

BANGKOK FLOOD PROTECTION SYSTEM

Bangkok Metropolitan Administration (BMA)



Catchment area of Chao Phraya River is 160,000 sq.km. or about 1/3 of the country

The Chao Phraya River flows passing through Bangkok area to the Gulf of Thailand

Existing Drainage System in Bangkok

Public drainage pipes

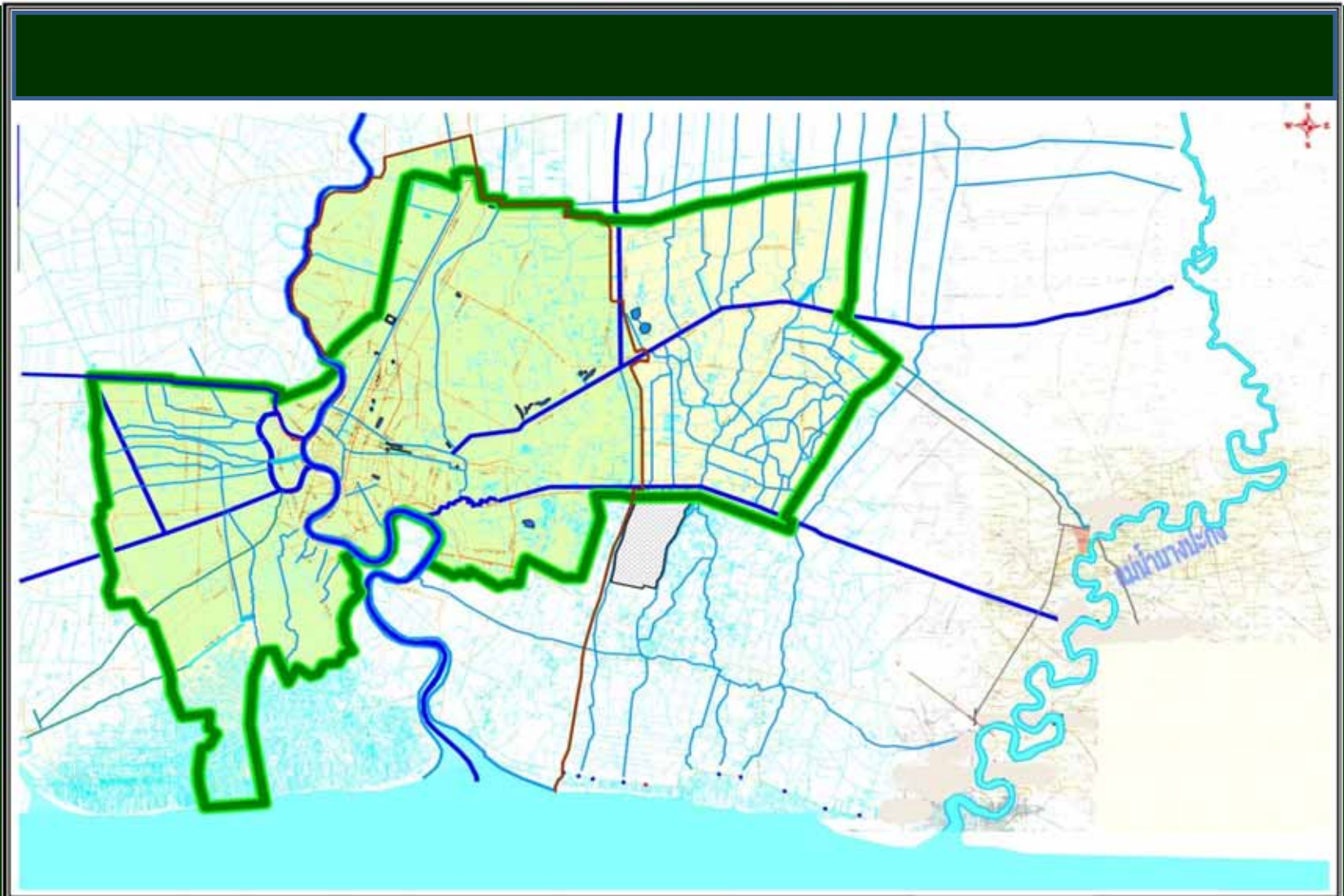
total length of 6,188 km.



1,682 Canals with total length of 2,604 km.



1,682 Canals with total length of 2,604 km.



158 Pumping stations
with total capacity of 1,638 cms



25 Retention Areas
total volume of 12.88 million cm.



7 Super Giant Tunnels with total capacity of 155.50 cms.



Flood wall with total length of 77 km.





07.11.2011 12:39



07.11.2011 14:56



พหลโยธิน ๒
Phutthamonthon Sai 2 Rd

ทางคู่ขนานลอยฟ้า
บรมราชชนนี
Elevated
Boromratchachonnani Rd

07.11.2011 15:05

Causes of Flooding in Bangkok in general

- Heavy rainfall exceeding the existing drainage capacity
- Coincidence of high tides
- Land subsidence
- Drainage system at certain areas not functioning up to capacity
- Insufficient number of water retention areas

Causes of Flooding in Bangkok in 2011

Mismanagement of reservoirs in several region of the
Large volume of water were retained and to be
released for agriculture

Five storms bombarded the central and northern regions
Bangkok had to withstand unanticipated upstream
discharges try

Causes of Flooding in Bangkok in 2011

- Malfunctioning of several sluice gates along the Chao Phraya River all of which are not under BMA
- Overflow of water over those gates into neighboring provinces north of Bangkok
- Excessive volume of water from the neighboring provinces flooded Bangkok
- The City of Bangkok constructed dykes of big sand bags and also controlled the influx with its sluice gates

Causes of Flooding in Bangkok in 2011

- Residents of neighboring areas living along the dykes and the sluice gates of BMA misconceived that the Nonexistence of the dykes and the free opening of the sluice gates would lessen the level of the flood in their residence.
- Those angered residents forcefully destroyed the dykes and opened the gates at their own wills.
- The City of Bangkok needed to repair the damages to Prevent further flooding.





16.11.2011 12:57



มูลนิธิส่งเสริม
การค้าข้าว
กรมพาณิชย์

Causes of Flooding in Bangkok in 2011

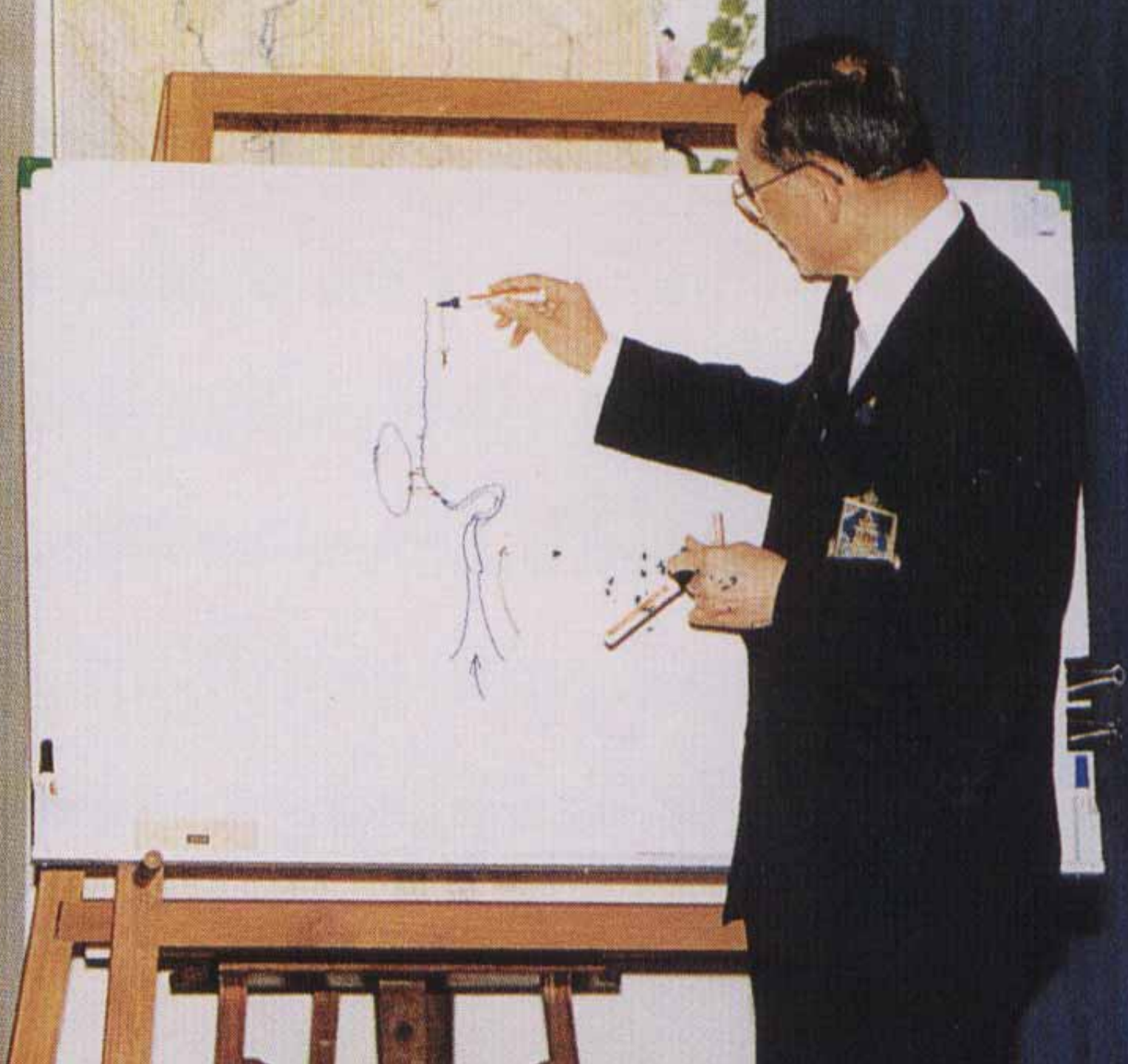
- Uncoordinated efforts among all governmental agencies tasked with water management

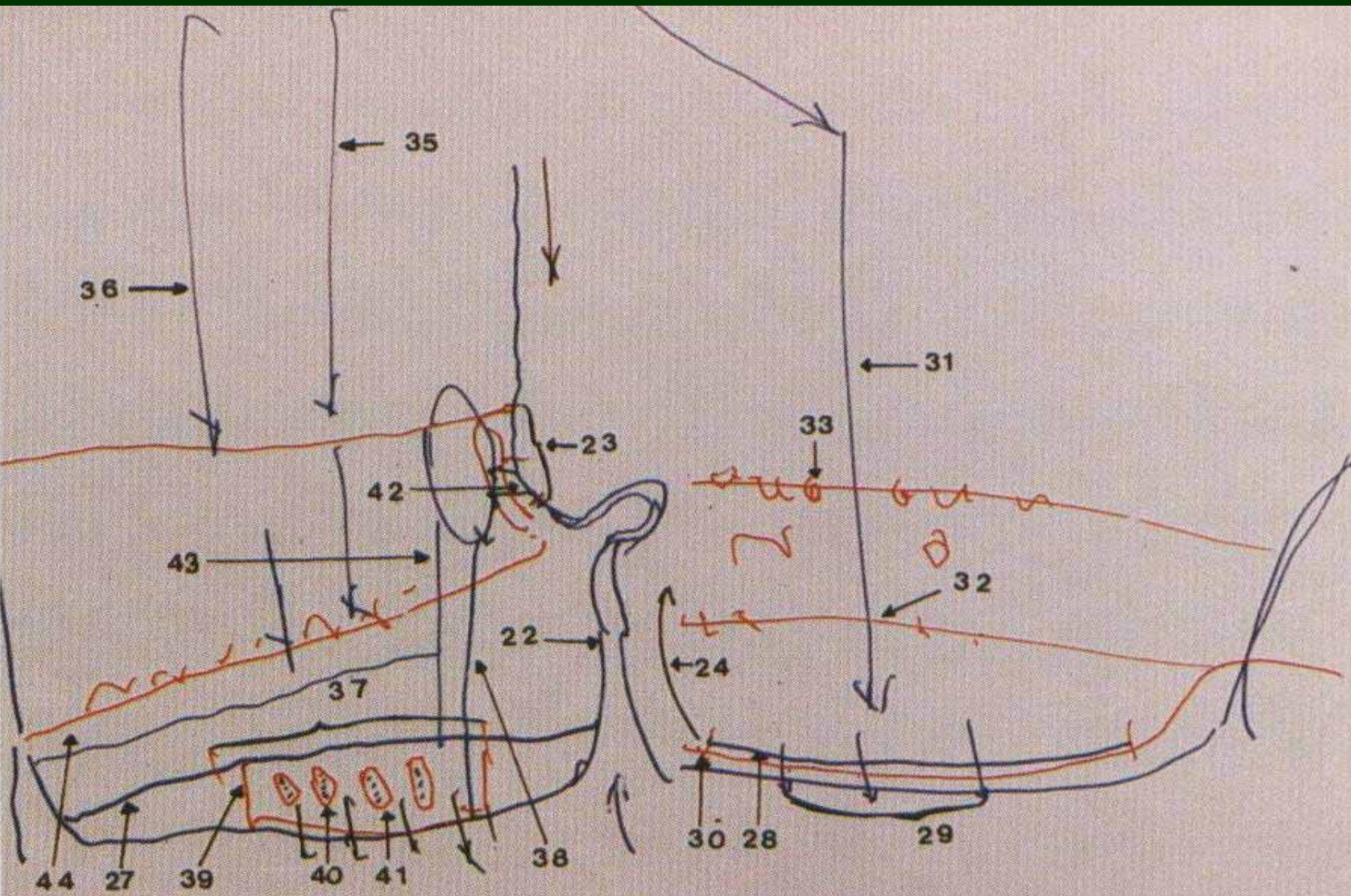
Causes of Flooding in Bangkok

in general = 5 factors

in 2011 = 11 factors

Bangkok Flood Protection System





Polder Systems

1. **Constructing dikes to protect overtop of the riverbank and overland flow from surrounding areas**

Polder Systems

2. Constructing drainage system within Bangkok area to drain water to the river.

The system consists of

- improving drainage pipes, canals and tunnels**
- constructing water gates**
- constructing pumping stations**
- constructing water retention areas**

Polder Systems

- 3. Installing Information System comprising of**
- **radar for rainfall monitoring**
 - **rainfall forecast system**
 - **automatic rainfall monitoring system**
 - **automatic monitoring system on flooding on roads and highways**
 - **automatic monitoring system on water in canals**
 - **automatic monitoring system on the operation of pumping stations and gates**



***Thank you
for
your
kind
attention***

*Talingchan
Floating Market*



The Design of Bangkok Flood Protection System

His Majesty King Bhumibol
Adulyadej's initiative

Water Management consulting
companies

7. Flood Control Center (FCC)

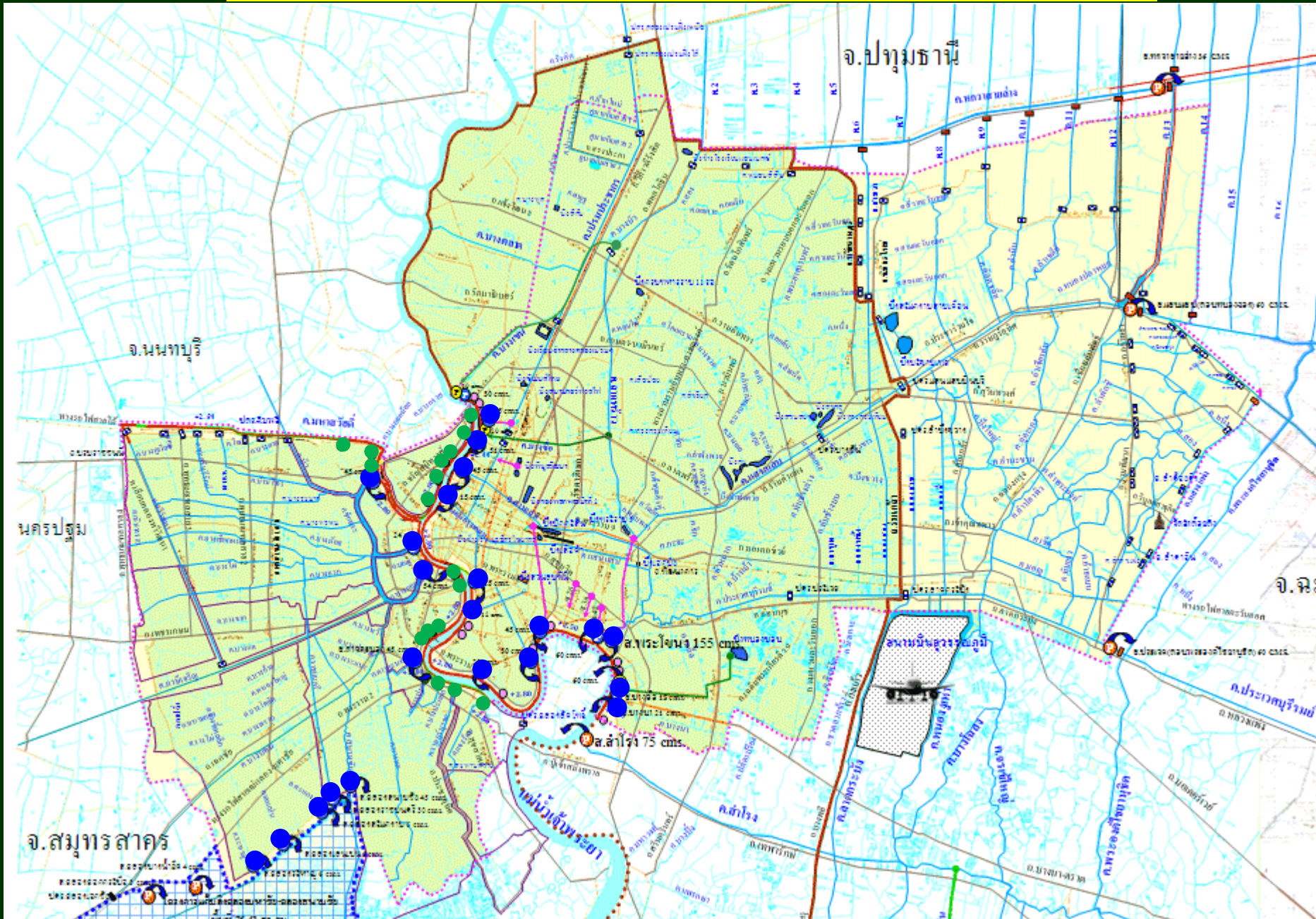
- Works 24 hours a day
- Report rainfall data from radar by radio, twitter and facebook of DDS
- Call center to receive direct information from people and broadcast using public radio



CAUSE OF FLOOD IN 2001

- MIS MANAGEMENT OF UPSTREAM
- MISUNDERSTANDING AND CONFLICT
OF PEOPLE ALONG FLOOD PROTECTION
BARRIERS

FLOOD MAP IN 2011



Flood Mitigation and Management in Bangkok Metropolitan Area

➤ Improvement of
Bangkok Flood
Protection



Flood Mitigation and Management in Bangkok Metropolitan Area

➤ Short-term Plan (achieve within 2012)

1. Dredging the main drainage canals 1.5 billion baht
 - 1.1 Bangkok budget for 460 canals, cost 417 million baht
 - 1.2 Budget from Government for 401 canals, cost 1.17 billion baht

2. Increase efficiency of drainage systems, initiate warning system, and setting the Flow Meter in the main canals, cost 684 million baht



Flood Mitigation and Management in Bangkok Metropolitan Area



3. Repair flood walls along the Chao Phraya River, Bangkok Noi canal, and Mahasawat.
4. Elevate flood walls along the River and the canals
 - Upstream, flood walls elevate from +3.00 m. to +3.50 m. above MSL.
 - Middle, flood walls elevate from +2.80 m. to +3.00 m. above MSL.
 - Downstream, flood walls elevate from +2.50 m. to +2.80 m. above MSL.
5. Elevate dike at eastern part of Bangkok under His Majesty's initiative (King's dike) from +1.50-+2.90 to be +3.00 m. above MSL.



Flood Mitigation and Management in Bangkok Metropolitan Area



➤ Long-Term Plan (achieve later than 1 year)

The plan is constructing and elevating flood walls and dikes and develop drainage systems in order to increase efficiency of flood protection for the future. The plan has been set from 2013 to 2017 and costs 67.8 billion baht. The activities consist of;

1. Strengthening and elevating flood walls along the Chao Phraya River, Bangkok Noi canal, Mahasawat canal, and dikes at eastern part of Bangkok under His Majesty's initiative (King's Dike)
2. Develop canal capacities to improve drainage efficiency by using the canals.
3. Develop drainage systems to increase the flow discharge to the Gulf of Thailand (e.g., constructing 3 new drainage tunnels)
4. Develop retention ponds
5. Provide materials and equipments for flood protection
6. Develop flood control center by improve of database of information systems and warning systems



7. Flood Control Center (FCC)

- Works 24 hours a day
- Report rainfall data from radar by radio, twitter and facebook of DDS
- Call center to receive direct information from people and broadcast using public radio

