

Urban Climate Change Resilience in Semarang - Indonesia

GUNAWAN WICAKSONO

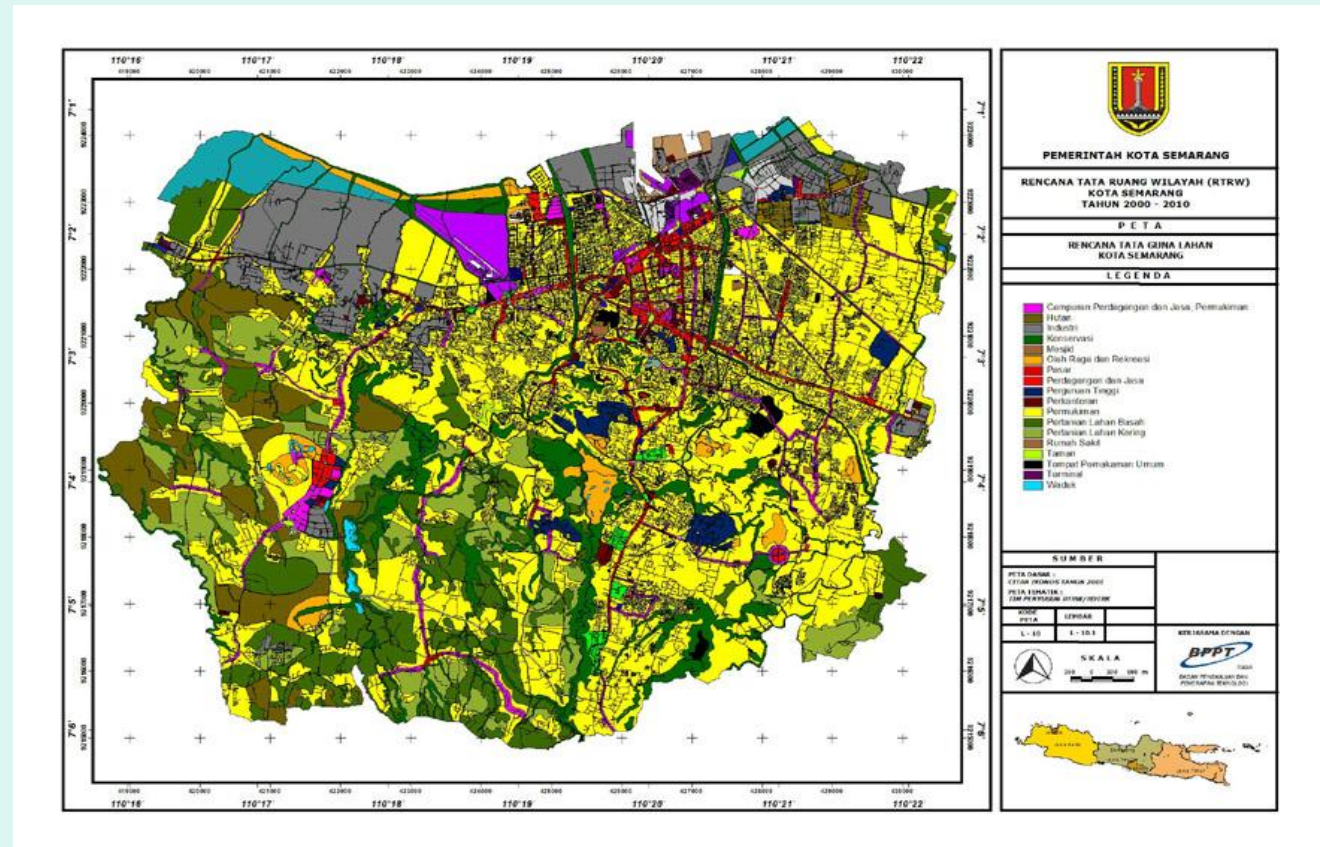
**ENVIRONMENTAL BOARD
SEMARANG MUNICIPALITY**



**City Engagement and Key Findings from CC City Team
Presented in
5th High Level Seminar on Environmentally Sustainable Cities
Surabaya, 28 Febr-1 March 2014**

1. City Context

- Location (map)
- Climate Information
- Demography
- Socio Economic situation (very brief)

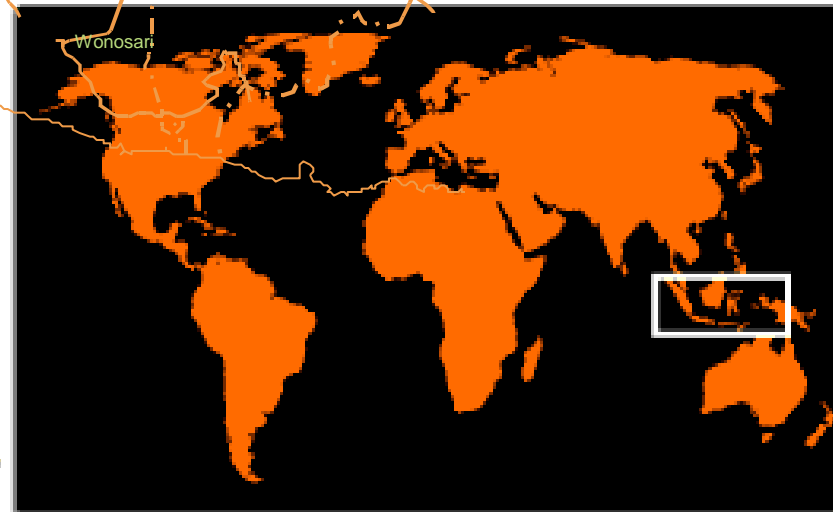


City Context:

Where am I ?



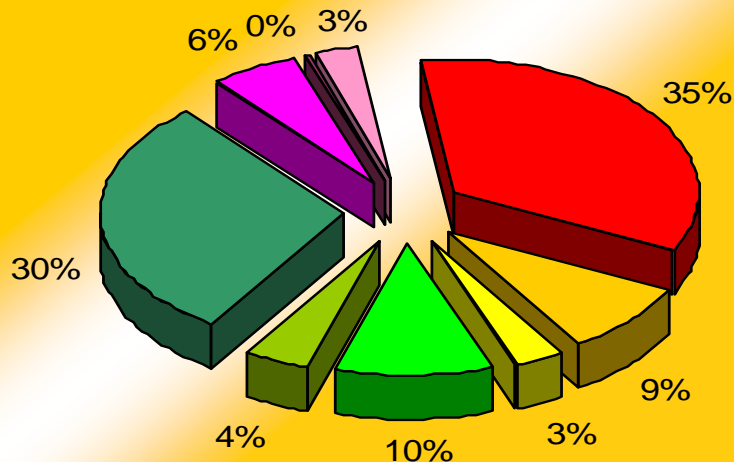
City Orde 1
City Orde 2



1. Semarang as capital of Central Java.
2. As a potentially trading node with adequate facilities: harbour, airports, railway station

DEMOGRAPHY (brief)

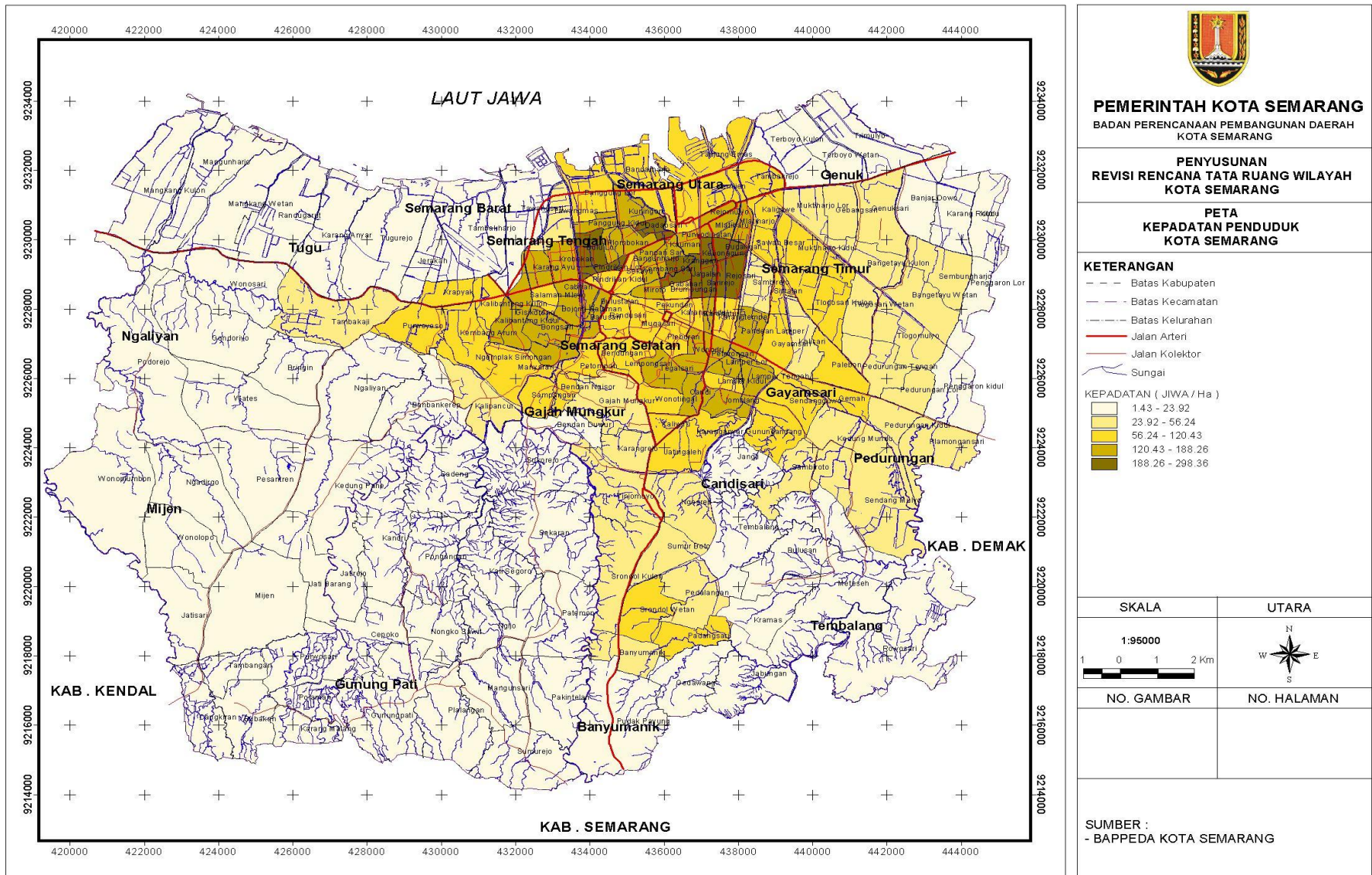
- Area : 37,360 ha (373 sq km)
- Number of population: 1.5 million
- Difference between men and women :
 $711204 - 721750 = 10546$
- Biggest population on Pedurungan District 157124 and smallest on Tugu District 25937
- Age category
 - children 280,467
 - Productive age 1,018,449
 - Non productive age 126,115
- Population stucture by jobs ;



petani
nelayan
pengusaha
buruh
pedagang
angkatan
PNS&ABRI
Pensiunan
lainnya

farmers
fisherman
entrepreneur
workers
trade
transport
civil serv & military
retired
others

POPULATION DENSITY (P/Ha)

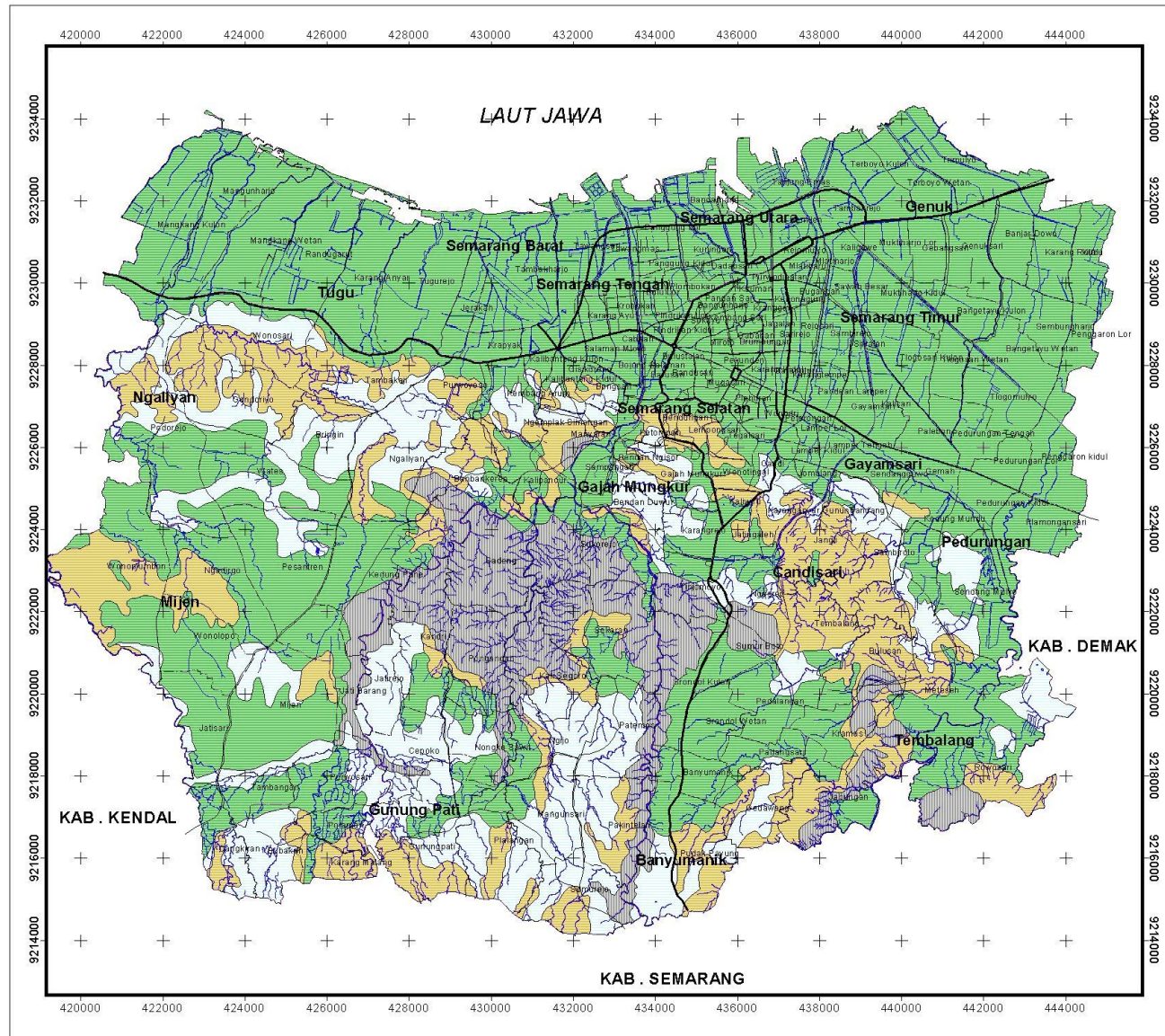


2. Why Semarang Sees URBAN CLIMATE CHANGE RESILIENCE is Relevant

- Overview of Vulnerabilities
- Existing Adaptive Capacities



LAND MOVEMENT



PEMERINTAH KOTA SEMARANG
BADAN PERENCANAAN PEMBANGUNAN DAERAH
KOTA SEMARANG

**PENYUSUNAN
REVISI RENCANA TATA RUANG WILAYAH
KOTA SEMARANG**

**PETA
GEOLOGI GERAKAN TANAH
KOTA SEMARANG**

KETERANGAN

- Batas Kabupaten
- Batas Kecamatan
- Batas Kelurahan
- Jalan Arteri
- Jalan Kolektor
- Sungai
- Menengah
- Rendah
- Sangat Rendah
- Tinggi

SKALA

1:95000



UTARA

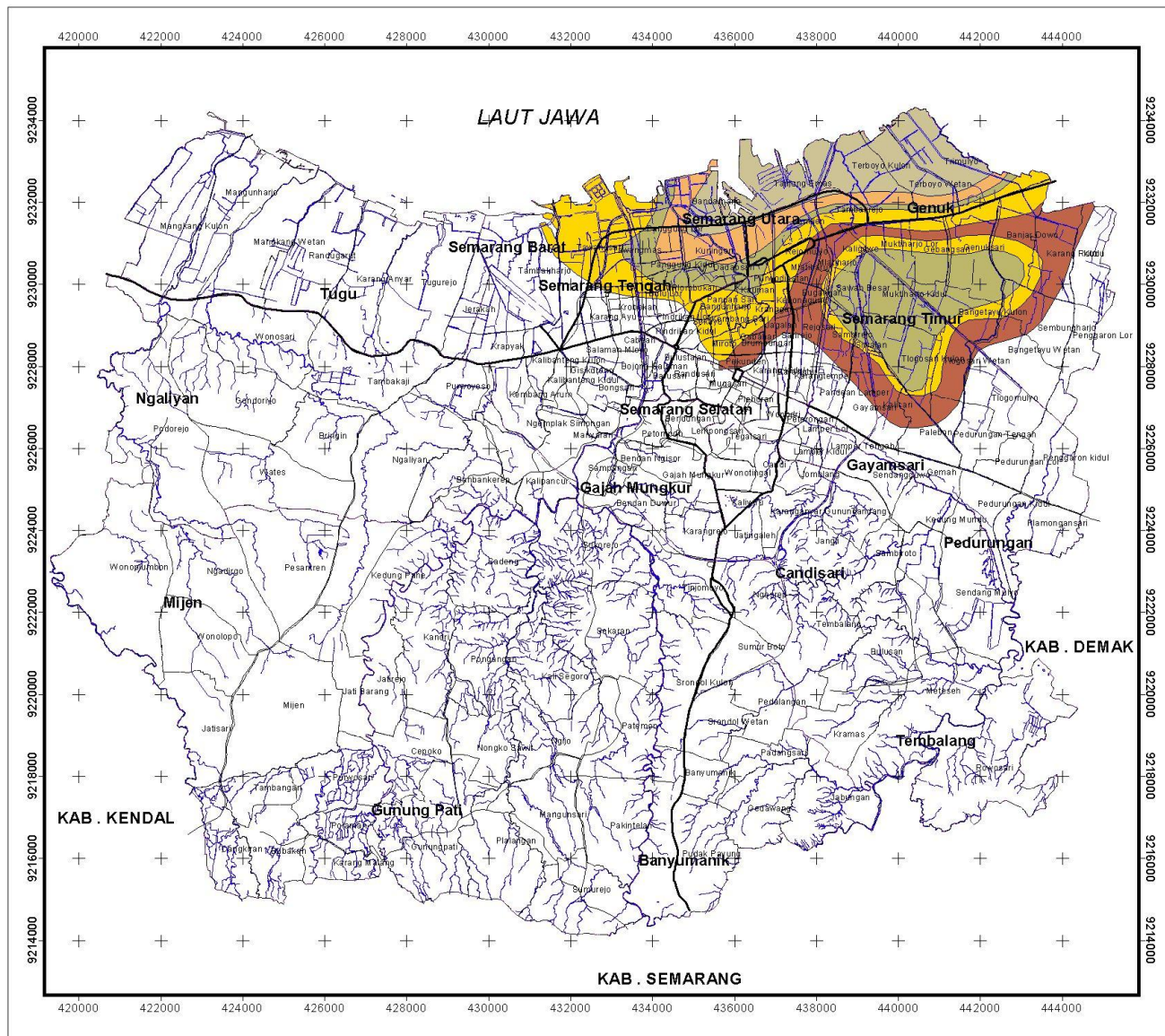


NO. GAMBAR

NO. HALAMAN

SUMBER :
- BAPPEDA KOTA SEMARANG
- PETA GEOLOGI TEKNIK LEMBAR
SEMARANG-MAGELANG
SKALA 1 : 100.000
SUDIBYO DKK 1997

LAND SUBSIDENCE



PEMERINTAH KOTA SEMARANG
BADAN PERENCANAAN PEMBANGUNAN DAERAH
KOTA SEMARANG

PENYUSUNAN
REVISI RENCANA TATA RUANG WILAYAH
KOTA SEMARANG

PETA
GEOLOGI AMBLESAN
KOTA SEMARANG

KETERANGAN

- Batas Kabupaten
- Batas Kecamatan
- Batas Kelurahan
- Jalan Arteri
- Jalan Kolektor
- Sungai

- 0 - 2 cm/tahun
- 2 - 4 cm/tahun
- 4 - 6 cm/tahun
- 6 - 8 cm/tahun
- > 8 cm/tahun

SKALA

1:95000
1 0 1 2 Km

NO. GAMBAR

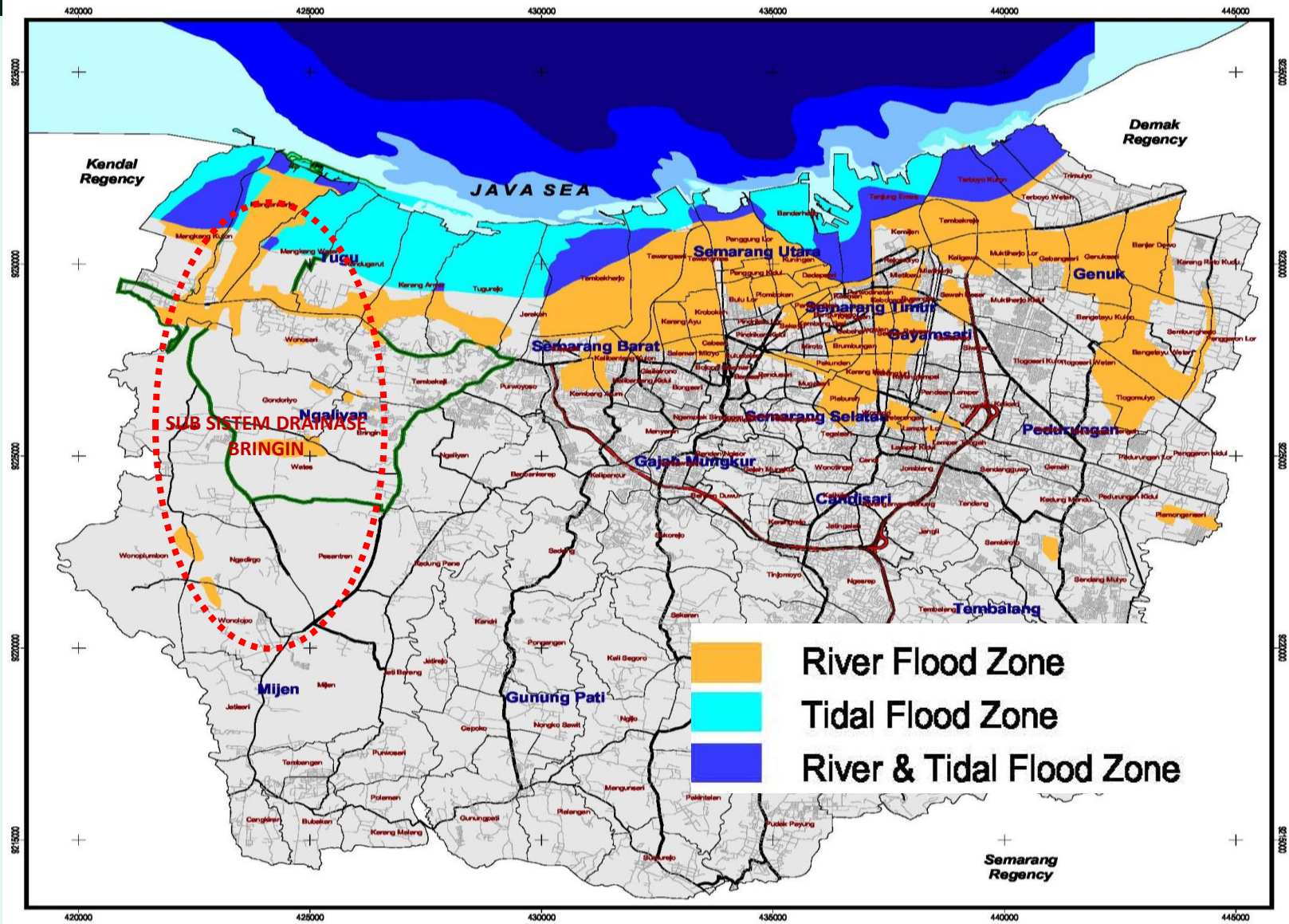
UTARA



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TIDAL FLOOD AND INUNDATION AREA

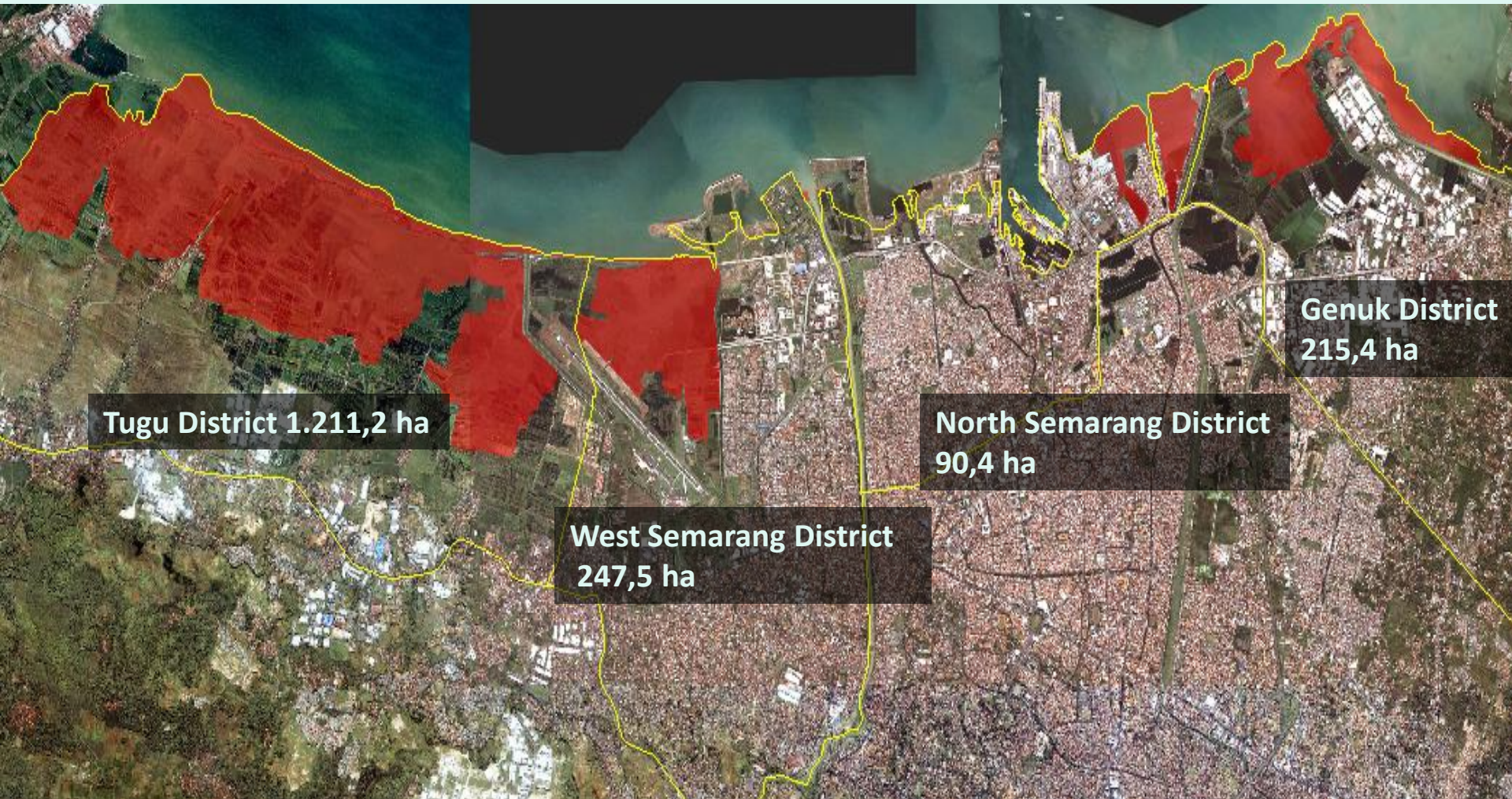


COMBATING FLOOD BECOMES FIRST MID TERM PROGRAM (SAPTA PROGRAM)

.....Do We Know?.....sea level rise 8 mm/year.

Coastal Erosion in Semarang, 1991 to 2009

Coverage area 1,764.5 ha (98.2 ha/year)



$$37360 - 1764 = 35596$$

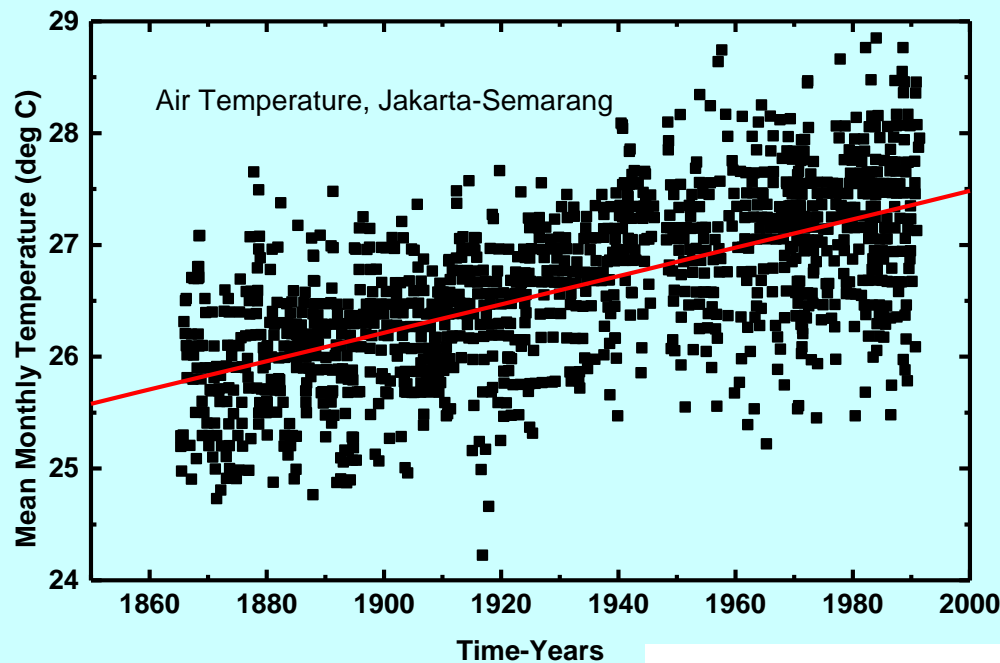
Wanna Proof ?????.....This is the fact.

Coastal line 1991

Tugu District , July 2010

2010.07.09 02:37

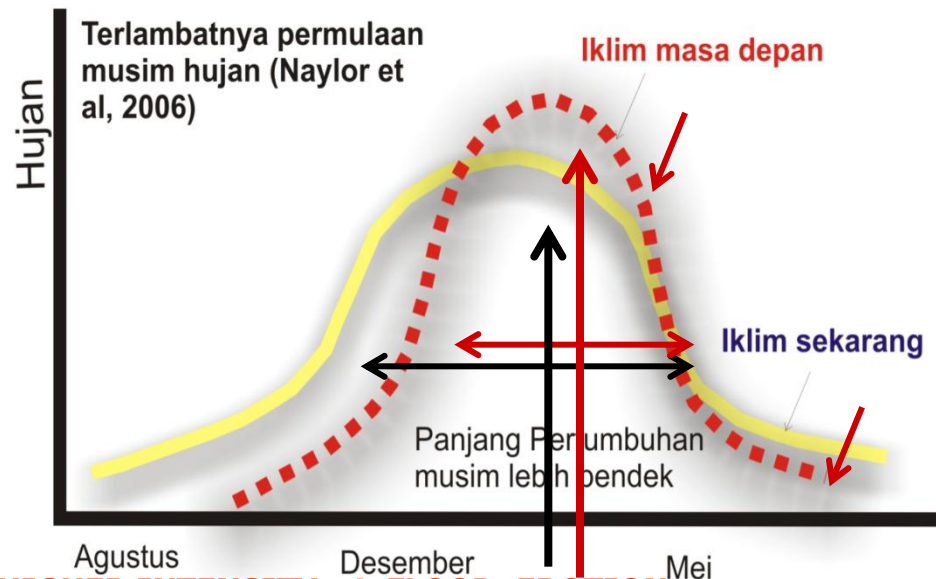




...AND HERE COMES
THE CLIMATE CHANGE

RAIN PATTERN CHANGES IN JAVA DAN
BALI

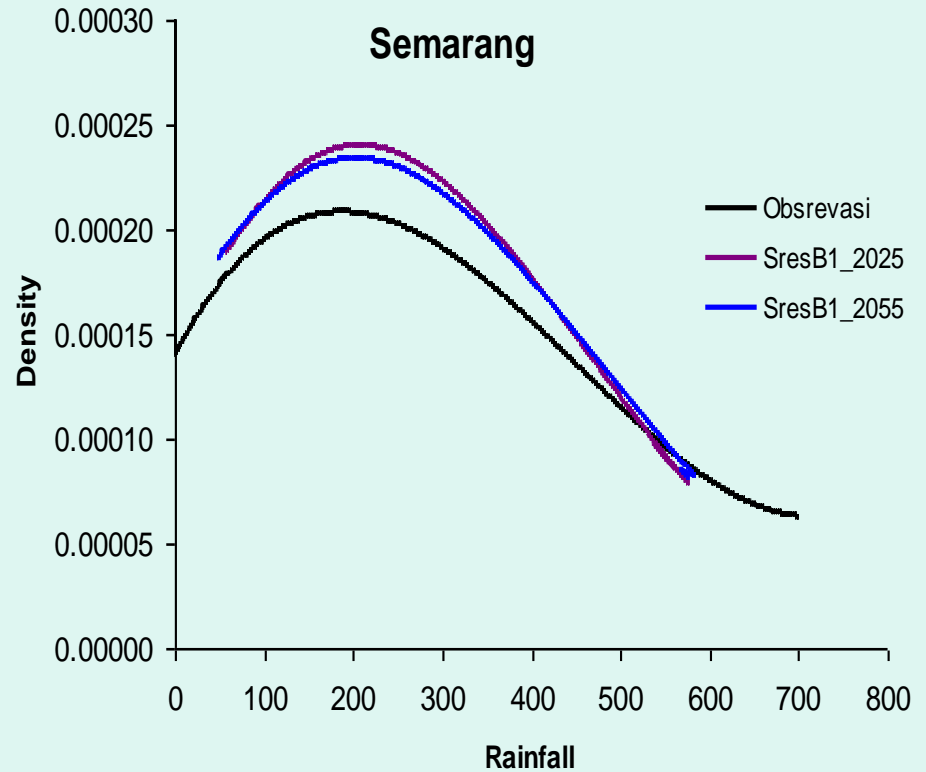
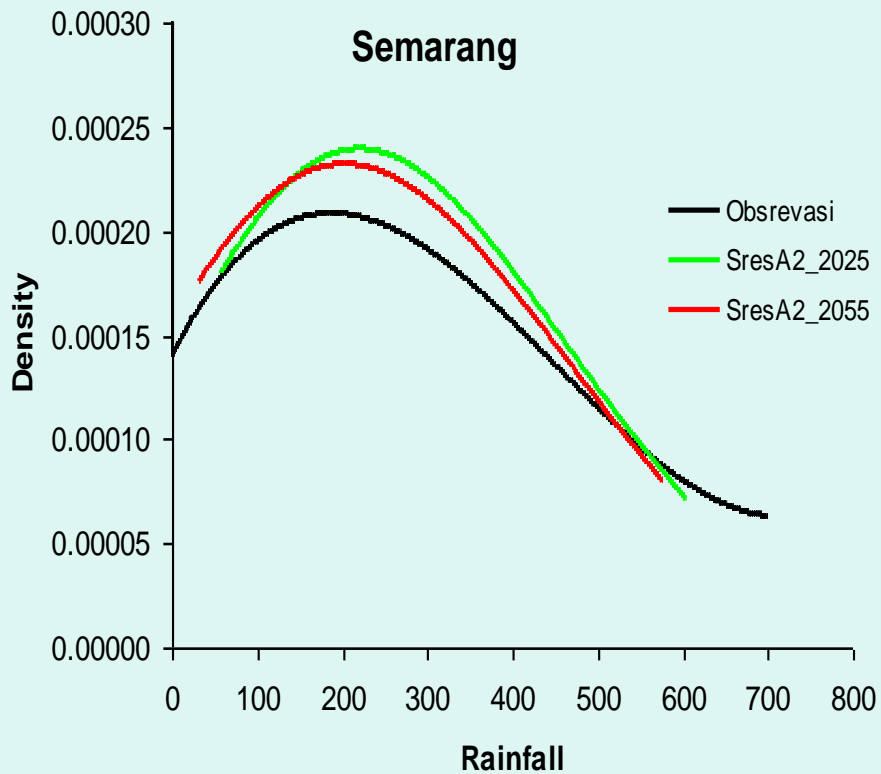
TEMPERATURE INCREASE IN
SEMARANG DAN JAKARTA



SMALLER RAIN SEASON, HIGHER INTENSITY---> FLOOD, EROSION
•LONGER DRY SEASON -----> DRAUGHT, LACK OF WATER SUPPLY

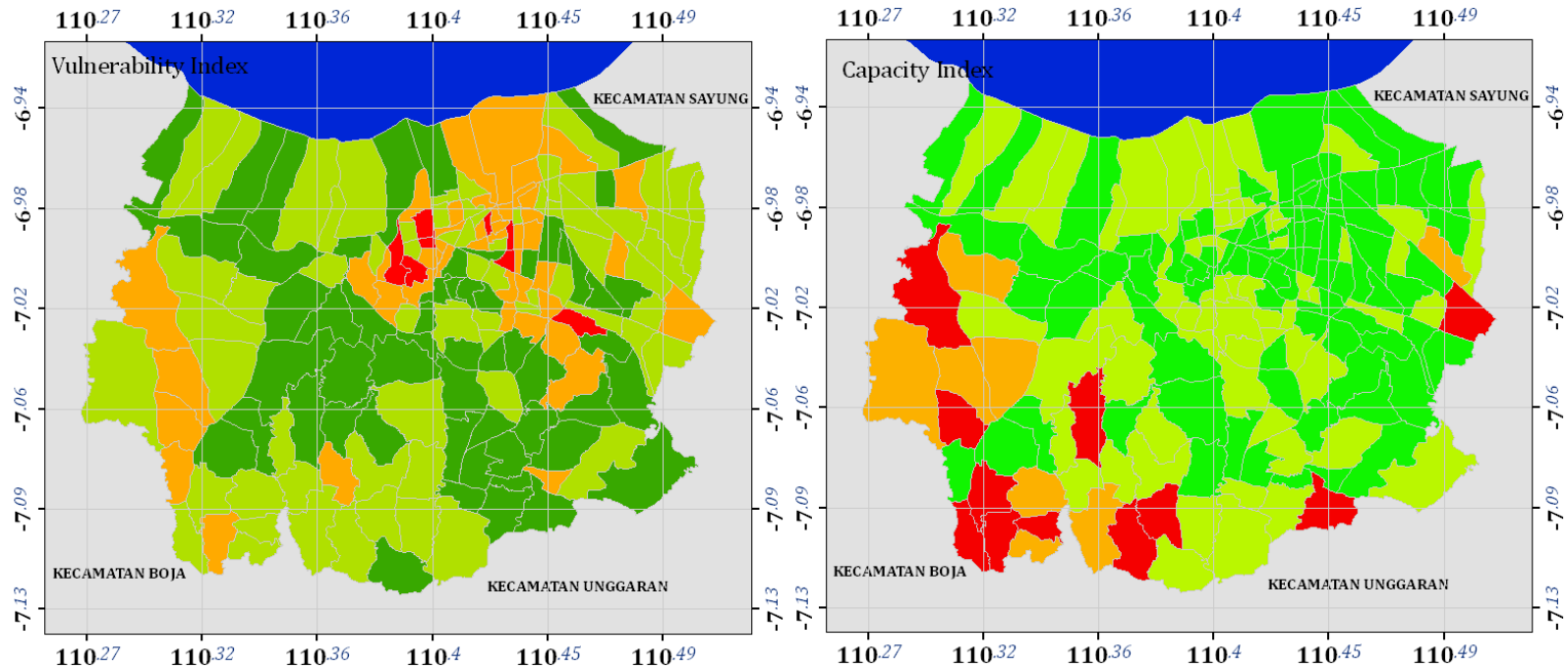
Sumber: Naylor et al (2007)

Monthly Rain Distribution



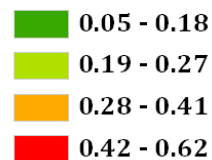
VULNERABILITY INDEX VS CAPACITY INDEX

[INDEX VALUE MAX= 1]

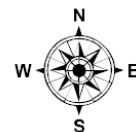
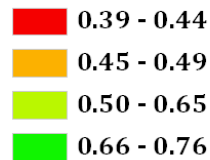


SEMARANG

Vulnerability Index



Capacity Index



0 25 50 100 150 200 km

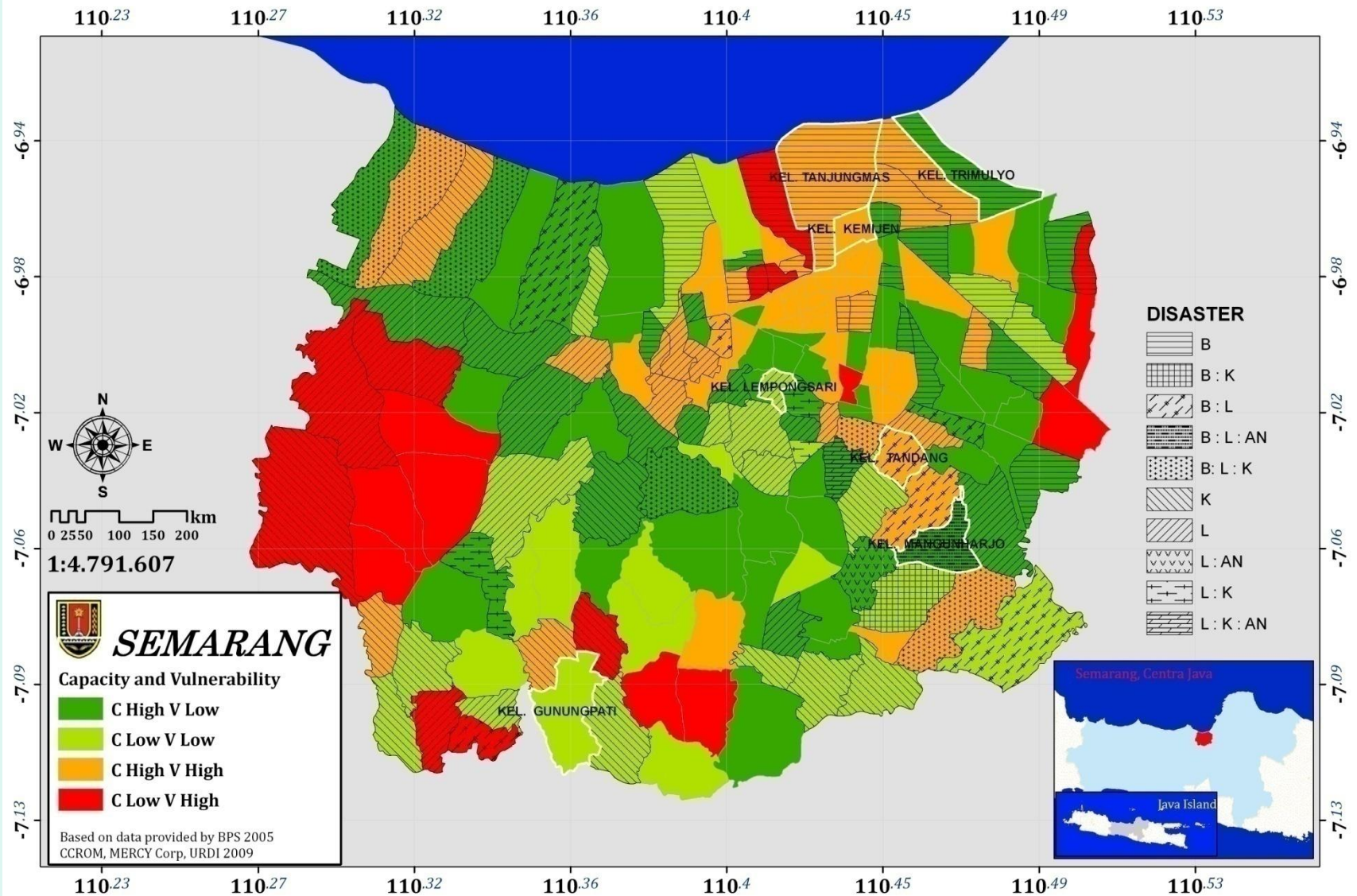
1:33,771 m [A3 size]

Based on data provided by BPS
CCROM, MERCY Corp, URDI 2009

Semarang, Centra Java



VULNERABILITY ANALYSIS (VA)



3. ACTIVITIES TO BUILD CITY RESILIENCE IN SEMARANG through ACCCRN

A. SHARED LEARNING DIALOGUES

WHO ARE INVOLVED? WHAT'S THE ADVANTAGE?
WHAT'S THE CHALLENGE

B. SECTOR STUDIES AND PILOT PROJECTS

HOW'S THE PROCESS OF SELECTION, WHO
IMPLEMENT, WHAT ARE THE STUDIES AND PILOTS
ABOUT

C. CITY RESILIENCE STRATEGY

WHAT'S THE RELEVANCE WITH OTHER GOVERNMENT
PLANS, HOW TO GAIN CITY POLITICAL SUPPORT



SHARED LEARNING DIALOGUE

SLD1: AUGUST 2009 and SLD2: JANUARY 2010

- **PEOPLE INVOLVED:**

MUNICIPAL AGENCIES: ENVIRONMENT, DEVELOPMENT PLANNING BOARD, COMMUNITY DEVELOPMENT, HEALTH, WATER RESOURCES, AGRICULTURAL, TOWN PLANNING, FIRE & DISASTER, METEOROLOGICAL & GEOPHYSIC

PRIVATE SECTORS: WATER SUPPLY, CHAMBER OF COMMERCE, COMPANY,

UNIVERSITIES: UNDIP, UNNES, UNIKA

N G O: “LEPAAS” (COASTAL AREA CONSERVATION), “BINTARI” (ENVIRONMENTAL CONSERVATION)

FACILITATOR: MERCY CORPS, IPB, URDI

OBSERVER: BLITAR

SHARED LEARNING DIALOGUE (SLD)

SLD1: AUGUST 2009 and SLD2: JANUARY 2010

A. RESULTING IN “TOP FOUR” CLIMATE HAZARDS IN SEMARANG

- INUNDATION AND *ROB FLOODING*
- COASTAL EROSION
- DROUGHT
- LANDSLIDE

B. COMMITTED TO ESTABLISH THE “CITY TEAM” ON CLIMATE CHANGE ADAPTATION

- CONSIST OF MUNICIPAL AGENCIES, NGOS, UNIVERSITIES AND PRIVATE SECTORS

C. CONTRIBUTION TO THE FOLLOWING STUDIES ON :

- VULNERABILITY ASSESTMENT,
- COMMUNITY BASED ASSESSMENT
- GOVERNANCE AND INSTITUTIONAL ANALYSIS

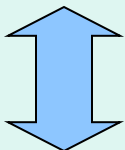
D. DEVELOP PILOT PROJECTS AND IDEAS FOR SECTOR STUDIES

Selected Subdistrict Pilot Project

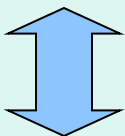
Nu	Project Title	Description
1	COASTAL AREA COMMUNITY ADAPTATION IN <i>TAPAK TUGUREJO</i> (COASTAL EROSION ISSUE, by Bintari NGO)	Constructing used tires sea wall along 100m Mangrove planting, local species and introducing new species (<i>Burguieria sp.</i>). Establish Stakeholder Platform.
2	COMMUNITY BASED HOUSING RENOVATION LOAN IN <i>KEMIJEN</i> (rob flooding, issue by NGO PERDIKAN)	Model of Housing Renovation Loan especially for the Women headed households as the most Vulnerable group.
3	ADAPTATION TO LANDSLIDE IN <i>TANDANG</i> (Landslide issue by P5/Undip)	Hazard and evacuation mapping, disaster information system Reducing landslide by introducing Vertifer Grass
4	ADAPTATION TO DROUGHT and LANDSLIDE IN <i>SUKOREJO</i> (Draught issue by UNNES)	Green Education and campaign Introducing Biopore Greening activities around spring water

ACCCRN activities

ACADEMIC STUDY:
VULNERABILITY AND
CLIMATE CHANGE
IMPACT, THEMATIC
STUDY



SHARED LEARNING
DIALOG AND
WORKSHOPS



ADAPTATION
MODEL: PILOT
PROJECTs

Results

CITY RESILIENCE
PLAN
CITY PROPOSAL
FOR ADAPTATION
ACTIVITIES

VULNERABILITY
IDENTIFICATION
CAPACITY
IDENTIFICATION

MIDTERM
DEVELOPMENT
PLAN, LAND USE
PLAN

NATIONAL

PROVINCE

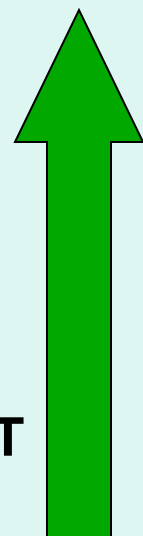
CITY LEVEL

DISTRICT

SUB DISTRICT

NEIGHBOURHOOD

Develop
ment
planning
meeting



ACTIVITIES AGENDA

2011-2016

- **CITY TEAM CAPACITY BUILDING:**
capability to develop ideas of concept notes/ proposals;
- **INTEGRATING Vulnerability Assessment (VA) and City Resilience Study (CRS) INTO MEDIUM TERM DEVELOPMENT PLAN**
- **ORGANIZING PROJECTS: RAINWATER HARVESTING** (\$ 100000 BY THE ROCKEFELLER FOUNDATION)

RAINWATER HARVESTING

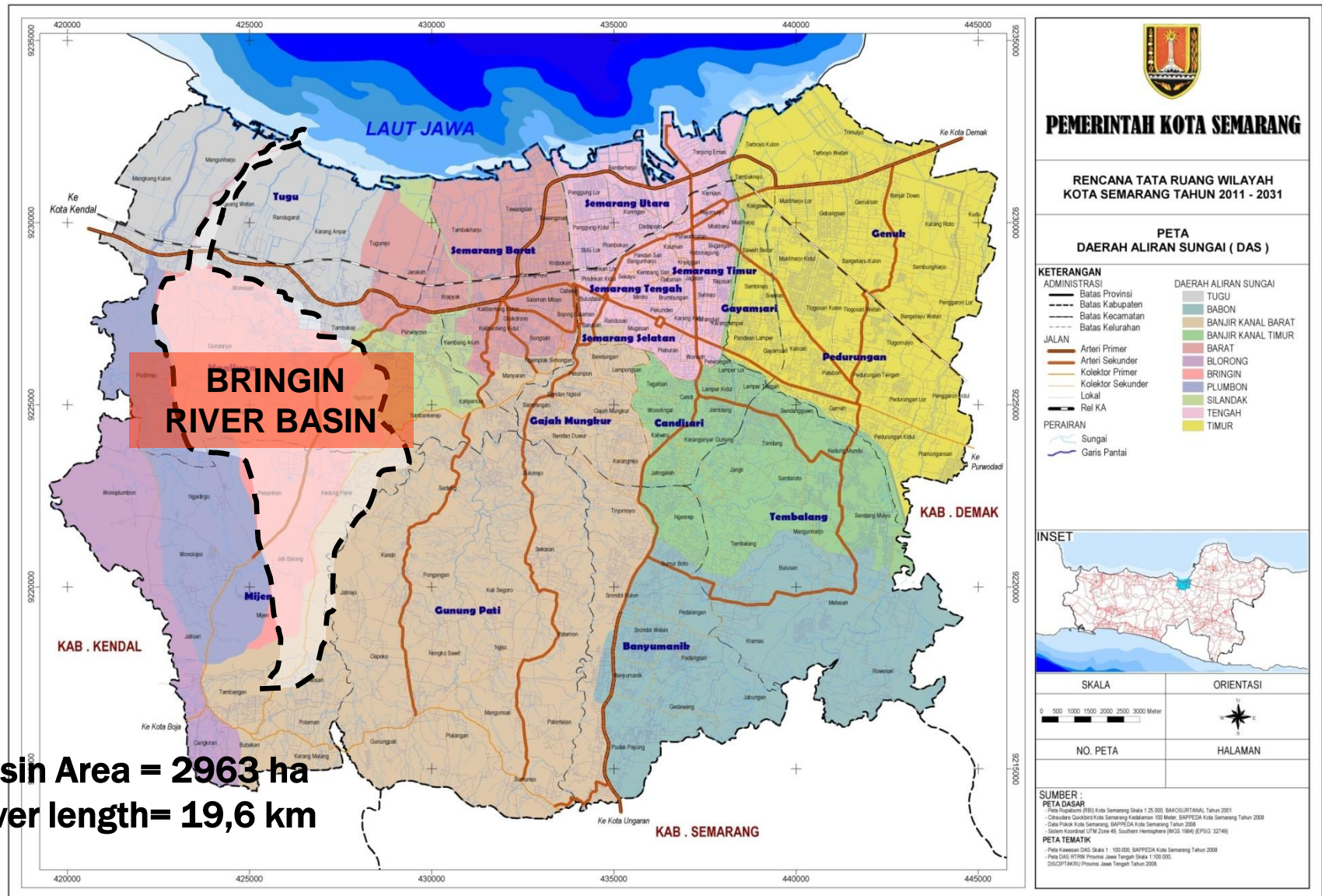


- 2011: 15 RWH household scale and 1 RWH communal scale serving 581 schoolchildren and water supply for 50-60 households (Rockefeller Foundations through ACCCRN Mercycorps)
- 2012: 38 RWH household scale
- 2013: 15 RWH HOUSEHOLD SCALE (improved filtering system)
- 2014: 10 RWH for SCHOOL BUILDING (bigger capacity)

DEVELOP APPROVED CONCEPT NOTES

- **FLOOD EARLY WARNING SYSTEM (FEWS)**
IN BRINGIN RIVER: FLOOD ISSUE
- **ACTIONS CHANGING THE INCIDENCE OF
VECTOR-BORNE ENDEMIC DISEASES
(ACTIVED):** HEALTH ISSUES
- **ENHANCING COASTAL COMMUNITY
RESILIENCE BY STRENGTHENING
ECOSYSTEM SERVICES AND DEVELOPING
ALTERNATIVE LIVELIHOODS IN SEMARANG
CITY (MANGROVE):** COASTAL DAMAGE ISSUE

FLOOD EARLY WARNING SYSTEM (FEWS): Bringin River ACCCRN PROJECT



National Program:

Multi Purpose

Jatibarang Dam

Located in Kreo River, 13 km up distance from Garang Kreo junction, 23 km from outfall

Coverage catchment upstream 53 km² wide including Regency neighbour.

251 Ha land ACQUISITION

Multi Purpose Project:

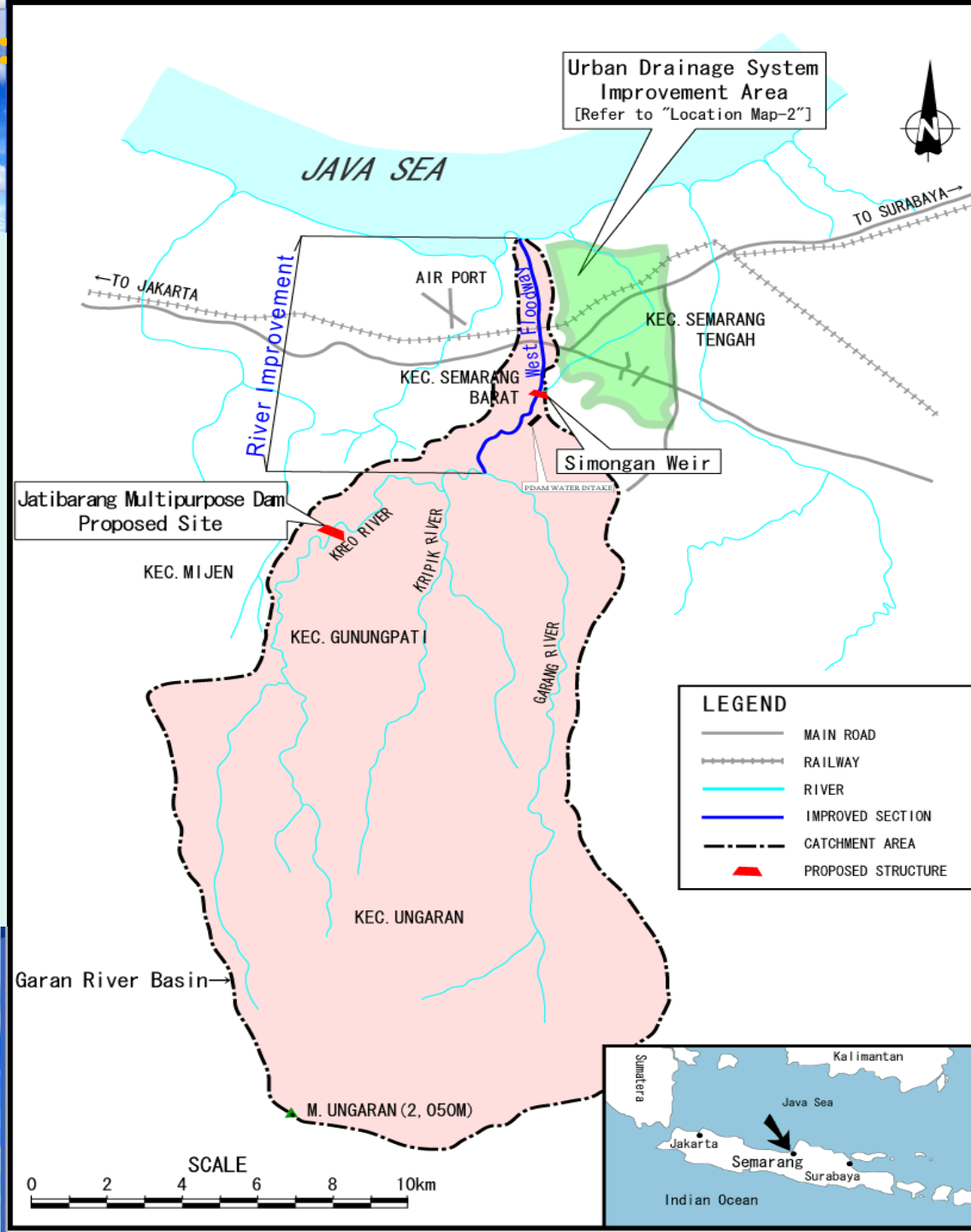
FLOOD CONTROL

WATER SUPPLY 1050 lt/sec

TOURISM

FISHING GROUND

Note: JATIBARANG DAM
proudly say will be
the biggest RWH project in
Semarang



MANGROVE & SEA WALL

2002-2012: RECLAIM 95 Ha of 196 Ha Fishpond Loss in the west area City



CONCEPT NOTES PLAN

(PROPOSED/DESIGNED)

- Urban Farming to Increase Citizens Food Security Resilience (will be proposed to ICCTF)
- Upstream conservation of the Garang river basin through sustainable agro-forestry and micro-credit mechanisms
- Etc.....

Award(s)

- On December 2013, Semarang announced as the group of 33 first of 100 Resilient Cities (100RC) pioneered by RF (the Rockefeller Foundations)

The 33 cities are.....

Ashkelon (Israel) Melbourne (Australia)
Bangkok (Thailand) Kota Meksiko (Meksiko)
Boulder (Amerika Serikat) New Orleans (Amerika Serikat)
Bristol (Inggris Raya) New York City (Amerika Serikat)
Byblos (Libanon) Norfolk (Amerika Serikat)
Christchurch (Selandia Baru) Porto-Alegre (Brazil)
Da Nang (Vietnam) Quito (Ekuador)
Dakar (Senegal) Ramallah (Palestina)
Durban (Afrika Selatan) Rio de Janeiro (Brazil)
El Paso (Amerika Serikat) Roma (Italia)
Glasgow (Inggris Raya) Rotterdam (Belanda)
Jacksonville (Amerika Serikat) San Francisco Bay Area –
Alameda, Berkeley, Oakland, San Francisco (Amerika Serikat)
Los Angeles (Amerika Serikat) Semarang (Indonesia)
Mandalay (Myanmar) Surat (India)
Medellín (Kolumbia) Vejle (Denmark)

4. Key Lessons and Challenges

- Involvement of city actors govt, ngos, univ, private sectors ?
- Political will and leadership
- Implementation of City Resilience Strategy

consistency: that will address city vulnerabilities and be adopted in Medium Term Development Plan

What CITY need to be SUPPORT

- **MAINSTREAMING CC ISSUE INTO ALL DEVELOPMENT SECTORS:** drainage materplan review
- **THE ROLE OF NATIONAL CC BOARD (DNPI)**
- **Developing NETWORKING**
(through City Government Association / APEKSI ?) ICLEI?
- **TO OPEN THE ACCESS BUDGET FROM NATIONAL (ICCTF) TO LOCAL GOVERNMENT OR FOREIGN DONOR COUNTRIES TO THE CITY**
- **GENERATING CSR AS ALTERNATIVE FUNDING RESOURCES**
- **LOCAL WISDOM ELABORATION**



THANK YOU

TERIMA KASIH

