Country Report

Department of Meteorology (DoM) Cambodia

Presenter's name

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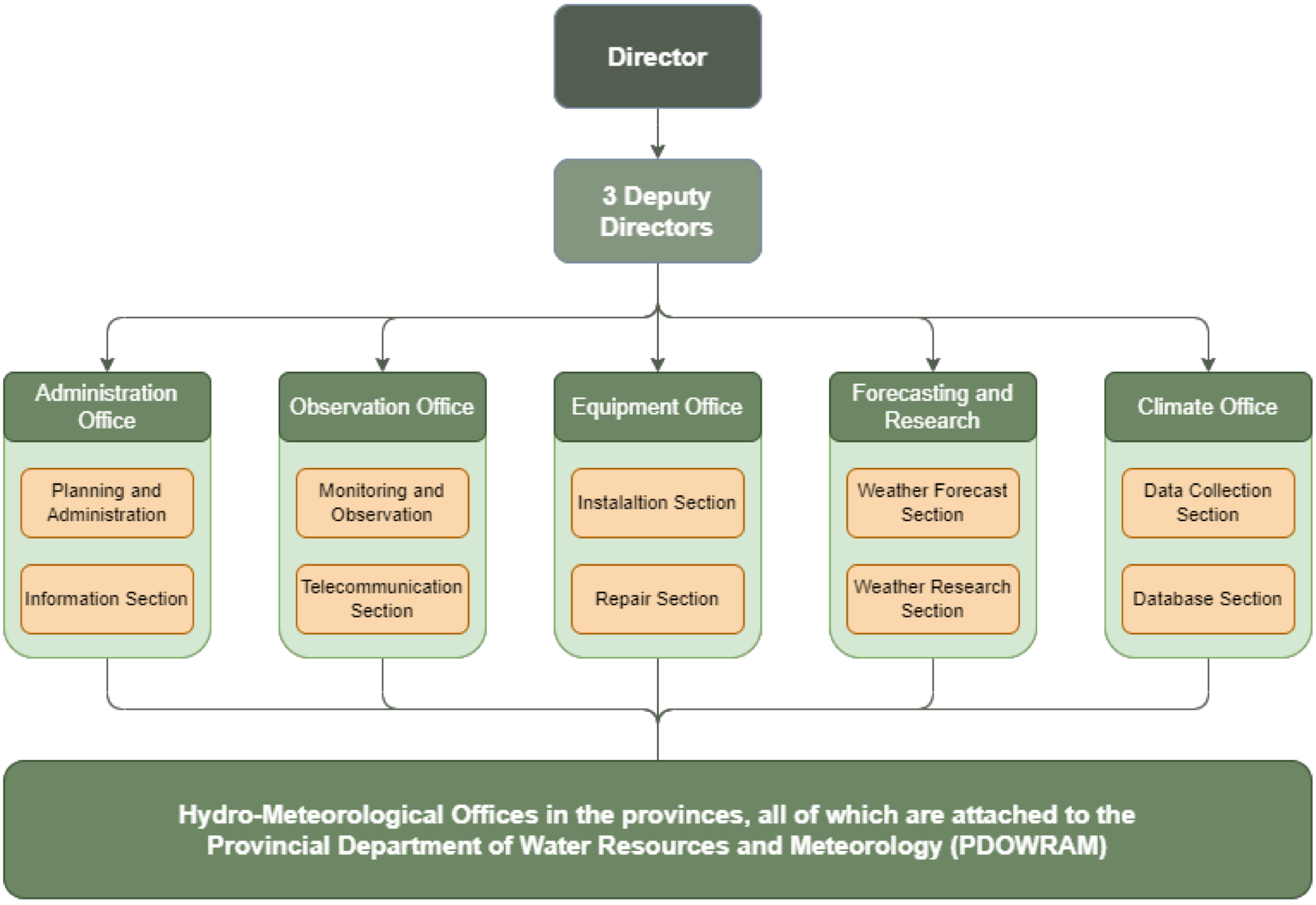
Table of Contents

1. Introduction

- Cambodian weather observation **began in 1894**.
- Cambodia joined the World Meteorological Organization **(WMO) in 1955**.
- From **1975 to 1979**, Cambodia was under political instability under the Khmer Rouge (**Democratic Kampuchea**), the weather **observation network and service were abandoned**, and **all types of equipment were destroyed**.
- During **1979-1995**, Cambodian **weather observation** was still in a **basic operational system** due to the **limited funds and capacity**.
- Between **1999 to 2008**, the weather observation in **Department of Meteorology (DOM)**, MOWRAM was **upgraded a bit further with the technical and financial support from JICA**.
- In **2011**, the project to install a **weather radar was initiated**, and **one weather radar system was installed** using the **Government budget**.
- From **2013 to 2023**, DOM installed around **86 automatic weather stations** with the financial support from the **government, ADB, GEF-UNDP, and KMA-Korea**.
- Currently, there are a total of **111 meteorological stations** installed across the country (**86 automatic weather** stations and **25 non-automatic stations** in each province) and a total of **235 rain gauges** (including automatic and non-automatic rain gauges).

Organizational structure of the DOM



2. Status of system/network configuration

Tokyo

Bangkok

WMO-SFTP Connection over Internet

WMO-FTP Connection over Internet VPN Link

10 Mbps
Firewall/router

GTS system

MSS1

MSS2

MSS Client1

MSS Client2

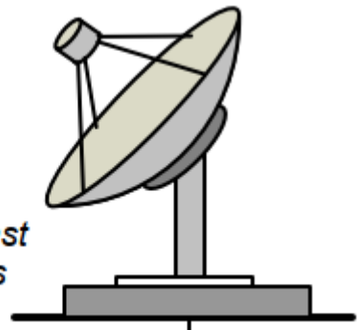
Satellite Client1 systems

Satellite Client2 systems

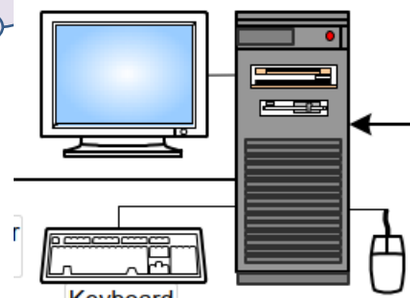
Local Network

Himawari-8/9 Satellite (140 E)

DVB-S2 HimawariCast Receptions



HimawariCast Data Acquisition/Processing PC



DVB-S2 Satellite Receiver Unit Novra S300D

Keyboard

2. Status of system/network configuration

Recent updates of MSS (Message Switching System)

- 2005-2006: Global Telecommunication System (GTS) was installed in Cambodia under support of JICA.
- In March 2010, Department of Meteorology was moved to the new place, GTS was re-installed and connected link to Bangkok again on June 14, 2010, and MTSAT was re-installed on July 15, 2010 that was under technical supported and assistant of WMO Volunteer
- November 2020: Upgrading system GTS of the current system
  - Established ftp links with Bangkok via the Internet
  - Established sftp links with Tokyo via the Internet

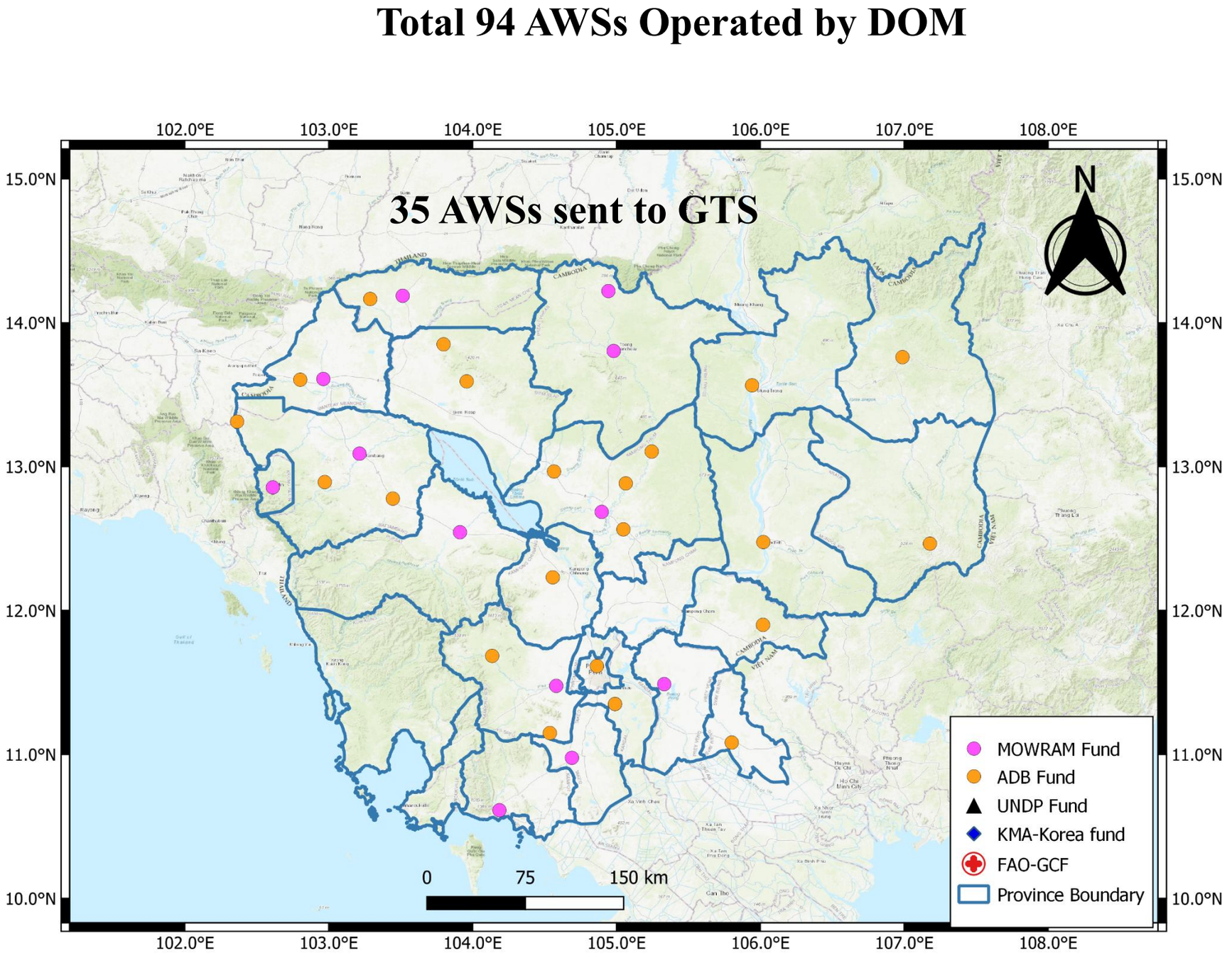
2. Status of system/network configuration

Recent updates of network connection to other countries

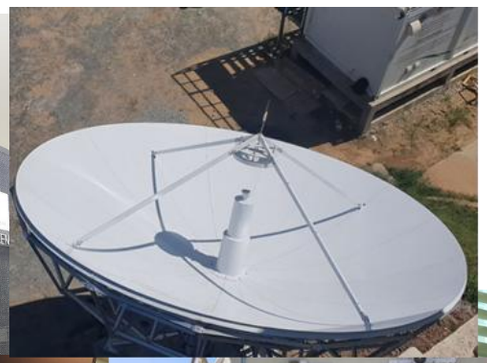
Centre	Protocol	Line	Data
Tokyo	WMO Socket	GTS, MPLS	JMA Model (GRIB), SYNOP, SHIP, TEMP, METAR …
Bangkok	WMO FTP	GTS, Internet	SYNOP, SHIP, TEMP, METAR, Forecast (NCEP), Warnings …
JMA		Radio Broadcast	Satellite image
MFI	FTP	Internet	NWP, forecast system
KMA		Radio Broadcast	Satellite image
…	…		

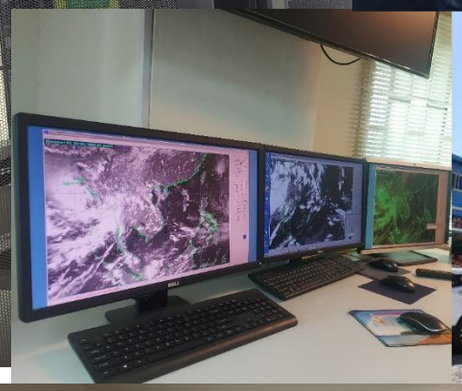
Current Status of Observation Network in Cambodia

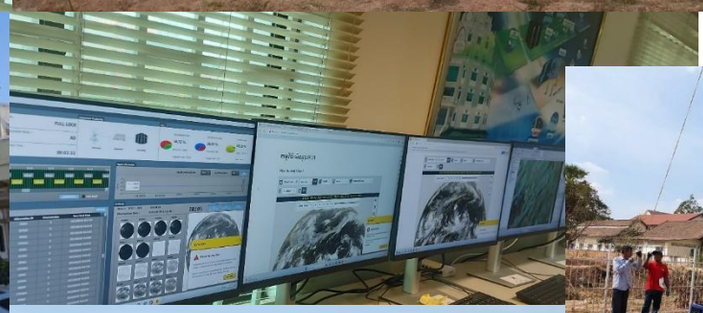
- **35 AWSs**: MOWRAM and ADB fund
- **24 AWSs**: Global Environment Facility-Lea Developed Countries Fu through UNDP
- **27 AWSs**: Korean Government through the Korea Meteorological Administration (KMA)
- **8 new AWSs** installed ir northern province of Cambodia supported by under GCF

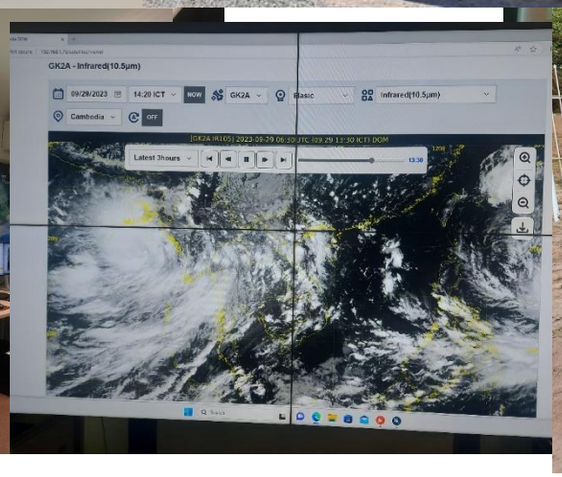


Real time data









AWS 86,Manual Rain Gauge 235

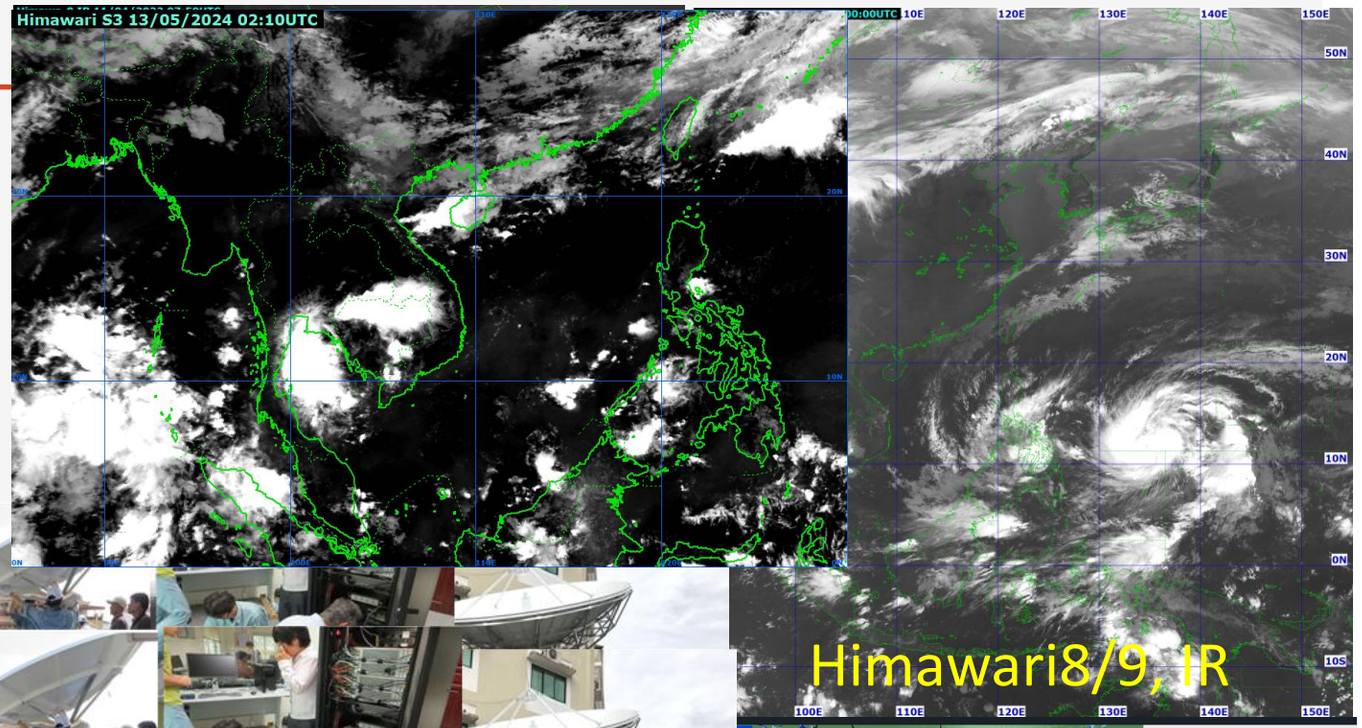
GK-2A,Himawari8/9

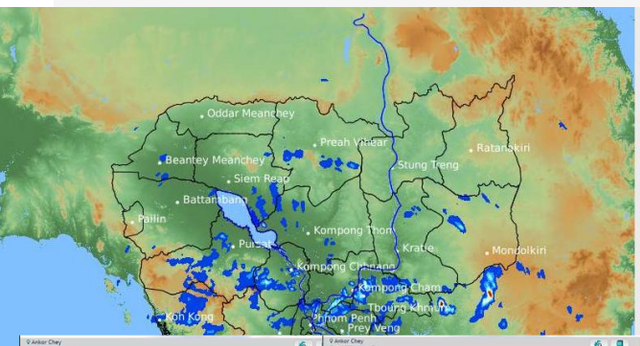
Satellite and Radar

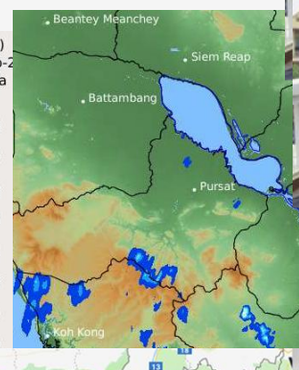
Nowcasting:

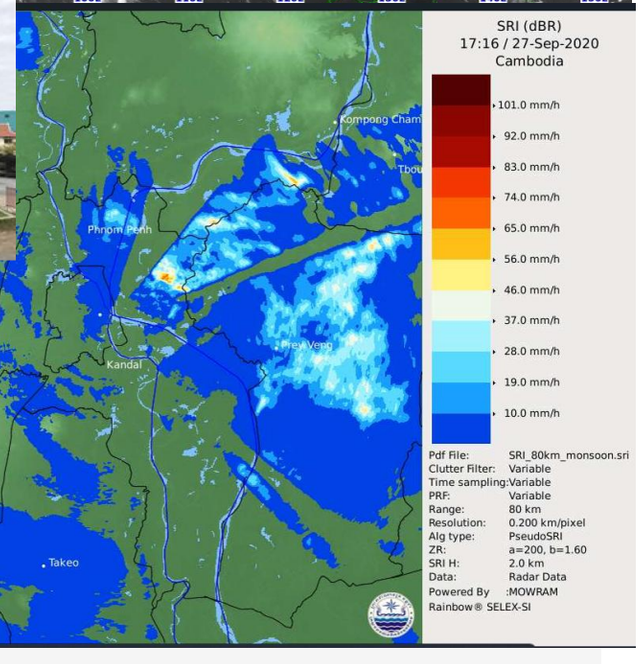
Mainly surface observation, weather satellite and radar, and persistence or trend forecasting

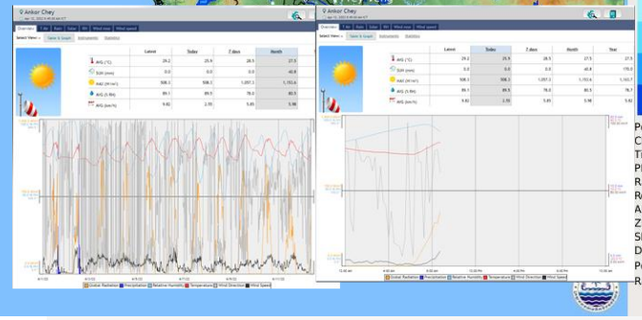
- IR,VS, Cloud convective areas, Heavy rainfall potential areas,

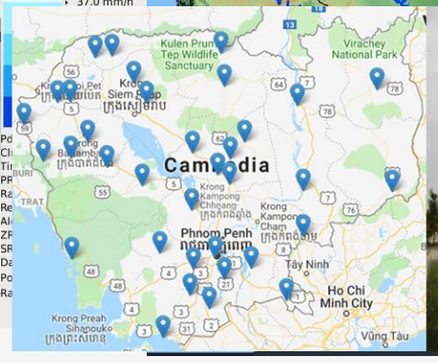












Trend of Real time data transferring form AWS

3. Challenges of the current system/network

- WIS2.0 is very new to DOM officers, need a lot of capacity building.
- DOM still lack of internal experts who can master GTS/WIS
- Capacity of DOM officers for GTS/WIS system is limited.
- Don’t have technical team to fix and solve ad hoc system problem.

4. Efforts towards WIS2.0

- DOM commit to migrate from GTS to WIS2.0
- DOM commit to improve capacity of our officers to master the future WIS2.0 system
- DOM willing to submit our observation information to the global observation network (WMO), e.g., AWS, Radar, radiosonde data …
- We need technical support from JMA, JICA, and other partners.
- DOM need data sharing back from WIS2.0, e.g., observation information, NWP output, warning information, …
- Participation to activities or events (training workshops) related to WIS2.0
- Need international experts on WIS2.0 to support on setting the system together with on-the-job training for DOM officers for effective capacity building

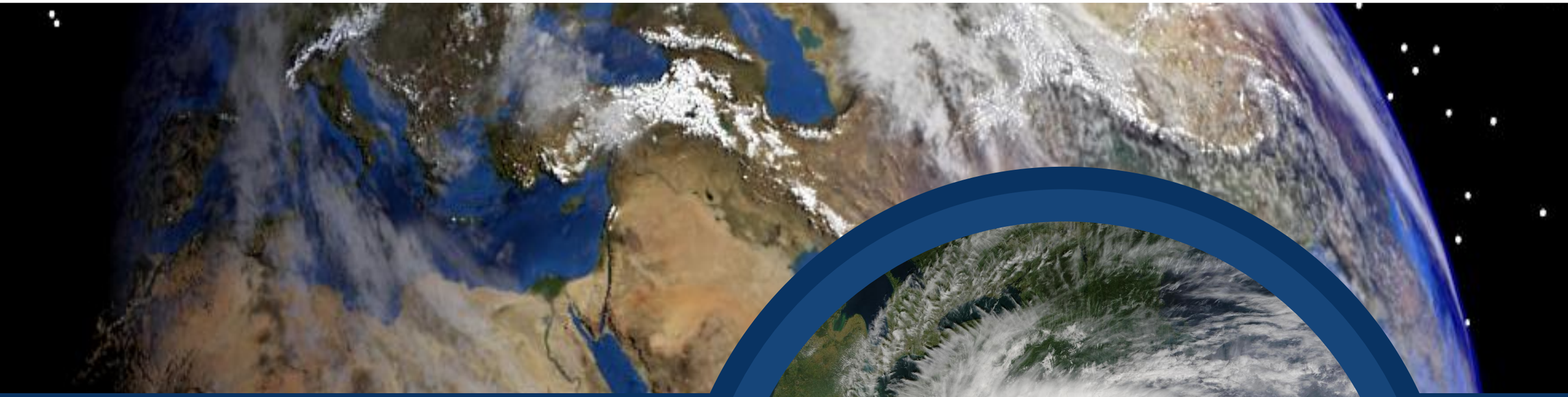
5. Expectation to JMA and other countries

- Support Cambodia to upgrade from GTS to WIS2.0
- Continue support MoWRAM on staff capacity building both short and long-term to master WIS2.0
- Data sharing among member countries is very important for monitoring weather condition to contribute to EW4ALL initiative.
- Request to GISC Tokyo support system WIS2.0 improve system networks
- Request to GISC Tokyo for better services to help improve system networks
- Request of further cooperation with JMA,JICA, other countries
- Suggestion upgrade the current system(GTS) to use WIS 2.0

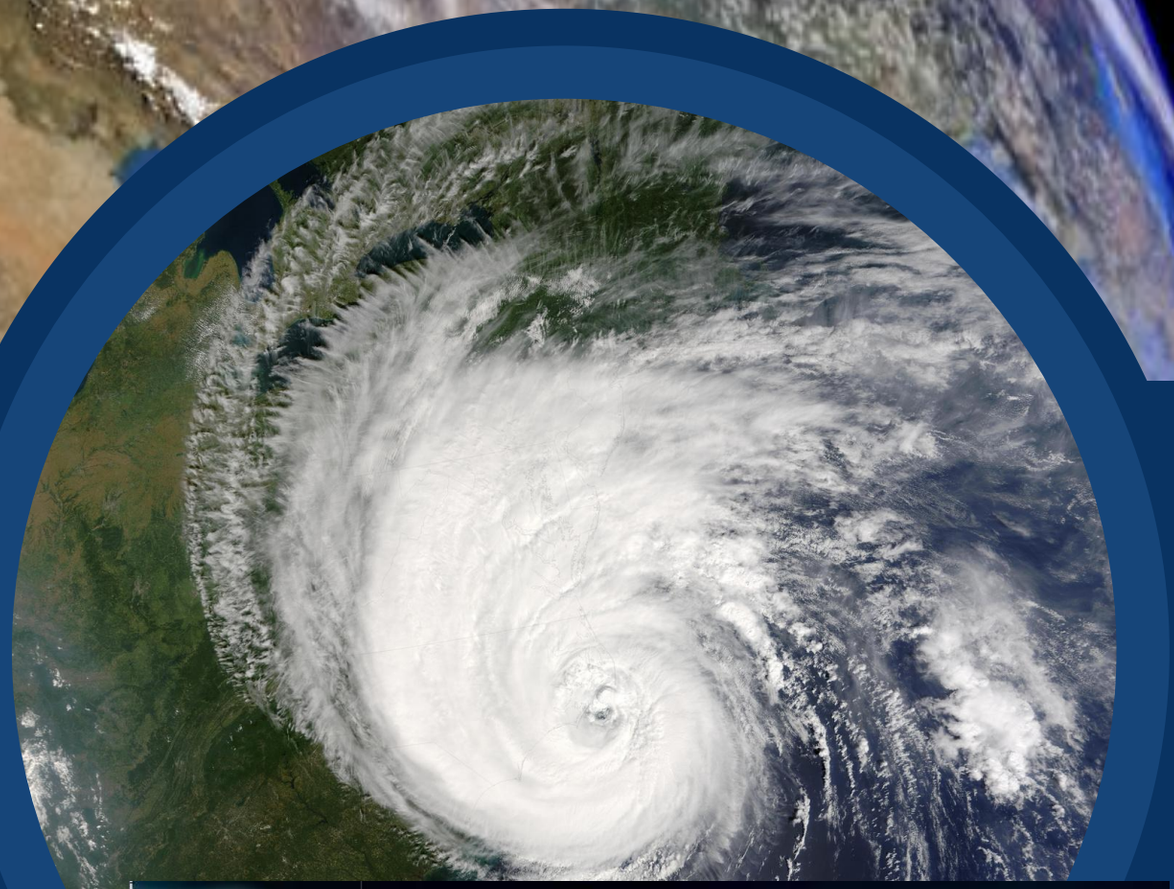
6. AOB (Any Other Business)

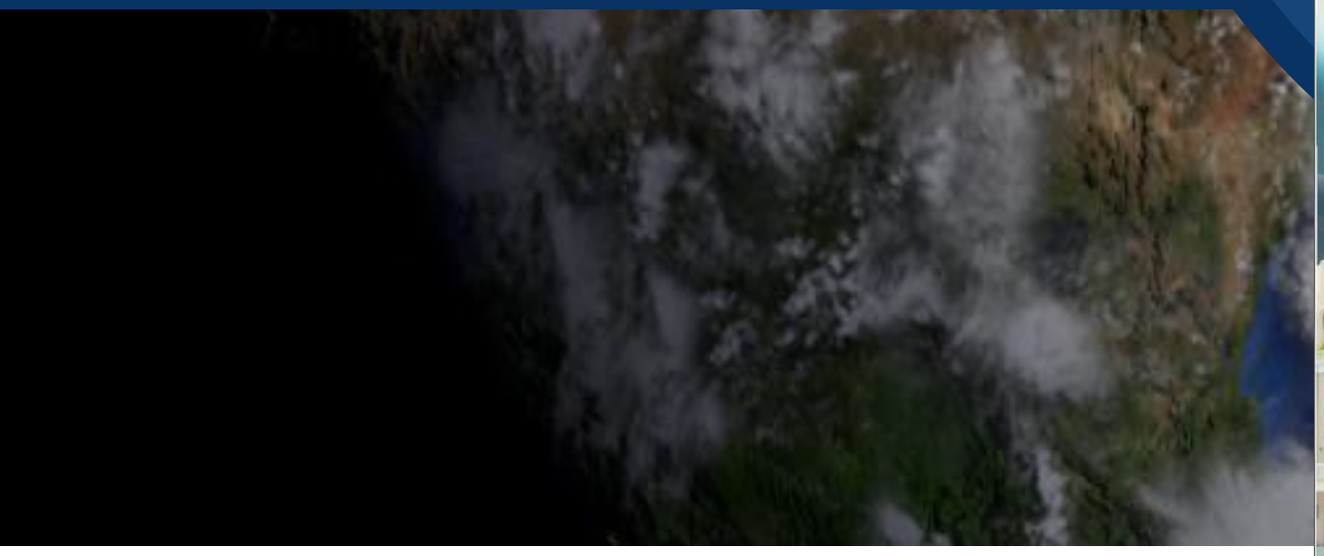
- Additional automatic weather stations will be installed in Cambodia. Need technical support to convert data to WIS-WMO format and join global network.

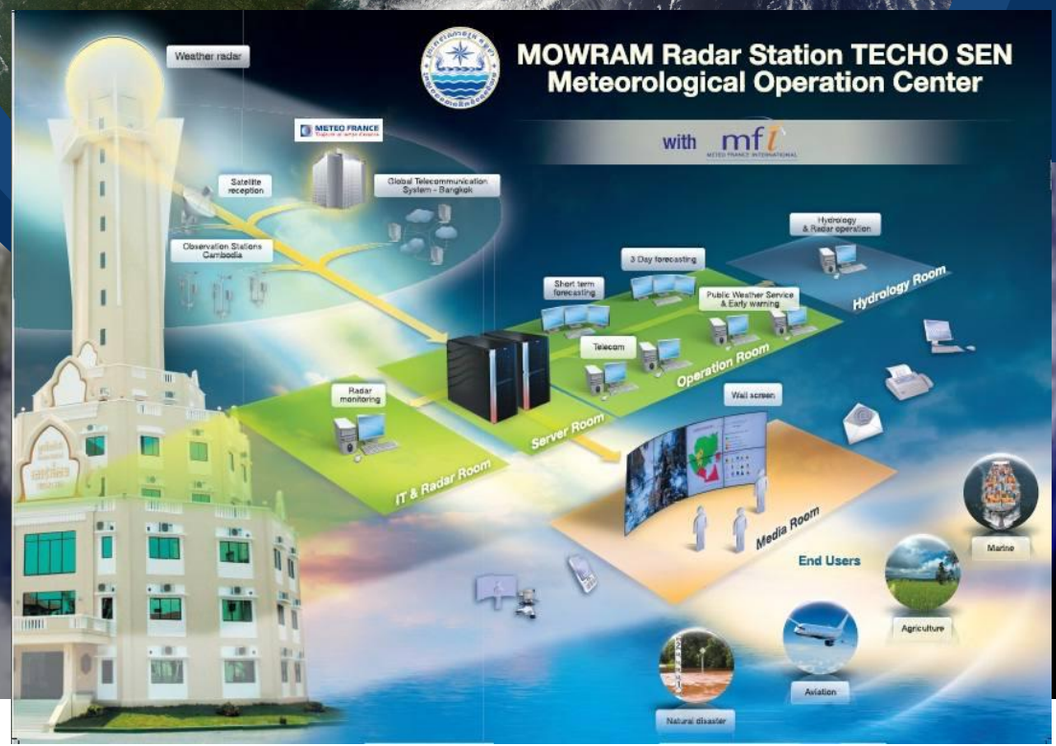
- Build technical capacity to the MoWRAM staff
- Improve telecommunication service
- Improve observation data management
- QA/QC system is required to ensure high-quality data is shared via WIS



THANK YOU!






MOWRAM Radar Station TECHO SEN
Meteorological Operation Center
with mfi
Weather radar
METEO FRANCE
Satellite reception
Global Telecommunication System – Bangkok
Observation Stations Cambodia
Hydrology & Radar operation
3 Day forecasting
Short term forecasting
Public Weather Service & Early warning
Telecom
Hydrology Room
Operation Room
Radar monitoring
Server Room
Wall screen
IT & Radar Room
Media Room
End Users
Marine
Agriculture
Aviation
Natural disaster