# How to bridge the gap of usable knowledge? Thailand Case

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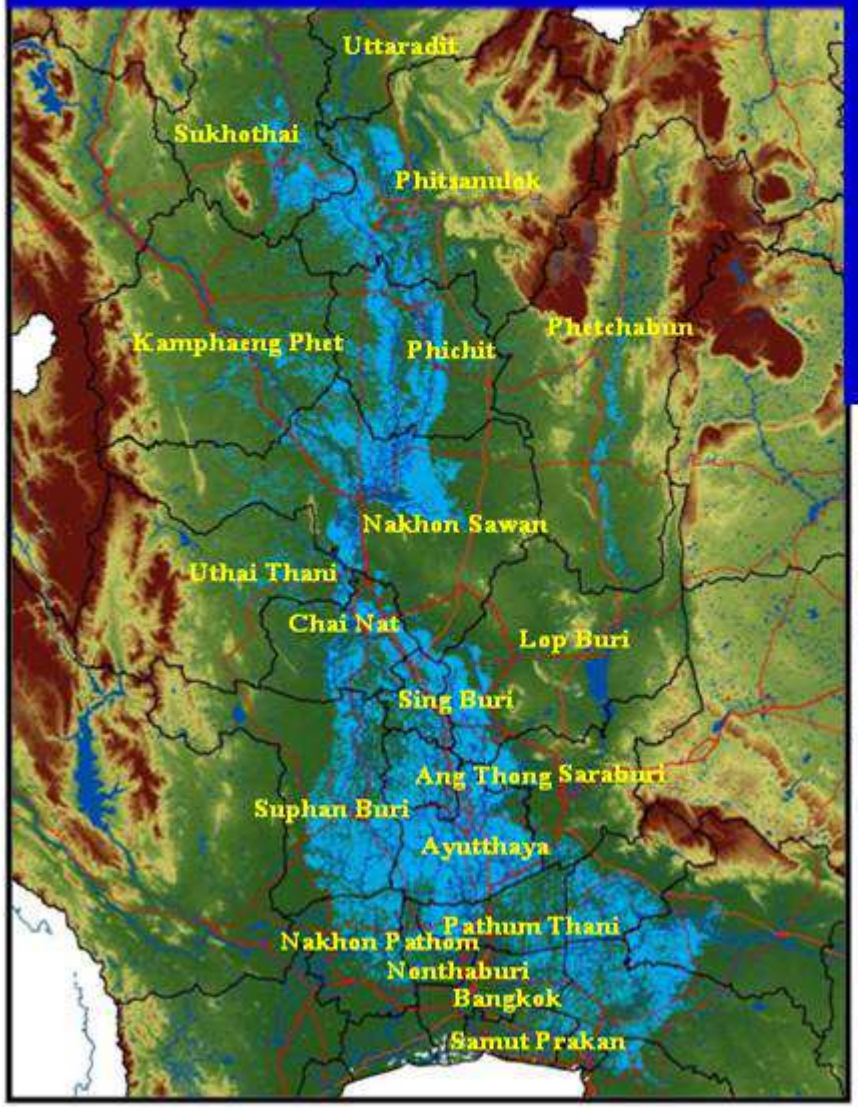
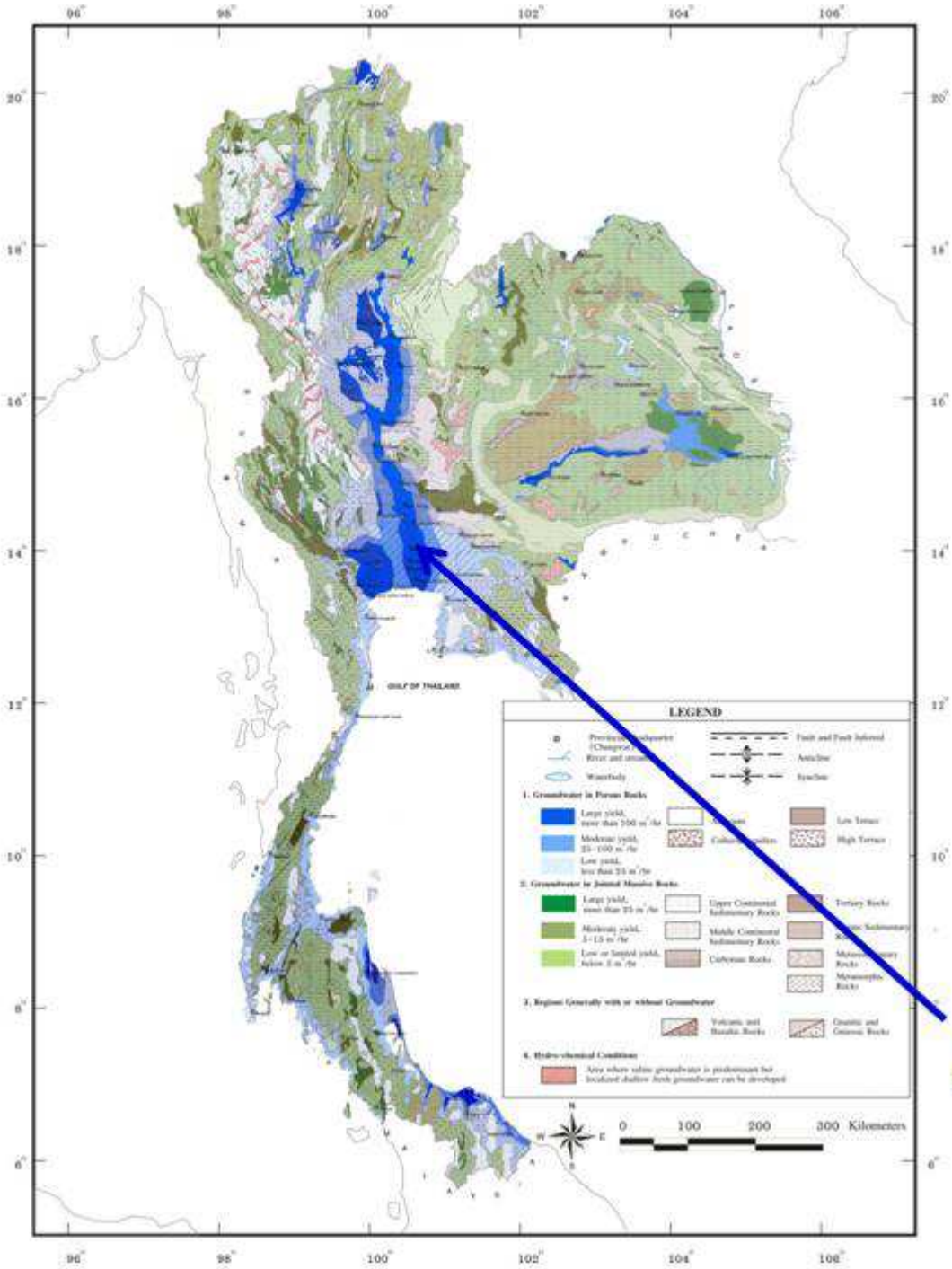
**Department of Water Resources, MNRE, Thailand.**
**Climate Change Adaptation, Tokyo, Japan, 1 October 2012**

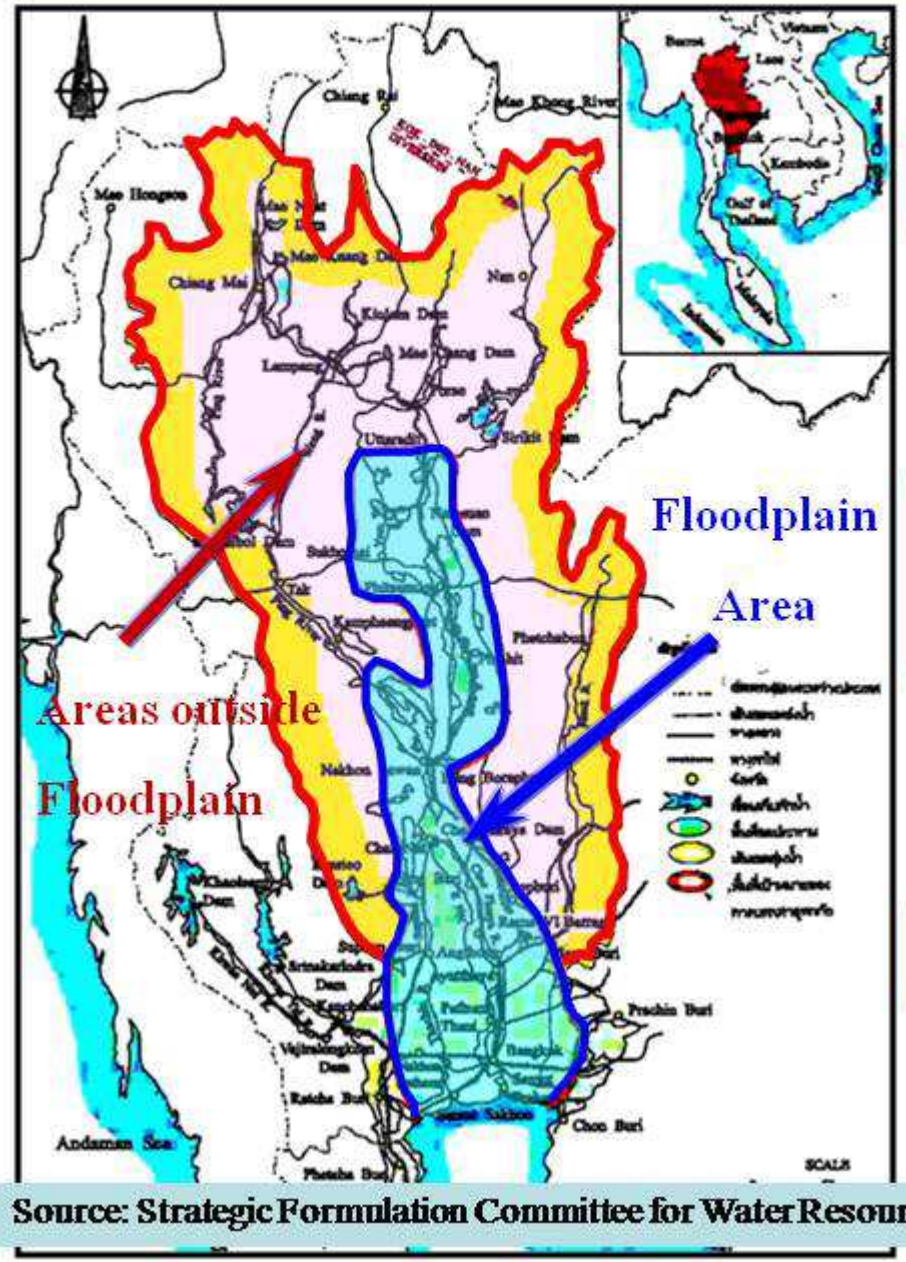







Flood Plains

# General Condition of Chao-Phraya River Basin: 158,000 km$^2$

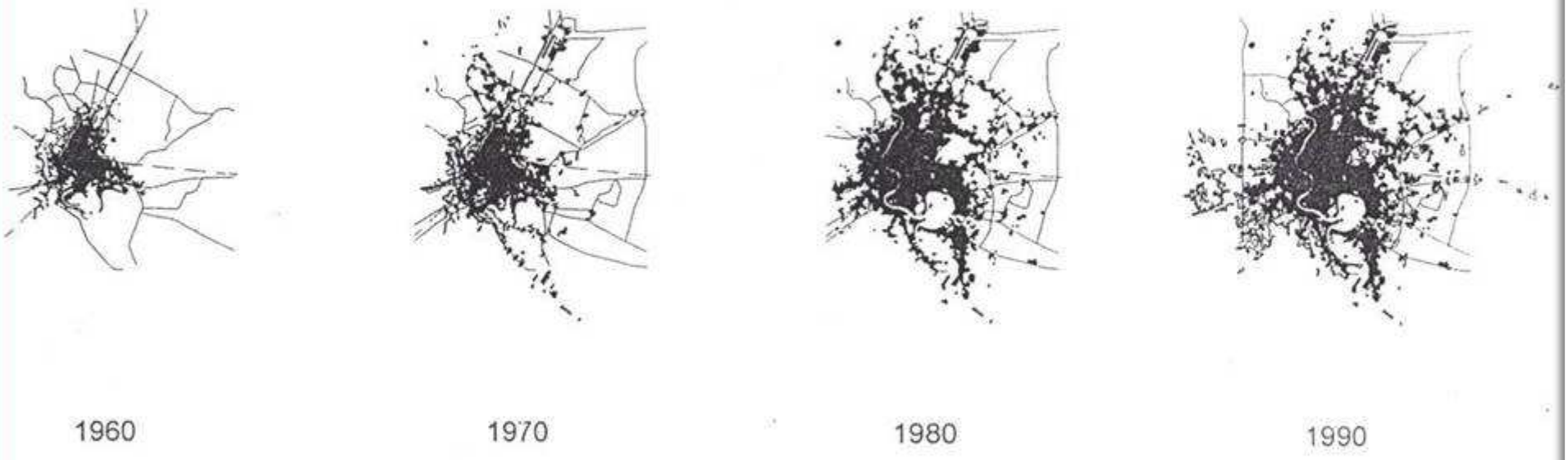



- Floodplain 35,000 km$^2$
- Areas outside Floodplain 123,000 km$^2$
- Population 25 million

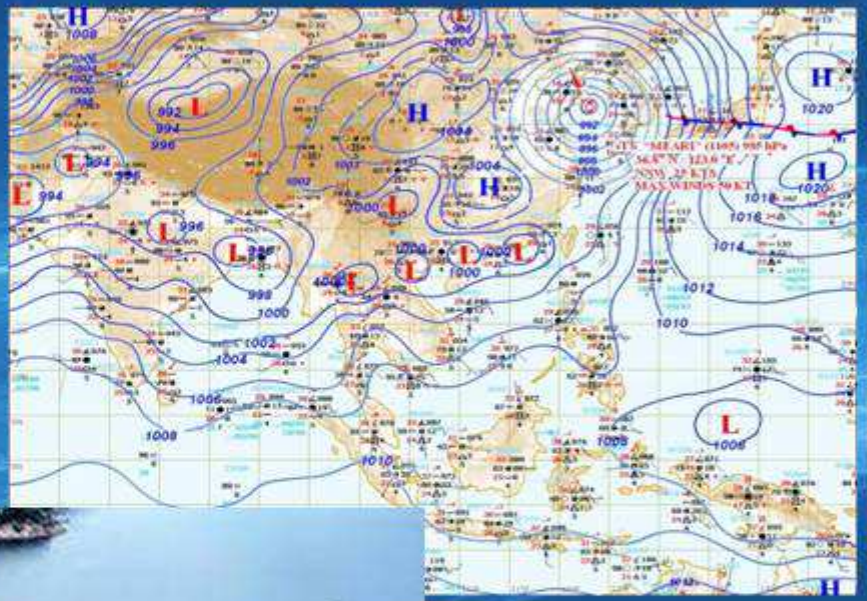
Source: Strategic Formulation Committee for Water Resources Management (SCWRM)

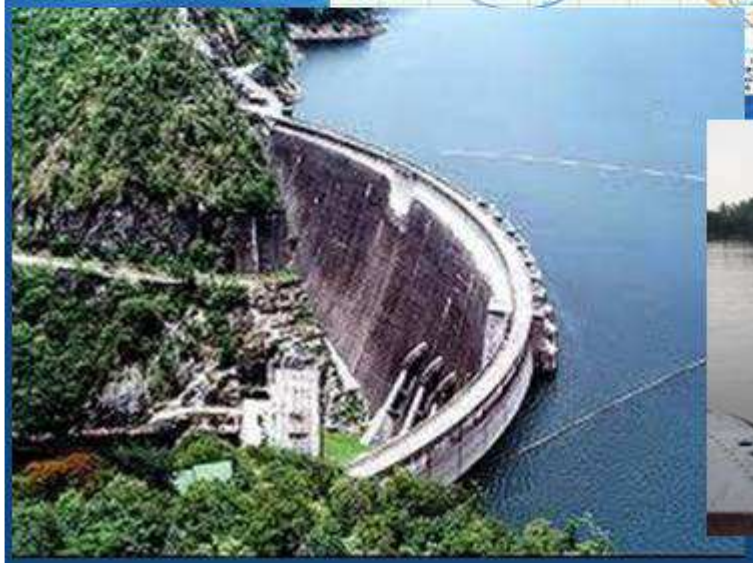
# Growth of Bangkok and vicinity areas

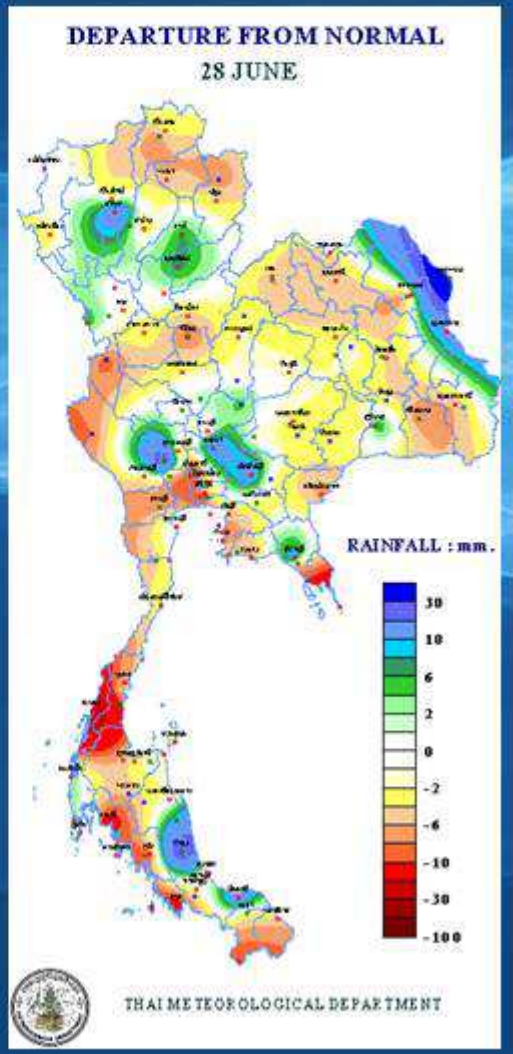
ภาพ 1-1 ประวัติการเติบโตและการขยายตัวของกรุงเทพมหานคร ระหว่างปี พ.ศ. 2503-2533



# Situation of Water Resources in 2011







# Cause of flooding in 2011

## Nature Causes

**1. Unusual run off**

maximum run off from August to mid October 2011 to Nakorn Sawan Province which **maximum flow of**

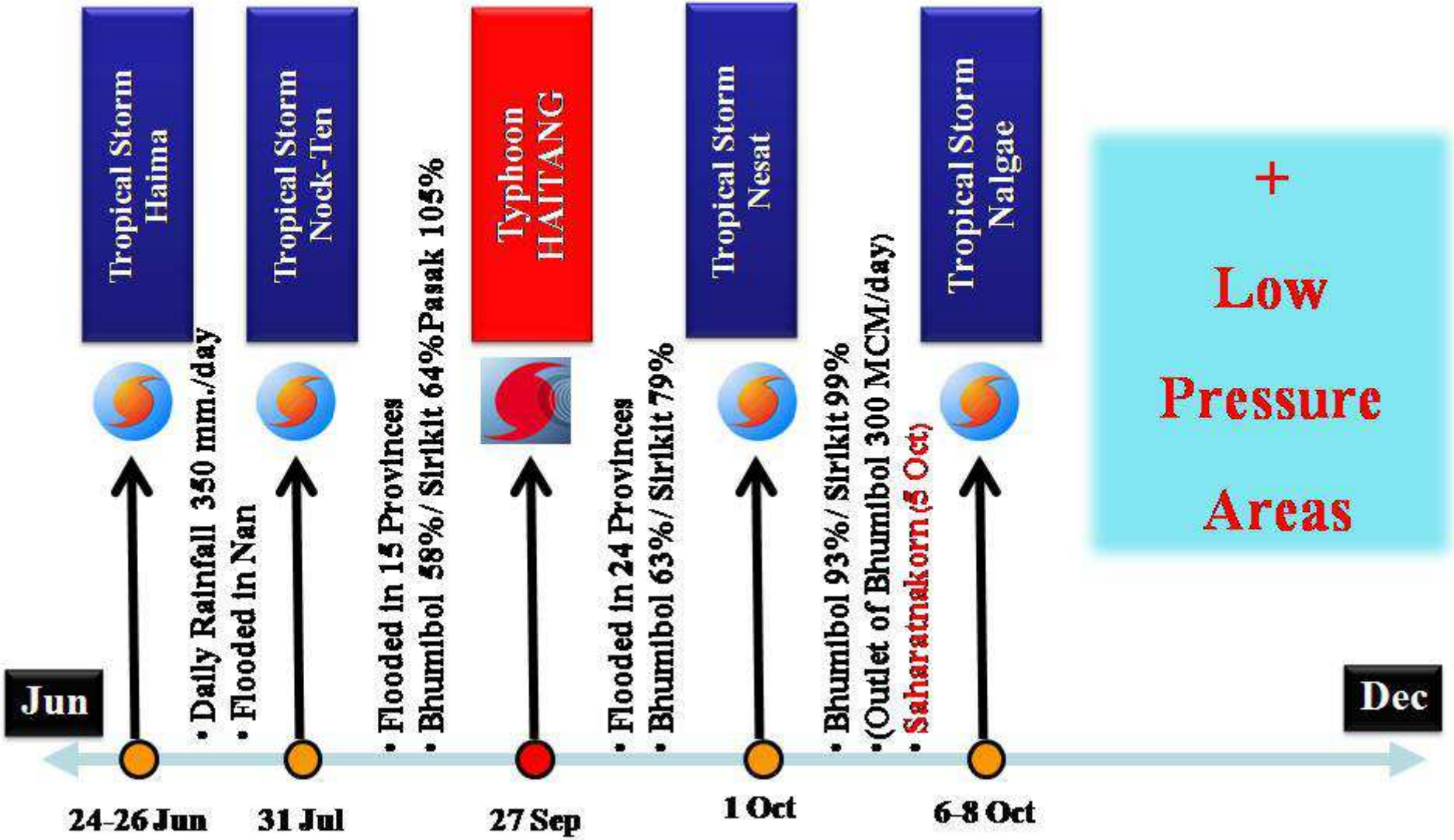

## Human Causes

**2. Water management : water resources development**

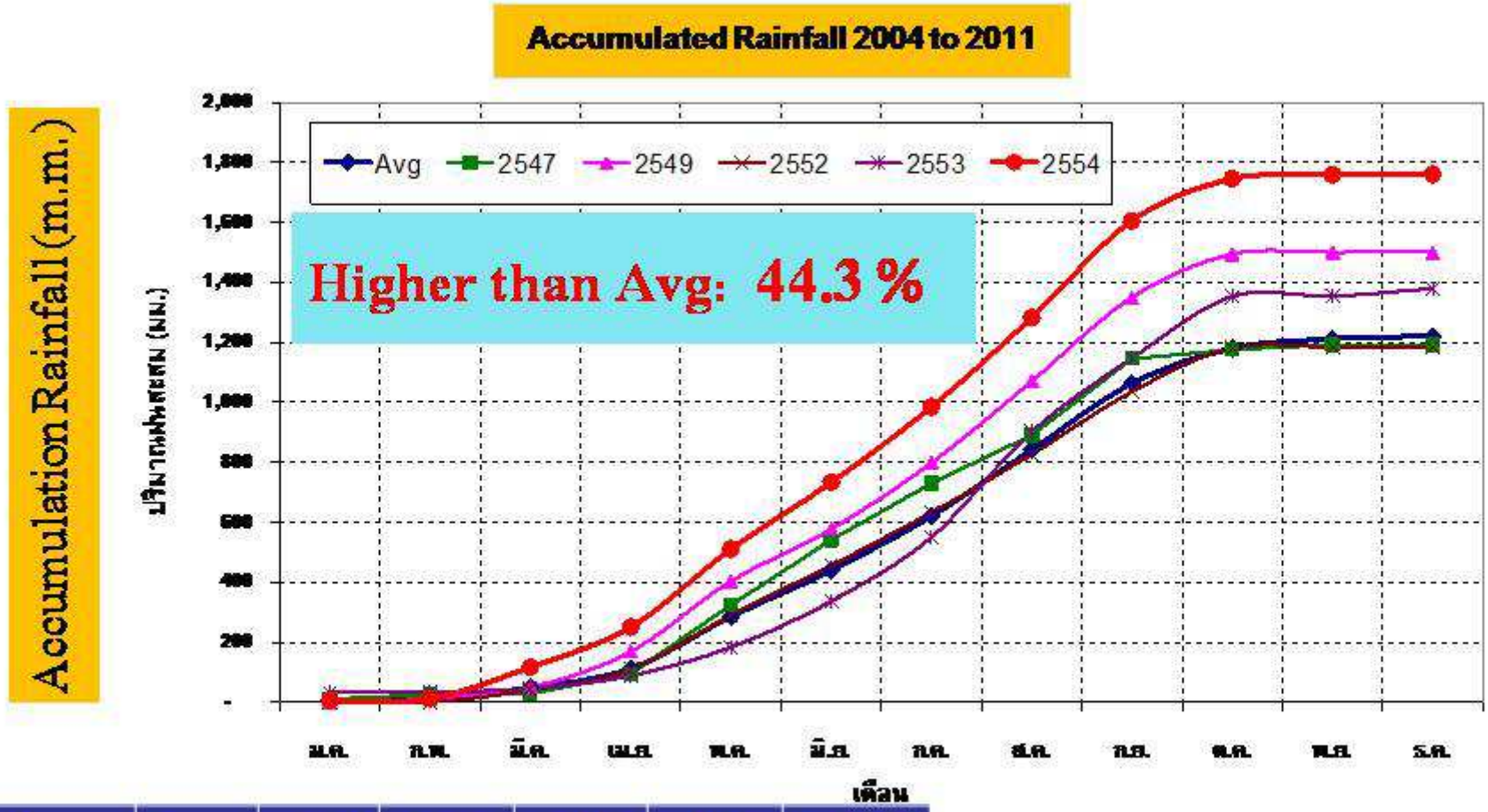
2.1 capacity and potential of water resources development projects was not enough to cope with unusual run off.

2.2 water management tools eg. Sluice gate, drainage systems, pumps etc. which is a limitation of present situation **but relevant to the past 50 years situation.**

# 1. Time line events in 2011



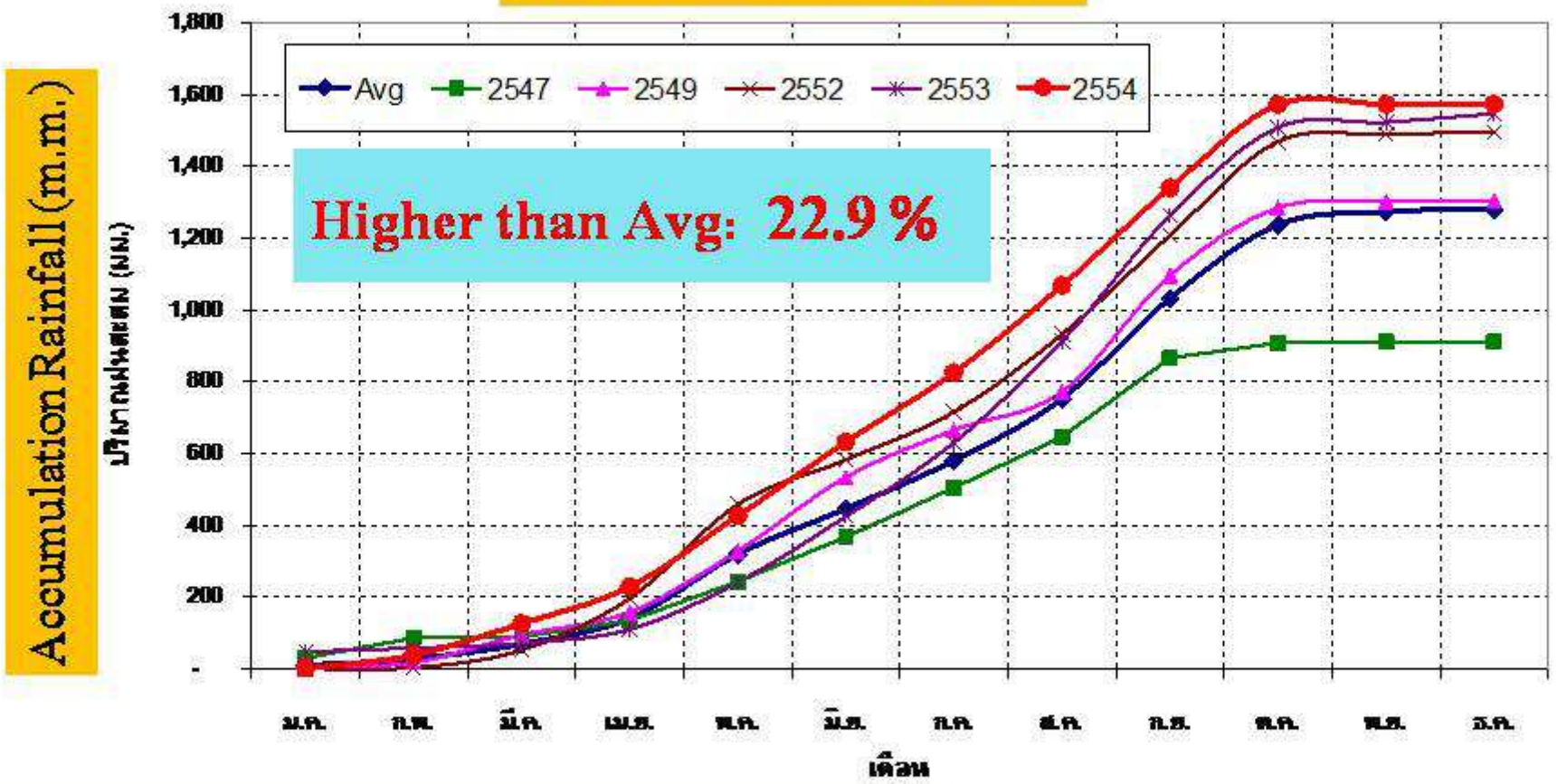
# Rainfall in the North of Thailand




| Year | Avg. | 2004 | 2006 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Rainfall | 1,220 | 1,191 | 1,500 | 1,184 | 1,379 | 1,760 |
| (m.m.) | | -29 | +280 | -36 | +159 | +540 |

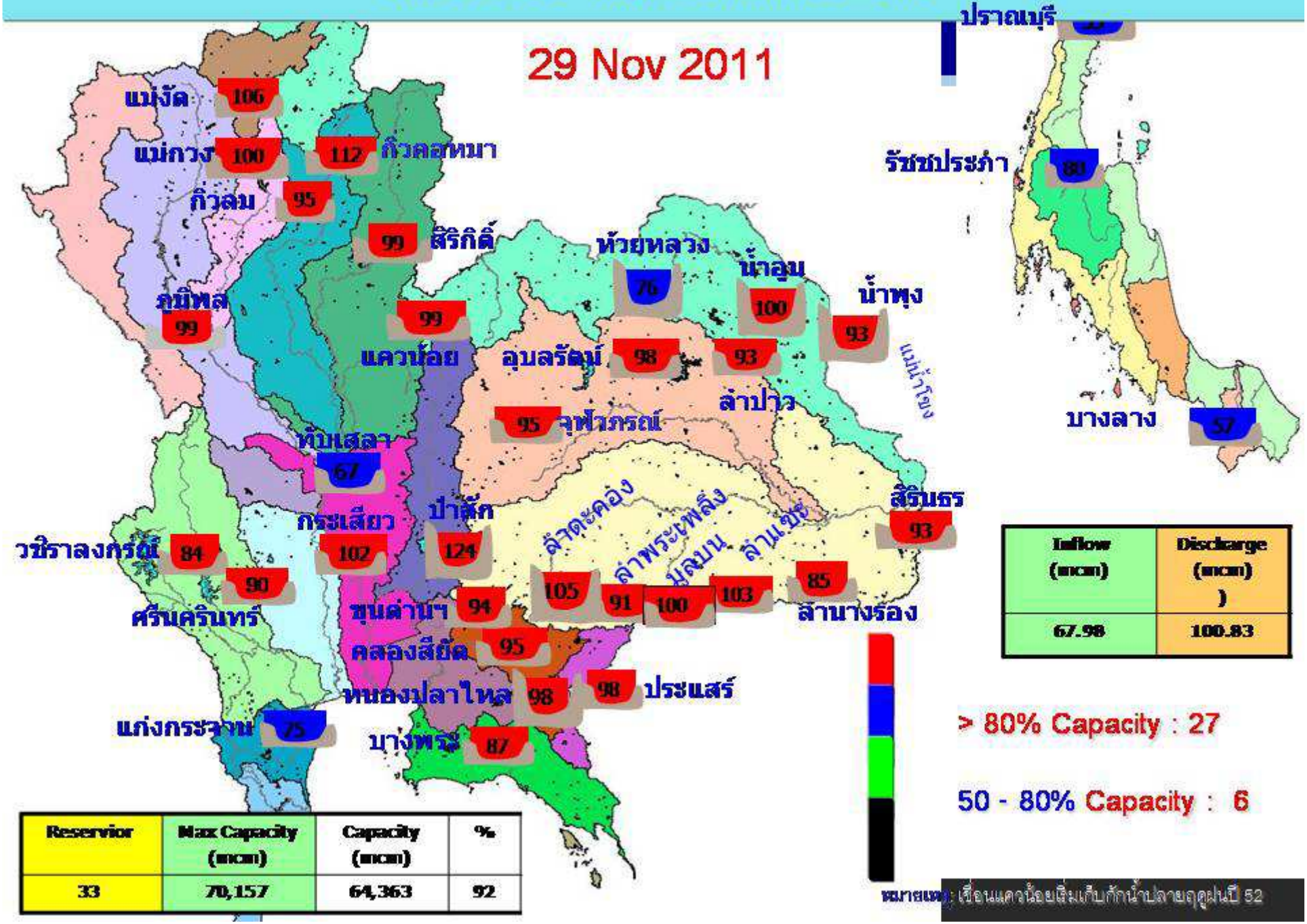
# Rainfall in the Central Part of Thailand

**Accumulated Rainfall 2004 to 2011**




| Year | Avg. | 2004 | 2006 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Rainfall (m.m.) | 1,280 | 911 | 1,305 | 1,495 | 1,549 | 1,573 |
| | | -369 | +25 | +215 | +269 | +293 |

# Status of 33 major Dams/Reservoirs




| Inflow (mcm) | Discharge (mcm) ) |
|---|---|
| 67.98 | 100.83 |

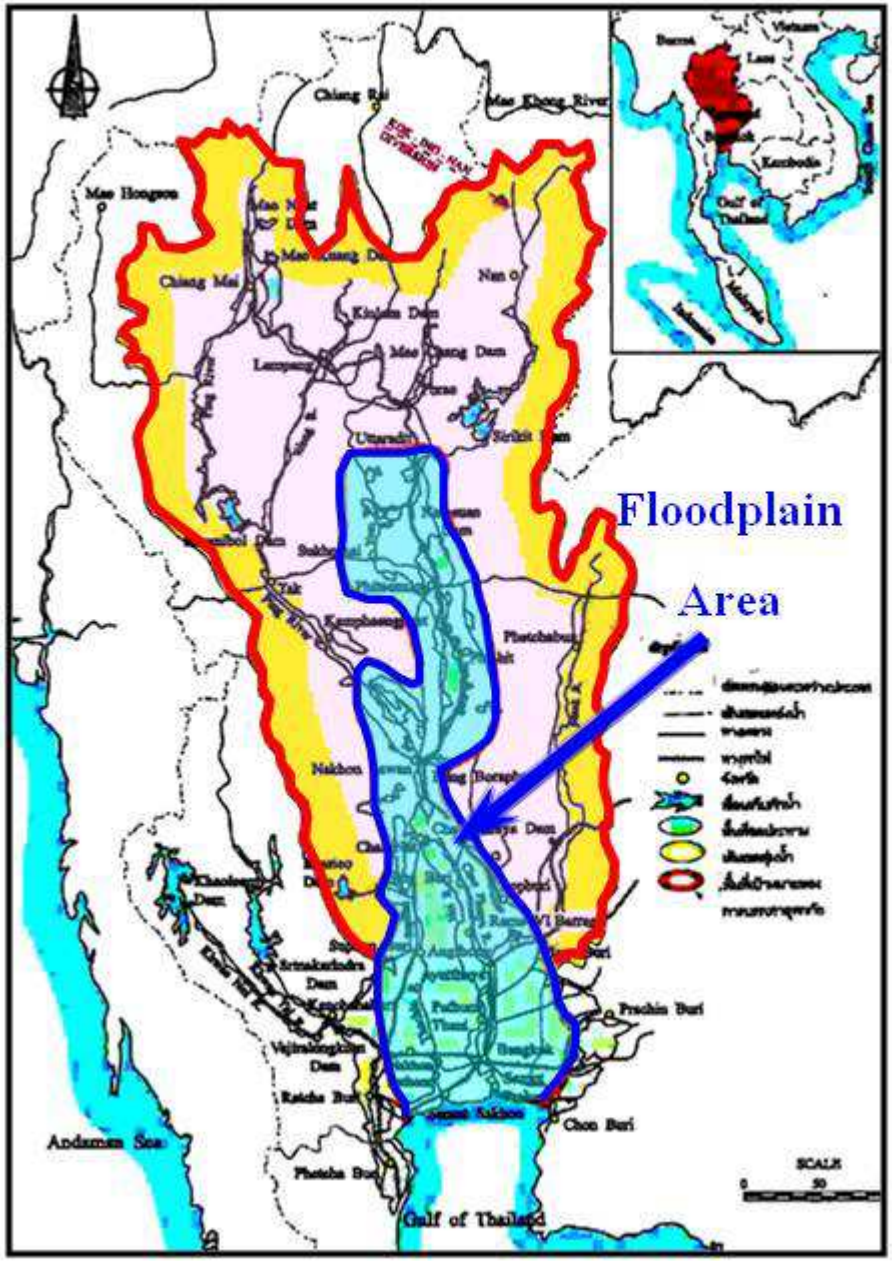
| Reservior | Max Capacity (mcm) | Capacity (mcm) | % |
|---|---|---|---|
| 33 | 70,157 | 64,363 | 92 |

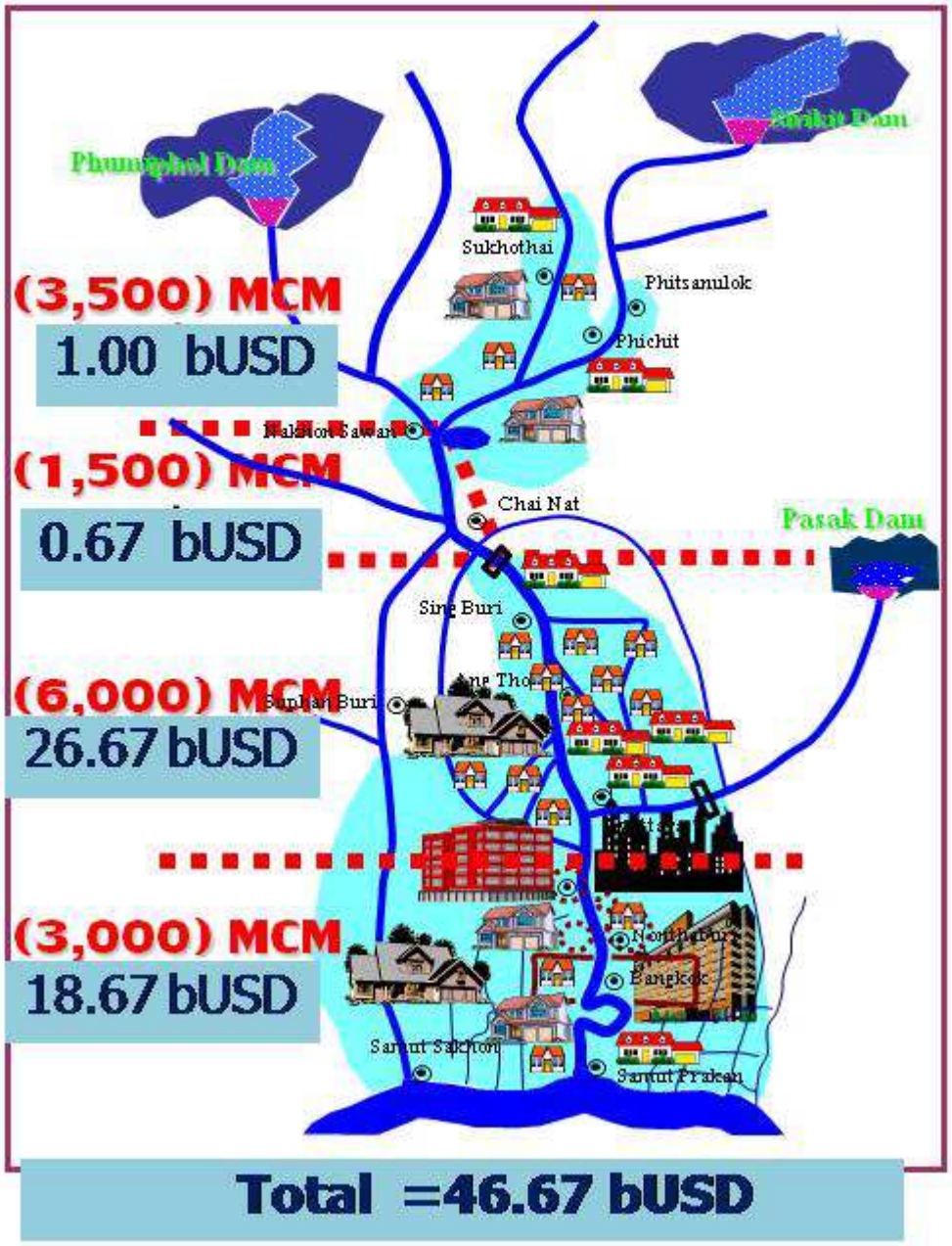
# Damages and Losses

| Sub Sector | Total (in Mn THB) | | |
|---|---|---|---|
| | Damage | Losses | Total |
| **Infrastructure** | | | |
| Water Resources Management | 8,715 | - | 8,715 |
| Transport | 22,878 | 6,263 | 29,141 |
| Telecommunication | 1,290 | 2,020 | 3,309 |
| Electricity | 3,191 | 5,321 | 8,512 |
| Water Supply and Sanitation | 3,538 | 2,104 | 5,642 |
| Cultural Heritage | 2,562 | 3,061 | 5,622 |
| **Productive** | | | |
| Agriculture, Livestock and Fishery | 37,992 | 30,328 | 68,320 |
| Manufacturing | 513,881 | 417,025 | 930,906 |
| Tourism | 5,134 | 89,673 | 94,807 |
| Finance & Banking | - | 115,276 | 115,276 |
| **Social** | | | |
| Health | 1,684 | 2,128 | 3,812 |
| Education | 13,051 | 1,798 | 14,849 |
| Housing | 45,908 | 52,807 | 98,715 |
| **Cross Cutting** | | | |
| Environment | 375 | 176 | 551 |
| **TOTAL** | | | |

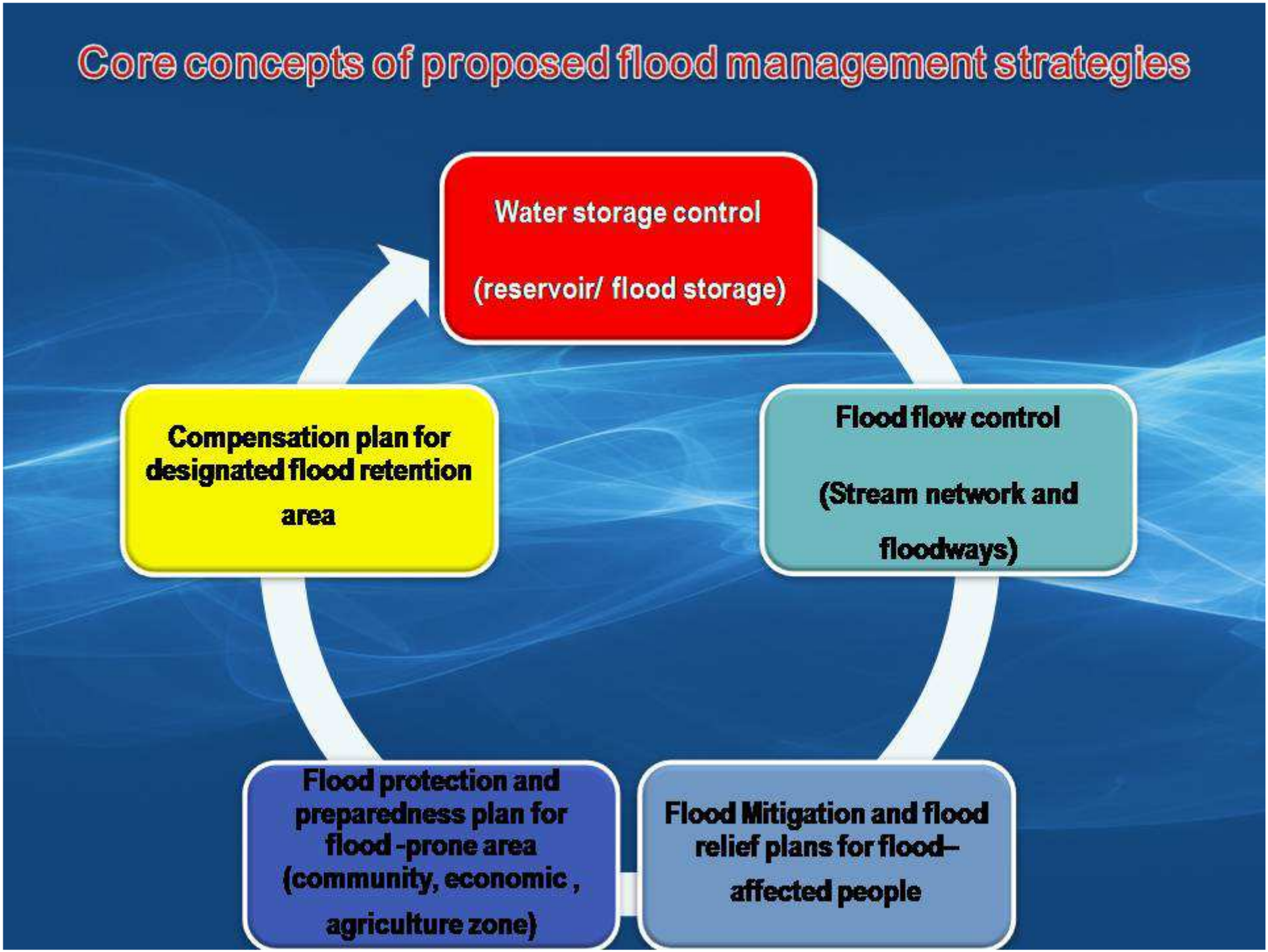
**Total =46.67 bUSD**

# Flood 2011: Damages in Floodplain

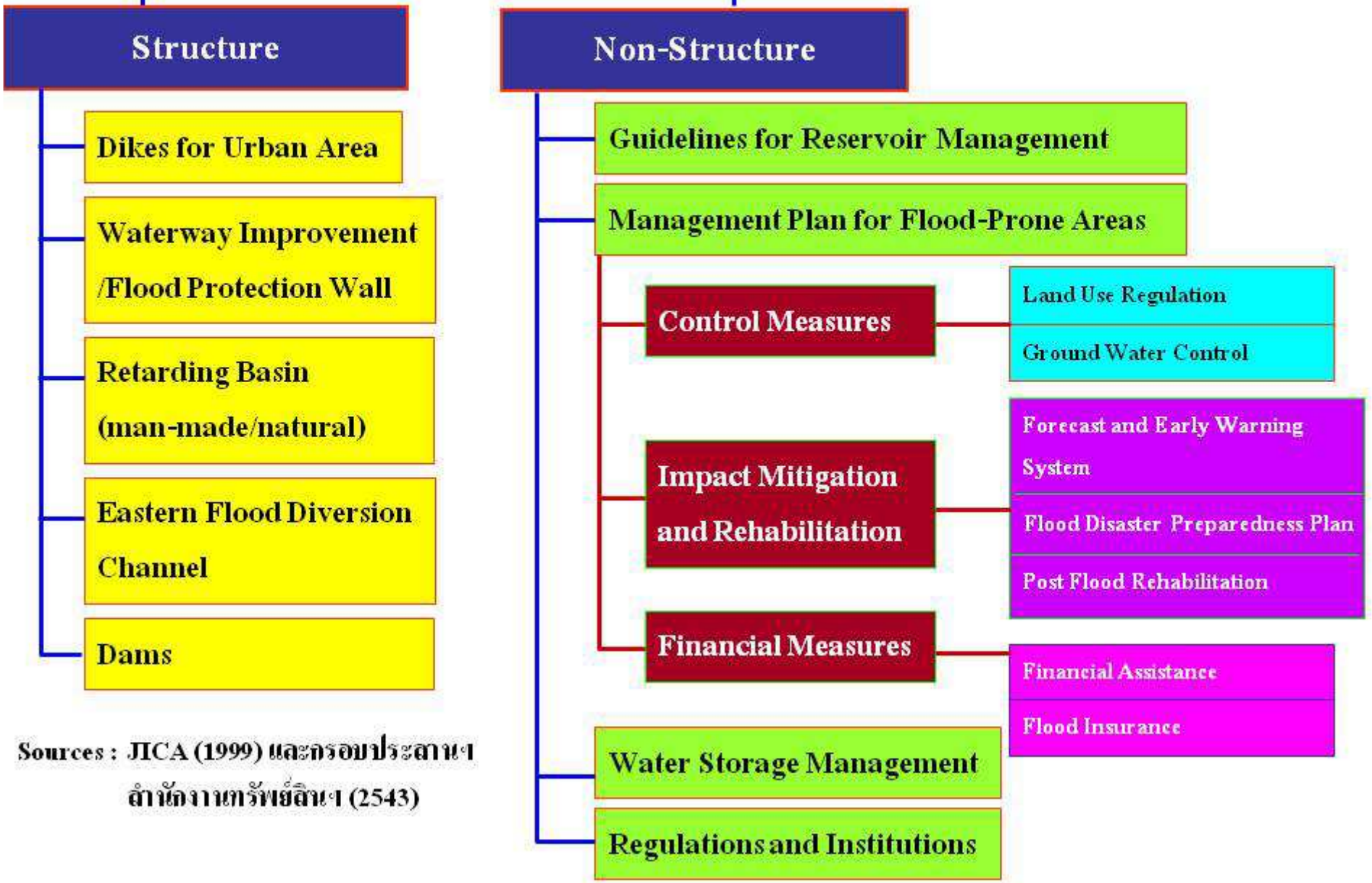


# Core concepts of proposed flood management strategies



# Long Term Measures for Flood Prevention in Chao-Phraya River Basin




Sources : JICA (1999) และกรอบประสานฯ สำนักงานทรัพยากรน้ำฯ (2543)

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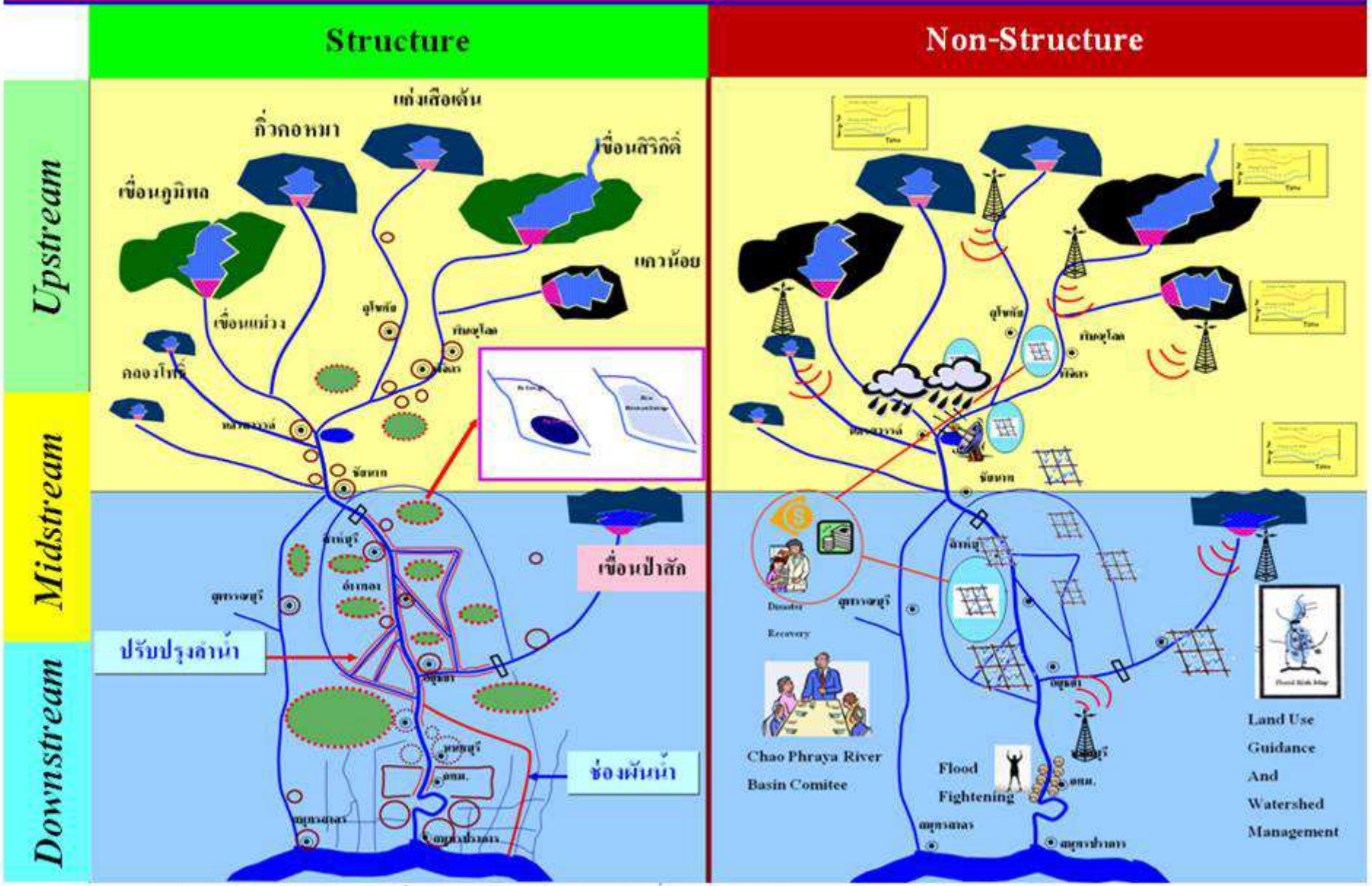


Sources: JICA (1999) และกรอบประสานฯ สำนักงานทรัพย์สินฯ (2543)

# Urgent Activities

1. Managing existing dams/reservoirs
2. Designating floodplain in the areas above Nakornsawan
3. Designating floodplain in the areas above Ayutthaya and floodway
4. Protecting major economic zones
5. Putting in place flood forecast and warning system in Chao-Phraya River Basin
6. Establishing the “single command authority”
7. Establishing special units to deal with urgent situations/specific areas

# Major Components

***Upstream***

- Forest and Land Rehabilitation/Conservation
- More Reservoirs
- Land Use/Development Regulation

***Midstream***

- Protection for Provincial Urban Areas
- Absorbing Flood Peak and Increasing Income in Irrigated Floodplain
- Land Use/Development Regulation

***Downstream***

- Protection for Important Economic Zone
- Floodways through/around the Areas
- Land use/Development Regulation

Scientific knowledge about the risks from climate changes has expanded but major gaps persist and many adaptation options still need to be further explored. Most research has focused on understanding potential impacts, vulnerabilities and sensitivities. Much more work is needed to be achieved , for example adaptation options and building adaptive capacities. Examples of improvement issues that need to be achieved include :
Review of institutional arrangement/Law enforcement
Prediction/Projection
Warning System
Disaster management systemization
Building Capacity

Considering Flood Mitigation and Management during 2011 floods, there are many agencies involved in this action such as Thai Meteorological Department (TMD), Department of Water Resource (DWR), Royal Irrigation Department (RID), Department of Disaster Prevention and Mitigation (DDPM) Bangkok Metropolitan Authority (BMA), Electricity Generating Authority of Thailand (EGAT), Department of Public Works and Town and Country Planning (DPWP), Land Development Department (LDD), and other supporting agents such as HAII, GISTDA etc. This has shown complexities and difficulties, in views of both institutional arrangement and law enforcement, for government to tackle the problems during the crisis.

Quality of Knowledge– reliable–accuracy–up to date

Demand of Users–delivered timely–problems oriented

Knowledge Access
Knowledge Sharing
Simple–easy to understand–not frighten

Community Practice
Knowledge Forum

Climate Change: excessive flooding

Early Warning Systems
Flash Flood–Land Slide