Community Based Organization Advocation of Urban Poor Network (Jaringan Rakyat Masyarakat Kumuh Kota/JRMK) Cooperative of Kampung Marlina (Koperasi Marlina Maju Bersama)	Non-Government Actor Non-Government Actor	
Community Residents and beneficiaries of the project in Kampung Marlina	Non-Government Actor	Community (C)
Academia University of Indonesia	Non-Government Actor	Academia (A)

miro

2. POLICY REVIEW

COLLABORATIVE GOVERNANCE

Governor's Decree No. 33 of 2024 on Improving Settlement Quality

"Improving the quality of settlements shall be achieved through integrated multi-stakeholder collaboration involving community organizations, local government units, and private sector actors to ensure inclusive and sustainable results."

— Governor's Decree No. 33/2024, Preamble

Governor's Regulation No. 90 of 2021 on Low Carbon Development Plans

"The implementation of low-carbon development requires coordination across sectors and the active participation of local communities to ensure that development goals are aligned with climate resilience and equity."

— Governor Regulation No. 90/2021, Article 7

2. POLICY REVIEW

UHI

Ministerial Regulation of Environment and Forestry (Peraturan Menteri LHK) No. 12 of 2024

"The regulation establishes the framework for implementing adaptation and mitigation actions in accordance with Indonesia's enhanced Nationally Determined Contribution (NDC), ensuring resilience in climate-vulnerable sectors including urban settlements."

— Permen LHK No. 12/2024, Chapter II

Governor's Regulation No. 90 of 2021

The provision of housing and settlement areas aims to promote activities that ensure the creation of safe, comfortable, and healthy residential environments. The planned actions include:

- a. Development of vertical housings*
- b. Enhancement of local public services to facilitate access to affordable housing for Jakarta residents with limited purchasing power through the Sejahtera Home Ownership Facilitation Unit (UFPRS)*
- c. Improvement of infrastructure and utility facilities in settlement areas and rental flats*
- d. Revitalization of existing rental flats;*
- e. Availability of functionally viable buildings through maintenance of social facility buildings."*

— Governor's Regulation No. 90 of 2021, Section on Housing and Settlement Areas

2. POLICY REVIEW

INFORMAL SETTLEMENTS

Law No.1 of 2011 on Housing and Settlement Areas

"The government shall guarantee the availability of housing and settlement areas that are habitable, healthy, safe, harmonious, and sustainable through planning, development, utilization, and control involving community participation."

— Law No. 1/2011, Article 3

Ministerial Regulation No. 14/PRT/M/2018 on Slum Prevention and Upgrading

"Slum prevention is carried out through improving environmental quality and preventing the emergence of new slums by handling the early symptoms or 'seeds of slums' with the participation of local communities and stakeholders."

— Ministerial Regulation No. 14/PRT/M/2018, Article 5

Governor's Decree No. 33 of 2024 on Improving Settlement Quality

Community preparation to improve informal settlement quality shall be carried out as part of the planning phase for Settlement Quality Improvement through the following measures:

- a. The establishment of Community Institutions in the form of Community Groups or legal entities formed by the local residents;*
- b. Community facilitation in the form of training or other forms of support; and*
- c. The provision of information services related to Settlement Quality Improvement and the optimization of two-way communication with the community.*

3. SEMI-STRUCTURED INTERVIEWS

IMPACT OF UHI IN THE INFORMAL SETTLEMENTS

Understand the context

HEALTH IMPACTS

SOCIO-ECONOMIC IMPACTS

BUILDING AND ENVIRONMENT IMPACTS

ACTORS' INVOLVEMENT AND THE COLLABORATIVE GOVERNANCE OF THE PROJECT

Explore the main issue

PRINCIPLED ENGAGEMENT

SHARED MOTIVATION

CAPACITY FOR JOINT ACTION

ENHANCING STRATEGIES FOR COLLABORATIVE GOVERNANCE

Evaluate and share future strategies

ENHANCING PRINCIPLED ENGAGEMENT

ENHANCING SHARED MOTIVATION

ENHANCING CAPACITY FOR JOINT ACTION

ENHANCING INNOVATION AND SCALING

3. SEMI-STRUCTURED INTERVIEWS

16 RESPONDENTS

RESIDENTS OF KAMPUNG MARLINA

Beneficiaries of the project

NON-GOVERNMENT ACTORS

NON-GOVERNMENT ORGANIZATION
RUJAK Centre for Urban Studies

COMMUNITY BASED ORGANIZATION
Cooperative of Kampung Marlina
Advocacy of Urban Poor Network

GOVERNMENT ACTORS

Housing Agency of Jakarta's provincial government
Ministry of Housing and Settlements Area

ACADEMIA

University of Indonesia

3. SEMI-STRUCTURED INTERVIEWS

IMPACT OF URBAN HEAT ISLAND (UHI) EFFECTS IN KAMPUNG MARLINA



3. SEMI-STRUCTURED INTERVIEWS

IMPACT OF URBAN HEAT ISLAND (UHI) EFFECTS IN KAMPUNG MARLINA

SOCIO-ECONOMIC IMPACTS



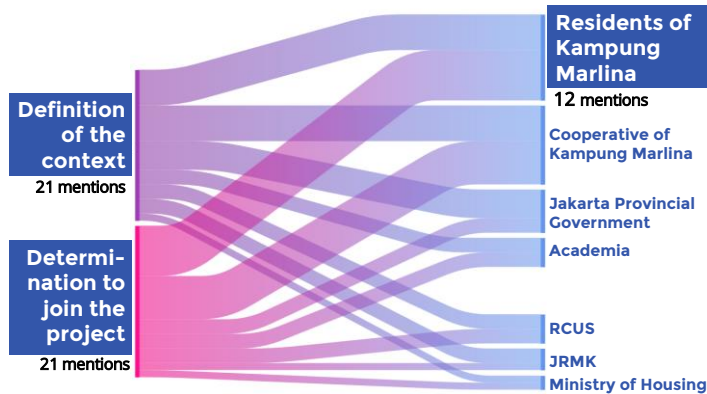
BUILDING AND ENVIRONMENT IMPACTS



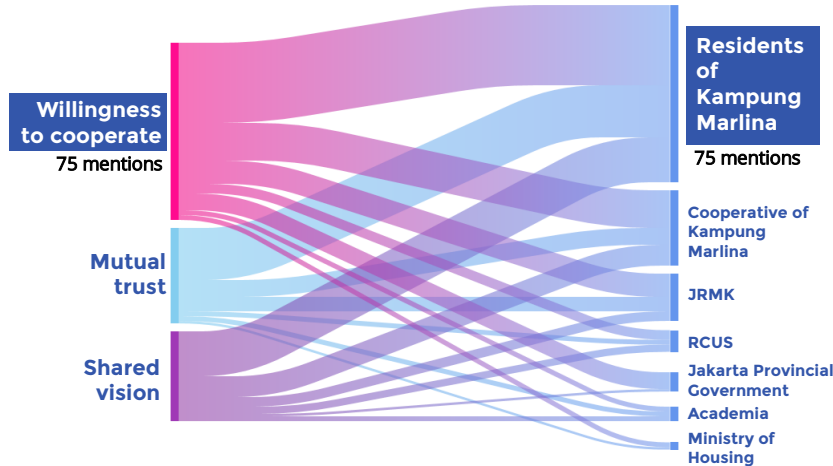
3. SEMI-STRUCTURED INTERVIEWS

COLLABORATIVE GOVERNANCE DYNAMICS

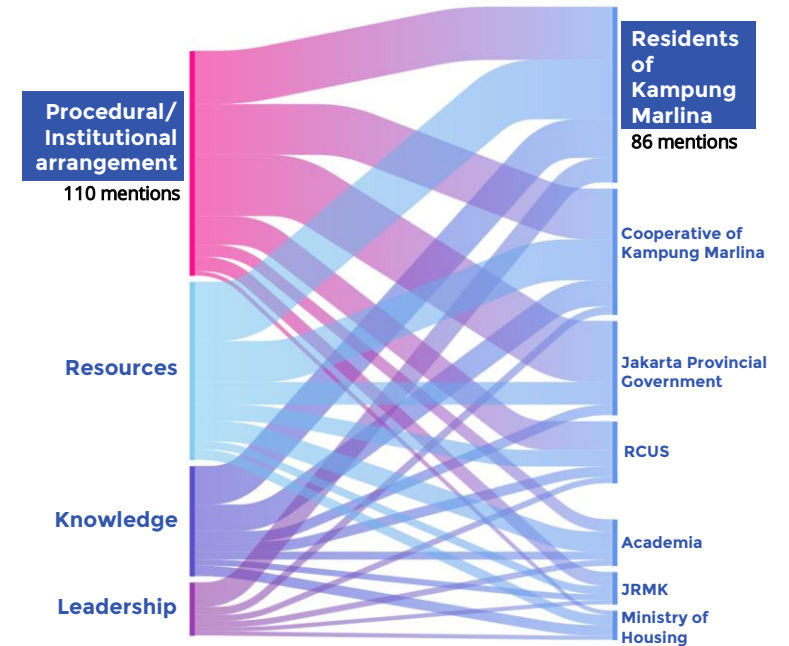
PRINCIPLED ENGAGEMENT



SHARED MOTIVATION



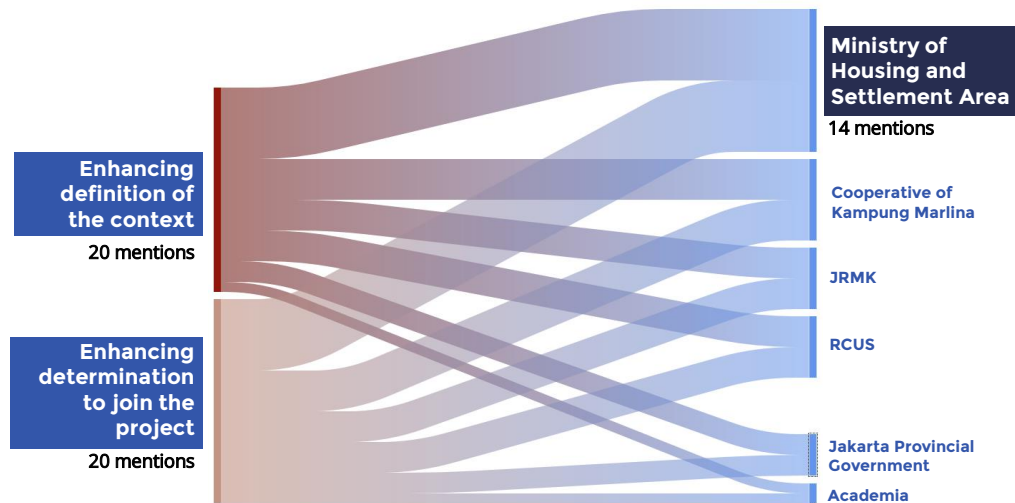
CAPACITY FOR JOINT ACTION



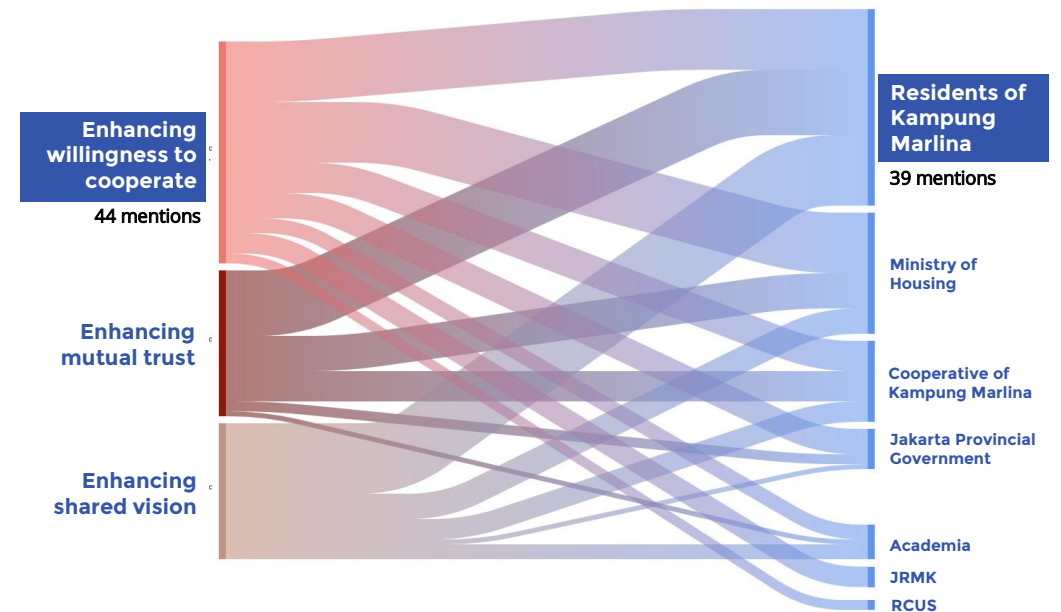
3. SEMI-STRUCTURED INTERVIEWS

ENHANCING COLLABORATIVE GOVERNANCE DYNAMICS

ENHANCING PRINCIPLED ENGAGEMENT



ENHANCING SHARED MOTIVATION

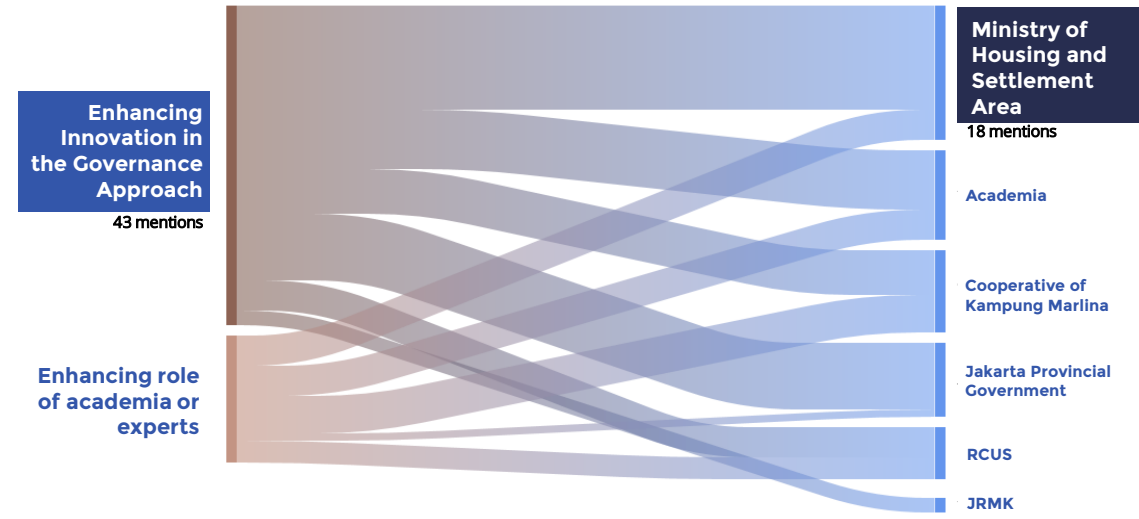
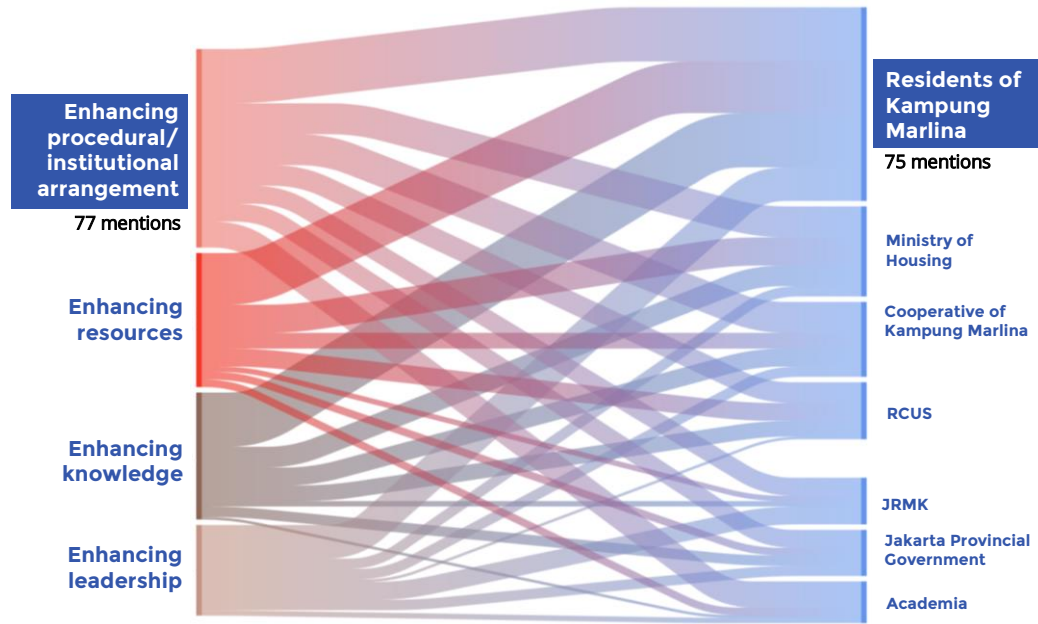


3. SEMI-STRUCTURED INTERVIEWS

ENHANCING COLLABORATIVE GOVERNANCE DYNAMICS

ENHANCING CAPACITY FOR JOINT ACTION

ENHANCING INNOVATION AND SCALING



4. OBSERVATION DURING FIELDWORK

**NOT INVOLVED
IN THE PROJECT**



**INVOLVED
IN THE PROJECT**



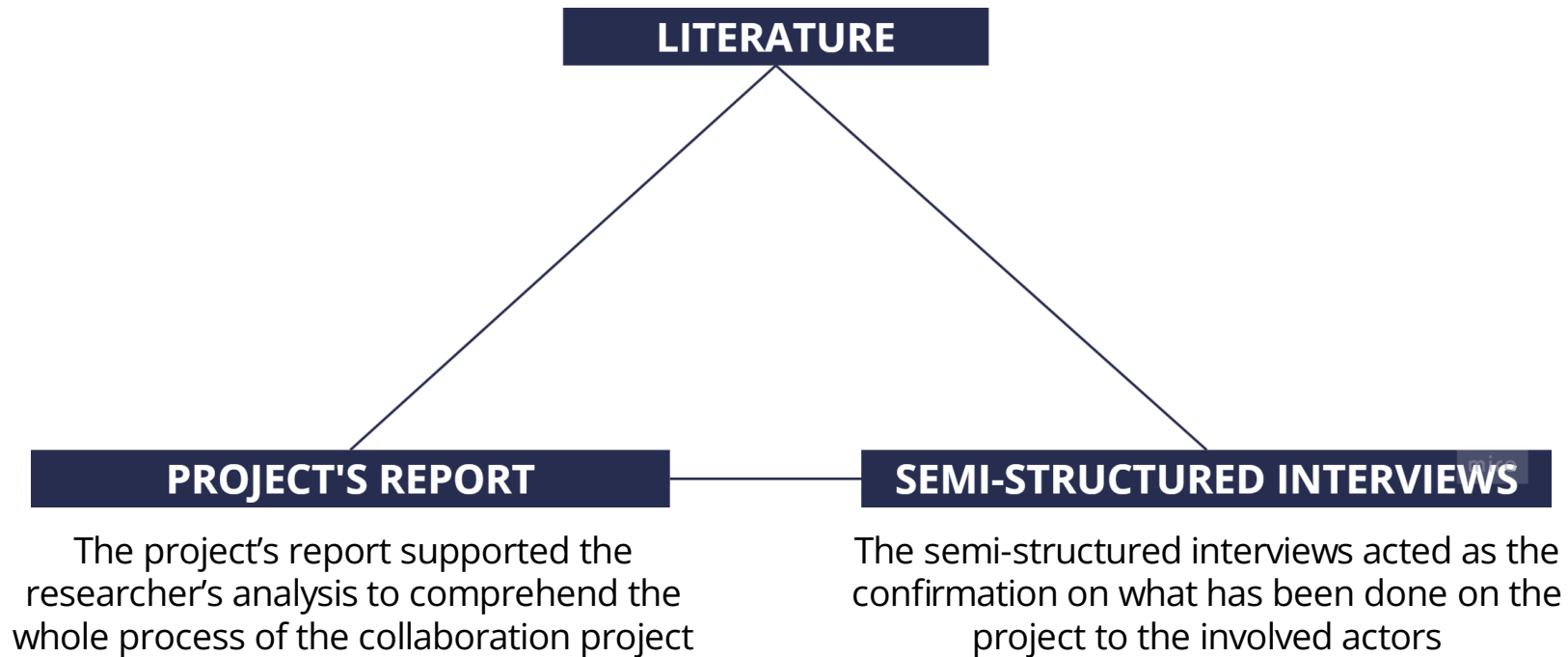
4

DELIVER

Triangulation analysis
Discussion

1. TRIANGULATION ANALYSIS

The literature analysis consists of academic literature and policies review. This step helped the researcher delve more and understand the context



IMPACT OF UHI EFFECTS IN THE INFORMAL SETTLEMENTS

	LITERATURE: ACADEMIC LITERATURE	LITERATURE: POLICY REVIEW	PROJECT'S REPORT	SEMI-STRUCTURED INTERVIEWS
HEALTH IMPACTS		The consideration to overcome the health impacts is unaddressed in the policies	Health impacts were not considered before or after the project.	Before the intervention, residents normalised the heat , and its impact on health received minimal attention .
SOCIO-ECONOMIC IMPACTS		The consideration to overcome the social impacts is unaddressed in the policies	The comparison on the social impacts was not addressed in the planning principles	The residents experienced improved social impacts after the renovation project
BUILDING AND ENVIRONMENT IMPACTS		The adaptation attempt is directed at vertical housing development	Adaptation attempt applied through the design principles	The renovation project made a positive impact on the residents' houses

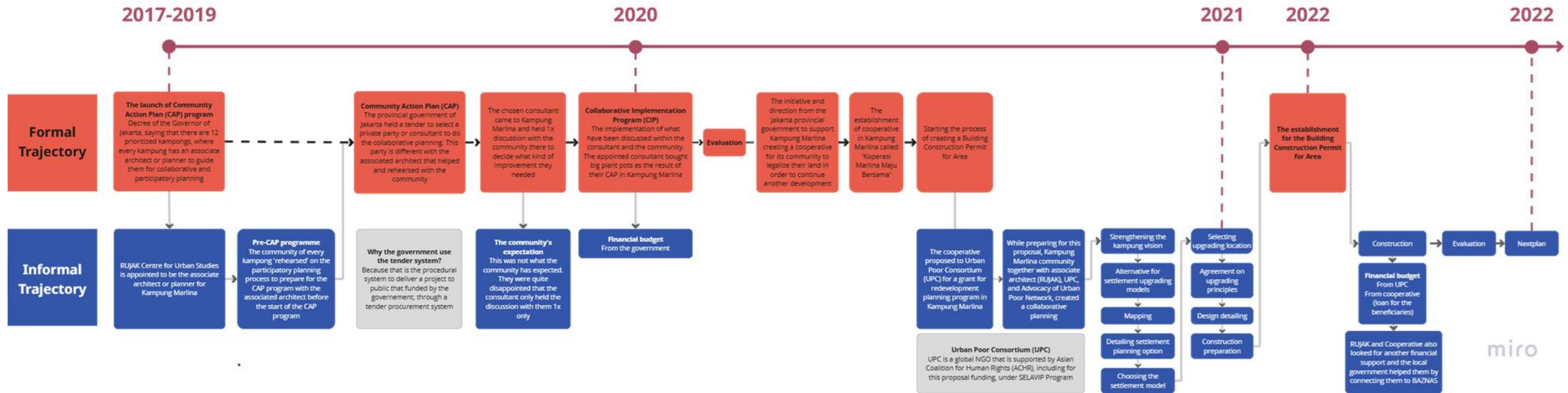
ACTORS' INVOLVEMENT AND THE COLLABORATIVE GOVERNANCE OF THE PROJECT

LITERATURE: ACADEMIC LITERATURE	LITERATURE: POLICY REVIEW	PROJECT'S REPORT	SEMI-STRUCTURED INTERVIEWS
PRINCIPLED ENGAGEMENT	The encouragement of understanding the context is mainly addressed to the community	The principled engagement is engaged through the weekly meeting process as one of the planning principles	The principled engagement was expressed in various ways across different actors
SHARED MOTIVATION	The policies mention involving different stakeholders in collaborative projects	Willingness to cooperate is addressed by the formulation of planning principles	The Residents of Kampung Marlina shared their big interest in this indicator and the government actors showed the result in the contrary
CAPACITY FOR JOINT ACTION	Procedural/institutional arrangement for joint action is addressed in the policies	The planning principles are addressed as the procedural/institutional arrangement	All actors agree that procedural/institutional arrangement plays the key role

ENHANCING THE STRATEGIES OF COLLABORATIVE GOVERNANCE FOR FUTURE PROJECTS

LITERATURE: ACADEMIC LITERATURE	LITERATURE: POLICY REVIEW	PROJECT'S REPORT	SEMI-STRUCTURED INTERVIEWS
ENHANCING PRINCIPLED ENGAGEMENT	The encouragement to understand the context is mainly addressed to the community	The commitment to present the collaborative planning process is shown with the detailed actions for the residents	All actors encouraged understanding the context can help to join the project , improving the actors' commitment
ENHANCING SHARED MOTIVATION	There is an article that explains about multi-stakeholder participation	Presented by giving the trust to the Cooperative to handle the selection process of the beneficiaries	The residents of Kampung Marlina give the most responds to this variable, focusing about the Willingness to Cooperate .
ENHANCING CAPACITY FOR JOINT ACTION	The encouragement to build up capacity is mentioned mostly for the community	By presenting the deliberation process as part of the procedural arrangement	All actors supported that improving procedural arrangement is the key to make the work more effective
ENHANCING INNOVATION AND SCALING	There is no explanation about any possibilities for future development	Making improvements on the measurement of before and after the project, and operationalization of the construction	Enhancing innovative approach in the governance system is the most encouraged to be the new strategy

TIMELINE



STAKEHOLDERS ROLE



Legends

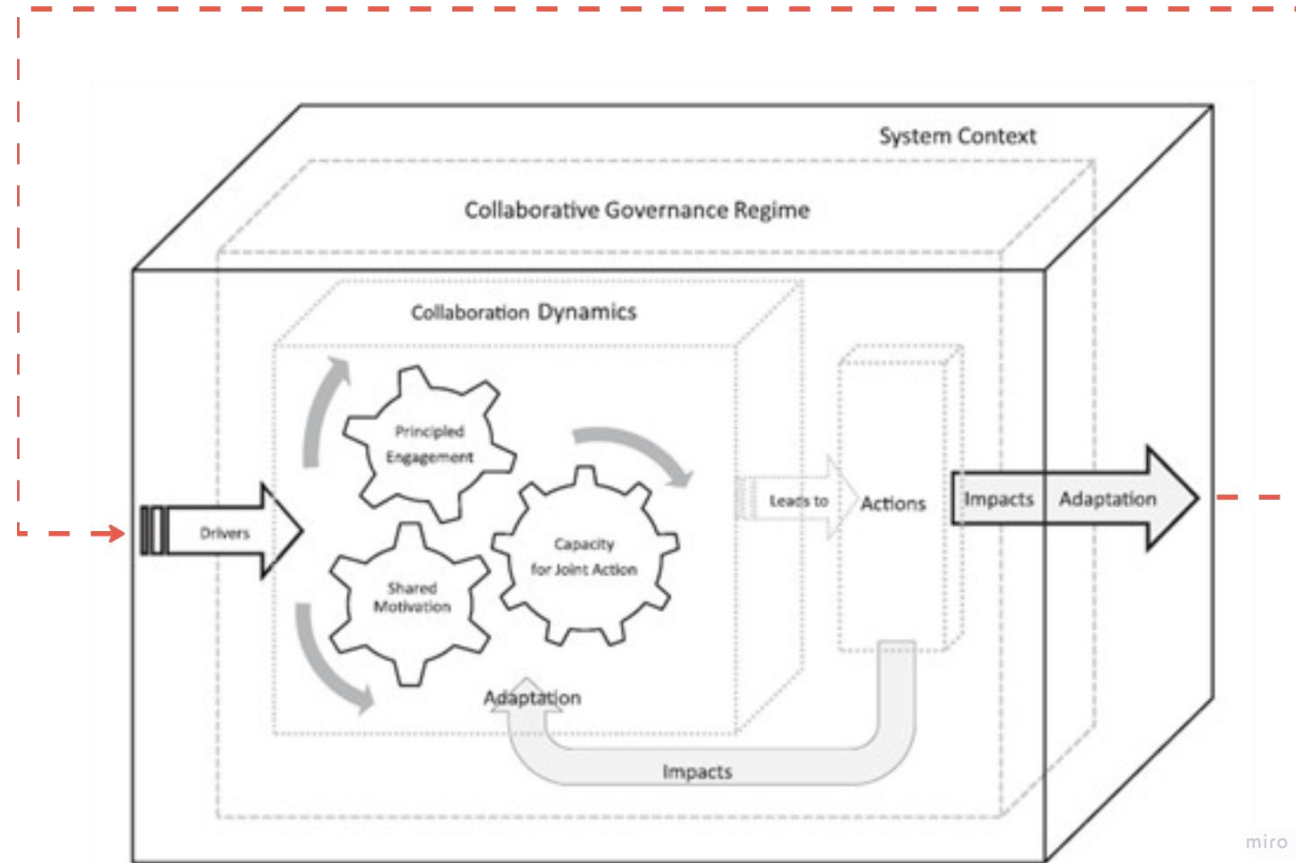
- Government (G)
- Non-Government
- Community
- Academia

2. DISCUSSION

Reflecting on the analysis

COLLABORATIVE GOVERNANCE IN PRACTICE

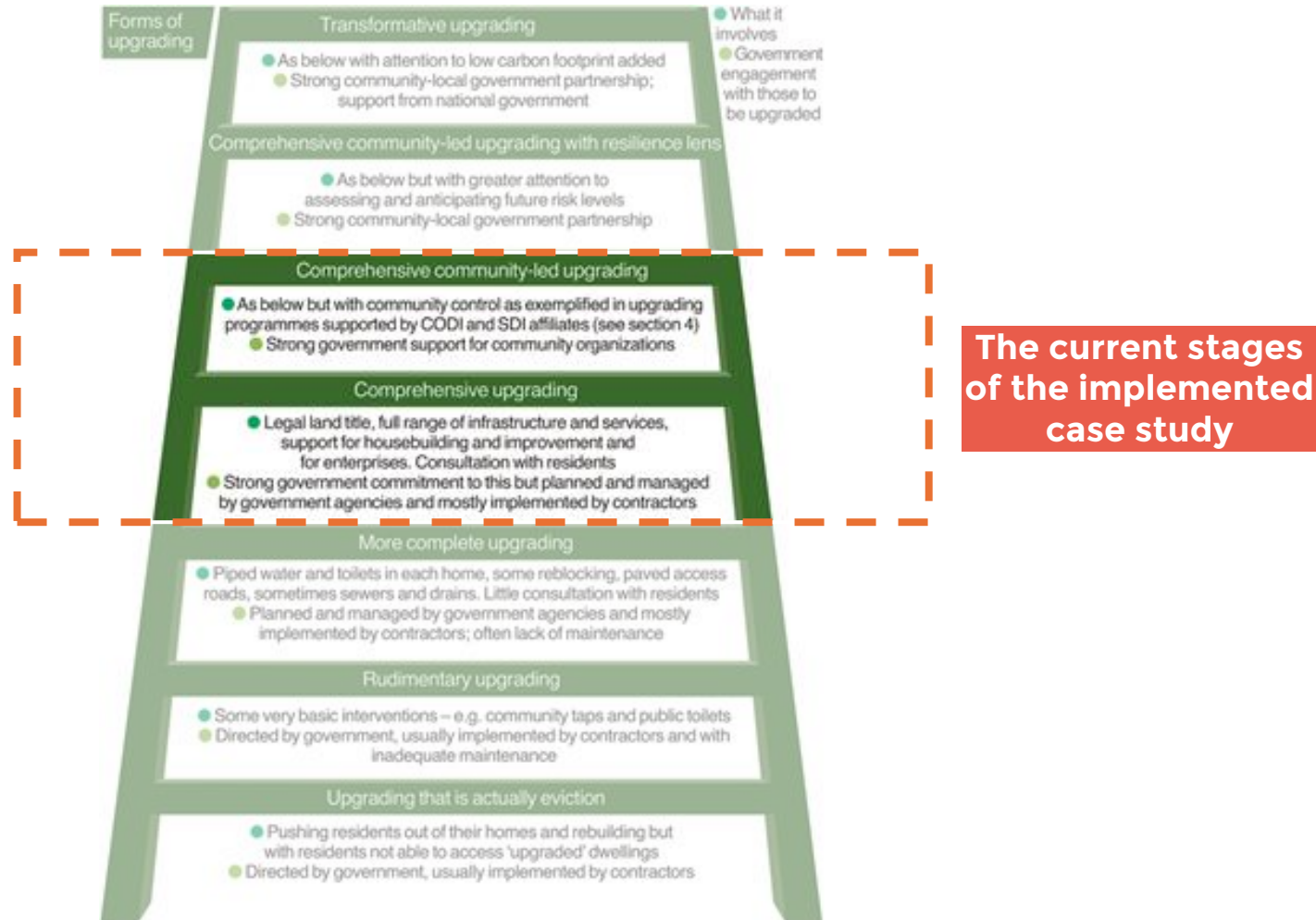
The Adaptation is potential to be a new Driver



Source: Emerson et al. (2012)

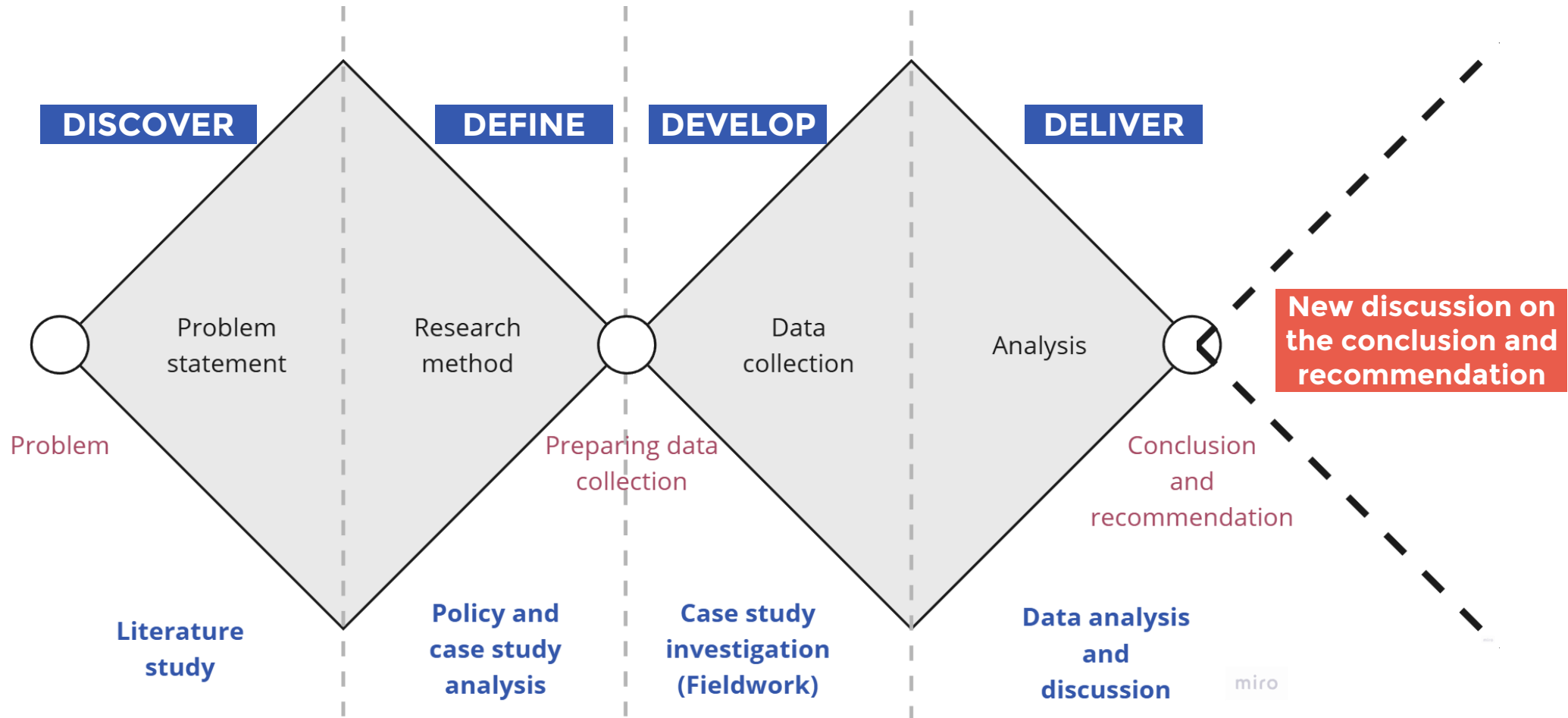
miro

TRANSFORMING THE COLLABORATIVE PLANNING PROCESS



Source: Satterthwaite et al. (2020)

REFLECTING ON THE RESEARCH PROCESS



Source: Own work, adapted from Design Council (2019)

LIMITATIONS

FRAMEWORK

Only captured the *Collaborative Governance Dynamics* from all component in the Integrative Collaborative Governance Framework

SCOPE

This research focuses on a single project that specifically located in one specific area with limited direct beneficiaries, which may constrain broader generalizations.

TIME

The semi-structured interview process was unable to gather all the data from the involved actors, therefore, relies on secondary data

RESULTS

The analysis relies heavily on interviews with the involved actors. While triangulated with documents and field observation, this may introduce bias or partial perspectives

5

CONCLUSION

CONCLUSION

SQ 1

How does the Urban Heat Island (UHI) effect impact the informal settlements in Jakarta?

The Urban Heat Island (UHI) effect is a **climate change phenomenon** that causes urban areas **experiencing higher temperatures**. In the case study of this research, **residents are exposed to high temperatures daily**, but are not aware that this heat is part of a broader environmental issue until the project takes place.

SQ 2

How was collaborative governance implemented in the Urban Heat Island (UHI) adaptation project in informal settlements in Jakarta?

Collaborative governance in the Kampung Marlina project was **implemented primarily through the efforts of non-governmental actors**, which led to participatory planning and facilitated coordination among stakeholders.

SQ 3

What strategies can be implemented to enhance collaborative governance in adapting the UHI effect in the informal settlement area in Jakarta in the future?

Based on the triangulation analysis, one essential strategy is **to improve procedural and institutional arrangements by adopting more flexible and inclusive governance approaches**. However, to make such efforts more effective and sustainable, the collaboration process must evolve into a more comprehensive and transformative model.

CONCLUSION

To what extent can collaborative governance support the adaptation of the Urban Heat Island (UHI) effect in informal settlements in Jakarta, Indonesia?

Collaborative governance has the potential to support UHI adaptation in Jakarta's informal settlements by encouraging solutions that are locally driven and responsive to specific contexts.

The Kampung Marlina case demonstrates that this evolving collaboration highlights the possibility of developing future projects with a more structured and inclusive governance approach. With improved systems and coordination from both government and non-government sides, future initiatives could be better positioned to support local adaptation strategies.

6

RECOMMENDATION

APPLY PARTICIPATORY AND LONGITUDINAL RESEARCH APPROACHES



APPLY PARTICIPATORY AND LONGITUDINAL RESEARCH APPROACHES



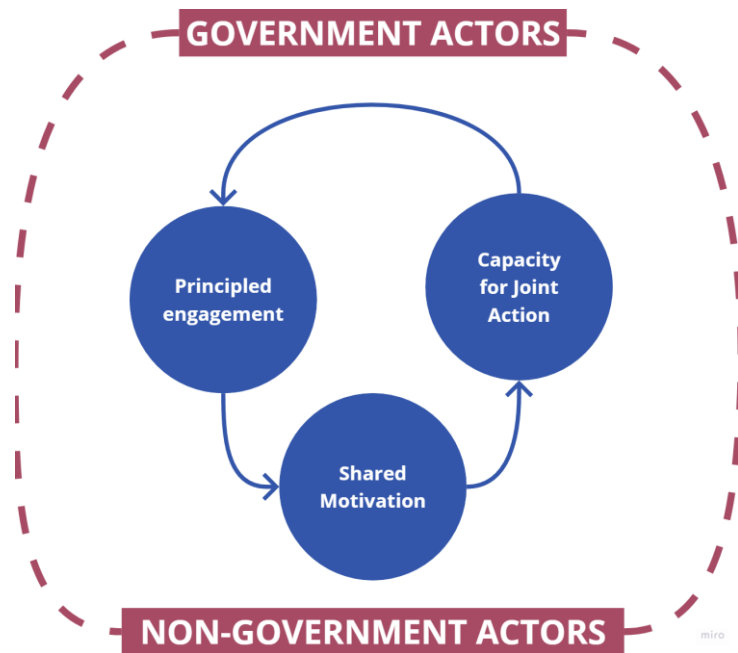
PARTICIPATORY APPROACH

Allow the community of Kampung Marlina to be more involved in the project and understand more about their neighbourhood area

LONGITUDINAL RESEARCH

Enhancing the deep understanding on the exploration of the Urban Heat Island impact in one location.

STRENGTHENING SHARED CAPACITY FOR BALANCED COLLABORATIVE GOVERNANCE

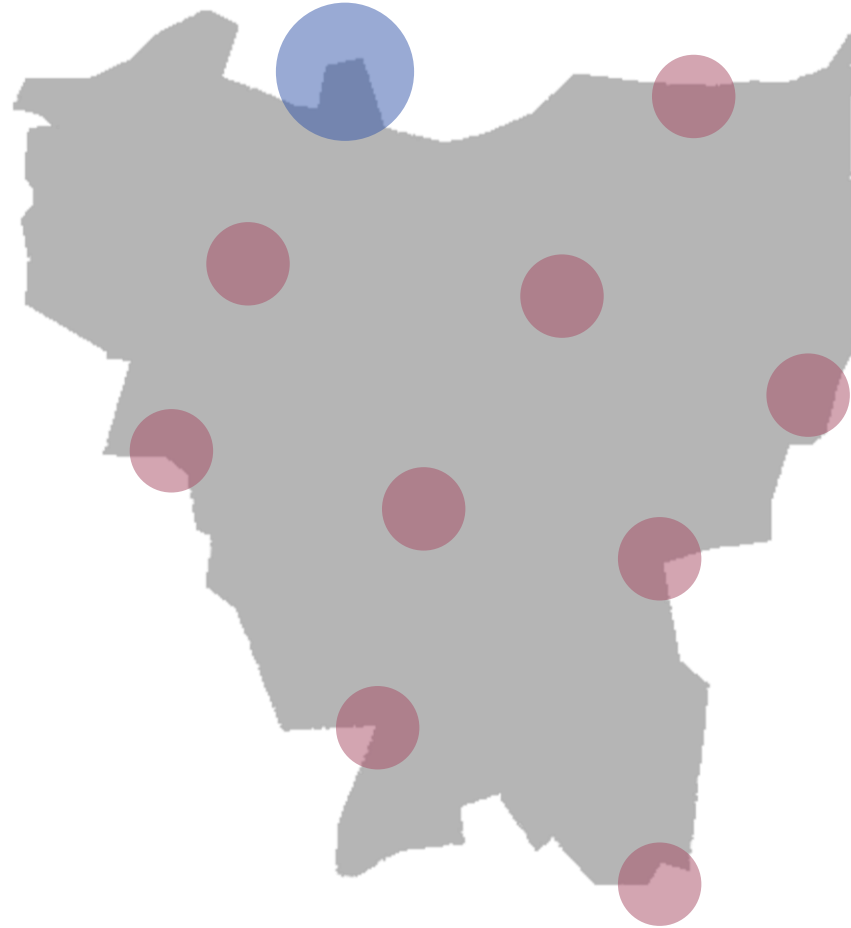


GOVERNMENT ACTORS

Enabler

NON-GOVERNMENT ACTORS

Collaborate more with academia and expert to enhance the community's capacity and capability



THANK YOU