



Thematic Workshop on Water Related Disaster and Its Management
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Flood and Drought Management in Thailand

Srisunee Wuthiwongyothin,
Water Resources Engineer,
Department of Water Resources, Thailand

1. Thailand's Water Situation

Thailand is still facing with water related problems such as water shortage, flood and water quality. All these problems have caused severe damages and adverse impact on the economy and people's way of life. To deal with the recurring calamities, Thailand is divided into 25 major river basins and 254 sub-basins, with total coverage areas of 512,000 sq.km. The total annual rainfall is 804,372 million cubic meters (MCM) while average rainfall is 1,573 mm./year. Average runoff is 213,423 MCM/year or equivalent to 3,425 mm/person/year.

2. Flood and Drought in Thailand

2.1 Flood

In Thailand, flooding results from tropical disturbances, typhoons, or a combination of the two. The heavy rainfall swells the rivers which bursts their banks or creates severe flooding conditions along the tributaries from backwater effects. Flooding in river basins in Thailand is often severe. Urban area along the mainstream is regularly flooded. The peak flood period lasts from early June in the North to early December in the South.

The hydro-meteorological causes of floods are prolonged heavy rains on saturated soils. This leads to an increase in surface runoff that can only slowly be discharged through the river systems. Flooding can occur due to river overflow or surface runoff. Heavy local rains throughout the region and typhoon-induced surges of water in the river system contribute to the overflow of riverbanks. In addition, a range of natural and man-made factors presently affect flooding.

Climate change, particularly global warming effects, is believed to be a contributing factor to increased frequency and intensity of severe flooding. Increased rainfall amount and sea-level rises will result in greater risk of flooding in low-lying coastal and estuary areas. Warming of the water temperature in the sea would result in an increase in the number and intensity of typhoons causing sea surges that would also contribute to inundation of low-lying areas.



2.2 Droughts

Droughts during dry season in Thailand occur frequently every year. This is due to continuous increase of water demand caused by population and economic growth of the country while the natural and man-made storage have insufficient capacity for the whole year. Most of the areas suffering droughts are the areas which water consumption and uses rely on rainfall and natural stream

3 Flood Risk Map and Drought Risk Map in Thailand

In the recently year, Government project to reduce magnitude of flood and drought problem. Department of Water Resources (DWR) set some criteria to prior flood risk area and drought risk area to planning and management these problem.

3.1 Flood Risk Map

Flood risk map areas set by overlay flood events satellite images 13 years later later (1993-2005). Show in Fig.1 Flood Risk Map Areas in Thailand. The picture shows land slide areas and flood areas. Thailand has flood risk areas about 4.4 million hectare. Number of villages in land slide and flash flood high risk areas are in 2,370 villages, in Fig2. Flood risk areas can rank in urban area by using many factors such as frequency of event, lost of economic, etc. Then it can divide into 32 urban areas in Fig 3.

3.2 Drought Risk Map

Drought in Thailand can be classified into 2 levels, the first level is the area where consumptive water is shortage and the second level is the area where agricultural water is shortage.

In 2005, Thailand had survey number of villages suffering droughts in consumptive water. There are 7,479 villages in Fig.4

Agricultural water shortage areas are set from some criteria, such as percent of irrigation area per agricultural area, annual runoff per population and percent of water demand per water shortage, etc. The level of agricultural shortage classified into 4 levels in Fig 5.

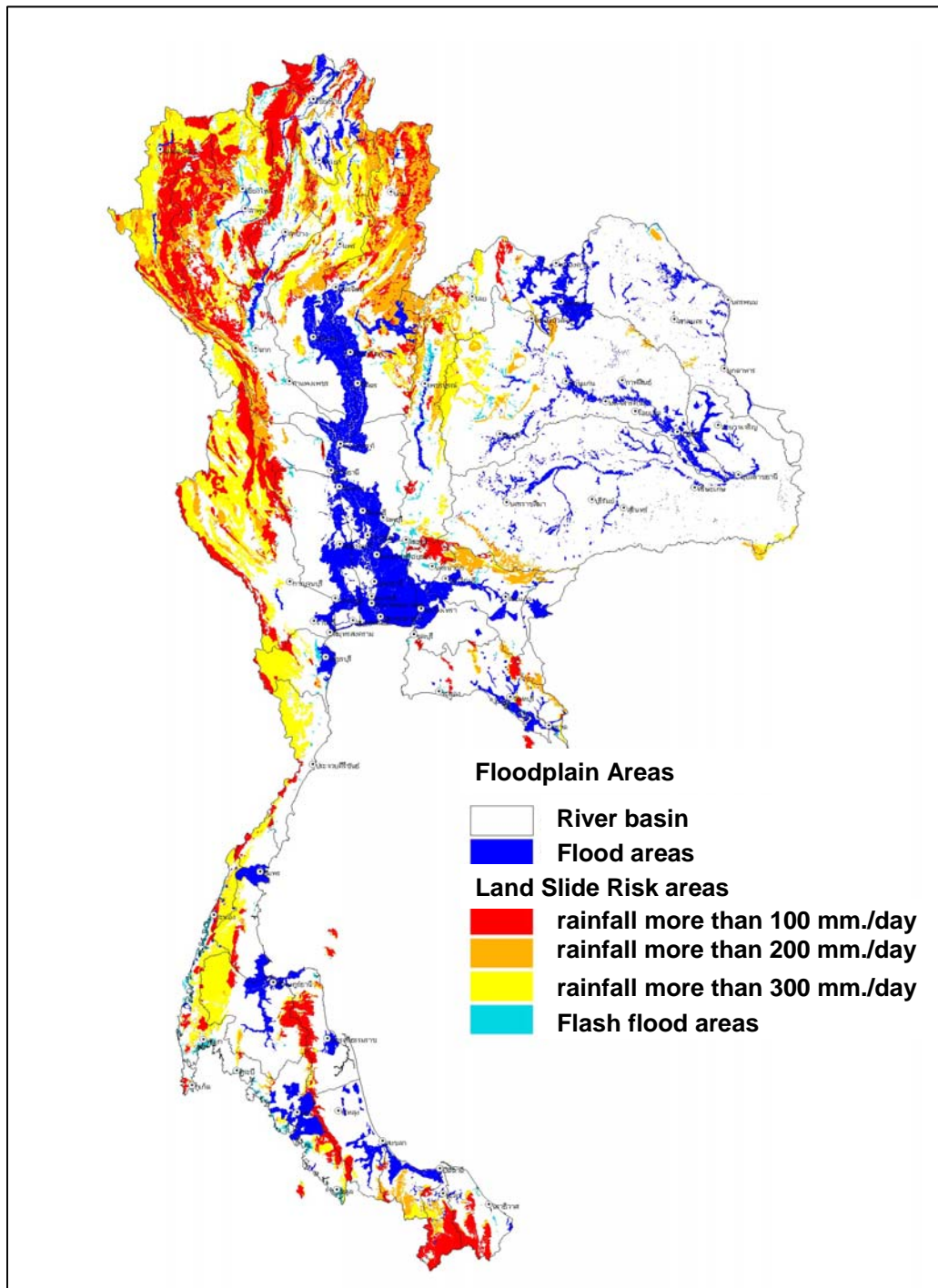


Fig.1 Flood Risk Map

Network of Asian River Basin Organizations

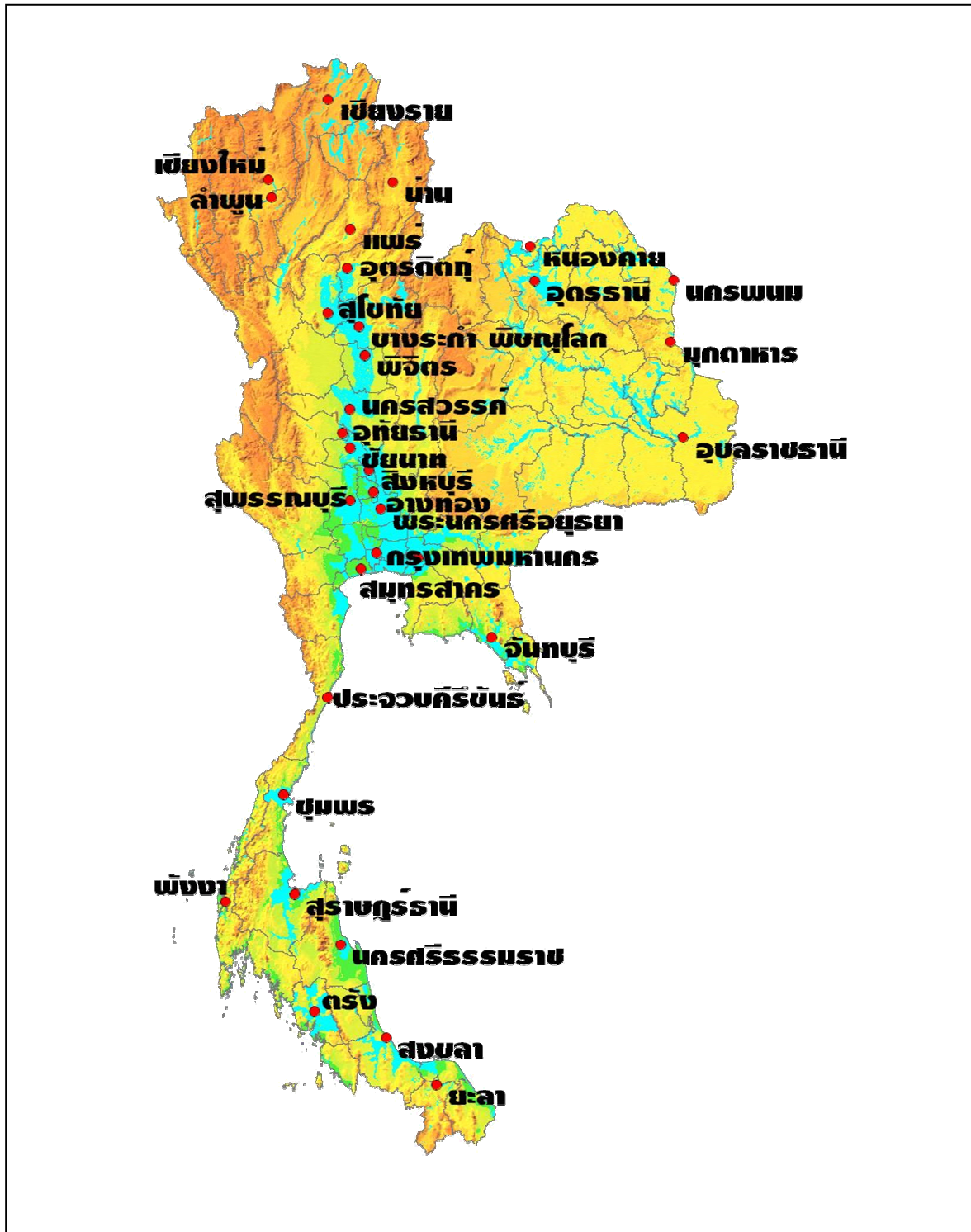


Fig.2 Flood Risk Urban Areas

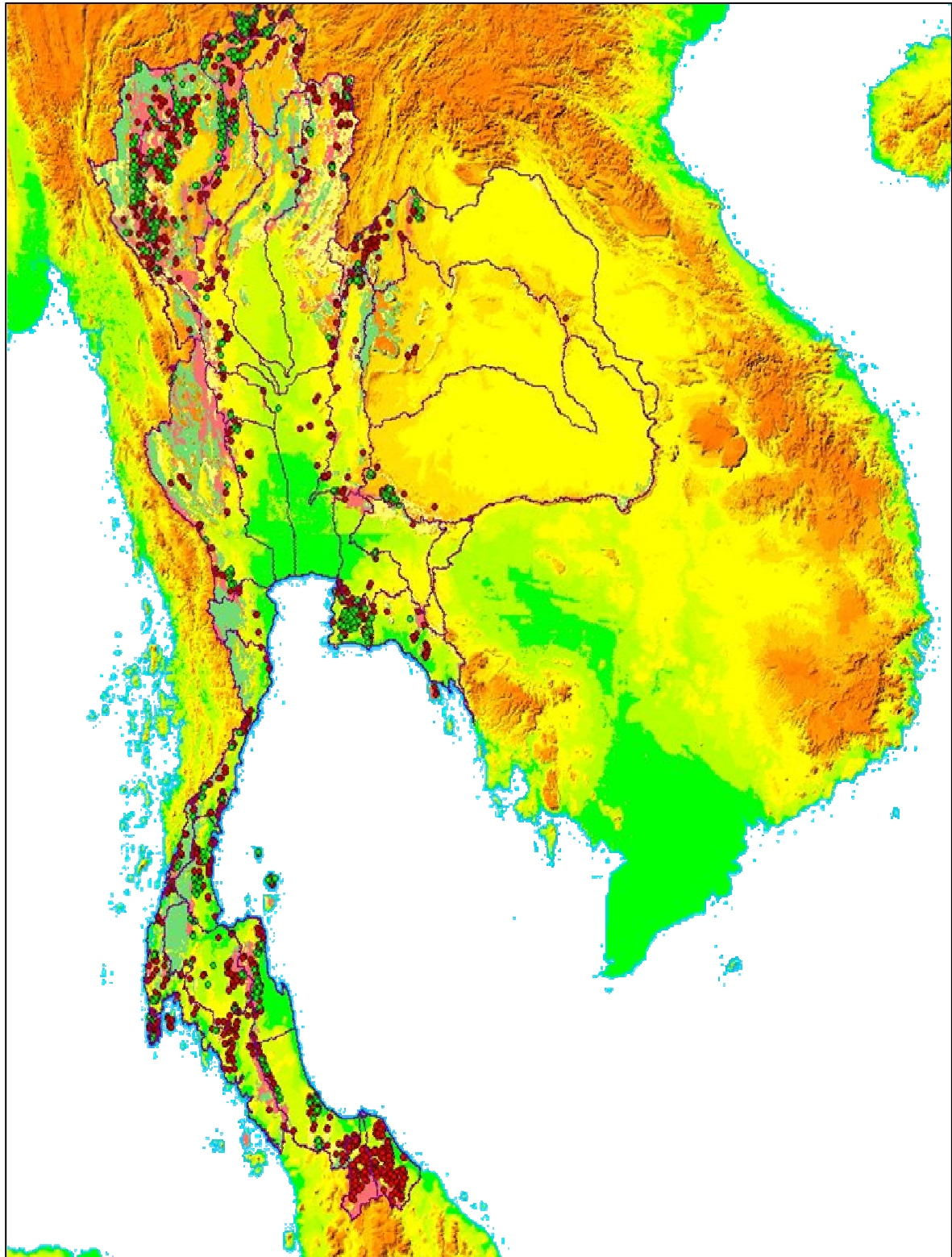
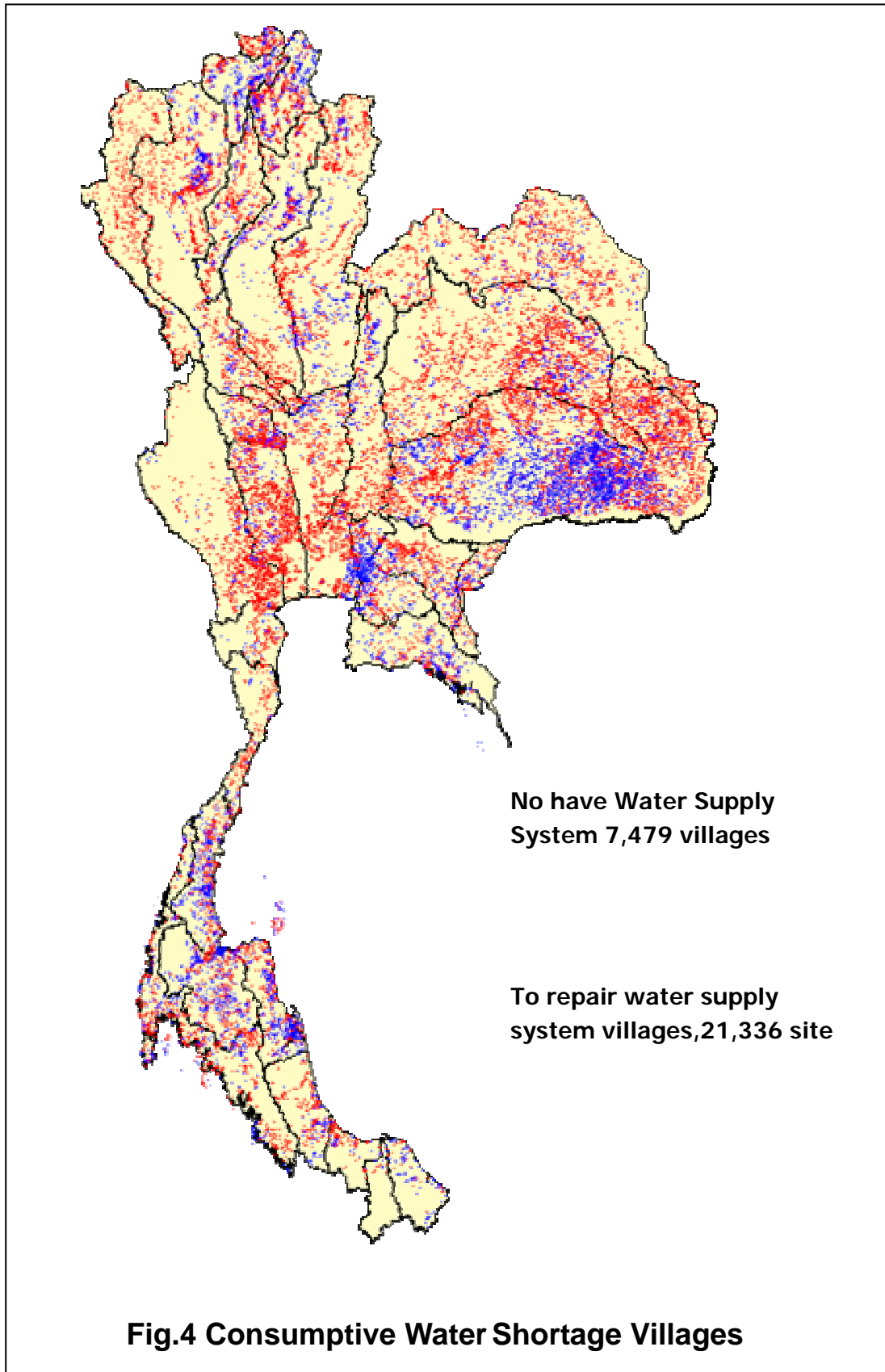
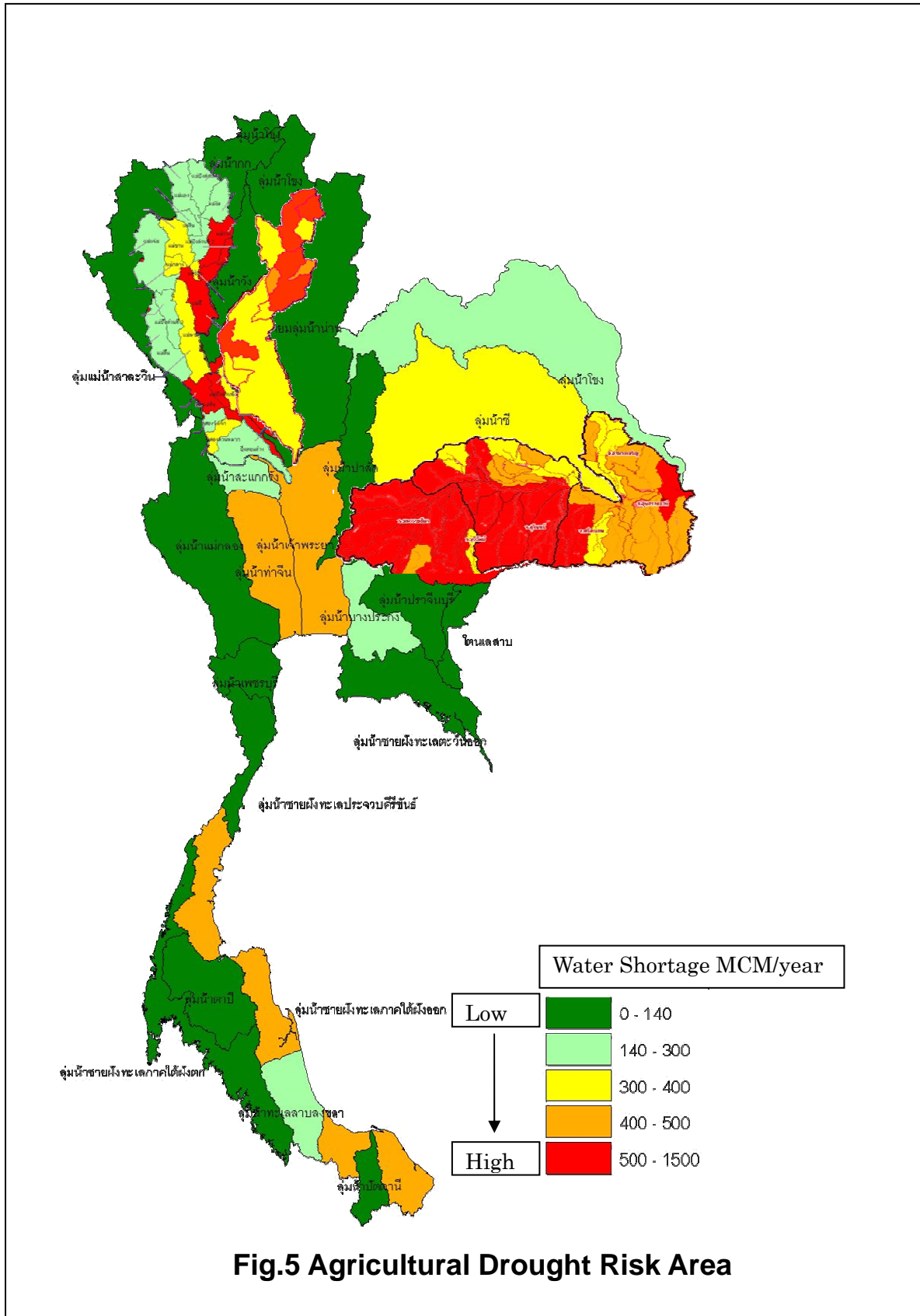


Fig.3 Land Slide and Flash Flood Risk Villages







4. Strategies and Measures.

Now Thailand had set six strategies and measures in flood management, and four strategies and measures in drought management to solve the problems. There are:

4.1 strategies and measures in flood management

1. Watershed protection and rehabilitation
- 2 Rehabilitation of water sources, waterway and wetlands
- 3 Development and improvement of water sources, drainage and diversion system
- 4 Land use management and flood protection in economic area
- 5 Improve of agricultural patterns
- 6 Flood management and rehabilitation

4.2 strategies and measures in drought management

- 1 Increase water supply
- 2 Water Spreading
- 3 Increase an efficiency of water supply system
- 4 Management

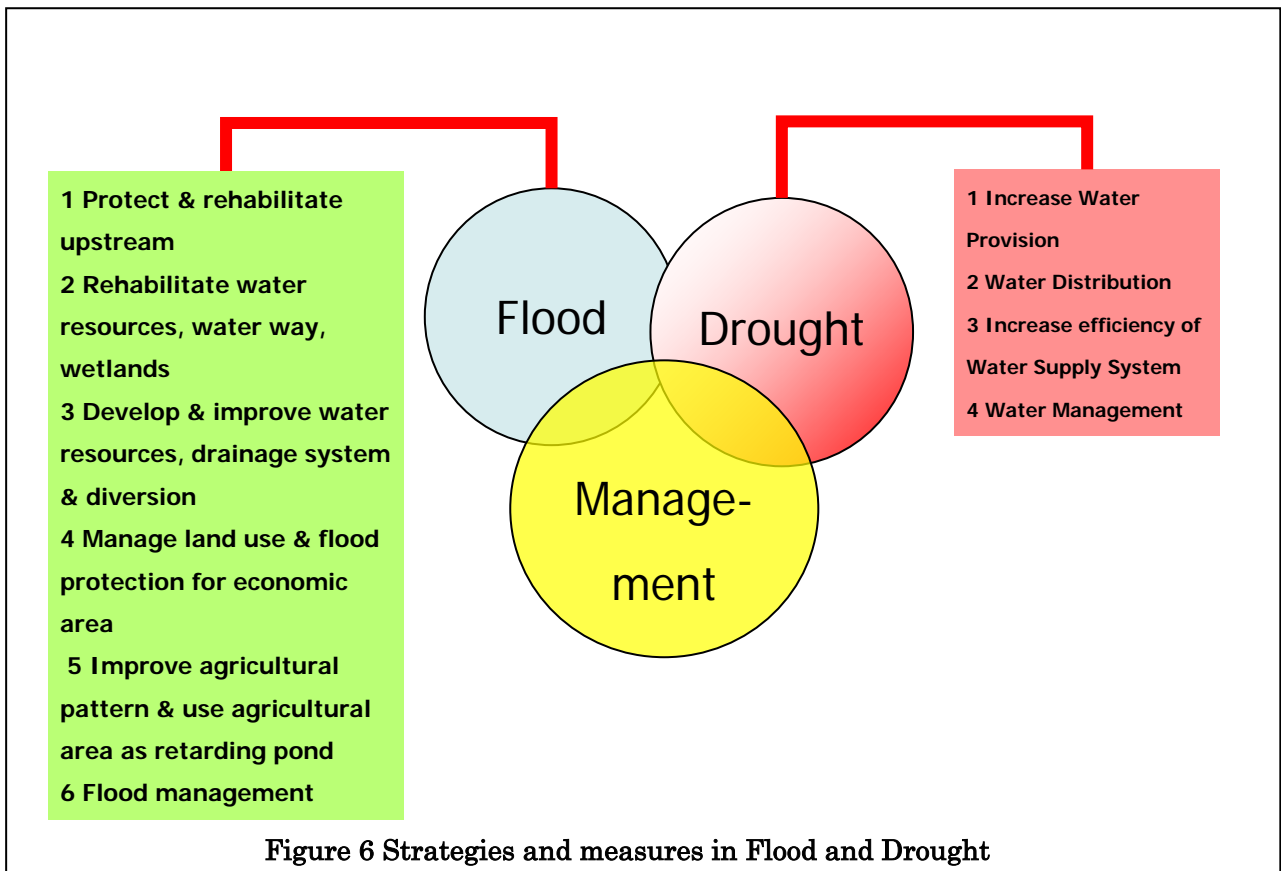


Figure 6 Strategies and measures in Flood and Drought



5. Measure on Flood Mitigation

There are 6 measure for flood mitigation and in each measurement set plans to implementation.

5.1 Protection & Rehabilitation of Upstream Forest for Healthy Ecology

- 1) Upstream Rehabilitation
- 2) Upstream Weir Construction
- 3) Reed Cultivation
- 4) Soil & Water Conservation

5.2. Rehabilitation on Water Resources, Water Way, & Wetland

- 1) Survey & Make Inventory of Wetland, Water Resources, & Natural Stream
- 2) Define Guidelines on Sustainable Use of Wetland
- 3) Improve/Rehabilitate Stream, Water Resources, Wetland in Pilot Area
- 4) Dredge the Stream for Drain& Boundary Marking
- 5) Retaining Wall for Bank Protection

5.3 Development/ improvement of Water Resources, Drainage System & Diversion

- 1) Reservoirs
- 2) Develop/Improve Diversion System
- 3) Develop/Improve Water Resources & Drainage System
- 4) Groundwater Management

5.4. Management of Land Use & Flood Protection in Economic Area

- 1) Plan, Layout, Define the Land Use Measure
- 2) Improve the Structures Obstructing water way along Communication Routes
- 3) Study & Construct the Flood Protection System in Community & Economic Areas

5.5 Improve Agricultural Pattern & Use Agricultural Area as Retarding Pond

- 1) Pilot Project on Use of Agricultural Area as Retarding Pond
- 2) Develop Rice Cultivation in Flood Risk Area

5.6 Flood Mitigation Management

- 6.1 Enhance the Participation of Local Administration Organization & People
- 6.2 Develop Tools & Mechanism for Management e.g. National Water Center, Decision support System. Etc.
- 6.3 Research on Flood Prevention & Mitigation
- 6.4 Oversee & Monitor the Project Implementation



6 Measure on Drought Mitigation

It has 4 measures for drought mitigation and in each measurement can implementation as below.

6.1 Measure on Increased Water Provision

- 1) Artificial Rain Project
- 2) Upstream Weir
- 3) Water Resources Rehabilitation
- 4) Water Resources Development
- 5) Water Quality Improvement for Shallow Well
- 6) Construction of Water Supply System & Groundwater Well
- 7) Farm Pond

6.2 Measure on Water Distribution

- 1) Water Conveyance System
- 2) Field Water Supply System
- 3) Pump & Truck
- 4) Mobile Unit of Groundwater Quality Improvement
- 5) Water Distribution Point Improvement/Conveyance

6.3 Measure on Increased Efficiency of Water Supply System

- 1) Village Water Supply System Maintenance
- 2) Groundwater Well Washing

6.4 Measure on Water Management

- 1) Increase Water Use Efficiency
- 2) Improve Dry Season Crop
- 3) Training on Water Supply Maintenance
- 4) Reservoir Control
- 5) Investigation on Status of Water Resources
- 6) Orient & Monitor the Water Quality
- 7) Research & Study for Drought Mitigation
- 8) Public Relation & Campaign for Water Saving
- 9) Knowledge transfer on Farm Pond
- 10) Drought Management Organization