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Urban Analysis Reports

**Mataram City**

Presentation of the findings

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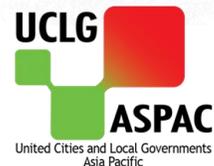
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# Mataram City

West Nusa Tenggara Province



# Introduction of the expert, team and methodology

## Expert Team

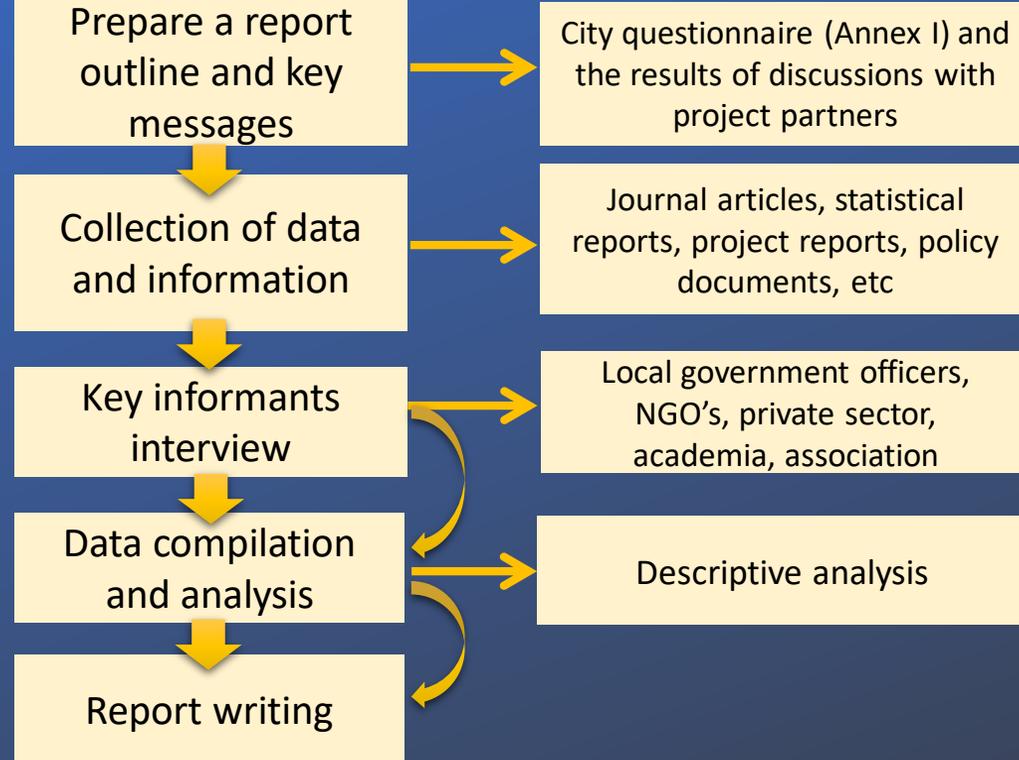
### 1. Wahyu Mulyana

- ± 25 years experience
- Doctoral Degree – Environmental Science
- Master of Arts - Urban Management
- Bachelor Degree – Urban Planning

### 2. Nila Ardhyarini H. Pratiwi

- ± 10 years experience
- Master of Environmental Science
- Bachelor Degree – Urban & Regional Planning

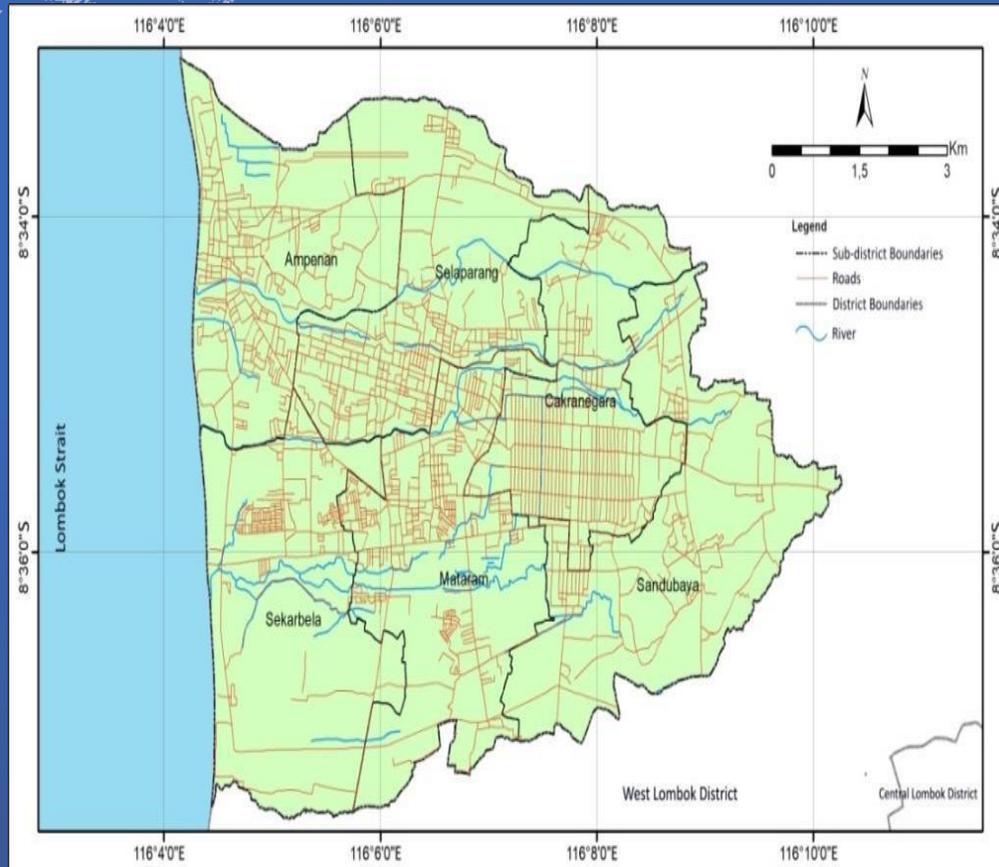
## Approach: Systematic Desk Study



## Key Informants

1. Mr. M. Nazaruddin Fikri (Head of Environment Agency)
2. Mr. H. Amirudin (Head of Local Development Planning Board)
3. Mr. H. Kemal Islam (Head of Housing and Settlement)
4. Mr. Budi (Transportation Agency)
5. Mrs. Baiq Harly Widayanti (University of Muhamadiyah Mataram)
6. Mr. Muhammad Ridha Hakim (World Wild Fund NTB)
7. Mr. Heri Susanto (Real Estate Indonesia -West Nusa Tenggara)
8. Mr. Arman Dwinanda (Indonesia's Association of Planner – West Nusa Tenggara)
9. Other contact persons: DPUPR – Cipta Karya; BPBD

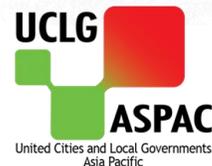
# What make the pilot city different?



- Coastal city in small island and surrounded by West Lombok Regency and Lombok Strait.
- Three towns constitute Mataram City area, from west to east, these are Ampenan, Mataram and Cakranegara.
- The city is crossed by four large rivers, which are Sungai Jangkok, Sungai Ancar, Sungai Brenyok and Sungai Midang flowing from the slopes of Mount Rinjani into downstream in Lombok Strait.
- Vulnerable to geological hazards, such as earthquakes and tsunami's.
- Vulnerable to climate change and hydro-meteorological disasters, such as sea level rise, extreme waves, abrasion, drought.
- The physical limitations of land availability for urban development have resulted in decreasing agricultural land and green open space.
- Mataram City has potential tourism attractions to be developed for city heritage tour and served as the hub to other tourism destination in West Lombok and North Lombok.
- Heterogenous ethnic groups such as Sasak, Balinese, Chinese, Malay and Arabic, however, it also prone to social conflicts.

# Summary report of the main findings and challenges of the city

- City resilience to flood risks is very important so that an Early Warning System for Floods needs to be built immediately.
- The need for adaptation to the impacts of climate change, especially for densely populated slum settlements in coastal areas such as Ampenan.
- The development of Mataram City has expanded into the surrounding area and increases the movement of people and goods from/to the city.
- The source of electricity is still depend on diesel power plants derived from fossil fuel.
- The development of new settlement area has caused to the increasing the need for clean water service
- Waste management through waste reduction efforts needs to be improved and waste treatments through waste to energy.



# General remarks and recommendations for the local action plan

- There was the climate vulnerability and risk assessment conducted for the Lombok Island including Mataram City and its surrounding areas By MoE, WWF and GIZ. The result shown that sectors affected to climate change are water resources and coastal.
- Further study should be done to update and elaborate the impacts of climate change into urban sector. The proposed study becomes the basis for the preparation of the Strategy and Action Plan in the Local Action Plan (LAP).
  - In addition, Mataram City doesn't have the GHG inventory to estimate all emissions and removals of greenhouses gases from given sources in a specific period of time. GHG inventory is aimed to:
    - understand link between environmental pollution and effects to sources of pollution
    - Identify the sectors, sources, and activities responsible for greenhouse gas emissions
    - help develop cost- effective mitigation policy
- The formulation of the LAP should be linked with the substance of Strategic Environmental Assessment (SEA) of Medium Term Development Plan (RPJMD) and become the input for preparing Technocratic Draft of RPJMD in Mataram City
- Forming City Teams and engaging multi-stakeholders as well as designing collaborative processes in LAP preparation.
  - The city team needs to determine the Technical Team that will be the core team for LAP formulation.

# Climate mitigation and adaptation

Ministry of Environment in cooperation with GTZ PAKLIM and WWF have conducted Risk and Adaptation Assessment on Climate Change in Lombok Island, West Nusa Tenggara Province.

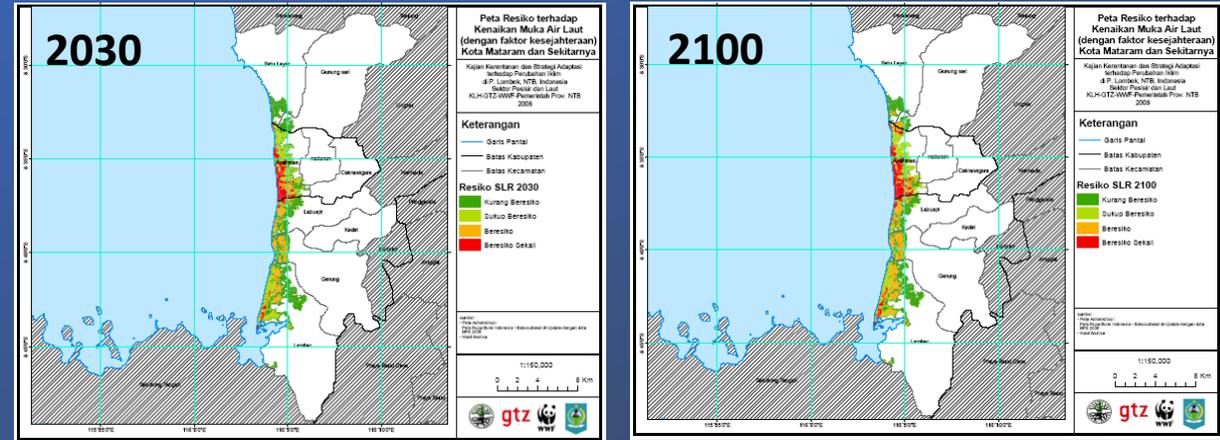
Affected Sector	Hazard	High Risk Area
Water	Drought; declining water availability; floods	Mataram
Agriculture	Crop planting failure	Central Lombok; East Lombok
Coastal and marine	Sea water temperature rise; weather extreme; rainfall pattern; river flow; sea level rise	Mataram

Source: KLHK, GIZ PAKLIM, and WWF 2012

## Adaptation Strategies:

- Capacity of data and information
- Appropriate technology for local water resource
- Flood prevention and response to flooding
- Physical adaptation of coastal area and small island
- Management of population, infrastructure and facilities

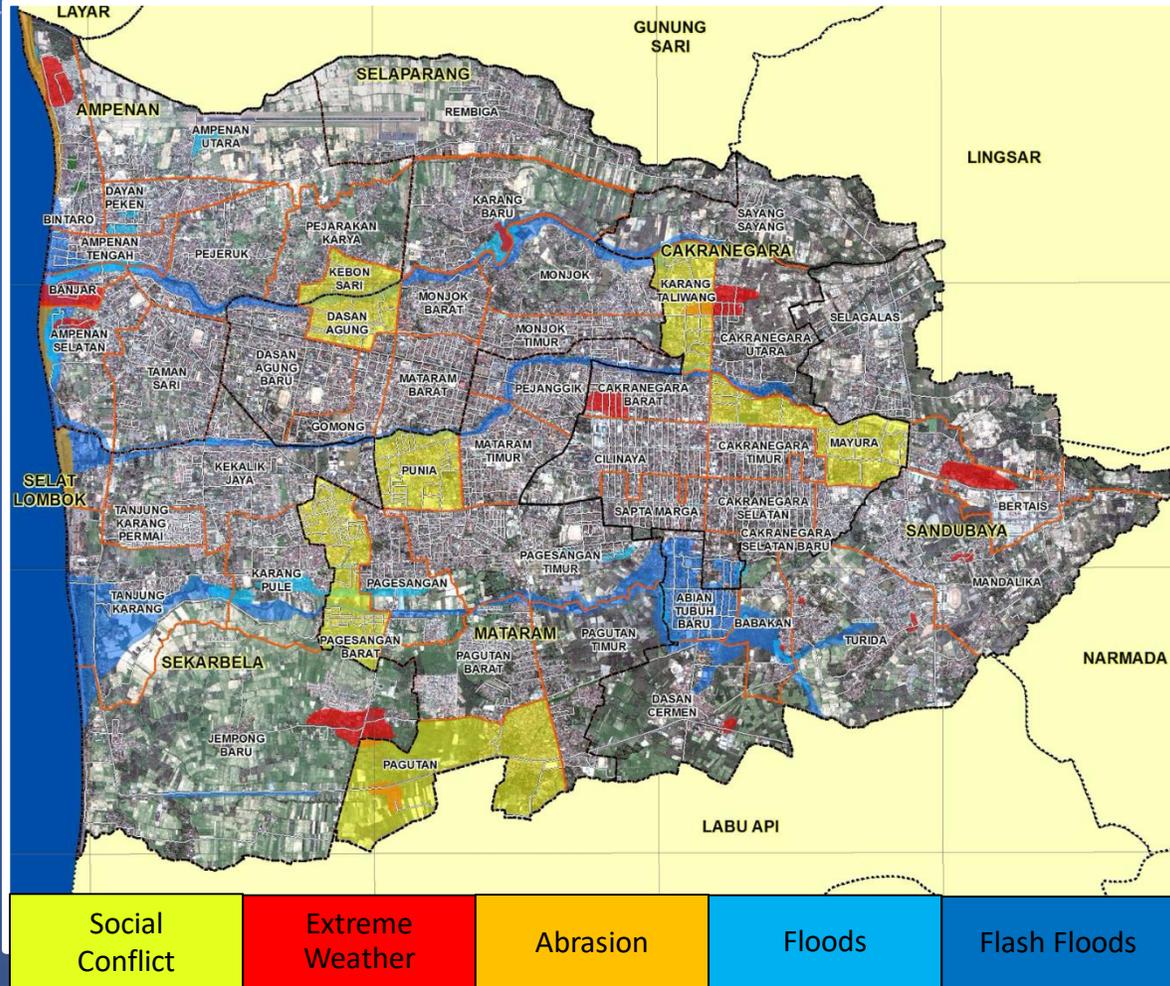
Risk map of climate change projections for year 2030s and 2100s in Mataram city and it's surrounding with population welfare factor



No	Risk Level	Coverage of Risk Level (ha)	
		2030	2100
1	Very low risk	2,230	1,871
2	Low risk	1,613	1,816
3	Medium risk	218	348
4	High risk	65	90

# Disaster preparedness, prevention and resilience

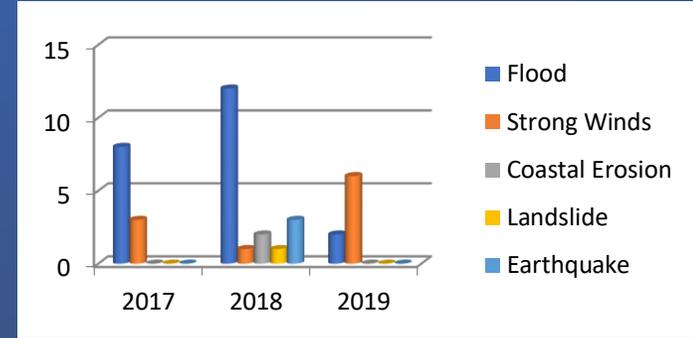
**DISASTER HISTORICAL MAP**



**DISASTER RISK INDEX**

Potential Hazard	Risk
Earthquake	Medium
Tsunami	Medium
Flood	Medium
Landslide	High
Coastal abrasion	High
Forest fire	High
Drought	Medium

**NUMBER OF DISASTER EVENT**



- After the 2018 Earthquake, Mataram City Government had prepared a Contingency Plans for earthquake and tsunami disaster preparedness and prevention, disaster management emergency and logistics, and post-natural disaster recovery.
- Warning Receiver System (WRS) has recently installed by BMKG to disseminate early warning for earthquake and tsunami. In addition there are two tower unit of Sirene for tsunami warning managed by Provincial Disaster Agency since 7 years ago. Early warning system for flood disaster is still on the planning proposal.
- Disaster risk reduction has been mainstreamed into RPJMD 2016-2021 and Spatial Plan 2011-2031

# Air pollution and other pollutions

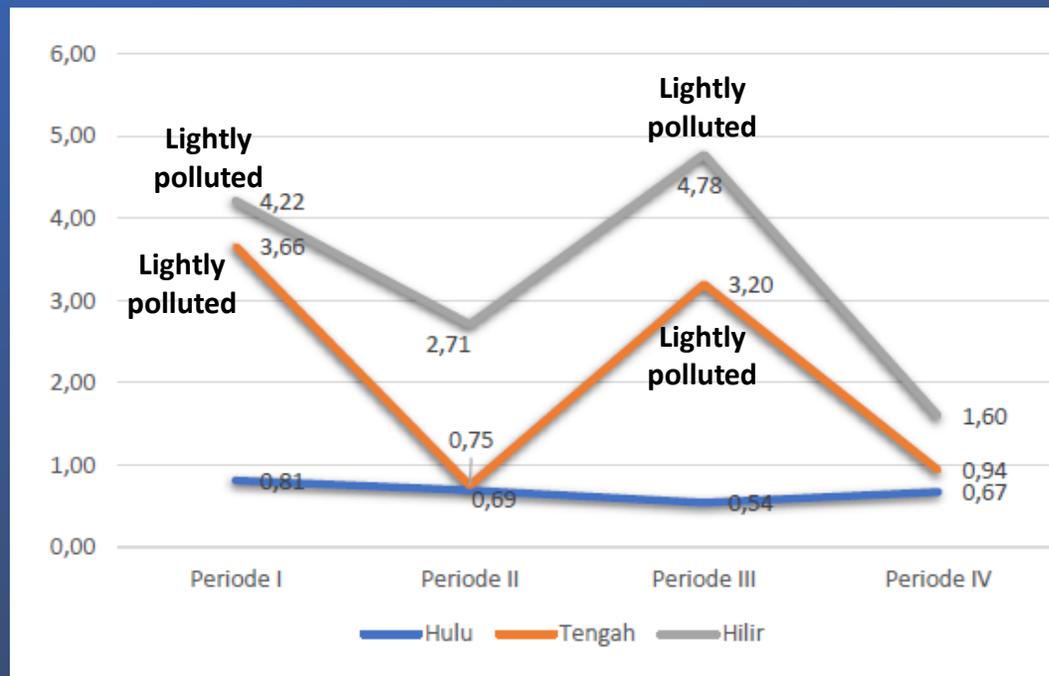
## Air Quality Monitoring Results in Mataram City, 2017

Parameter	Unit	Ambient (PP No. 41/1999)	Result
Dust (Total Suspended Partikulat/ TSP)	$\mu\text{g}/\text{Nm}^3$	-	7.57
Timbale (air)	$\mu\text{g}/\text{Nm}^3$	-	< 0.2
Sulfur dioksida (SO <sub>2</sub> )	$\mu\text{g}/\text{Nm}^3$	900	< 1
Carbon Monoxide (CO)	$\mu\text{g}/\text{Nm}^3$	30,000	< 1
Nitrogen dioxide (NO <sub>2</sub> )	$\mu\text{g}/\text{Nm}^3$	400	< 1
Nitrogen Oxide (NO)	$\mu\text{g}/\text{Nm}^3$	-	< 1
Total Nitrogen (NOx)	$\mu\text{g}/\text{Nm}^3$	-	< 1
Carbon dioxide (CO <sub>2</sub> )	%	-	< 1
Ambient temperature	°C	-	32
Gas temperature	°C	-	31
Noise	dβ	55	46.5

Source: Environmental and Forestry Agency of West Nusa Tenggara Province

- The ambient air quality of Mataram City is in good condition.
- Almost all parameter in several locations met the ambient.

## Pollution Status of the Jangkok River, 2019



Source: Environmental Agency of Mataram City, 2020

- The highest pollution status in the Jangkok River is in the downstream (period III). The high IP value or pollution status is due to the high parameter values of fecal coli and total coli in the river.

# Waste management

## Solid Waste Management

WASTE REDUCTION	Bank of Waste (8)	2.2 ton
	Bank of Waste School (23)	3 ton
	Informal Waste Collector (10)	5.46 ton
	TPS3R Un-organic (10)	0 ton
	Pokja LISAN (22)	0.2 ton
WASTE TREATMENT	Separation	
	Collection	Central Bank of Waste (3 ton)
	Processing	3 Unit of TPS3R (3 ton)
	Transporting	
	Final Processing Site	246.5 ton

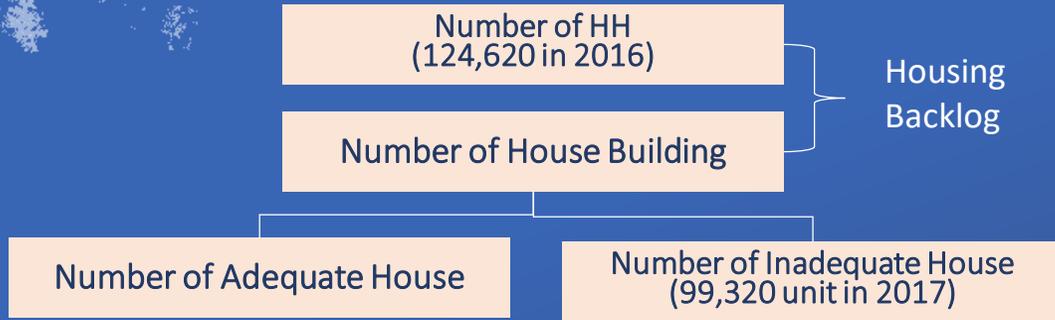
- Number of waste generated is about 1,350 m<sup>3</sup>/day or 337.6 ton/day
- Waste disposed to final processing site is 985.5 m<sup>3</sup>/day or 246.5 ton/day (73.13%) at Controlled Landfill TPA Kongok (8.6 ha) in West Lombok Regency under the inter-municipal cooperation
- Local Regulation No. 1 of 2019 on SWM mandated the City to carry out Waste Reduction and Waste Treatment
- The proposed waste to energy is being discussed as one alternative solution of waste treatment considering waste-generated

## Waste Water Management

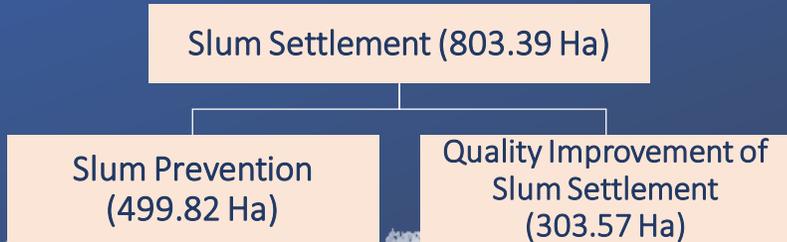
On-Site Domestic Waste Treatment System (SPALD-S)	% of HH connected to adequate septic tank	88.24
	% of HH connected to safe septic tank	6.66
	% of HH accessed to public toilets	4.83
	% of HH connected to communal sanitation centre (MCK; MCK++)	0.69
	% of HH connected to communal septic tanks (< 10 HH)	0.06
	% of HH with inadequate individual septic tank	4.67
	% of HH with open defecation	0.44
Centralized Domestic Waste Treatment System (SPALD-T)	The capacity of sludge treatment plant (IPLT Kebon Kongok) (m <sup>3</sup> per day)	20
	% of HH connected to mixed public toilets in settlement area	0.32
	% of HH connected to Settlement-Area Waste Water Treatment Plant (IPAL)	1.44
	% of HH connected to City-Wide Waste Water Treatment Plant (IPAL Perkotaan)	N.A

- Centralized waste water treatment system at the city scale does not yet exist only limited to communal waste management and has not been evenly distributed in all settlements.
- Huge gap to achieve Universal Access

# Informal settlements



- Slum Indicators**
1. Building irregularities (69%)
  2. Building density
  3. Road quality (49%)
  4. Drainage system
  5. Water supply
  6. Waste water treatment
  7. Solid waste management
  8. Fire protection



## Slum Settlements

No	Sub-District	# of Village	# of Slum Village	Slum Area 2016 (Ha)	Characteristic of location	Disaster Risk
1	Ampenan	19	7	90,97	Coastal, Riverbank & urban fringe	Coastal abrasion; Rob Flooding
2	Sekarbela	5	3	50,52	Coastal, Riverbank & urban fringe	Coastal abrasion; flooding
3	Mataram	9	2	9,46	Urban fringe	Flash flood
4	Selaparang	9	6	92,13	Riverbank	Flash flood
5	Cakranegara	10	4	31,78	Commercial Area	Flash flood
6	Sandubaya	7	3	48,72	Commercial Area	Flash flood
		<b>59</b>	<b>25</b>	<b>303,58</b>		

## Slum Typology

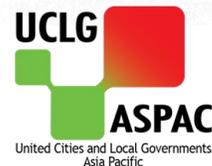
1. Coastal areas: 44.97 Ha (14.81%)
2. Jangkok Riverbank areas: 73.21 Ha (24.12%)
3. Ancar Riverbank areas: 22.37 Ha (7.37%)
4. Trade and business centre areas: 14.09 Ha (4.64%)
5. Non Areas: 105.45 Ha (42%) → Neighborhood improvement

Area's Improvement

## Slum Alleviation Program:

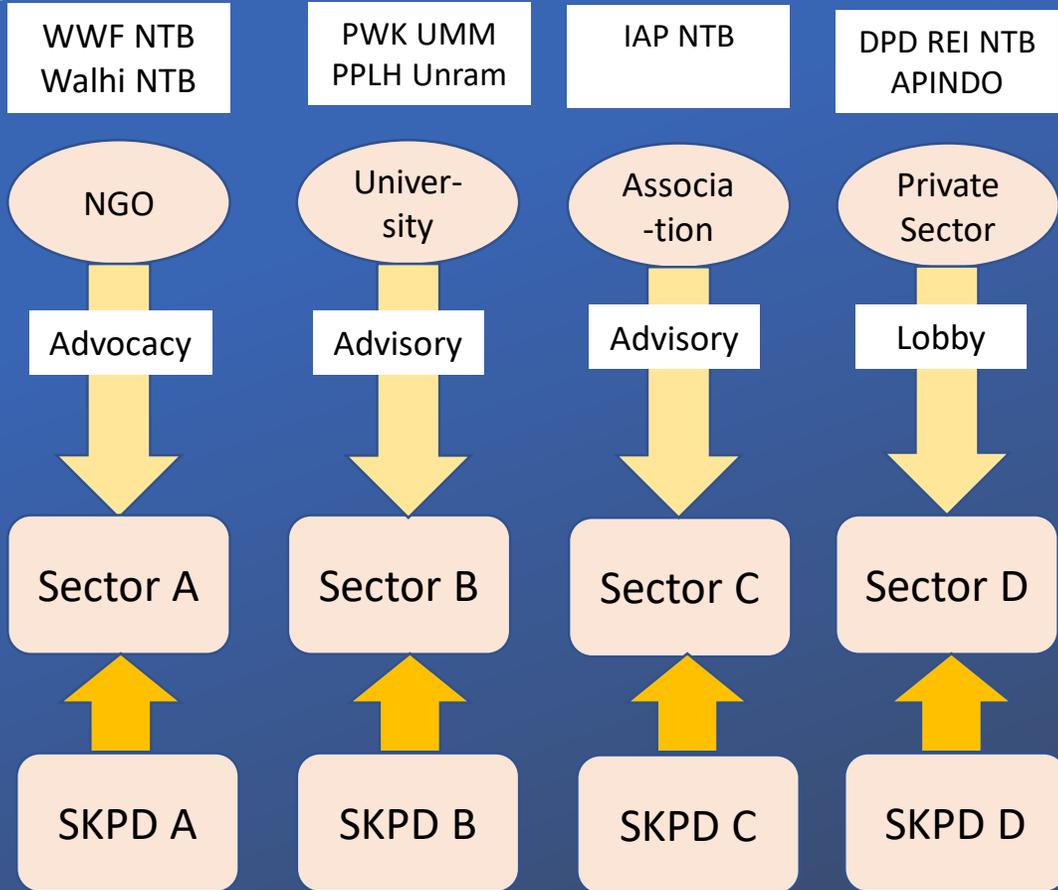
1. National Flagship Program – City Without Slum (KOTAKU)
2. Local Budget

Progress till 2019: Remaining Slum Areas - 97.2 Ha in 7 Slum Villages

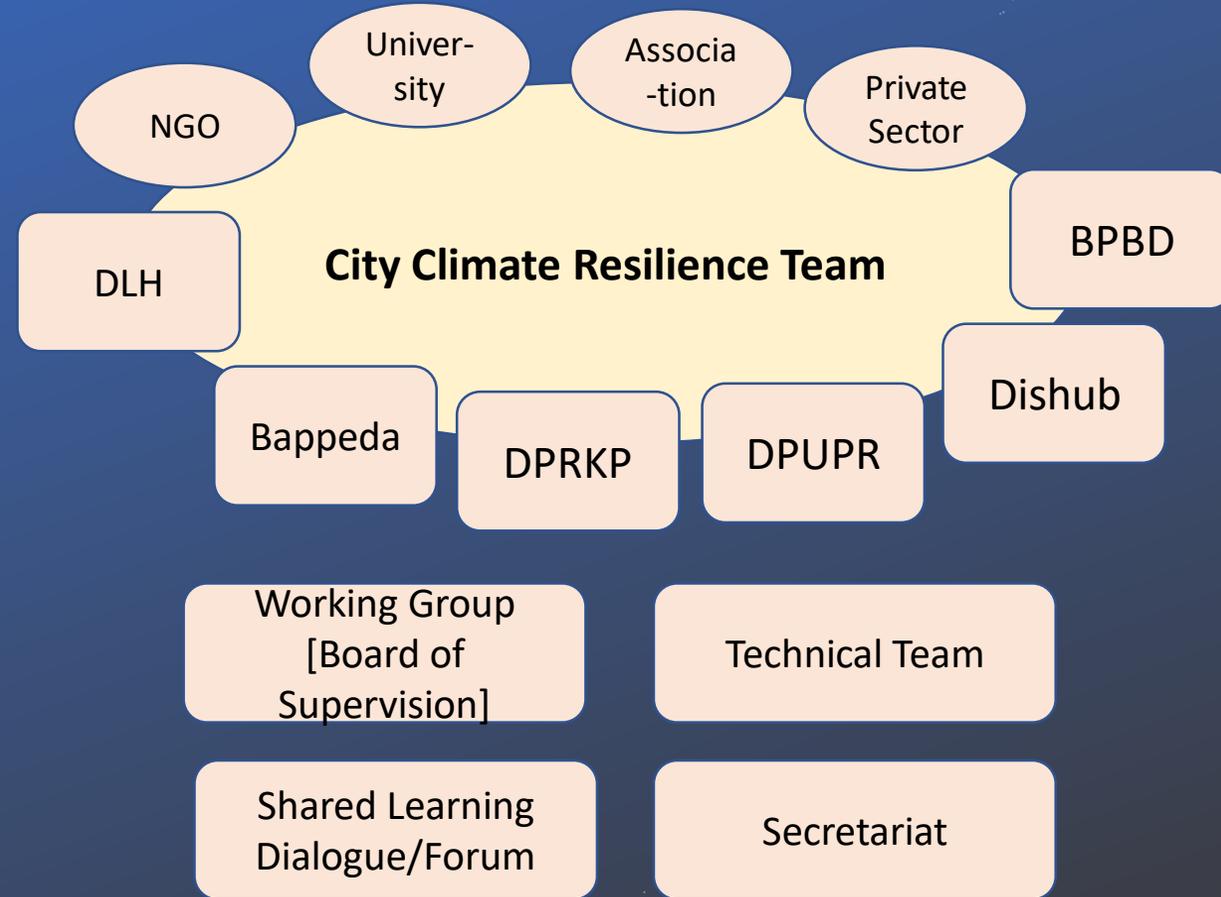


# Participation of civil society and governance

## Existing Mechanism



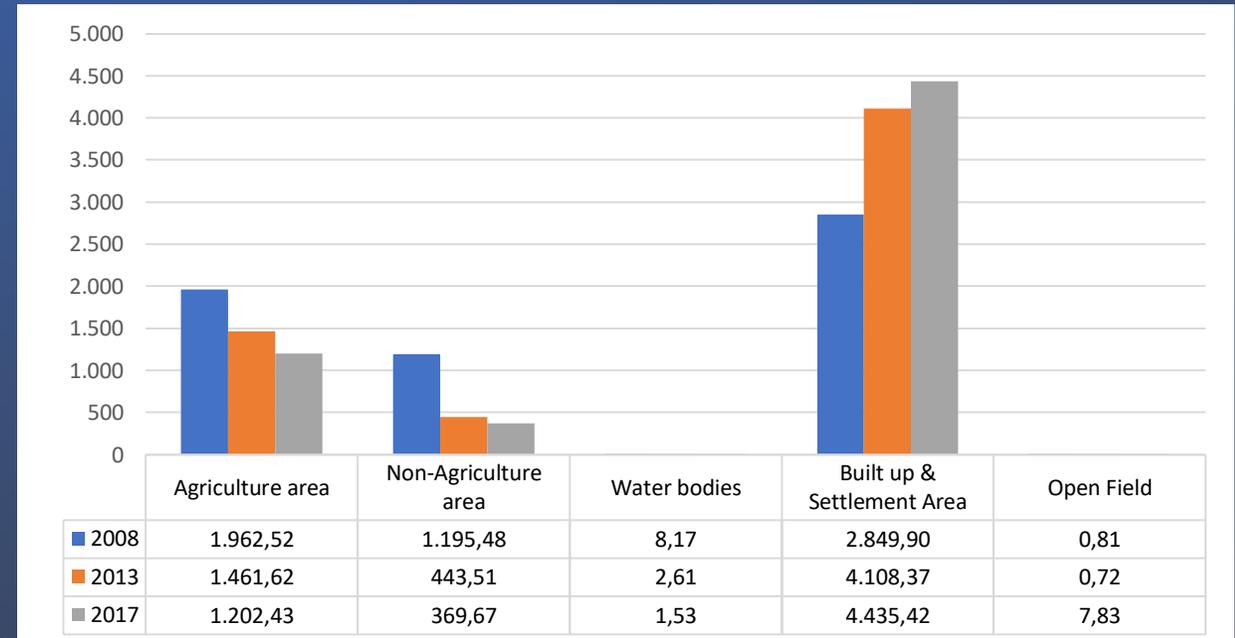
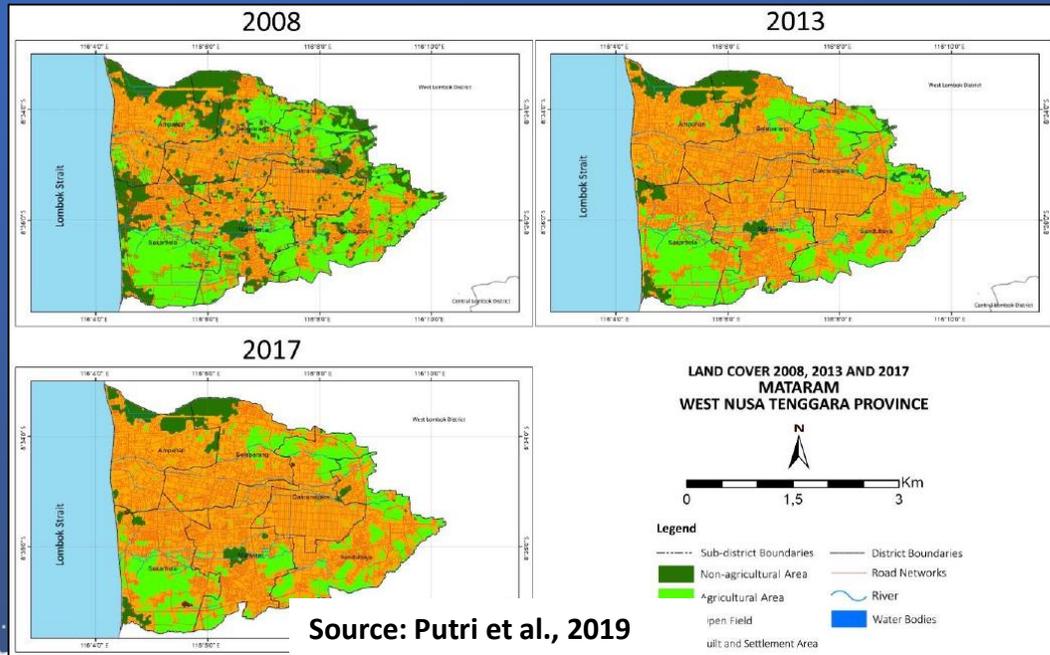
## Proposed Mechanism



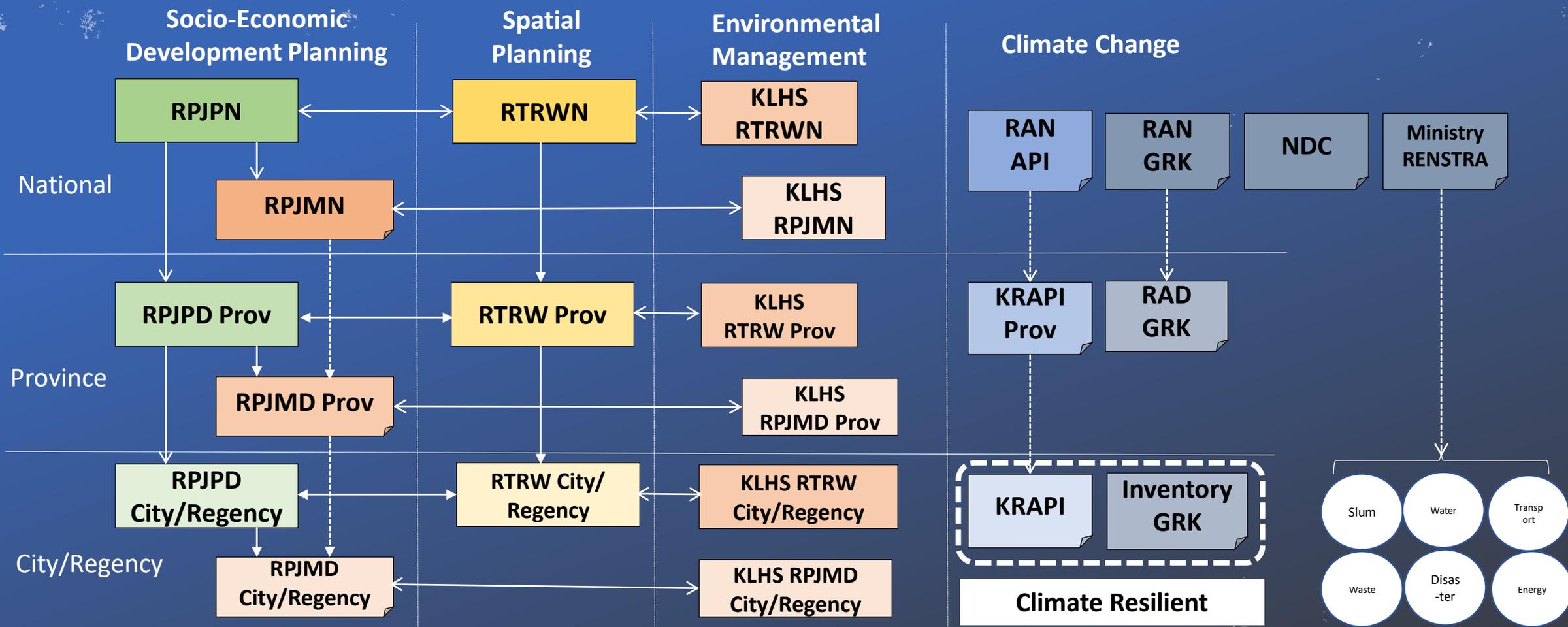
# Challenges in terms of land use, spatial planning, housing provision and green spaces

- The physical limitations of land for regional development have resulted in decreasing agricultural land and green open space

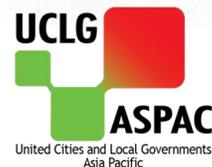
- Rapid urbanization makes the pattern of land use more varied including settlement, office, industry, and other urban facilities.
- In the period 2008-2017, land cover in Mataram City has changed to the increasing of built up and settlement area which reached 1.585,52 hectares (26.35%).
- There were the decrease in land cover especially on agriculture area by 760,10 ha (-12, 63%), non-agriculture area by 825,81 hectares (-13.72%), and water bodies by 6,64 hectares (-0.11%).



# Articulation with the national policies

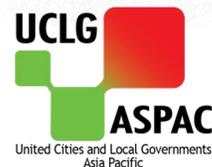


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# Best practices and challenges of the municipality

- The city's resilience to the effects of climate change is closely linked to the sustainable use of natural resources, including water, food and energy.
- An integrated land use policy is needed in The Metropolitan Mataram Raya in order to achieve city resilience and sustainable.
- Development of the Climate Village (*Kampung Iklim*) in the coastal area to increase community resilience.
- Downscaling analysis for coastal hazard which can be used as input in policy making.
- Drinking water service still face some obstacles such as: high water leakage (non-revenue water), continuity of services, etc.



# GHG mapping (and further analysis)

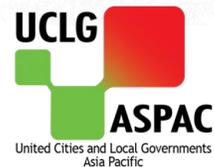
- Mataram City is not yet conducted the GHG inventory



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