

Impacts of Climate Change on Water Resources and Cooperation Possibilities

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Workshop on Water and Spatial Planning in a
Changing World due to Climate Change
21 January 2009

Outline

- Climate change impact to water sector
- Current efforts
- Challenges
- cooperation possibilities

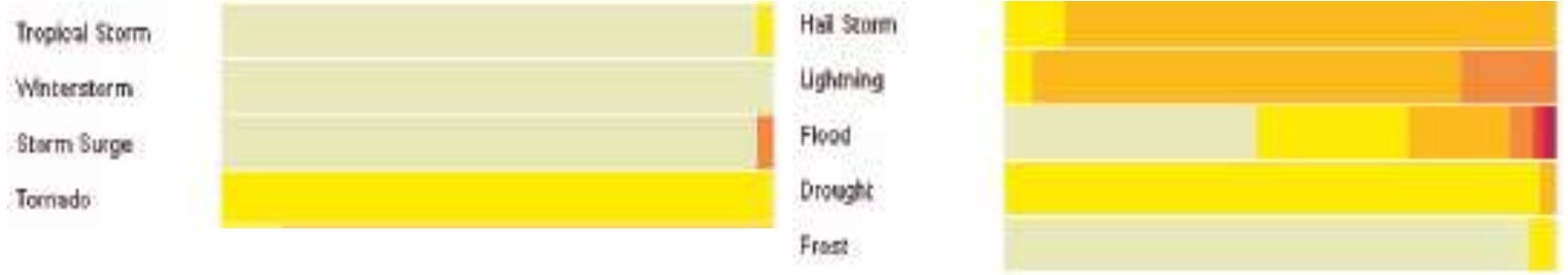
primary effects of climate change in Indonesia

- Temperature Increases;
 - a significant increase in maximum and minimum temperature was observed in most of stations.
 - The highest rate of minimum temperature changes: observed in Polonia-Medan (0.172°C per year)
 - maximum temperature changes: observed in Denpasar (0.087°C per year).
 - Average the rate of changes of temperature over the 33 stations in minimum: 0.047°C and maximum: 0.017°C
- Changes in Levels and Distribution of Rainfall;
 - decreasing trend of annual rainfall accumulation during last decades (except in Lesser Sunda Islands and an eastern coast of Java).
 - southern part of Indonesia (South Sumatra, Java and Eastern Indonesia): wet season tended to increase, while dry season rainfall tended to decrease.
 - northern part of Indonesia (e.g. Sumatra), both seasonal rainfall showed a slight increase.

primary effects of climate change in Indonesia

- Storm Intensity Increases;
 - Sea Level Rise;
 - Changes in Coastal/Ocean Characteristics
- Storm Intensity Increases;
 - 65 stations: increasing trend in MSL has been observed
 - Sea level rise will accelerate wide spread of coastal erosion where the land border has been subsiding.
 - *Rob phenomenon* in Demak: inundation of coastal area during spring tide since 1995.
 - affected > 650 ha of coastal areas
 - damages infrastructures (roads, railways)
→ create problem for transportation and economy

Degree of exposure to natural hazards and percentage of area affected (UN-OCHA, 2006)



The bar charts show the degree of exposure to natural hazards and the percentage of area affected none very high

Current efforts

- **Regulations**

- Presidential Regulation concerning the environmental restoration of Cliwung river catchments area, Jakarta Bay
- National Action Plan Addressing Climate Change

- **Environmental Programs**

- “National Declaration on Effective Water Management in addressing Disaster” signed by eleven ministries under coordination of Coordinator Ministry of People Welfare at the Global Water Day XII in 2004
- National Partnership Movement to save Water (GN-KPA) announced by President on 28 April 2005 in essence cover 6 strategic component:
 - (1) Spatial Planning, physical development, land and population;
 - (2) forest and land rehabilitation along with water conservation;
 - (3) Control of damaging by water ;
 - (4) management of water quality and water pollution control;
 - (5) consumption saving and management of water demand; and
 - (6) utilization of water resource in a fair, efficient and sustainable way.
- Ministry of Marine Affairs and Fishery with the local government has been implementing some a number of activities to mitigate the impacts of climate change in the coastal areas, i.e. rehabilitation of mangrove areas, coastal sediment stabilization, and construction of pile-house.

- Rapid Assessment (landslide, flood, mapping)
- Pilot project VA assessment in Lombok island
- Clean river Program
- Industrial rating program
- Biopore
- Toward Green Indonesia (MIH) & Aforestation (National forest and land rehabilitation)
- Water Conservation (Watershed Management, Absorption Well , Reservoir)
- Forest Fire Master Plan Poverty Derivation land clearing without burning ⇨ such as: government will supply fertilizer and contribute good quality seed) → Education for Farmer
- Peatland management
- Integrated coastal management
- Flood Management
- Reconstruction/redesign of irrigation → Agriculture
- Encouraging CDM Project increase by sectoral approach
- Development of Green Building Concept

Strategic Challenges

- Capability **improvement on climate/ weather prediction** and establishment of **information flow mechanism** that lead to increased communities' **adaptive capacity** and **proactive attitude** in reducing climate risks.
- **“ Robust V&A assessments** are needed to enable more informed adaptation planning and policy decision“

Challenging research activities

- Increase our understanding on:
 - (regional) **variations**, including those caused by non-uniform patterns of temperature and salinity changes in the ocean.
 - **Effect** of large-scale **water extraction** or **compaction of peatlands** to **SLR**;
 - **Development of various methods and tools**, including regional climate models, that appropriate for application in different conditions in Indonesia;
- More research/ assessment on **Socio-economic analysis**
- Understanding more on **how and to what extent rainfall** contribute to slope movement
- **Projections for future El Niño variability** and the state of the Pacific Ocean for regional climate change projections throughout the tropics and in North America

Challenges

Adaptation to Climate Change in Water resources Sector

Supply adaptation

- modification of existing physical infrastructure;
- construction of new infrastructure; and
- alternative management of the existing water supply systems

Demand adaptation

- conservation and improved efficiency;
- technological change; and
- market/price-driven transfers to other activities

urgent needs (1)

- Development of spatial planning based on environmental carrying capacity with climate change consideration
- Enhance the capacity on weather/climate prediction and information flow (for reducing the climate risks, particularly in the vulnerable communities such as farmers and fishermans)
- Enhance the public awareness
- Establishment of Information Center on Climate Change
 - GHG inventory
 - Clearing house/ web-site portal
- Training:
 - Decision maker in each sector/institution/departement
- Enhance the coordination on climate change integration into sector/department policies (close coordination with Bappenas, Finance Dept)

urgent needs (2)

- Revitalization all policies related to climate change
- Updating the RAN-PI (based on current climate study);
- Restructurization of information services
- Study/assessment on climate change:
 - GHG inventory (local emission factor);
 - Social-economic aspects
- Methods and tools development

Possibility for bilateral cooperation

Demonstration projects

- Replication of VA assessment in other selected local areas in Indonesia
- Potential location for cities to exchange experiences in the areas of spatial planning and water management
 - Kab. Sragen or other local governments which have high commitment
 - upstream of Bengawan Solo (current condition: high degraded; routine flood occurs)
- Development of Mitigation and Adaptation in low-areas;
- Demonstration project for climate-friendly city development (e.g. Jakarta, Solo, etc.)
- Biogas project development and waste management → to be considered for CDM project development
- Rehabilitation and reforestation program → potential tourism

Capacity building and transfer technology

- Institutional strengthening, also in cooperation between institutions
- Joined development, training and implementation → for spatial planning and water management and climate;
- Governance, cooperation with NGOs
- Legal and policy development → review existing regulation and policies on water management (inclusion of climate change consideration into existing regulation)

Other possible bilateral Cooperation

- Cooperation on Water Quality and Quantity Monitoring and Evaluation System Development
- Cooperation on Institutional (Community, Private and Public) Capacity Building Development
- Cooperation on Spatial Planning System related to Water Conservation and Climate Change
- Cooperation on Peatland Conservation at the Low Land Area
- Cooperation on Developing Action Plan on River and Lake Priority

A pair of hands is shown from a low angle, cupping a small, vibrant green seedling with several leaves and a small amount of dark soil. The background is a bright blue sky with scattered white clouds. The overall mood is one of hope and care.

Thank you

and have a good day.....

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