



# Development and Implementation of the South East Asia Flash Flood Guidance System (SEAFFGS)

*Ha Noi, Viet Nam, 20-23 November 2017*

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## Flash flood forecasting and warning infrastructures of National Meteorology and Hydrological Services of Cambodia

Department of Meteorology, Cambodia

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# 1-National capacity for the provision of flash flood early warnings

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Cambodia NHMSs has been provided two kind flash flood warning :

1- Localize flash flood at tributaries

2-Tansboundary flash flood

For the tool of FFGs we are using the products and interpretation from the MRCs

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## 2- National capacity for weather forecasting and nowcasting (Global and limited Area Models, meteorological data processing and visualization software)

The image displays the Synergie 4.6.2 software interface for NWP Modelling. The main window is titled 'Models' and shows a 'Parameters' panel with 'Wind bars' selected. Below this is a large grid plot titled 'US / 0.5 - Wind bars' showing pressure levels (1000HPA to SURFACE) and time (00 to 16 UTC). A secondary window shows 'Radiosounding' options for 'LOCATION SELECTION' and 'LOCATIONS'.

**Parameters Panel:**

HEIGHT	Geopotential	MSLP	T	DPT	RH
Abs. Vort	Wind bars	Wind Speed	Stream Lines	Vert Velocity	
LI	SI	CAPE	WBPT		

**Models List:**

- ARP - GLOB/1.5
- ARP - SEA/0.5
- ECMWF/2.5
- GFS - GLOB/0.5
- JAPAN/1.25
- JAPAN/25

**Radiosounding Panel:**

Associated messages:  TEMP  TEMPSHIP  TEMPBUF

DATA TYPES:  Observation  Forecast

LOCATION SELECTION:  All  Asia  Preferred

LOCATIONS:  Cambodia  Cambodia\_Large  Asia  Global

# NWP Modelling



# 3-Current hydro-meteorological networks (number and types of meteorological and hydrological stations, Radar network, data dissemination methods, GTS reporting, databases)

## Manual and Automatic Weather Stations

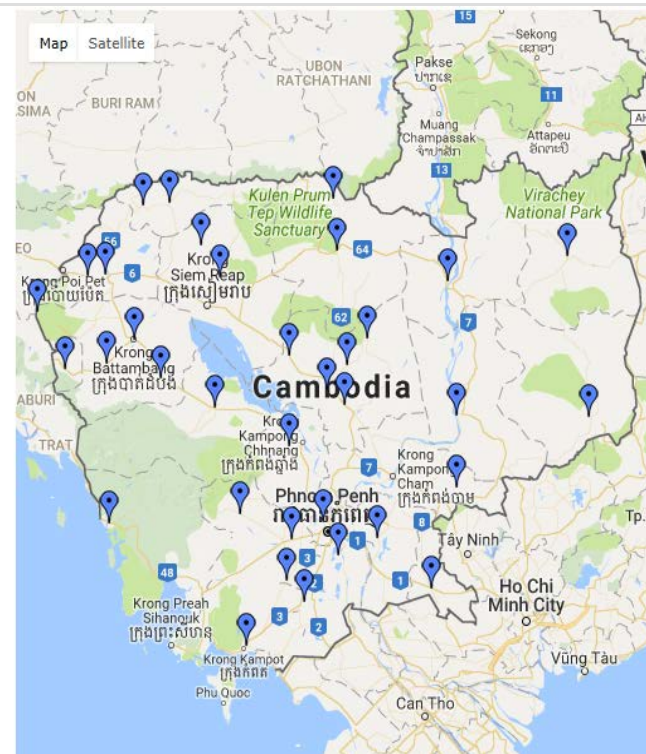
### Synoptic Stations

- 35AWS and 24 Synoptic are operational with manual observational equipment.
- 75 hydrological stations Manual reading
- 20 Telemetry Stations
- Data collection by SMS, Phone, and E-mail.

## Real time data 35 Stations AWS

### Reports:

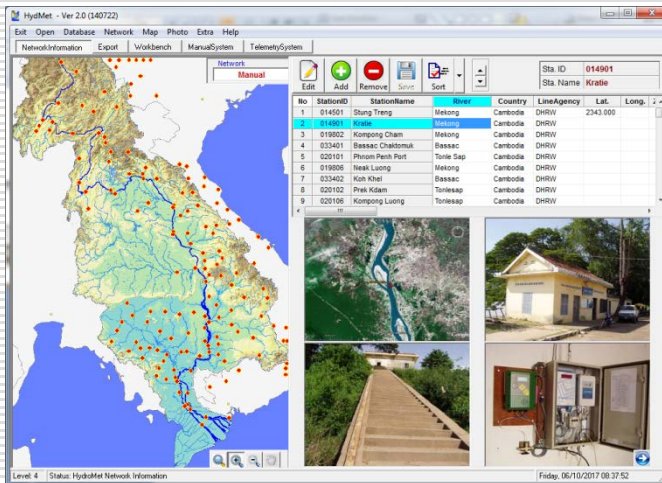
- Station Last Update
- Summary Report
- Report For Today
- Report For Yesterday
- Report For 7 Days
- Report For 14 Days
- Download Report
- System Graph
- Cumulative Rainfall Report
- Daily Rainfall Report



# Regional Data Sharing

Telemetry System  
(Automatic Data Transferring)

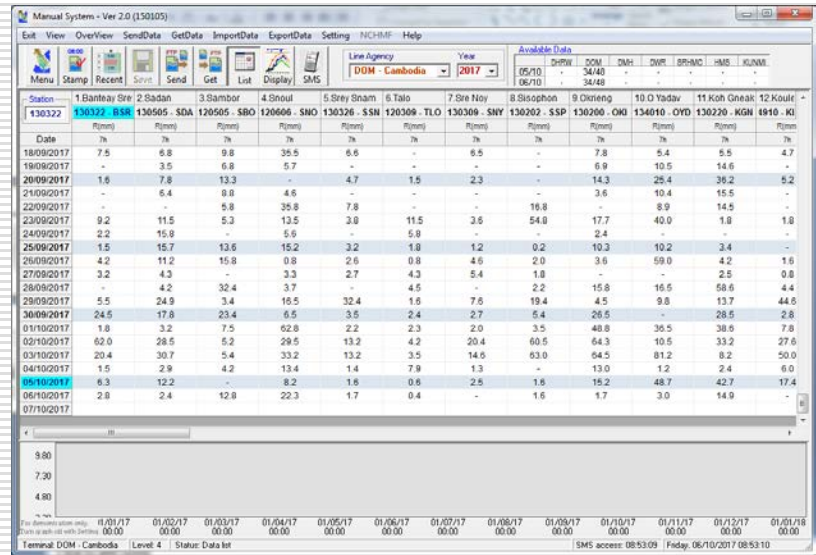
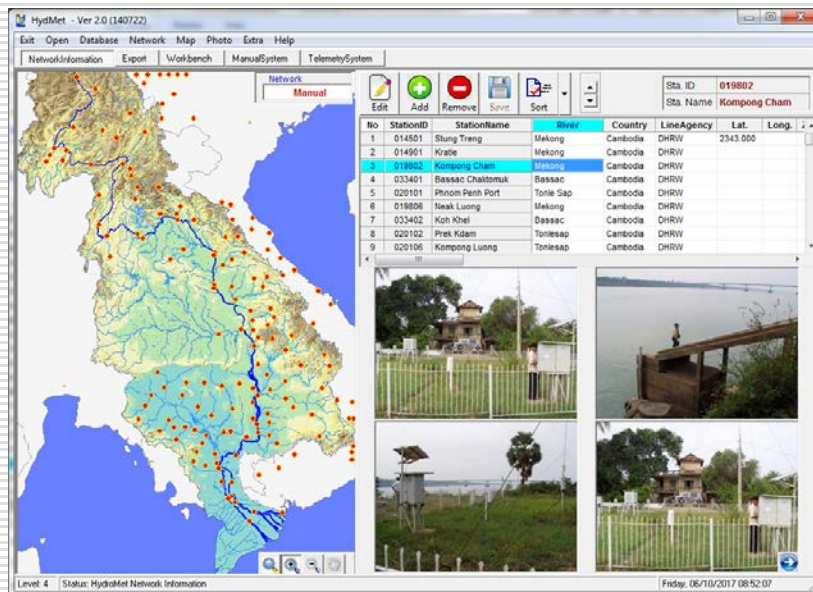
Flood Levels for Hydrological  
Station ( Cambodia )



# Hydro-met Stations

## Station Networks in Basin

## Rainfall Data



# Installation of real time data transmission system AR 31/11



02/02/2018

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System overview



server system



discussion



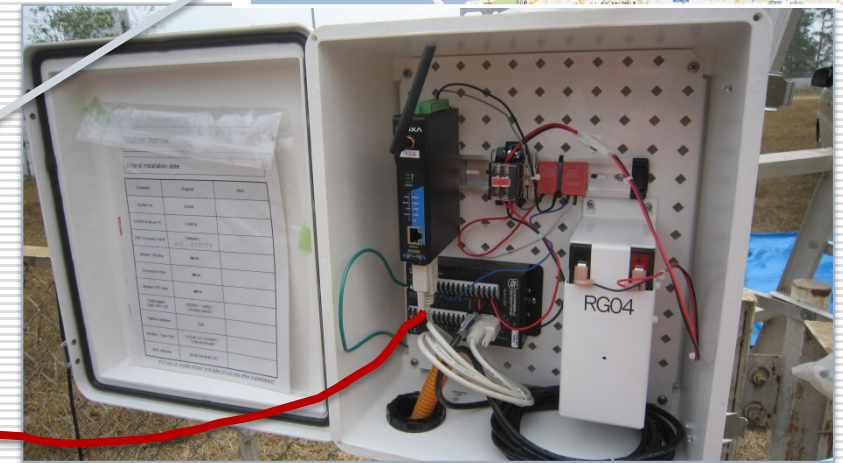
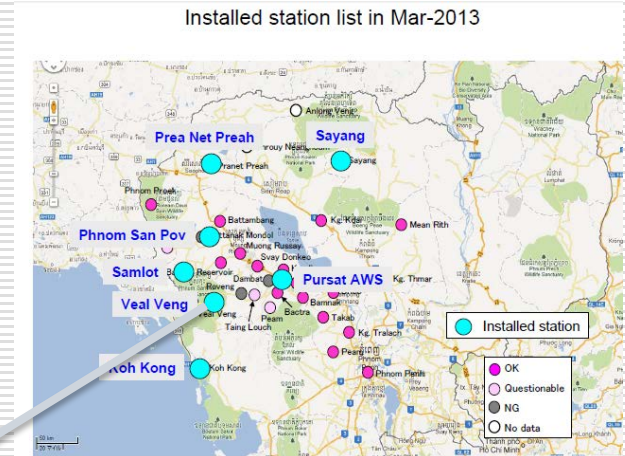
# Installation of near real-time data transmission system

Soil moisture sensor data logger

Ex- Veal Veng Station, real time data



Rain Gauge



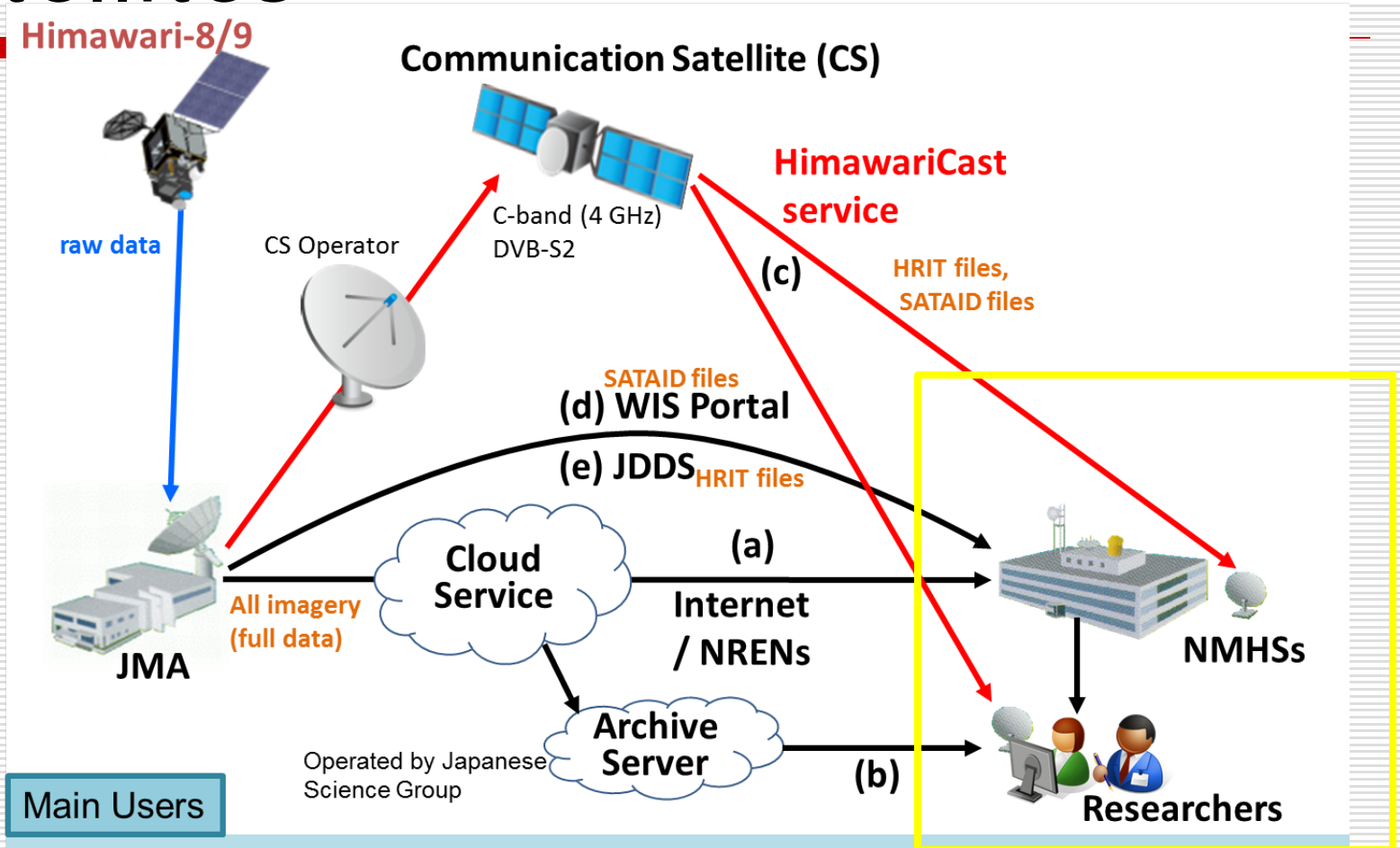
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Box: Data logger, modem, battery

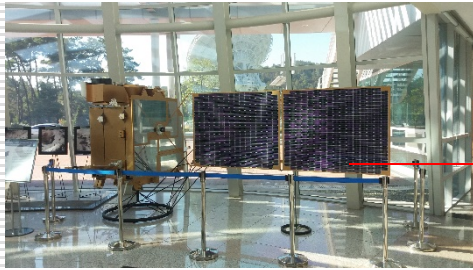
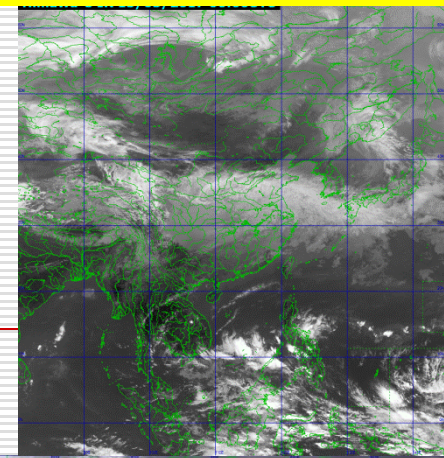
# Satellites

Himawari-8/9

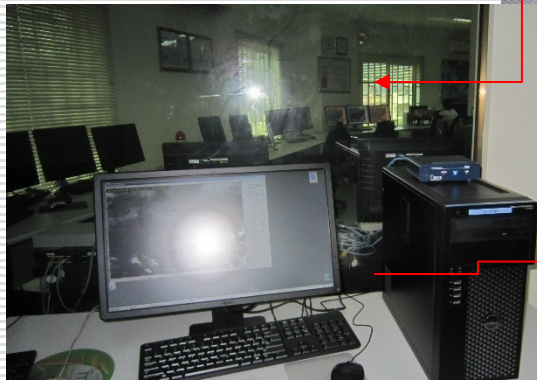
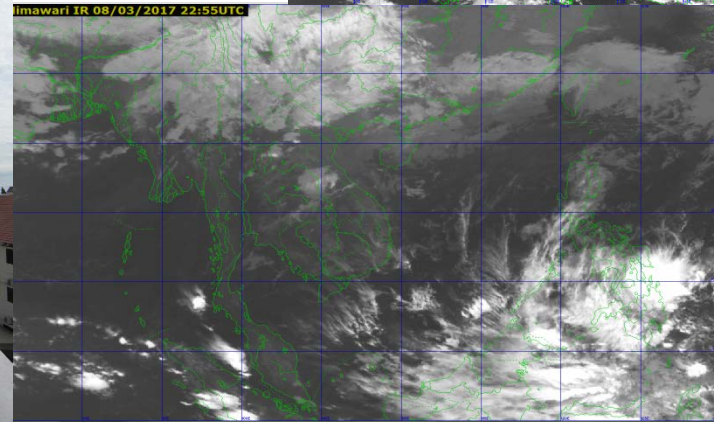


# Satellite Himawari 8/9- JMA

Receiving Ground Station Satellite  
WMO/JMA



Receiving  
Server



02/02/2018

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# Radar Images

**Rainbow Control Center**

File View Tools Help

File Edit Sensors Windows Help

Sensor : Cambodia

View Products

Online

CAPPI dBZ Range: 240 km CAPPI_240_2_cappi Auto Download			
CAPPI dBZ Range: 480 km CAPPI_480_2_cappi Auto Download			
CAPPI V Range: 240 km CAPPI_240_2_cappi Auto Download			
MAX dBZ Range: 240 km MAX_240_max Auto Download			
MAX dBZ Range: 80 km MAX_80_max Auto Download			
MPPI dBZ Range: 100 km MPPI_100_mppi Auto Download			
MPPI dBZ Range: 240 km MPPI_240_mppi Auto Download			

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02/02/2018

**Rainbow Control Center**

File View Tools Help

File Edit Sensors Windows Help

Sensor : Cambodia

View Products

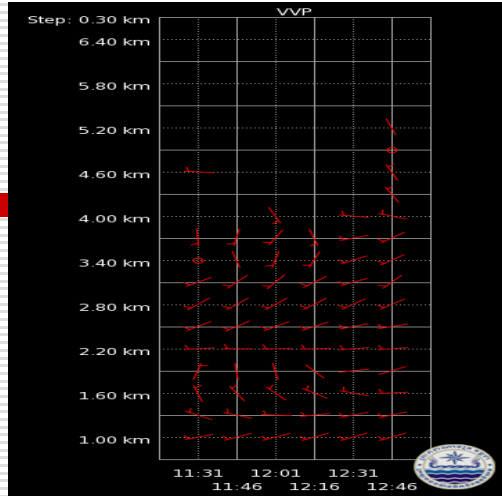
Online

SRI dBR Range: 80 km SRI_80km_cyclone_s Auto Download			
SRI dBR Range: 80 km SRI_80km_monsoon Auto Download			
SWI Range: 240 km SWI.swi Auto Download	<b>SWI</b>	<b>SWI</b>	<b>SWI</b>
CTR Range: 240 km CTR.ctr Auto Download	<b>CTR</b>	<b>CTR</b>	<b>CTR</b>
RTR Range: 240 km RTR.rtr Auto Download			
WRN Range: 100 km 100_ZvW_vol_KHM- Auto Download	<b>WRN</b>	<b>WRN</b>	<b>WRN</b>
WRN Range: 240 km 240_ZvW_vol_KHM- Auto Download	<b>WRN</b>	<b>WRN</b>	<b>WRN</b>

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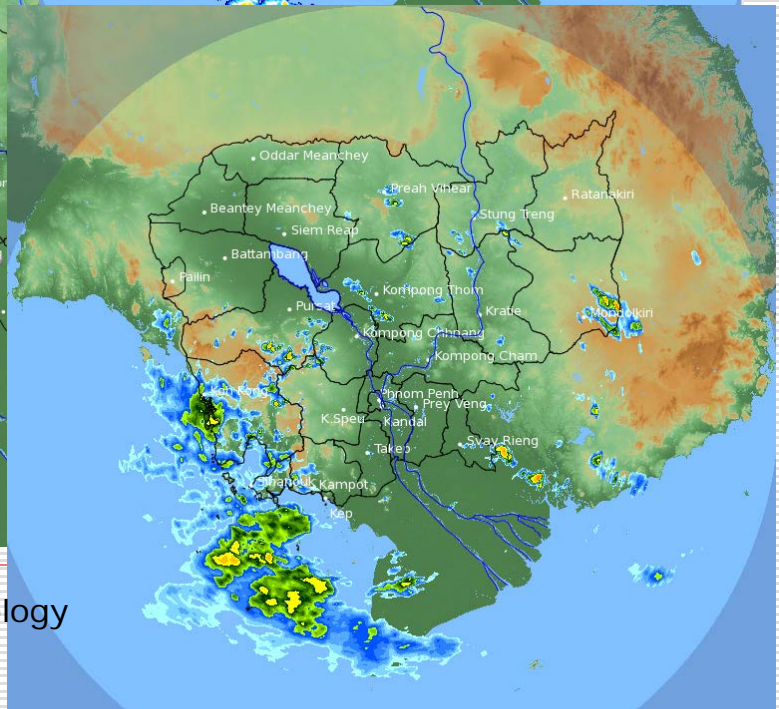
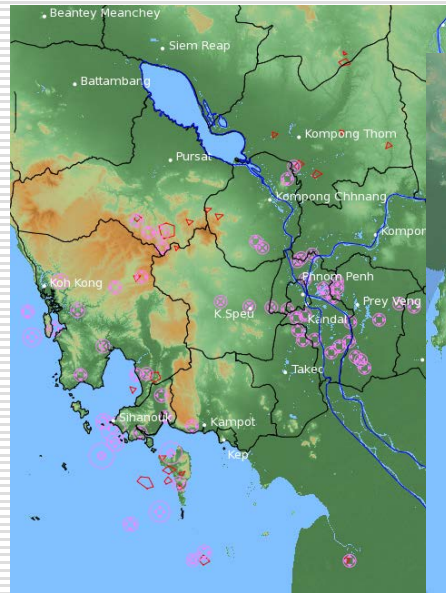
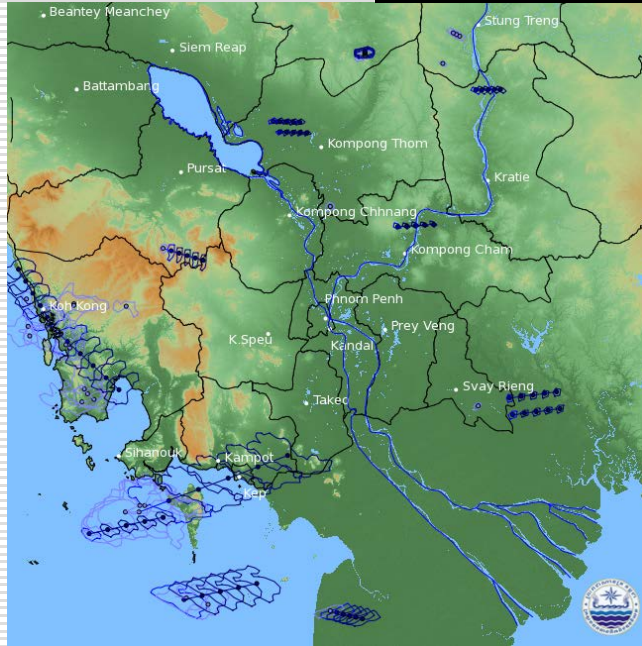
# Radar Images



**VVP (V)**  
**12:46 / 15-Jul-2013**  
**Cambodia**

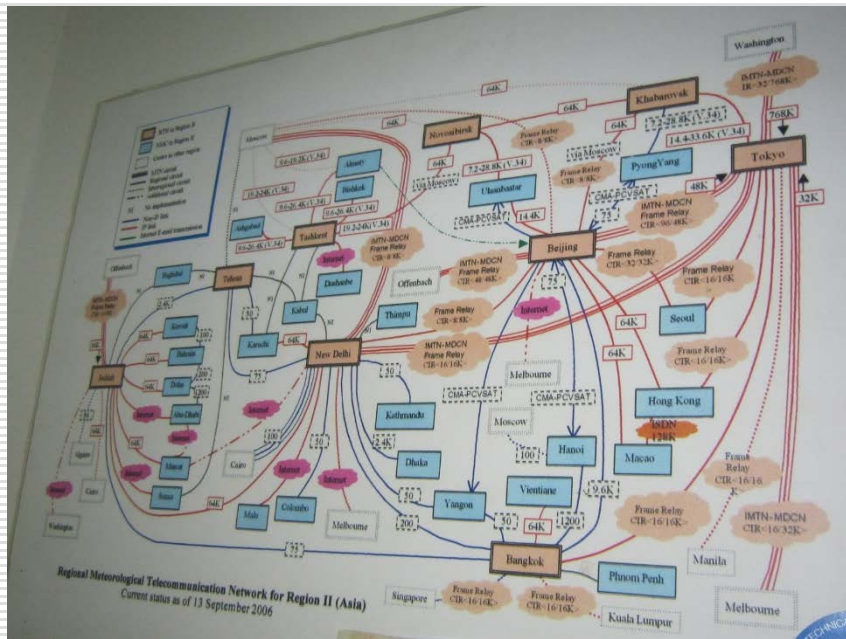
Pdf File: VVP.vvp  
 Range: 5 km to 25 km  
 Clutter Filter: Variable  
 Time sampling: Variable  
 PRF: Variable  
 Alg type: Complete  
 Elevation: 0.5 deg to 25.0 deg  
 Second reg: On

Powered By : MOWRAM  
 Rainbow® SELEX-SI



# Global Telecommunication System (GTS)

We got the various meteorological data /information as well as early warning for any extreme events occurred in the region via Regional Global Telecommunication System (GTS) linked from TMD, Bangkok.



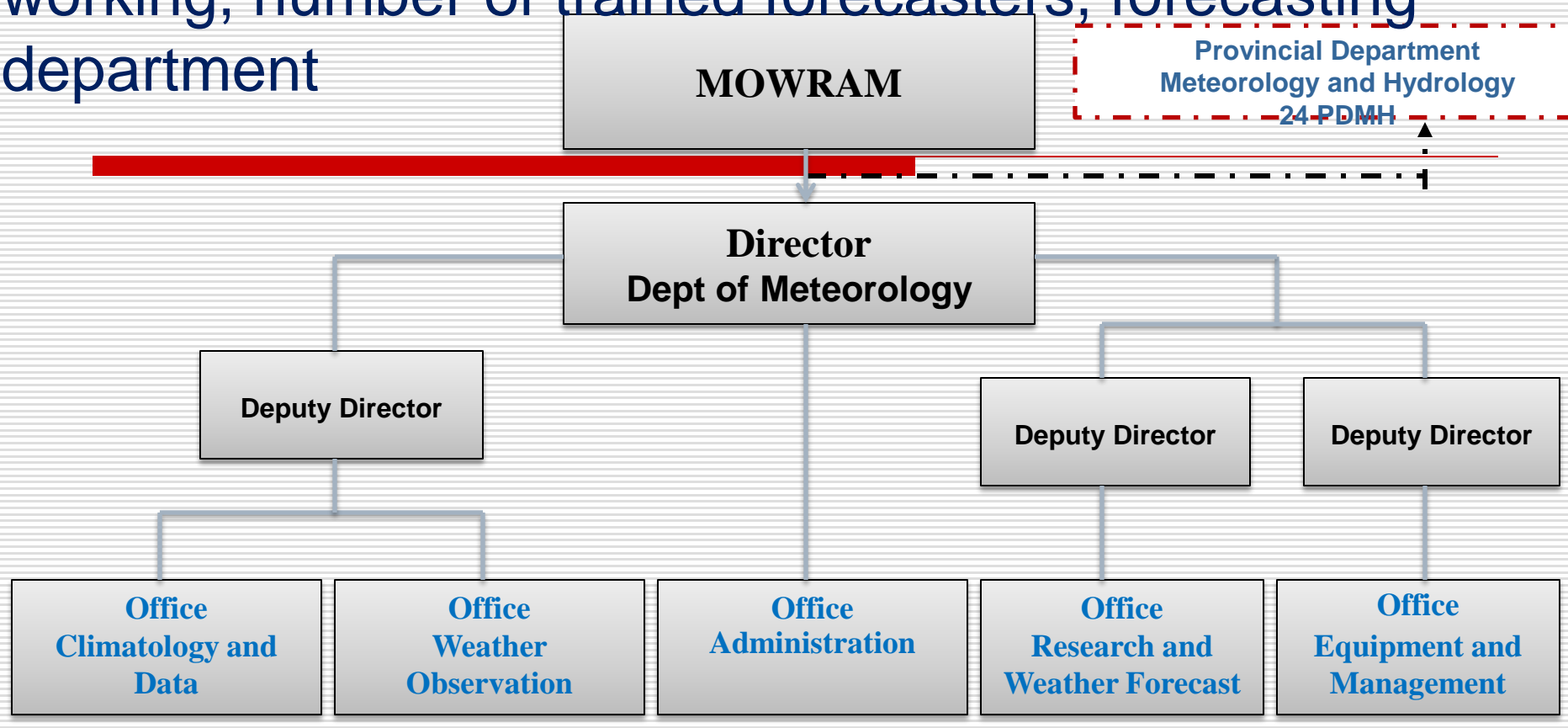
## 4-Availability of systematically observed hydrometeorological data (availability of the data, data types, digital or paper, periods of coverage) since May 2012

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Hydro meteorological data has been manage and record both manually and automatically

- For hydrology data since 2012 (Hymost Data base, and Papers)
- For meteorology data not complete parameter since 2012, ( Excel and Paper)

# 5- Organizational structure and human resources (7/24 working, number of trained forecasters, forecasting department



## Meteorological Organization

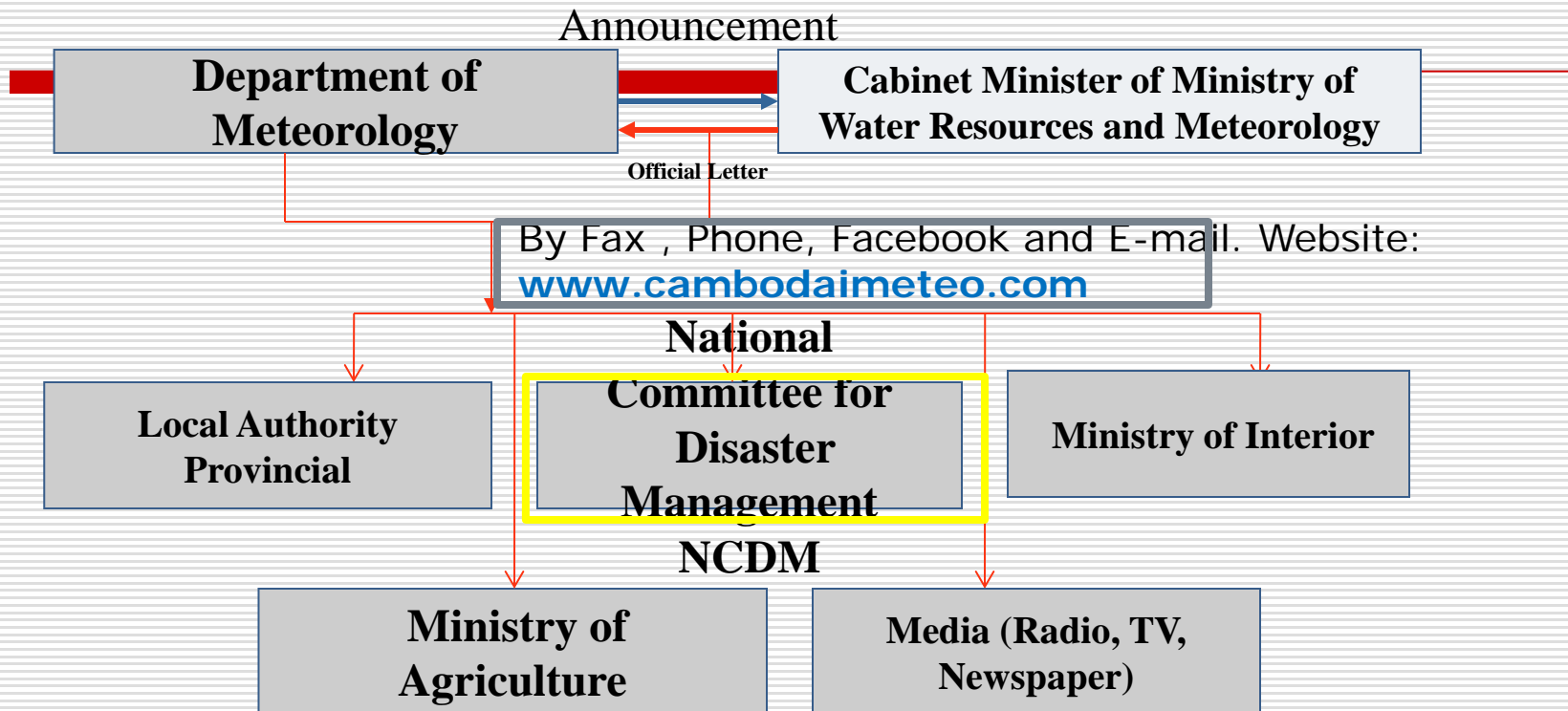


# ❖ Department Of Meteorology (DOM)

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- We have total staffs 43 are working in the 2017.
  - 5 are masters degree; 10 are engineers, 16 are technicians, 13 are simple staffs.
  - DOM are divided 5 offices :
    - Administration office (9 staffs)
    - Weather forecast office (7 staffs)
    - Climatology and data office (7 staffs)
    - Equipment and management office (7 staffs)
    - Weather observation stations office ( 9 staffs);
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# 6-Dissemination and Warning Procedure



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*Thank You for Your Attention*