

# The Trifecta: Climate Change, Urbanization, Water Supply



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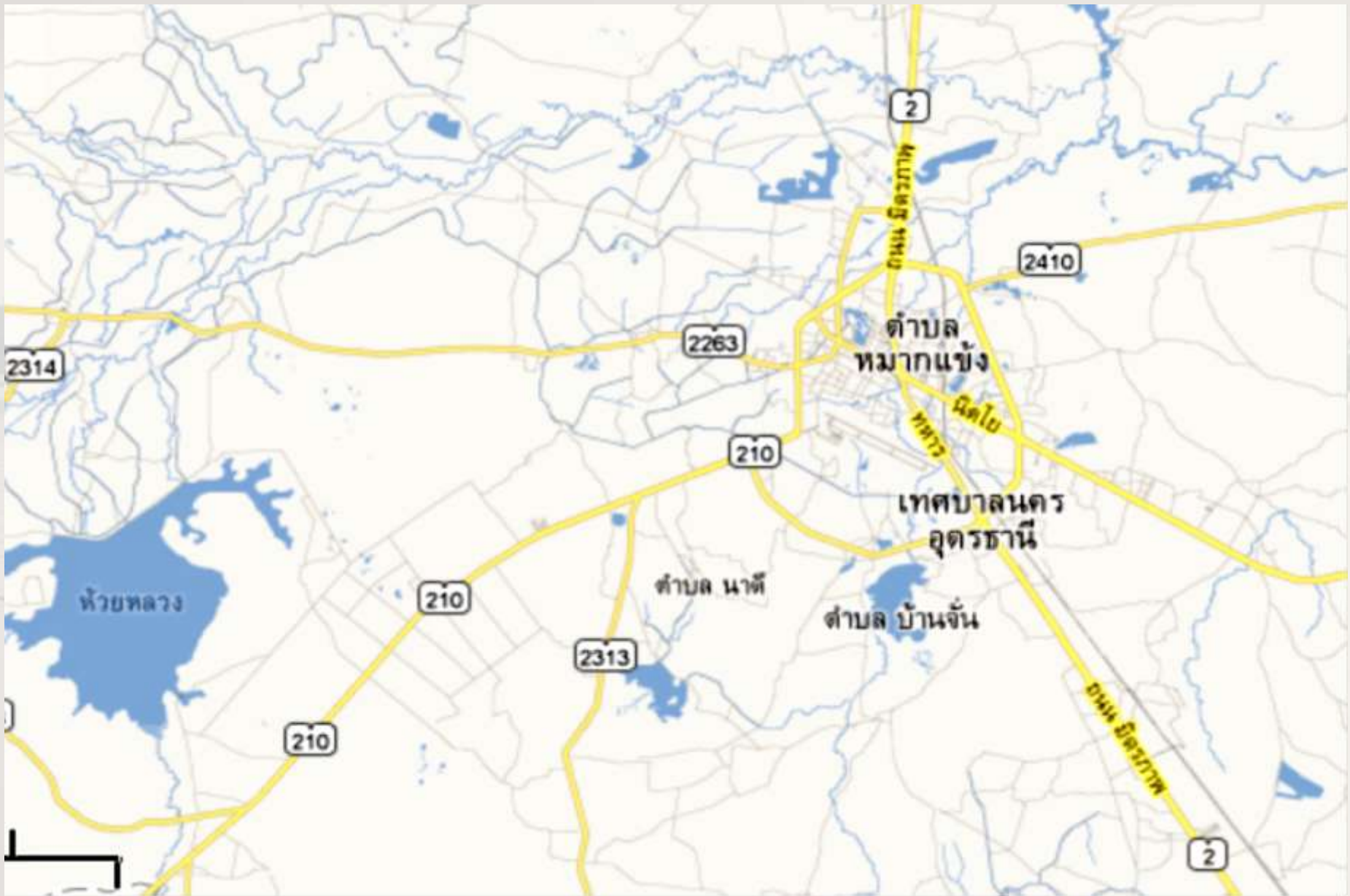
Mekong-Building Climate Resilience in Asian Cities (M-BRACE)

Asia-Pacific Climate Change Adaptation Forum | 1 October 2014

# Why Udon Thani?



- Rapid urbanization
- Climate change
- Experiences flood and drought
- Limited and/or deteriorating water sources
- Institutional challenges limit long-term planning

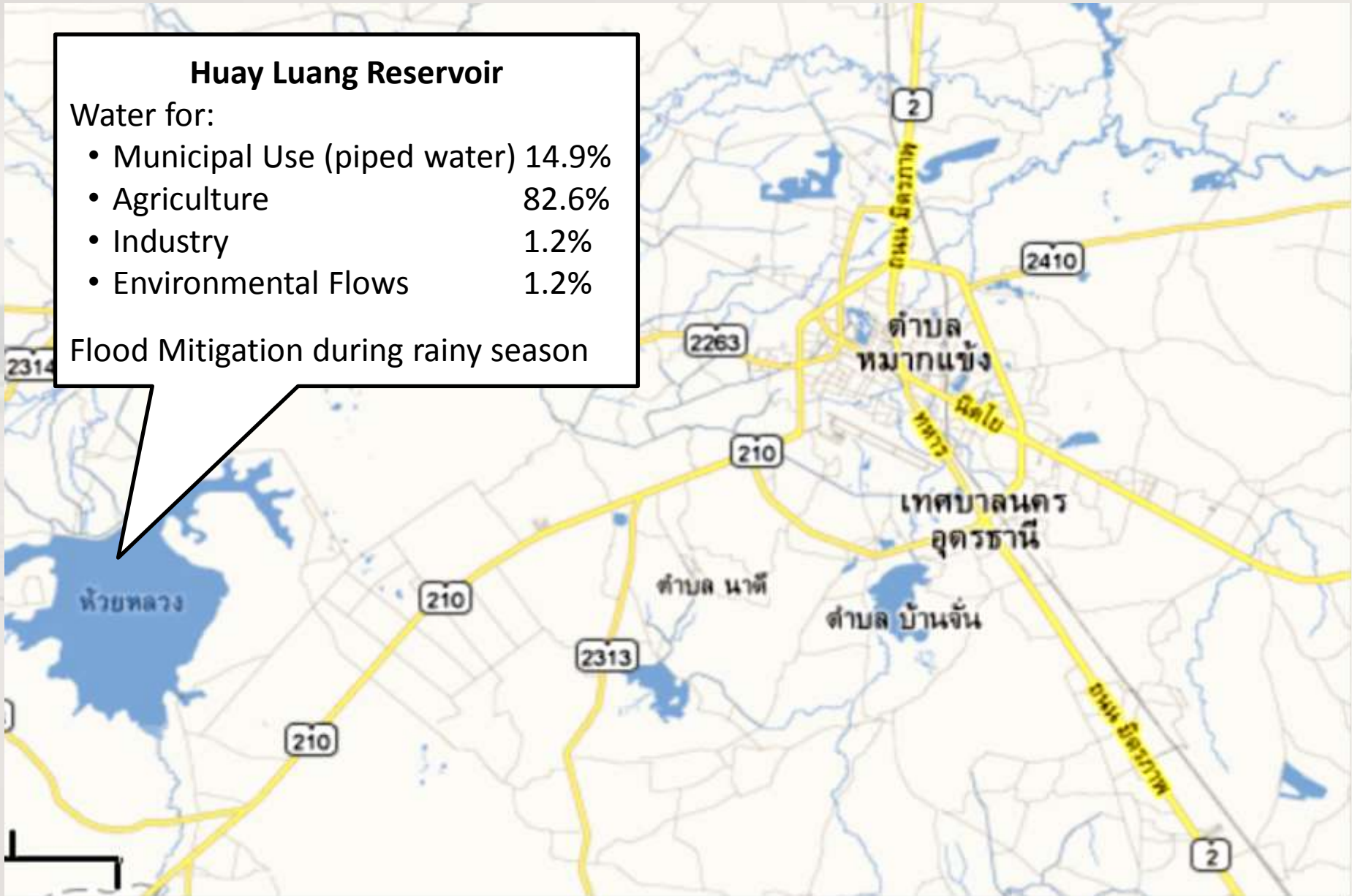


## Huay Luang Reservoir

Water for:

- Municipal Use (piped water) 14.9%
- Agriculture 82.6%
- Industry 1.2%
- Environmental Flows 1.2%

Flood Mitigation during rainy season



## Huay Luang Reservoir

Water for:

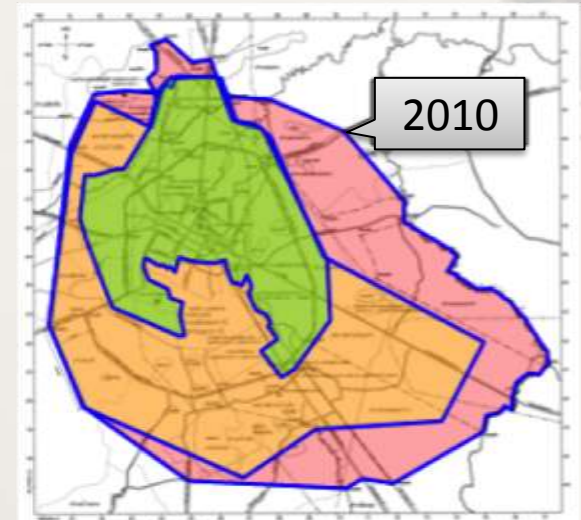
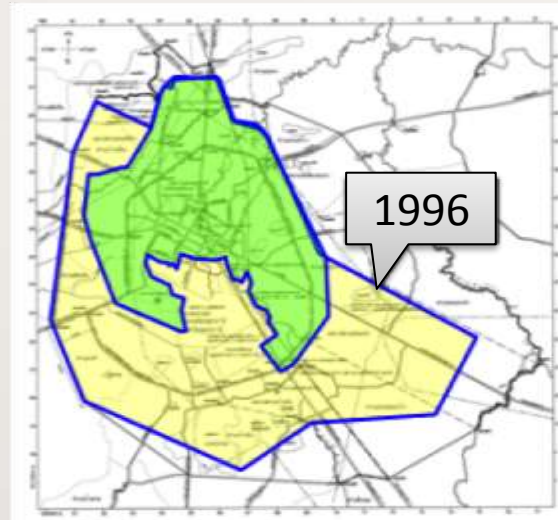
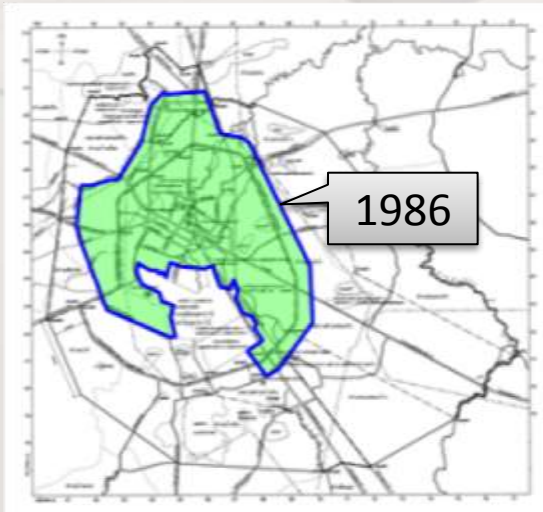
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Flood Mitigation during rainy season

**Small Water Bodies**  
Local Agriculture Use  
Local Home Use  
Environment

# Urbanization

- Population growth
- Economic development
- Growth of urban area
- Industrial parks
- Potash mine



# Impacts on Water Supply

- Population Growth
- Economic Development
- Industrial Parks
- Potash Mine
- Growth of Urban Area
- Increased municipal demand
- Switch to municipal (piped) supply
- Increased municipal demand
- Pollution of water sources
- Loss of local water sources
  - In-Filling
  - Pollution
- Greater flood risks

# Nong Dae

- 900 Rai (144 Hectares)
- Before
  - Wetlands
  - Water Supply for Nearby Communities
- Now
  - In-filled for housing development and convention center
  - New residents connect to municipal supply (Huay Luang)
  - Wastewater pollution degrading water supply
  - Old residents connecting to municipal supply (Huay Luang)
  - New flooding in neighboring communities



## Huay Luang Reservoir

Water for:

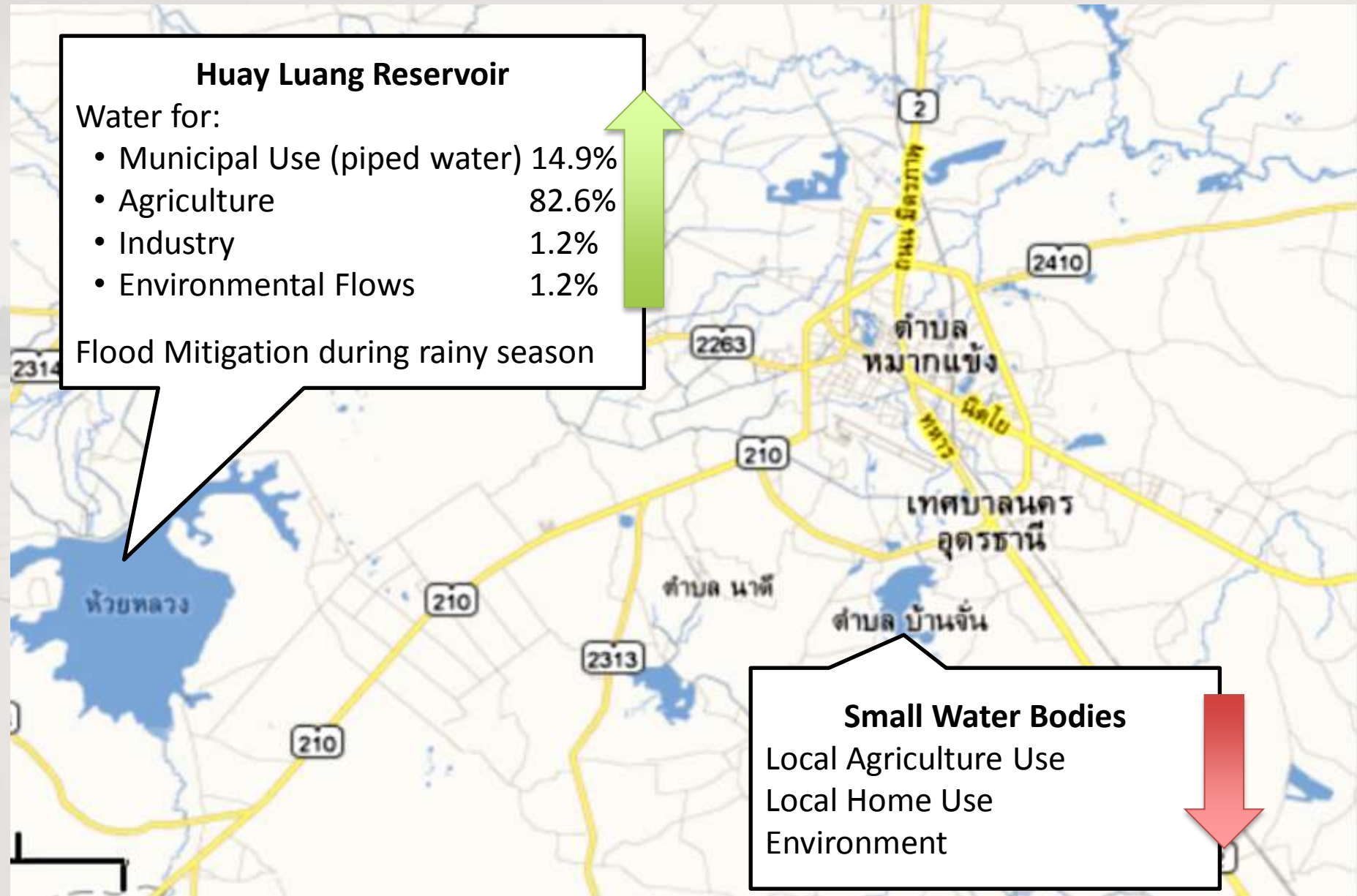
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## Small Water Bodies

- Local Agriculture Use
- Local Home Use
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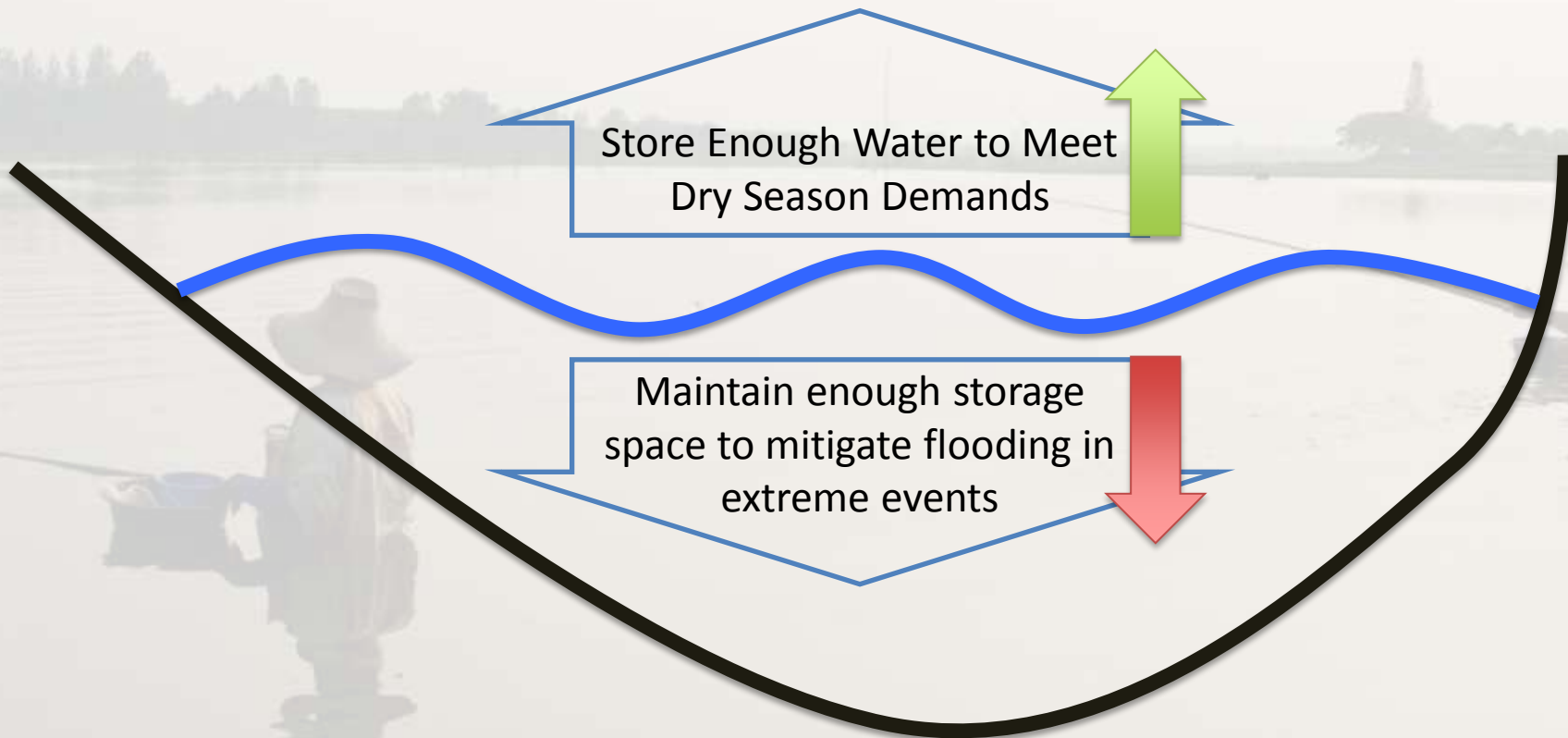


# Management at Huay Luang Reservoir

Store Enough Water to Meet  
Dry Season Demands

Maintain enough storage  
space to mitigate flooding in  
extreme events

# Management at Huay Luang Reservoir



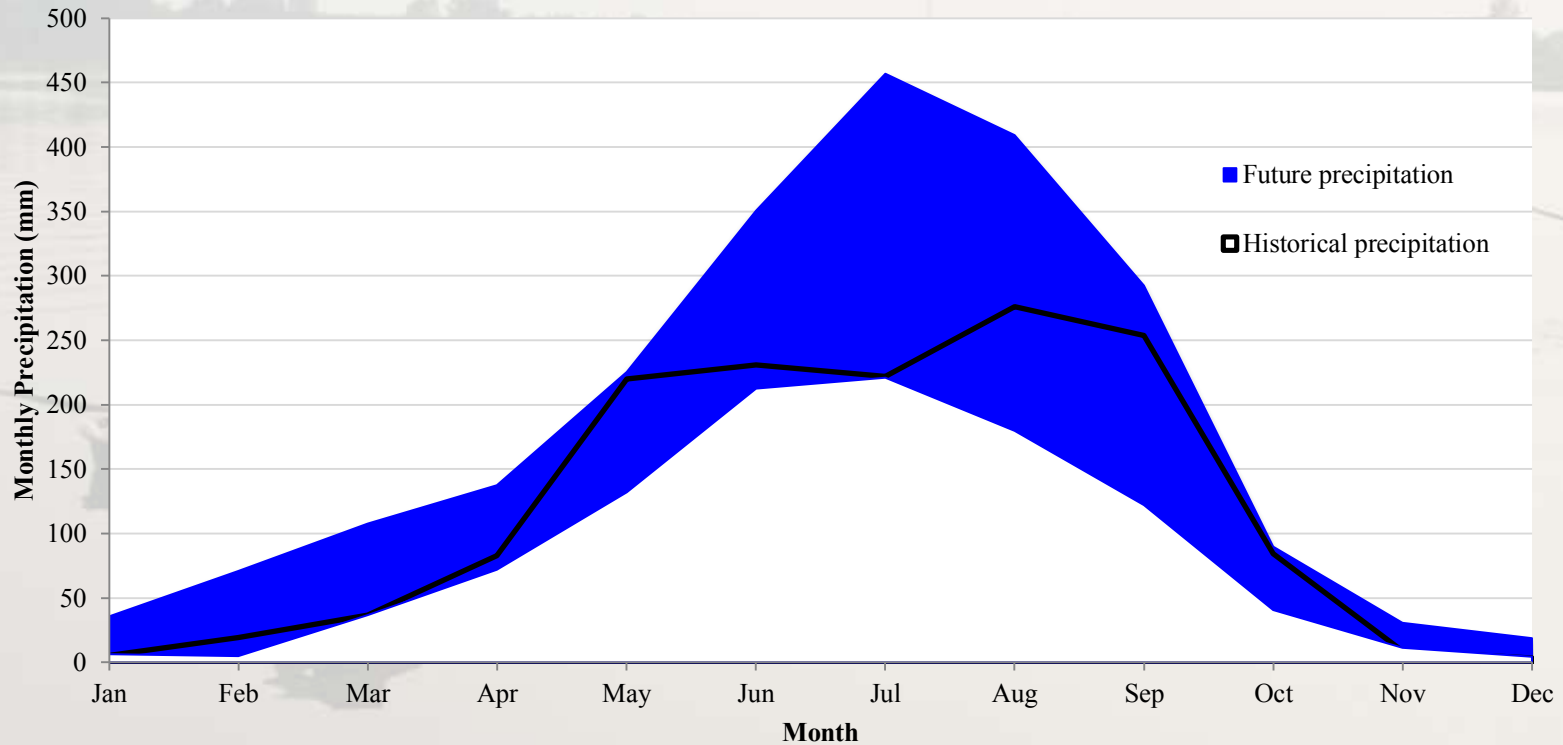
# Hierarchy of Uses Depleting Water

- Municipal Use
- Environmental
- Agriculture
- Industry



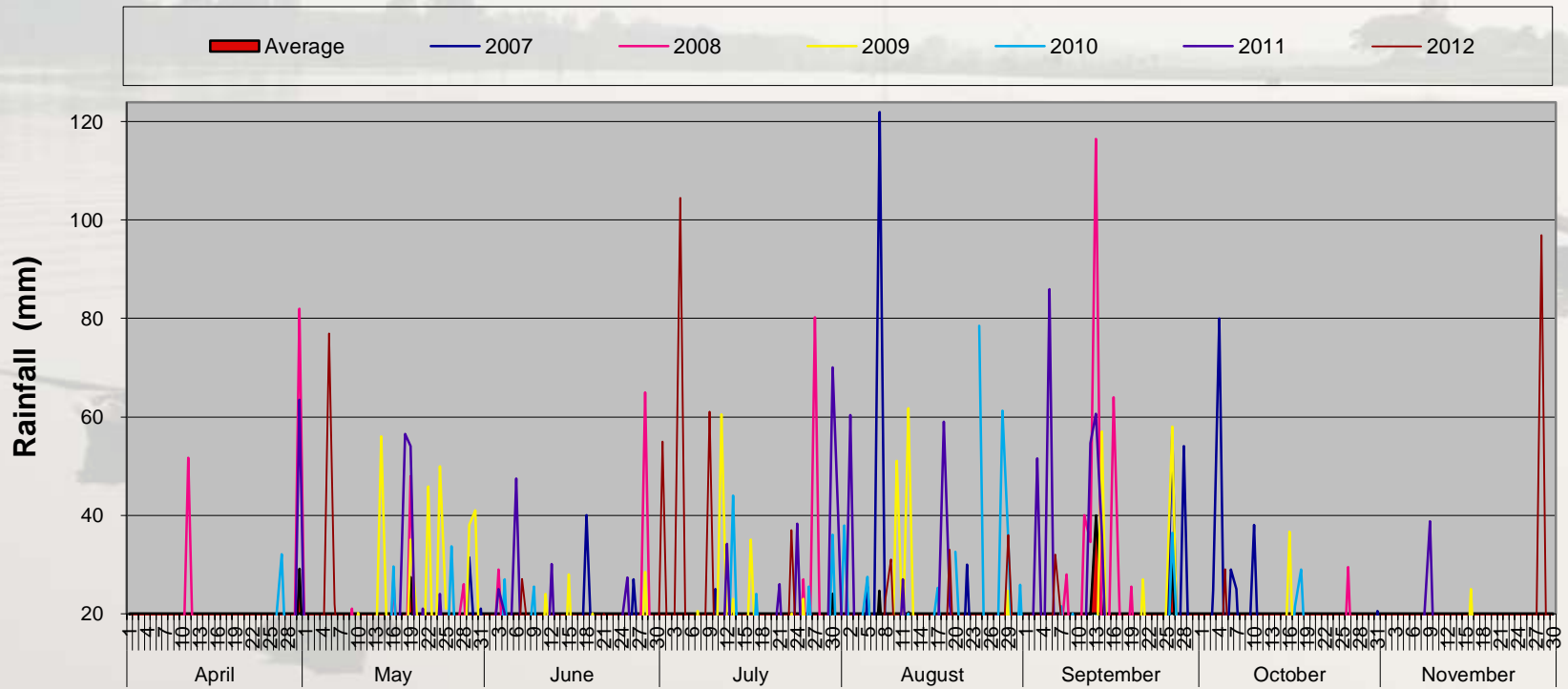
# Climate Change: Precipitation

Mekong River Corridor Precipitation: Current vs. 2045-2065 Projection



# Climate Change: Precipitation

## Daily Rainfall over 20mm in Rainy Season Udon Thani



# Challenges for Water Supply

- Increased water demand on reservoir due to urbanization
- Reduction of natural features to supply water and manage floods due to urbanization
- Greater importance on managing reservoir and water system to meet needs of all users
- Uncertainty in climate makes management difficult

# Options for Udon Thani

- Better plan and manage urbanization
- Link local water bodies into system
- Pay farmers to not use irrigated water
- Expand Huay Luang Reservoir
- Re-operate the reservoir
- Divert water from Mekong River



# Addressing these Challenges

## Barriers

- Short-term planning and management
- Development and land-use plans not integrated
- Lack of coordination amongst levels of government
- Lack of data/access to data

## Opportunities

- Urbanization, climate and water are policy priorities
- Multi-stakeholder resilience building
- Shared visioning and scenario modeling process

THANK YOU



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