Urban Climate Change Resilience in Semarang - Indonesia

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City Engagement and Key Findings from CC City Team
Presented in
5th High Level Seminar on Environmentally Sustainable Cities
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1. City Context

- Location (map)
- Climate Information
- Demography
- Socio Economic situation (very brief)
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: 
  711,204 - 721,750 = 10,546
- Biggest population on Pedurungan District 157,124 and smallest on Tugu District 25,937
- Age category:
  - children 280,467
  - Productive age 1,018,449
  - Non productive age 126,115
- Population structure by jobs:

- petani 35%
- nelayan 6%
- pengusaha 10%
- buruh 9%
- pedagang 4%
- angkatan civil serv & military 3%
- PNS&ABRI 3%
- Pensiunan 10%
- lainnya 30%
2. Why Semarang Sees URBAN CLIMATE CHANGE RESILIENCE is Relevant

- Overview of Vulnerabilities
- Existing Adaptive Capacities
TIDAL FLOOD AND INUNDATION AREA

Combating flood becomes first mid-term program (SAPTA program)

River Flood Zone
Tidal Flood Zone
River & Tidal Flood Zone

SUB SYSTEM DRAINAGE BRINGIN

JAVA SEA
Kandul Regency
Coastal Erosion in Semarang, 1991 to 2009
Coverage area 1,764.5 ha (98.2 ha/year)

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37360 – 1764 = 35596

...Do We Know?.........sea level rise 8 mm/year.
Wanna Proof ?????.......This is the fact.
TEMPERATURE INCREASE IN SEMARANG DAN JAKARTA

RAIN PATTERN CHANGES IN JAVA DAN BALI

...AND HERE COMES THE CLIMATE CHANGE

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

Monthly Rain Distribution

Semarang

- Observed
- SresA2_2025
- SresA2_2055

Semarang

- Observed
- SresB1_2025
- SresB1_2055
Overview of Vulnerabilities (from VA)

VULNERABILITY INDEX VS CAPACITY INDEX

[INDEX VALUE MAX = 1]
VULNERABILITY ANALYSIS (VA)

SEMARANG
Capacity and Vulnerability
- C High V Low
- C Low V Low
- C High V High
- C Low V High

Based on data provided by BPS 2005
CCROM, MERCY Corp, URDI 2009
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, METEOROGICAL & GEOPHYSIC
PRIVATE SECTORS: WATER SUPPLY, CHAMBER OF COMMERCE, COMPANY,
UNIVERSITIES: UNDIP, UNNES, UNIKA
NGO: “LEPAAS” (COASTAL AREA CONSERVATION), “BINTARI” (ENVIRONMENTAL CONSERVATION)
FACILITATOR: MERCY CORPS, IPB, URDI
OBSERVER: BLITAR
A. RESULTING IN “TOP FOUR” CLIMATE HAZARDS IN SEMARANG
• INUNDATION AND ROB FLOODING
• COASTAL EROSION
• DROUGHT
• LANDSLIDE

B. COMMITED 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 ASSEMENT,
• COMMUNITY BASED ASSESSMENT
• GOVERNANCE AND INSTITUTIONAL ANALYSIS

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

Development 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 BRINGINRIVER: 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

Basin Area = 2963 ha
River length = 19.6 km
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 (Liban) 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