"Adapting to Climate Change Cities in Indonesia

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2nd HLS on Environmentally Sustainable Cities

Kitakyushu, 15-16 March 2011

Introduction
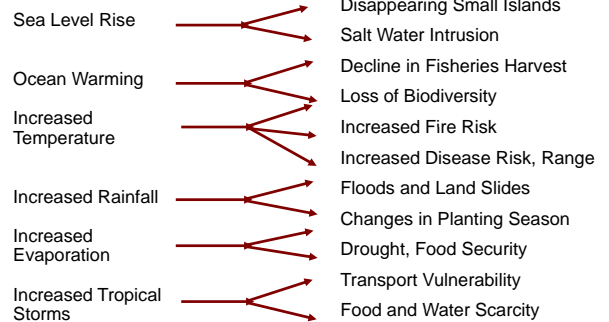

Archipelago of Indonesia

- Indonesia is the largest archipelagic in the world consisting of five major islands and totally more than 17,500 islands
- Population : 222 million people (2006), very high coastal population → 65 % of Java population live in the coastal region
- Indonesia has 5.8 million km^2 with potential coral reef area $\pm$ 61,000 km^2, sea grass of 30,000 km and mangrove forest area 93,000 km^2
- Indonesia consist of 3.1 million km^2 of sea (62% of the total area) and 2 million km^2 of land area with shoreline length of 81.000 km
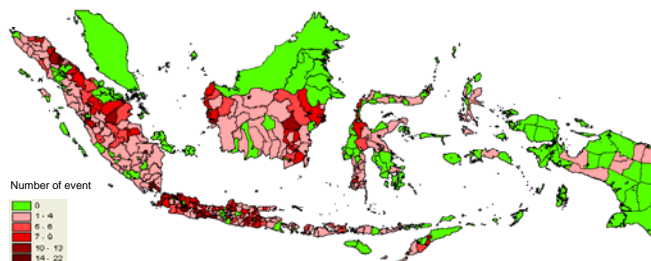

Climate Change Effects

- Sea Level Rise
- Ocean Warming
- Increased Temperature
- Increased Rainfall
- Increased Evaporation
- Increased Tropical Storms

Impacts on Indonesia

- Disappearing Small Islands
- Salt Water Intrusion
- Decline in Fisheries Harvest
- Loss of Biodiversity
- Increased Fire Risk
- Increased Disease Risk, Range
- Floods and Land Slides
- Changes in Planting Season
- Drought, Food Security
- Transport Vulnerability
- Food and Water Scarcity

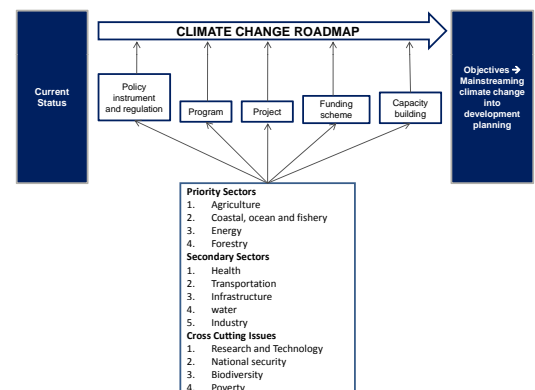## Flood disaster area in Indonesia (District basis)

Number of event

- 0
- 1 - 4
- 5 - 6
- 7 - 9
- 10 - 19
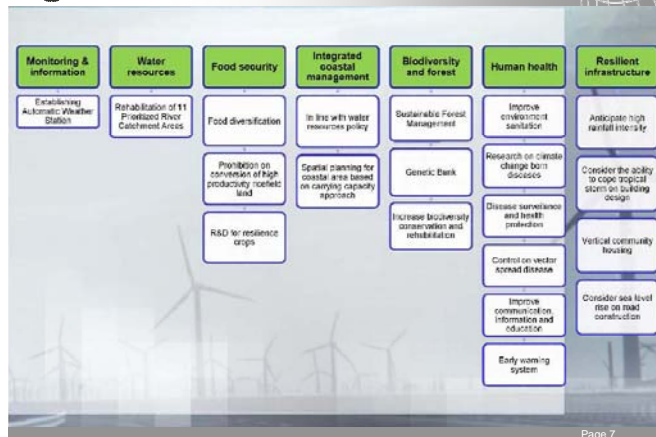- 14 - 22

Disaster data analysis BAKORNAS, 2002-2006

Integrating Climate Change to National Development Planning Process

Current Status

CLIMATE CHANGE ROADMAP

- Policy instrument and regulation
- Program
- Project
- Funding scheme
- Capacity building

Objectives → Mainstreaming climate change into development planning

Priority Sectors
1. Agriculture
2. Coastal, ocean and fishery
3. Energy
4. Forestry

Secondary Sectors
1. Health
2. Transportation
3. Infrastructure
4. water
5. Industry

Cross Cutting Issues
1. Research and Technology
2. National security
3. Biodiversity
4. Poverty

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on-going and planned activities on adaptation ❶

- Development of National climate change adaptation policies and programs (regulation, institutional, actions)
  - Develop the Ministerial Decree concerning climate change Adaptation based on UU 32/2009
  - Transfer of knowledge for local stakeholders
  - Develop materials for capacity building
  - Assist local government on adaptation action/strategies
  - Conduct public consultation in relation to integrate climate change issue into local action plan
  - Restoration on river basin/Water catchment areas.
  - Spatial Planning based on Ecosystem and Strategic Environmental Assessment (KLHS).
  - Mangrove Rehabilitation on coastal areas.
- Develop the Ministerial Decree Concerning Green building
  - Dissemination of regulation
  - Development of Green Building policy
  - Develop technical criteria for certification
- Utilization livestock manure to biogas as a new source of energy:
  - Enhance river water quality
  - Increase community's income
- Vulnerability and adaptation assessment
  - Lombok-Nusa Tenggara barat (tentative: will be completed on March 2009)
  - Tarakan District-East Borneon and South Sumatera (replication of V&A assessment in Lombok)
  - Development of adaptation assessment map in Indonesia
  - Climate change adaptation assessment on health sector through using medicines traditional.
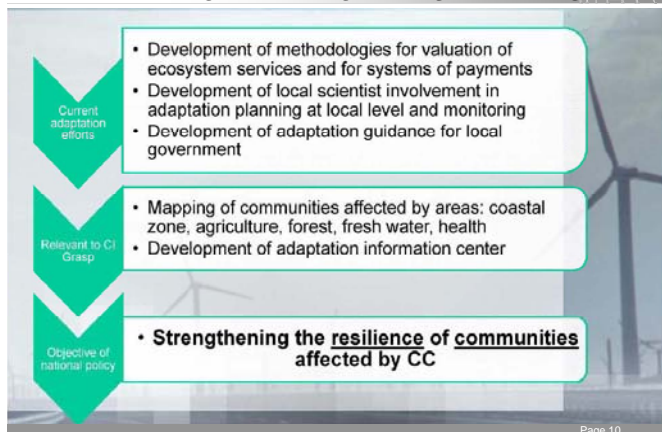
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on-going and planned activities on adaptation ❷

- "Kampung Iklim" program
  - Develop concept and priority criteria on "Kampung Iklim"
  - Coordination Meetings and ground check
  - Election for the location where the project will be implemented
  - Identification and planning on the needs of mitigation and adaptation efforts to the location
  - Public consultation for "Kampung Iklim" program planning in its location.
- Development of vulnerability to climate change index (Vulnerability Index-VI)
  - Stocktaking the vulnerability and adaptation assessments in Indonesia (previous, on-going, and planned assessments)
  - Technical assistance/support on the on-going and planned V&A assessment → areas representing Indonesia territory (Tarakan-East Kalimantan, South Sumatera, Molluccas and Papua, Java, Sulawesi)
  - Development of VI-concept, taking into consideration different approaches such as multi-criteria approach, development of parameters/measures/criteria
- Establishment of data base and information systems related to adaptation and vulnerability issues in Indonesia [relevant to CI Grasp]
- Setting up Adaptation Regional Center under UNFCCC (as party's proposal)
  - As data center, research and assessment, set up strategy and policy concerning adaptation from party to UNFCCC.

Current adaptation efforts	• Development of methodologies for valuation of ecosystem services and for systems of payments • Development of local scientist involvement in adaptation planning at local level and monitoring • Development of adaptation guidance for local government
Relevant to CI Grasp	• Mapping of communities affected by areas: coastal zone, agriculture, forest, fresh water, health • Development of adaptation information center
Objective of national policy	• **Strengthening the <u>resilience</u> of <u>communities</u> affected by CC**
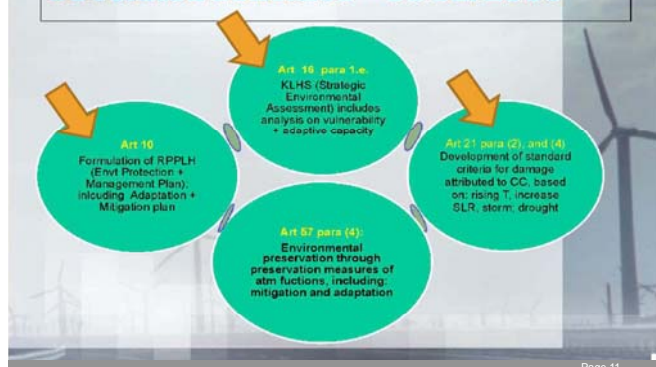
SOME MILESTONES – RELEVANT TO VULNERABILITY
INPRES (PRESIDENTIAL INSTRUCTION) NO. 1/ 2010

- Identified CC vulnerability parameters in coastal areas, terrestrial ecosystem (that impact to flood and landslides)
- Identified CC vulnerability parameters of Lombok Island, in agriculture, water resources, sea level rise, climatic-extreme events, rainfall temperature;
- Composed draft of standard criteria for damage caused by climate change;
- Composed vulnerability map for sea waves, flood and landslides of Java Island, Sumatera, and Kalimantan;

SCOPE OF STUDY/ ASSESSMENT: IMPORTANT MILESTONES
will be elaborated further in the discussion

- ✖ **Climate Trend analysis and its projection**
- ✖ **SLR trend analysis and its projection**
- ✖ Development of Adaptation options
- ✖ Establishment of adaptation actions/activities
- ✖ **Integration into RPJMD** - Mid-Term Regional/Local Development Plan

LESSONS LEARNED

- **How "to do" mainstreaming of climate change in development policy**, namely the integration of risk assessment and climate change adaptation into RPJMD West Nusa Tenggara Province
- The study shows that **the formulation of adaptation strategies are more appropriate when they are preceded by a Risk Assessment** so as to avoid under- over- or mal-adaptation

LESSONS LEARNED

- **The Adaptation Strategy formulated for each relevant sector** (then further elaborated into the program and adaptation activities) **must be integrated into the strategic plan** of each Department, including Department of Irrigation, Agriculture, Department of Marine and Fisheries and also various other related Agencies
- On the basis of this study was compiled the Ministry of Environment's Draft Regulation on Implementation of Control Policy in the Regional Impacts of Climate Change

Lessons Learned from Lombok

- **High quality long-term climate data** are difficult to find, whereas they are fundamental for detecting the actual climate change

- Simple **climate projection method based on outputs of IPCC AR-4 models** can provide information on possible trend of averaged rainfall and temperature but estimation of extreme events will require more much efforts

- The **hazard of current climate variability** is more obvious and there is more sound know-how to foresee

Moving to "replication" in Tarakan and Sumsel

- **"Replication" maybe more complicated that it sounds,** at least for Tarakan, because we are doing "micro scale", and Sumatera Selatan because the area is too large to be considered as a single point

- **Resolving temporal variation and extreme events** is more important for Tarakan

- **Resolving spatial variation is more important** in Sumatera Selatan

- *…..so there are always new challenges*

Concluding remarks

- Climate analysis and projection must be carried out to provide a science basis for risk and adaptation assessment to climate change

- It maybe difficult to develop a uniform method for climate analysis and projection in Indonesia but we may be able to define the basic principles and guidelines

- The works for Tarakan and Sumatera Selatan is on progress