



## THE THIRD GENERAL MEETING OF NARBO

# Community-based Flood Early Warning System in Brantas River Basin



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Certificate No. ID03 / 0127



# Description of Brantas River Basin

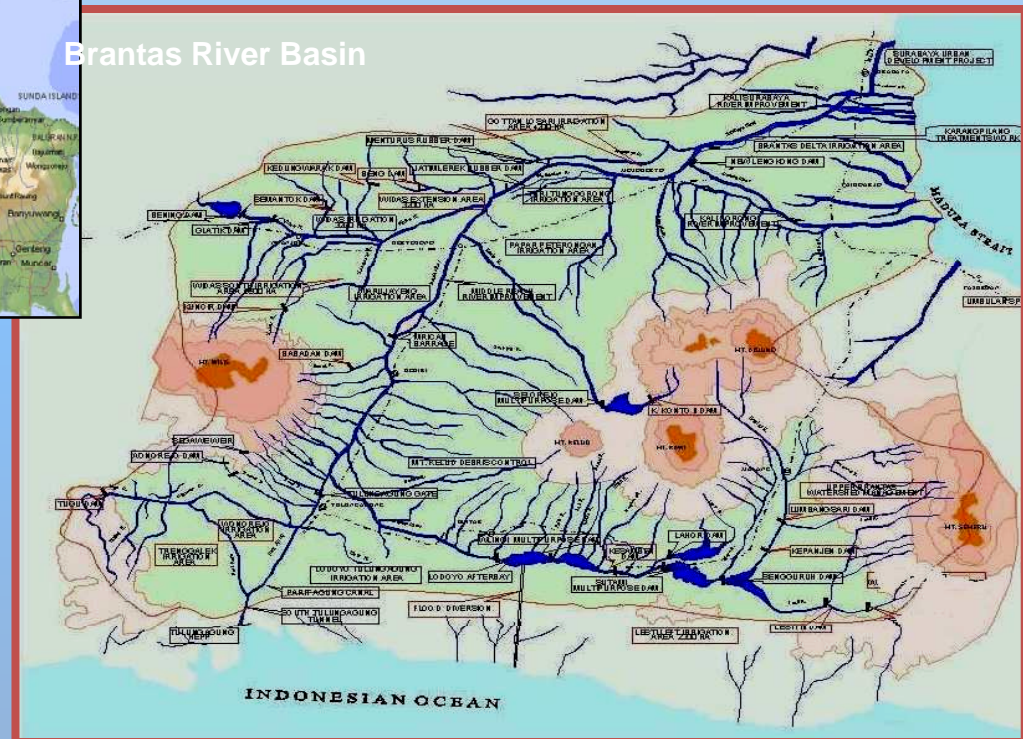


East Java



Brantas River Basin

Brantas River Basin



- Active volcanoes: Mt. Kelud & Mt. Semeru
- Land Use (2004) :
 

- paddy field	39.0%
- dry land	12.0%
- plantation	22.0%
- forest	11.0%
- settlements	12.0%
- others	4.0%

- Basin Area : 11,800 km<sup>2</sup> (25% of E. Java)
- Population (2003) : 15.5 million (43% of E. Java)
- Average Rainfall : 2,000 mm/year
- Water Potentials : 12 billion m<sup>3</sup>/year
- River Length : 320 km



# Background

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- Floods frequency and magnitude in the Brantas River Basin increase due to excessive rainfall.
- Most of the tributaries aren't covered by the Flood Forecasting and Warning System (FFWS) facilities installed in 1990.

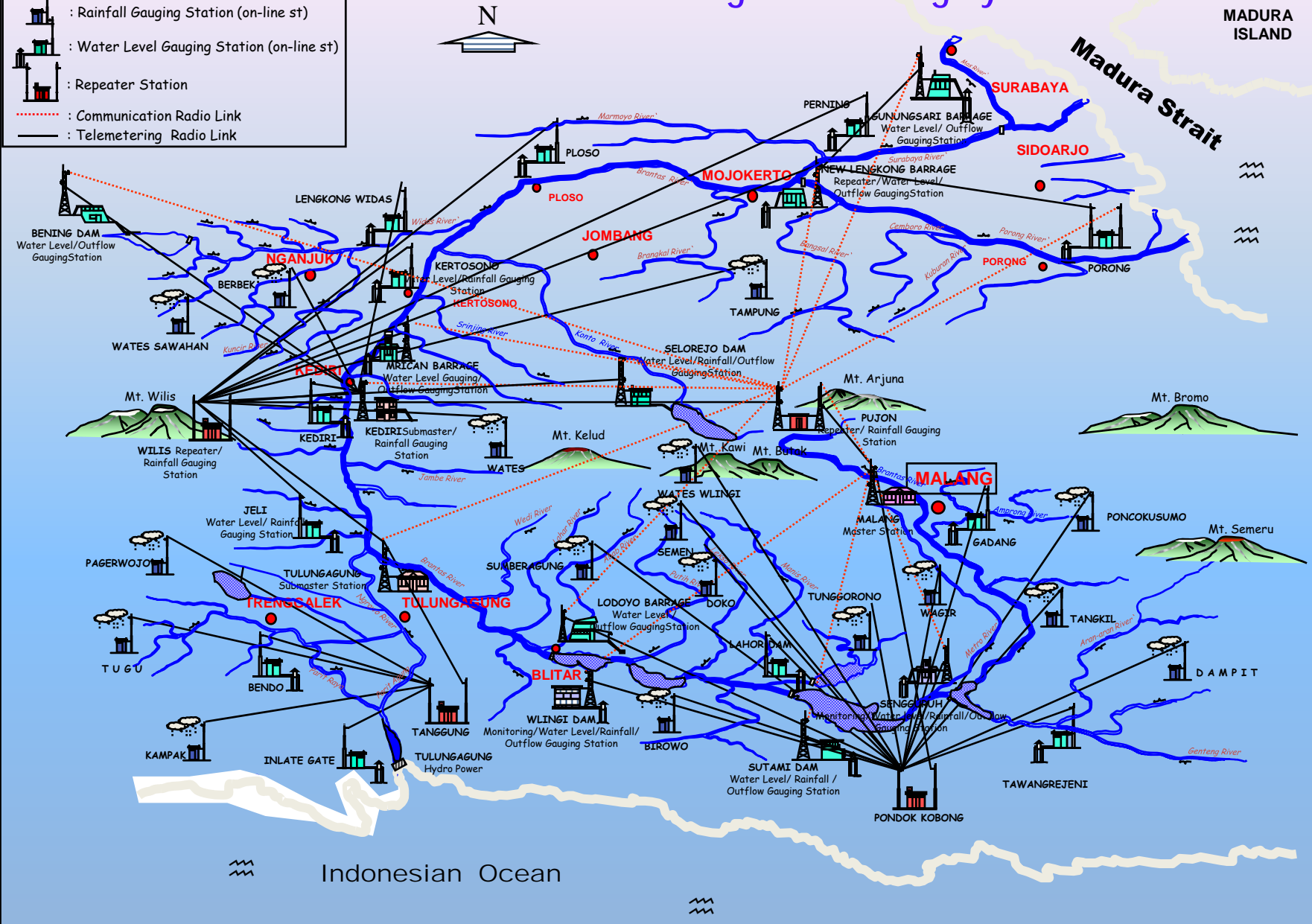




# Notes :

-  : Rainfall Gauging Station (on-line st)
-  : Water Level Gauging Station (on-line st)
-  : Repeater Station
-  : Communication Radio Link
-  : Telemetry Radio Link

## Flood Forecasting and Warning System





# Flood Forecasting and Warning System (FFWS) Facilities

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Installed	:	1990
Communication	:	radio wave frequency
Rainfall stations	:	26 nos
Water level stations	:	15 nos
Sub-master stations	:	3 nos
Repeater	:	2 nos
Master station	:	1 nos



## Flood damages in tributaries of Brantas Basin



Pait Village, Trenggalek Recency  
2006





## Flood damages in tributaries of Brantas Basin



Durenan Village, Trenggalek Recency  
2006





# Concept

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- Community-based flood early warning systems is “people-centered” system and empower individuals and communities threatened by flood hazards to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life, damage to property, environment and loss of livelihood.
- It provides the community and disaster mitigation committee with advance information on the floods risks that can be readily translated to disaster prevention, preparedness response actions against loss of lives and injuries.
- It helps reduce economic losses by allowing people to better protect their assets and livelihood.
- The system uses available low (simple) technology (the spare parts can be easily found in the market).





water level  
monitoring  
stations



rainfall  
monitoring  
stations

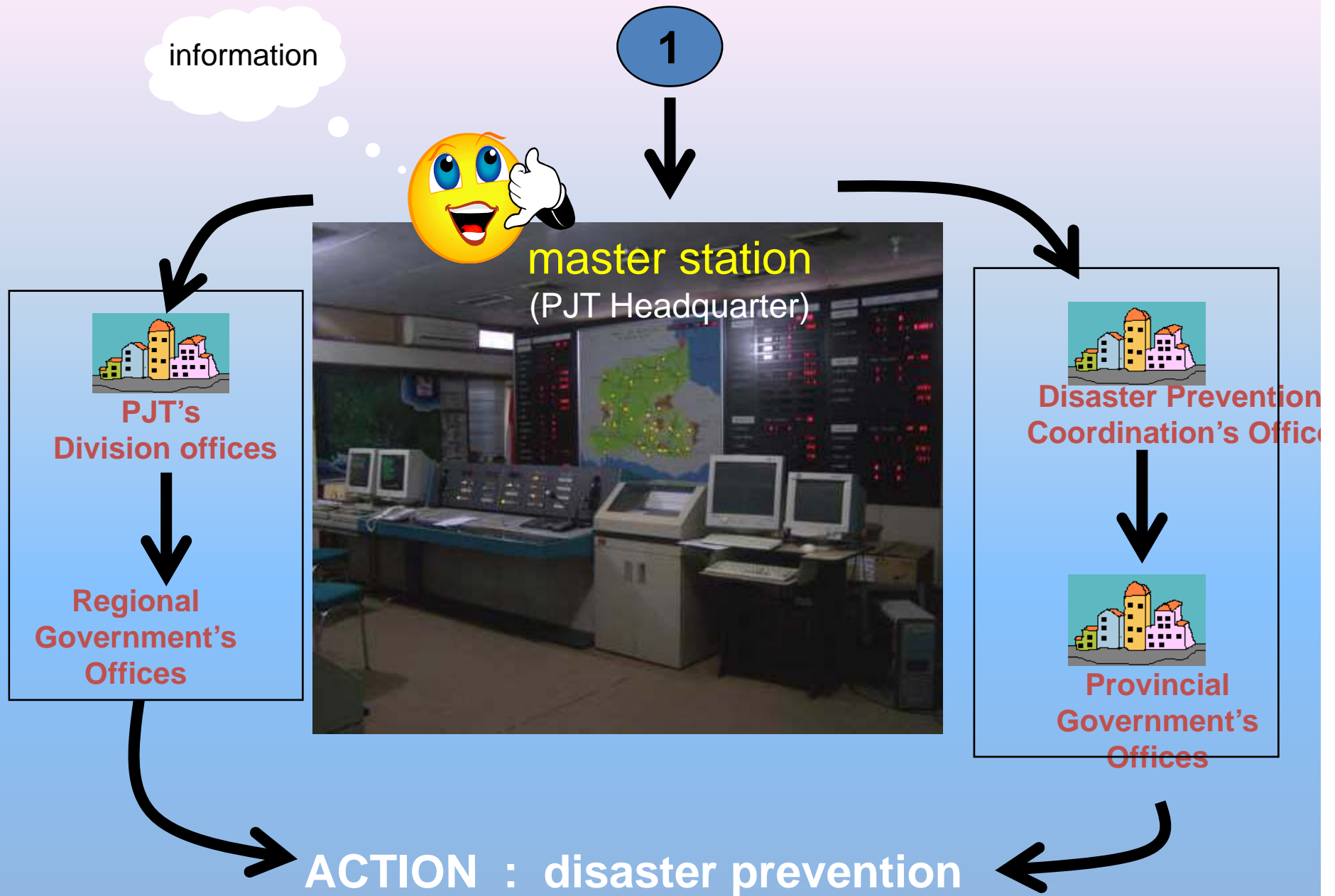


repeater station



1







# EARLY WARNING DEVICES PRINCIPLE

RAINFALL  
WATER LEVEL



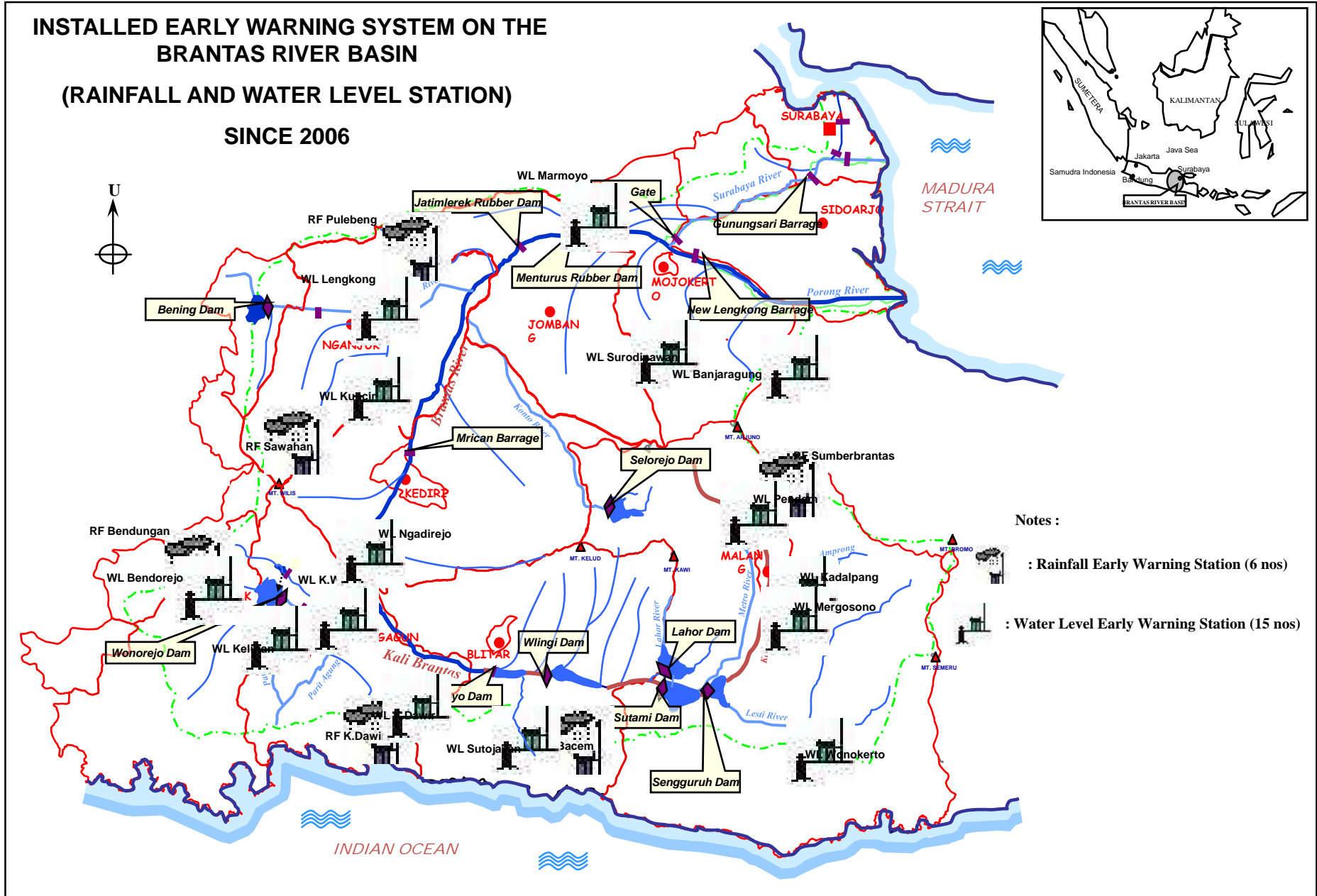
**connected to an alarm  
installed in one of the village officer's house**



# INSTALLED EARLY WARNING SYSTEM ON THE BRANTAS RIVER BASIN

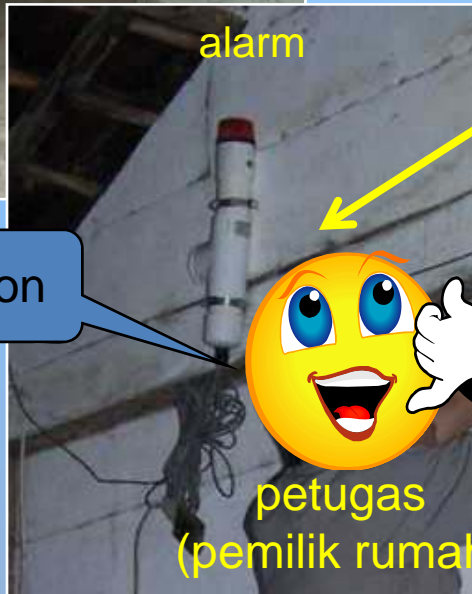
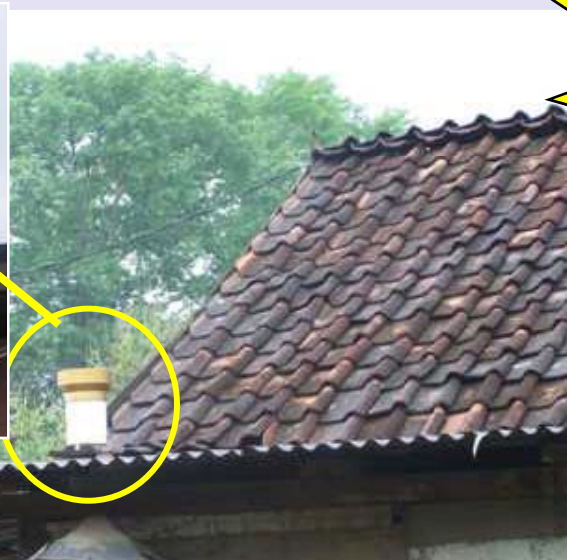
(RAINFALL AND WATER LEVEL STATION)

SINCE 2006





rain > x mm



information

RAINFALL  
WARNING

1





water level detector  
 $WL > x \text{ el. M}$

BLINK..BLINK..BLINK...  
RING..RING..RING..RING....



information

**WATER LEVEL WARNING**

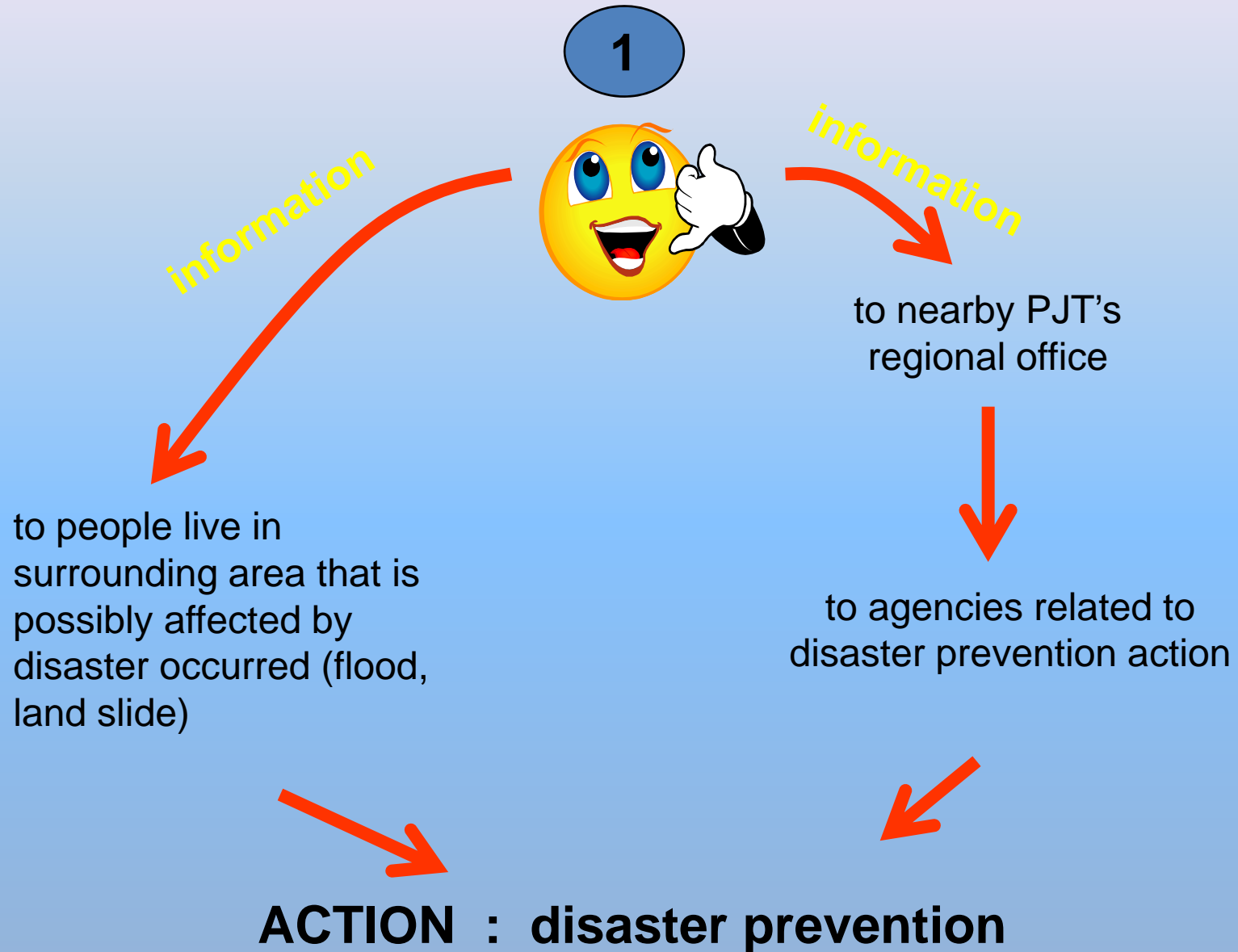
1



Staff/House Owner



# Information Flow

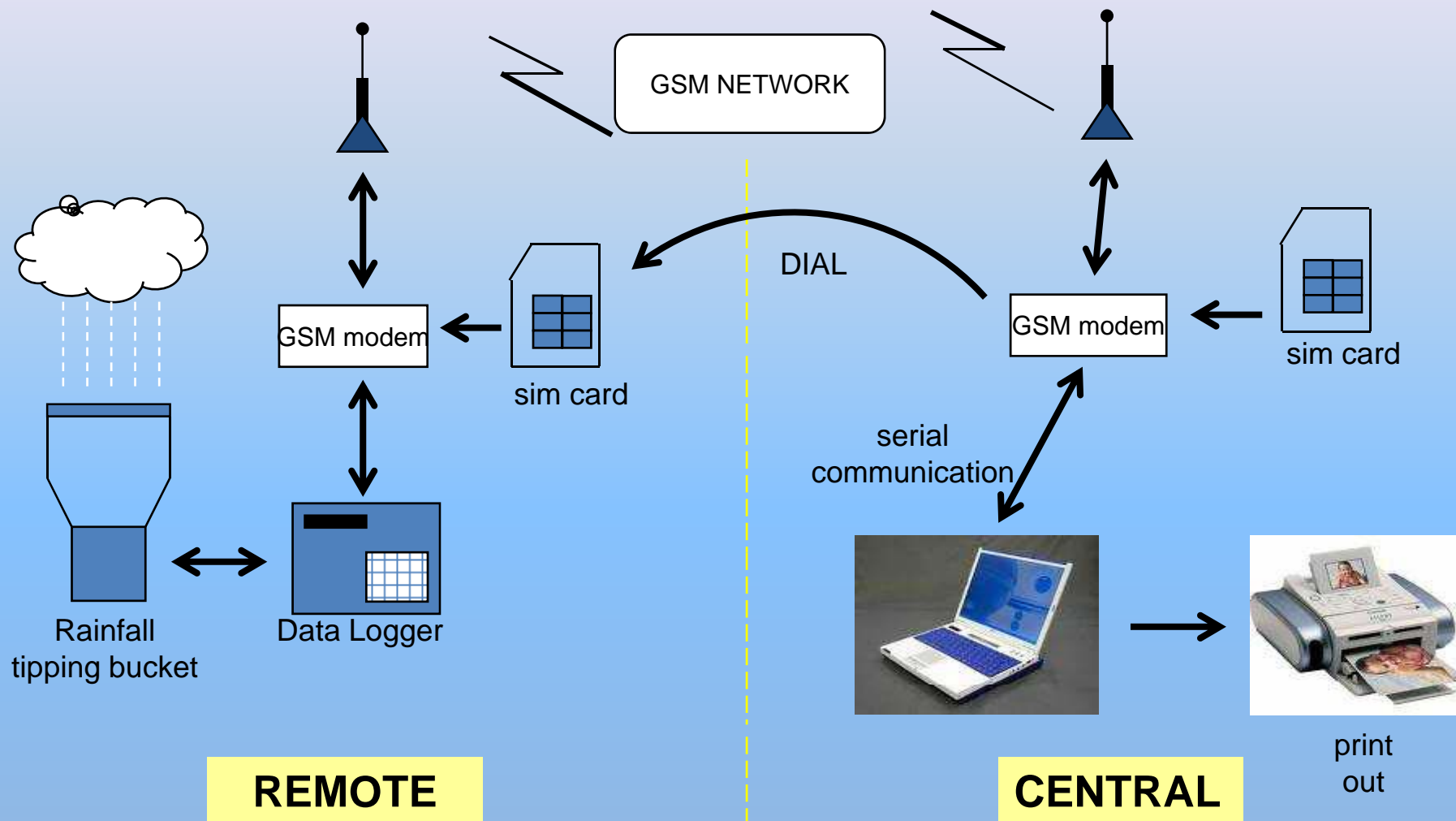




# TELEMETERING SYSTEM USING GSM NETWORK



# Rainfall Monitoring Device (CSD Circuit Switched Data)



TELEMETERING SYSTEM USING GSM NETWORK



## Rainfall Monitoring Device : example in PJT's area (CSD - [Circuit Switched Data](#))



Gealog Data Logger

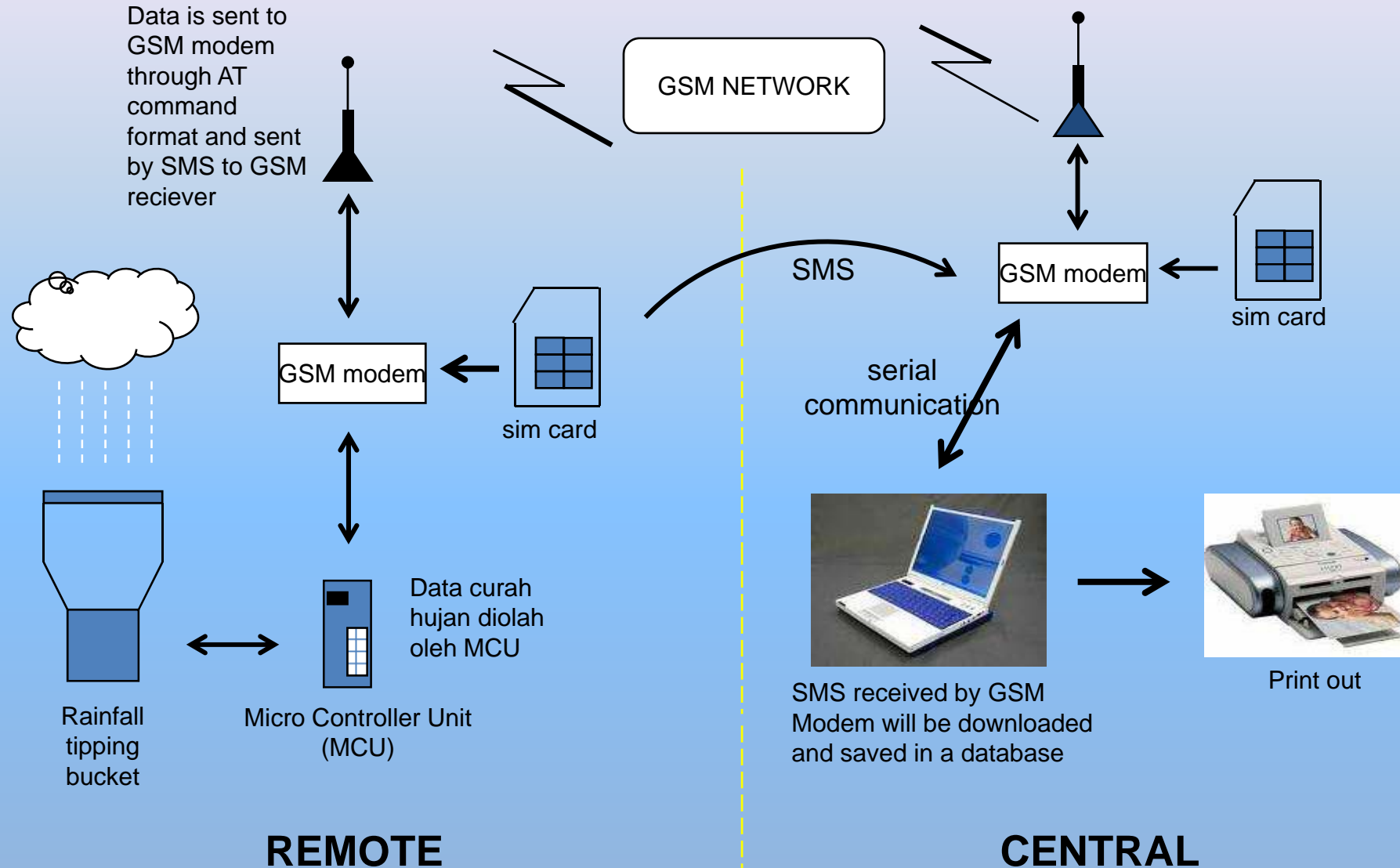
Antenna GSM Modem

GSM Modem

Trawas Rainfall Station  
(CSD)



# Rainfall Monitoring Device (SMS - short message service)





*Thank You*



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