Utilizing information from space-borne sensors for climate risk management

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Climate Variable
- temperature
- precipitation
- humidity

Change to Climate Variable

Impact
- hazards
- environment
- people
- elements at risk

Risk

INITIATIVES
Modeling regional climate change
Early warning systems
Dynamic downscaling of future climate projections for Thailand

- Hat Yai & Chiang Rai
- Input to flood management, agriculture, tourism planning
- Use-defined temporal resolution
- Felt need: DEM to generate impact scenarios
Rainfall in Hat Yai, Thailand

2000–2009

%change

2010–2019

2020–2029

2030–2039

%change

%change

%change
Flood Forecasting & Early Warning Systems

- Hydrological observation
  - ground observation
  - satellite observation

- Flood monitoring
  - monitoring system
  - flood model

- Flood early warning
  - local risk assessments
  - SOPs, exercise
  - downscaling, CC impacts assessment

Safer communities and sustainable development through disaster risk reduction
Flood Modelling System

- Observed
- DEM, river, soil land use
- Climate model
- Forecast/Modeled
- GIS
- Output
- inundation map, risk map

Hydrological Model

Rainfall
Flood Forecasting and Warning System for Semarang, Indonesia

Initial conditions and corresponding project activities:

• Bringin river – no measuring stations for rainfall, river level, stream flow; no river model; no DEM; no flood risk map ➔ installed “automated” gauges, data collection, model development and callibration

• Satellite data for tidal forecast, no coastal inundation model ➔ model development

• Flash flood at slope, riverine flood at the flood plain, tidal inundation at the sea ➔ EWS development

• General understanding that climate change will increase precipitation ➔ ???
Utility of space technology

• Digital elevation model, digital terrain model
• Images for change detection
• Generation of hazard map, land use map
• Telemetry, SMS for telemetry, GPS for positioning of measuring stations
• Possibility: gridded precipitation values that combine gauge and satellite measurement (e.g. Global Precipitation Climatology Project)