

# FLOOD RESPONSE

oleh

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# Tindakan Mengatasi Masalah Banjir

- Langkah-langkah Struktur
- Langkah Bukan Struktur
- Tindakan 'Flood Response'



10 June 2003 Flood

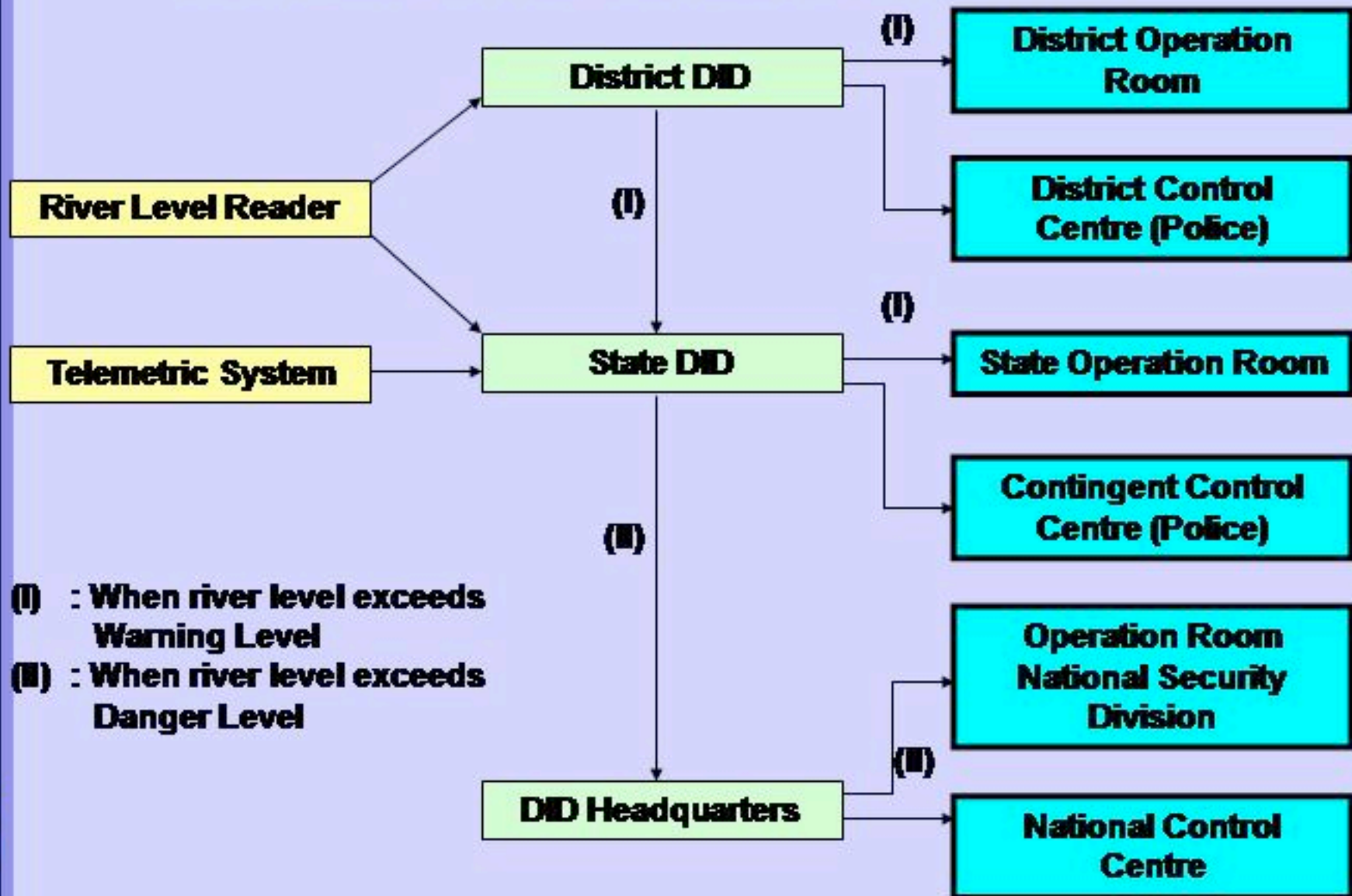


# FLOOD RESPONSE

- INVOLVES AN ORGANISED APPROACH
- AIMED AT MINIMISING DAMAGE DURING FLOODS
- THE KEY IS PREPAREDNESS



# DID'S OPERATIONAL STANDING ORDER FOR DISSEMINATION OF CURRENT RIVER LEVEL INFORMATION



# What Steps To Be Taken

- i) Sebelum Banjir
- ii) Semasa banjir
- iii) Selepas Banjir



# What Steps To Be Taken

## Sebelum Banjir

- a) Sungai dan parit dibersihkan supaya tiada sekatan kepada aliran
- b) Ban sungai dan pantai dipastikan dalam keadaan kukuh
- c) Persediaan kemudahan-kemudahan seperti empangan, stesen pam, stesen pemantauan banjir, kemudahan komunikasi, bot, pam bergerak, bekalan bahan 'flood fighting' seperti batu, bag pasir dll.



## What Steps To Be Taken

- d) Pengemaskinian inventori seperti sistem pemantauan, ramalan dan amaran banjir, kawasan-kawasan yang sering dilanda banjir(hot spots) dan kemudahan bantuan.
- e) Persediaan jentera tindakan kecemasan banjir JPS seperti penubuhan pasukan kecemasan /peninjauan banjir, penyediaan Manual Operasi Banjir, penyediaan Bilik Gerakan Banjir peringkat Daerah / Negeri / Persekutuan, latihan operasi kecemasan banjir.





# What Steps To Be Taken

## Semasa Banjir

- a) Operasi berterusan menyokong operasi bantuan banjir
- b) Flood fighting
- c) Pengumpulan, penyebaran dan dokumentasikan maklumat banjir seperti tempat-tempat banjir, bilangan orang terlibat, jalan-jalan yang terputus dan laluan alternatif, langkah-langkah tebatan banjir yang dicadangkan.



# What Steps To Be Taken

## Selepas Banjir

- a) Pemulihan fizikal seperti memperbaiki kemudahan-kemudahan
- b) Kumpulkan maklumat banjir
- c) Analisis lepas banjir seperti sebab-sebab banjir, mengenalpasti langkah-langkah penyelesaian



## What Steps To Be Taken

- d) Penilaian selepas banjir seperti kelemahan dalam operasi kecemasan banjir, kelemahan dalam langkah-langkah tebatan banjir, sediakan rancangan-rancangan jangka pendek dan jangka panjang bagi mengatasi banjir serta meningkatkan lagi tindakan kecemasan banjir
- e) Sediakan Laporan Banjir dan hantar kepada Ibu Pejabat JPS Malaysia dan pihak-pihak yang berkenaan



# **FLOOD DAMAGE ASSESSMENT**

## **Guidelines and Procedures for the Assessment of Flood Damage in Malaysia (October 2003)**



# FLOOD DAMAGE ASSESSMENT

The collection of actual damages is approached consistently across nations and is as follows:

- Identify areas affected by flooding during the event (or events) being assessed;
- Record the depth of inundation or the level to which floodwaters rose;



# FLOOD DAMAGE ASSESSMENT

- Record, in detail, the extent of damage for all of the buildings and properties involved, accounting for all items damaged.
- The total damages recorded are the actual damages for that particular flood only. These damages cannot be applied to any other flood as actual damages but they can be used as an indicative value for future floods of a similar nature.



## FLOOD DAMAGE ASSESSMENT

**Five (5) common activities have been identified that will establish a best practice approach**

- Flood damage assessment teams enter the affected area very shortly after a flood has occurred**



## FLOOD DAMAGE ASSESSMENT

- Flood damage assessment teams should consist of professionals with broad knowledge of flood behavior and able to value the damaged possessions.
- The flood damage assessment must cover all possible sources of damage.





## FLOOD DAMAGE ASSESSMENT

- The assessment teams must be able to access information regarding any insurance information, “community service” or charitable payments.**
- All data collected must be documented in a consistent form to a National Standard.**



# FLOOD FORECASTING AND WARNING SYSTEM



# Flood Forecasting

## Why?

- **Implementation of a flood mitigation scheme does not occur today**
- **To optimise the operation of a Flood Management Scheme**



# Flood Forecasting and Warning System (FFWS)

## Ultimate Goal of the System

- establish a **fast, reliable and robust** data management and modelling system
- capable of issuing forecasts under **all conditions.**

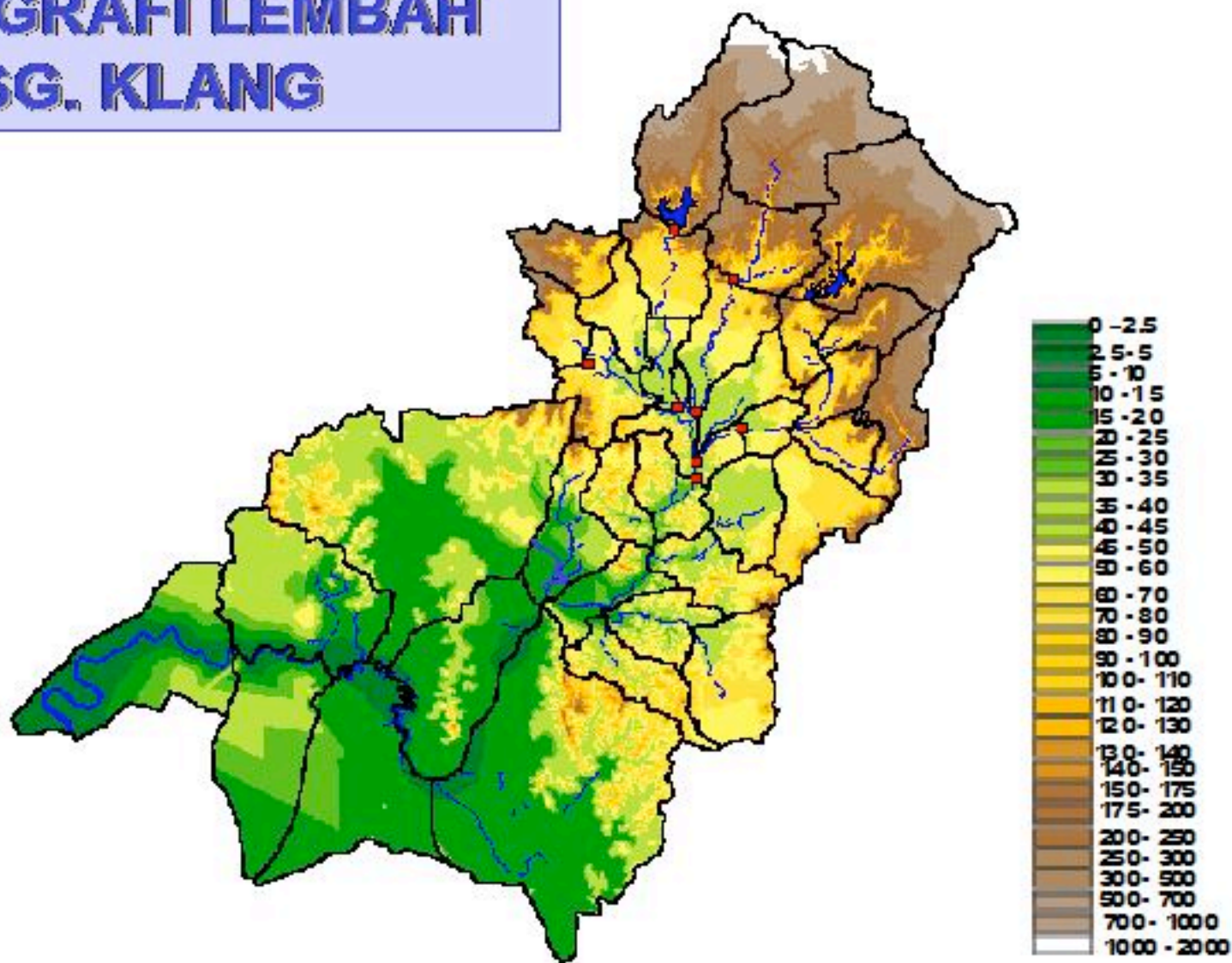


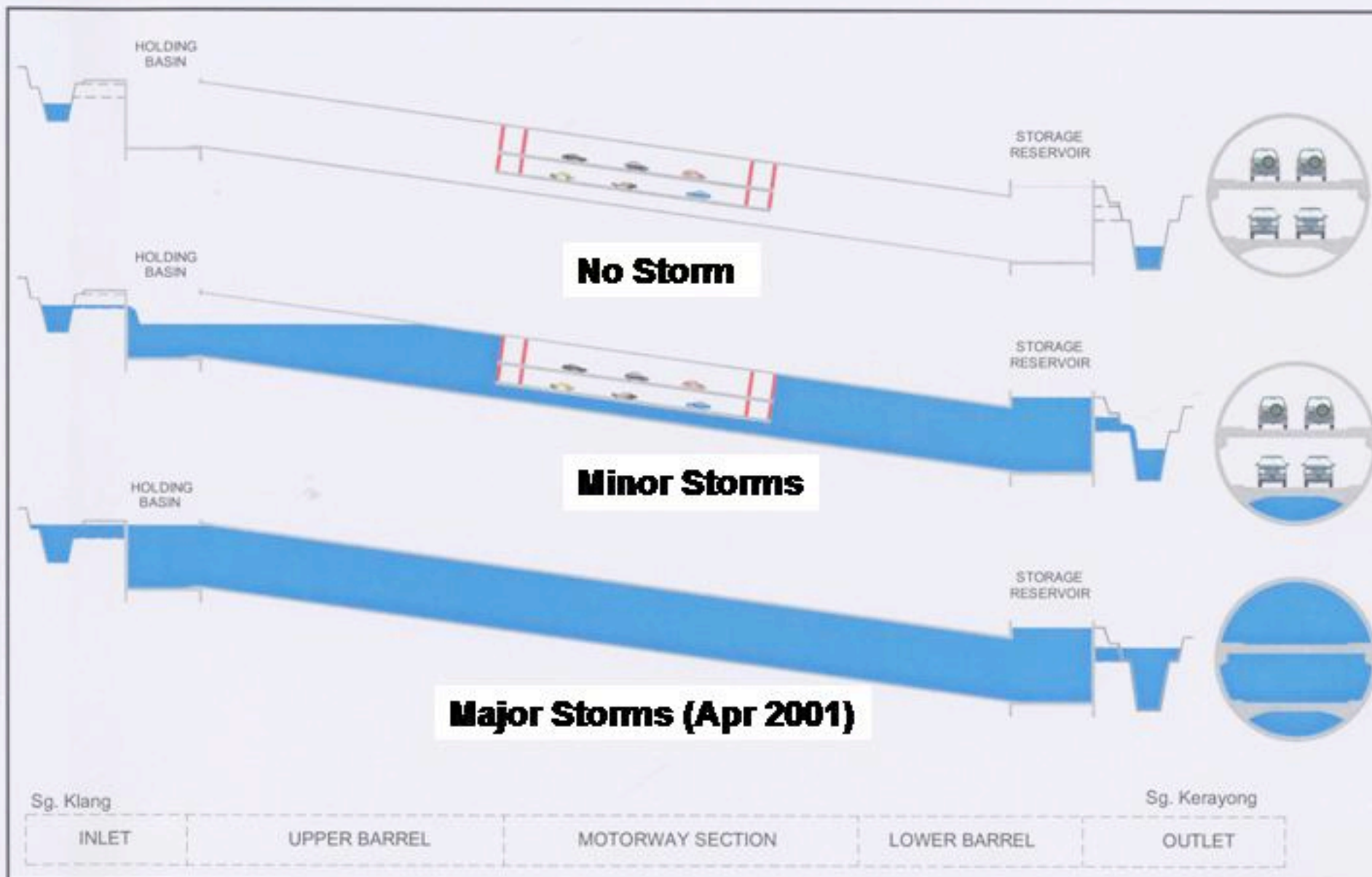
# FAST

- **Why Fast ?**
  - **fast responding catchment (Klang Valley)**
- **Stormwater Management and Road Tunnel (SMART)**
  - **Clear the motorway tunnel emergency evacuation**



# TOPOGRAFI LEMBAH SG. KLANG





## SMART - Modes of Operation

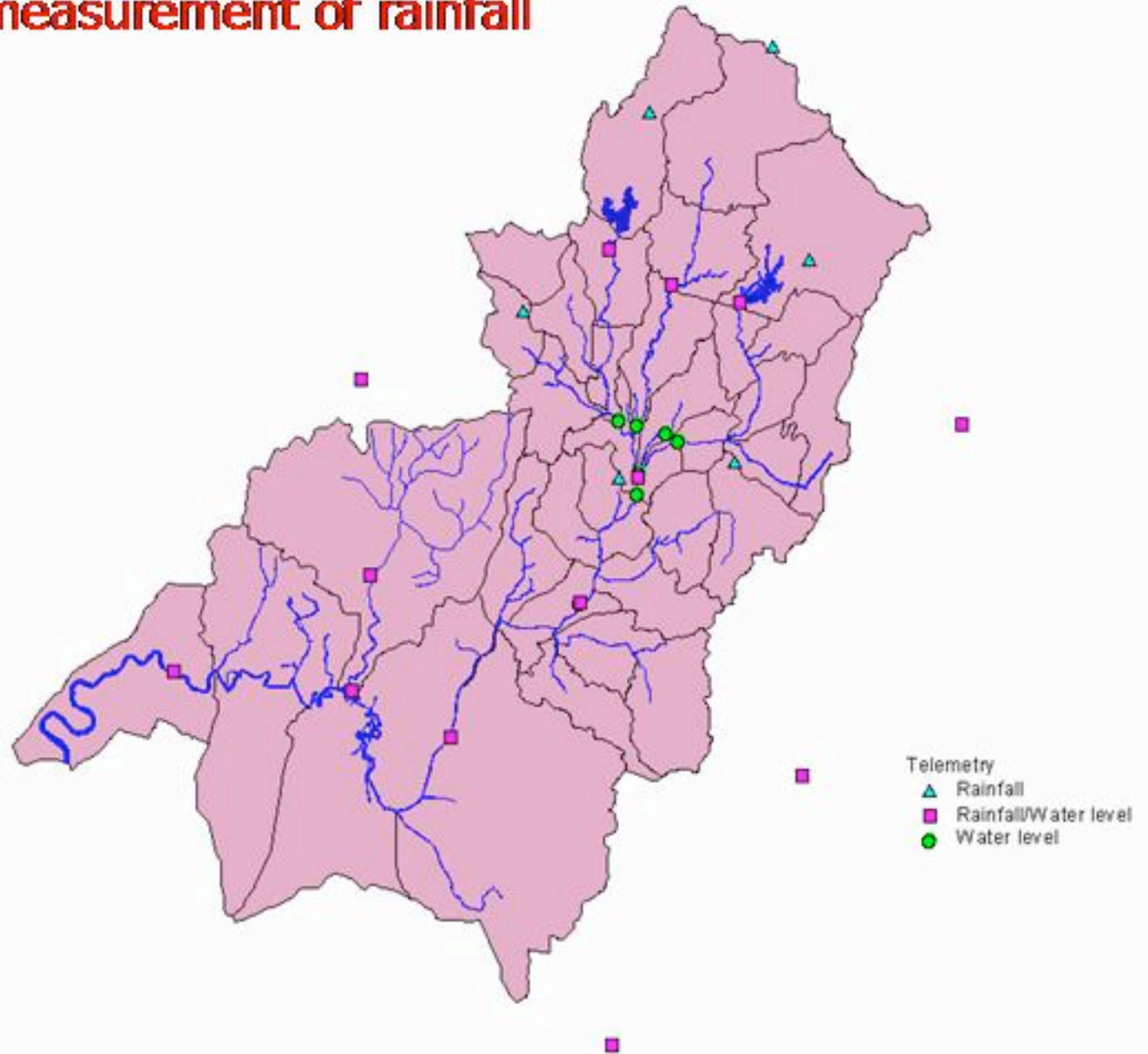
# RELIABILITY

- **Accurate measurement of rainfall**
- **Accurate in Modelling**





# Accurate measurement of rainfall



# Rain Gauges and Radar

- Today two technologies are generally used to monitor rainfall events
  - Rain gauges
  - Radar
- The strength of the rain gauges:
  - good point rainfall estimation and
  - high temporal resolution
- The weaknesses:
  - limited spatial resolution
  - limited visualisation of the observations
- Gauge adjusted radar-rainfall estimates combine the strengths of RADAR and rain gauges.



# Robust

- **Input data (Real time telemetry data)**
- **Minimise failure in data transmission**



# TERIMA KASIH

