

JMA/WMO WORKSHOP ON EFFECTIVE TROPICAL CYCLONE WARNING IN SOUTHEAST ASIA

TROPICAL CYCLONE MONITORING IN LAO PDR

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Tropical cyclone genesis motoring

- *Department of meteorology and Hydrology (DMH) in Lao PDR is a governmental organization under the MONRE and is assigned as national service provider of both fields Meteo - Hydrological monitoring and products*
- *Weather Forecasting and Aeronautical Division is responsible for tropical cyclone monitoring and its disturbances with potential to develop into TD by using SATAID and also products of the Joint Typhoon Warning Center issues probabilistic information on TC formation at its website such as from RSMC JMA, Hong Kong, Korea and other sources.*
- *Almost every tropical cyclone had affected to Lao PDR (duration time of rainy season or end of rainy season).*
- *The rainfall distribution during passage of TC was much more than usual*

Tropical Depression Warning

DMH is monitored by:

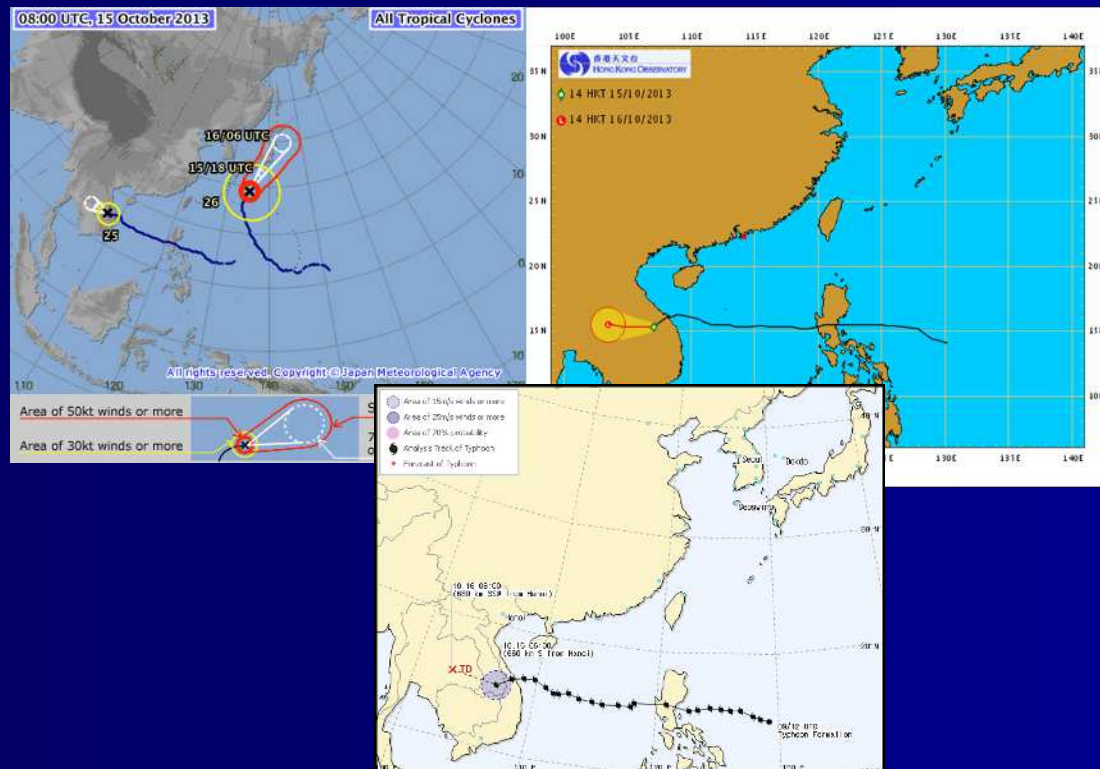
- Meteorological observation data
- Weather maps
- Satellite imageries
- Doppler Radar data
- Utilize the typhoon forecast and NWP Products from ECWMF , RSMC (JMA) , KMA , Hong Kong and other center through GTS and Internet .

Tropical Cyclone Warning and Forecasting challenges

- DMH Lao is still lack of methodology and practical skill
- *DMH have not analyzed any TC parameters only refers to RSMCs Tokyo, Hong Kong, KMA and other sources*
- *Lack of practical experience on Tropical Cyclone forecasting technique in forecasting and monitoring of TD, TS after landfall.*
- During the passage of TS was occurred by the flash flood
- *Need expert mission to assist operation task of Typhoon analyzing and forecasting.*

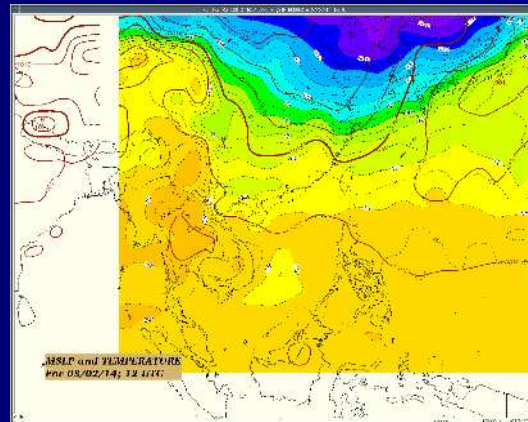
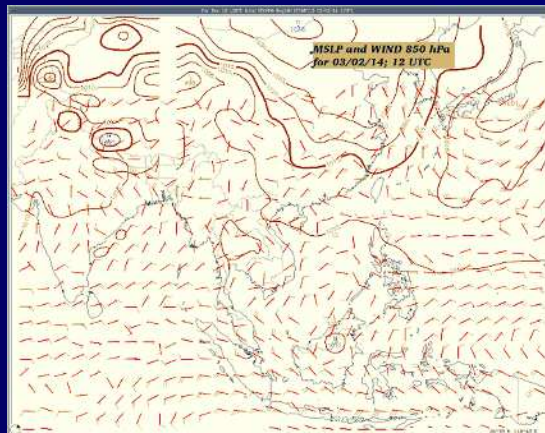
Tropical Cyclone Product

- *TC products RSMCs we issued to the public which is Ty track forecast that received from severe weather demonstration WMO web site*
- *From these website the result of precise forecast and early warning provided by DMH was helpful for making arrangements and preparing measure by each level of government lines agencies.*



Numerical Weather Prediction Status for Effective Warning

- DMH no have NWP models in operational using models provided by foreign centers.
- Used NWP status for effective warnings from UK ECMWF through GTS by using Synergie soft ware visualization from Meteo-France, JMA, KMA and from other sources
- Application techniques of NWP products for short-range (0-72 hrs) operational forecasts



Emergency Response for TC Disasters

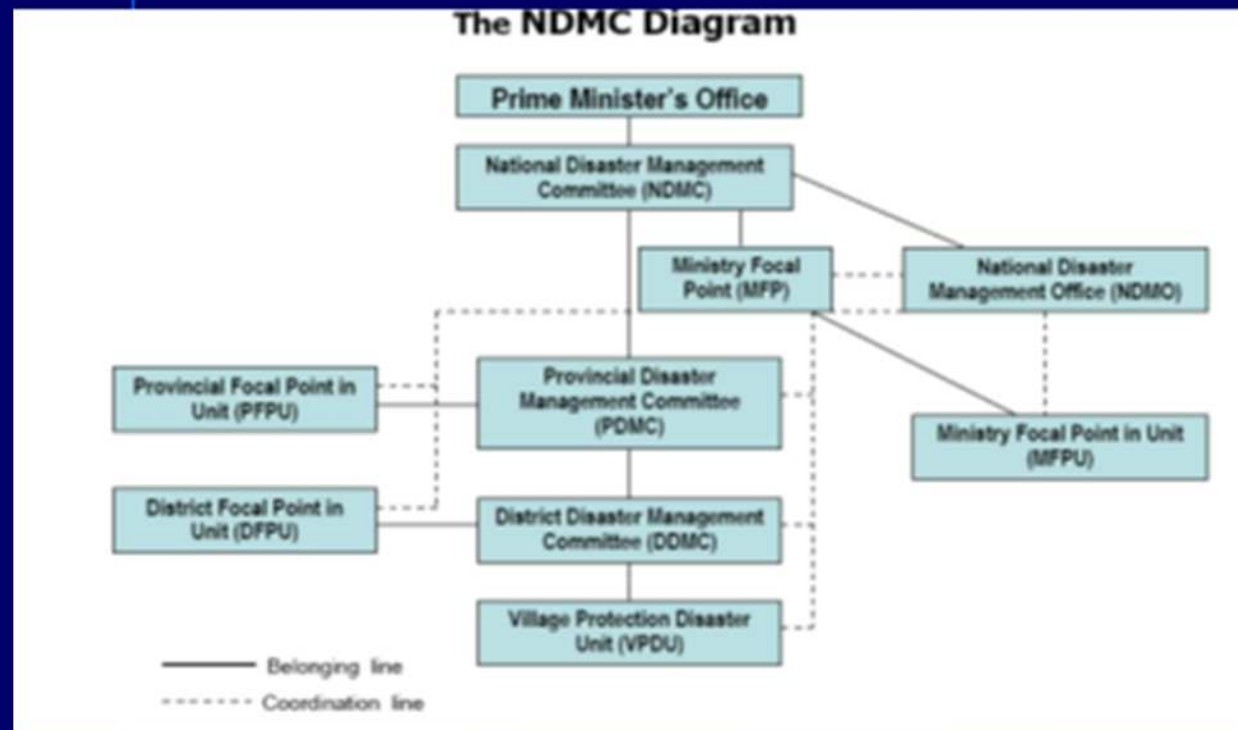
- Natural Disaster prevention and mitigation is one of measures that contribute to the poverty alleviation strategy of the Lao PDR government.

- *Disaster Management Institutions:* *The NDMC consisting of representative from 16 key ministries and Lao Red Cross:*

1. *Ministry of Defense: Vice Prime Minister Chairman*
2. *Minister of Natural Resources and Environment: Vice –Chair alive in service*
3. *Minister of Agriculture and Forestry: Vice-Chair*
4. *Minister of Public Works and Transport: Vice-Chair*
5. *Minister of Labour and Social Welfare: Vice-Chair*
6. *Minister of Public Health: member*
7. *Minister of Security: member*
8. *Chairman of Lao Red Cross: member*
9. *Vice Secretariat administrative Group Center Government of Lao Revolution Youth: member*
10. *Vice Director of General Staff Department, Ministry of Defense: member*
11. *Director of Cabinet Office, Ministry of planning and Budget : member*
12. *Director of Cabinet Office, Ministry Foreign Affairs: member*
13. *Director of Cabinet Office, Ministry of Education and Sports: member*
14. *Direct of Cabinet Office, Ministry of Finance: member*
15. *Director General, Mass Media Department, Min. of Information, Culture and Tourism: Member*
16. *Disaster Management and Climate Change Department, MONRE: Secretariat*

Legal Framework for TC Disaster Management

National Disaster Management Framework



Emergency Response Mechanism

The national emergency response mechanism when massive TC disasters are expected to occur as follow:

Prime Ministry Office, National Disaster Management Committee (NDMC), Ministry Focal Point(MFP), Ministry Focal Point in Unit(MFPU), National Disaster Office(NDMO), Provincial Disaster Management Committee (PDMC), Provincial Focal Point in Unit(PFPU), District Disaster Management Committee(DDMC), District Focal Point in Unit(DFPU) and Village Protection Disaster Unit(VPDU)

Organs Responsible for Warnings and Evacuation Orders

Organs responsible for warnings and evacuation orders when TCs and associated severe weather phenomena, i.e., heavy rainfall, strong wind, flood, inundation are expected to occur as: Provincial Disaster Management Committee(PDMC), Provincial Focal Point in Unit(PFPU), District Disaster Management Committee(DDMC), District Focal Point in Unit(DFPU) and Village Protection Disaster Unit(VPDU).

Tropical Cyclone warning issuance

These are issued three categories :

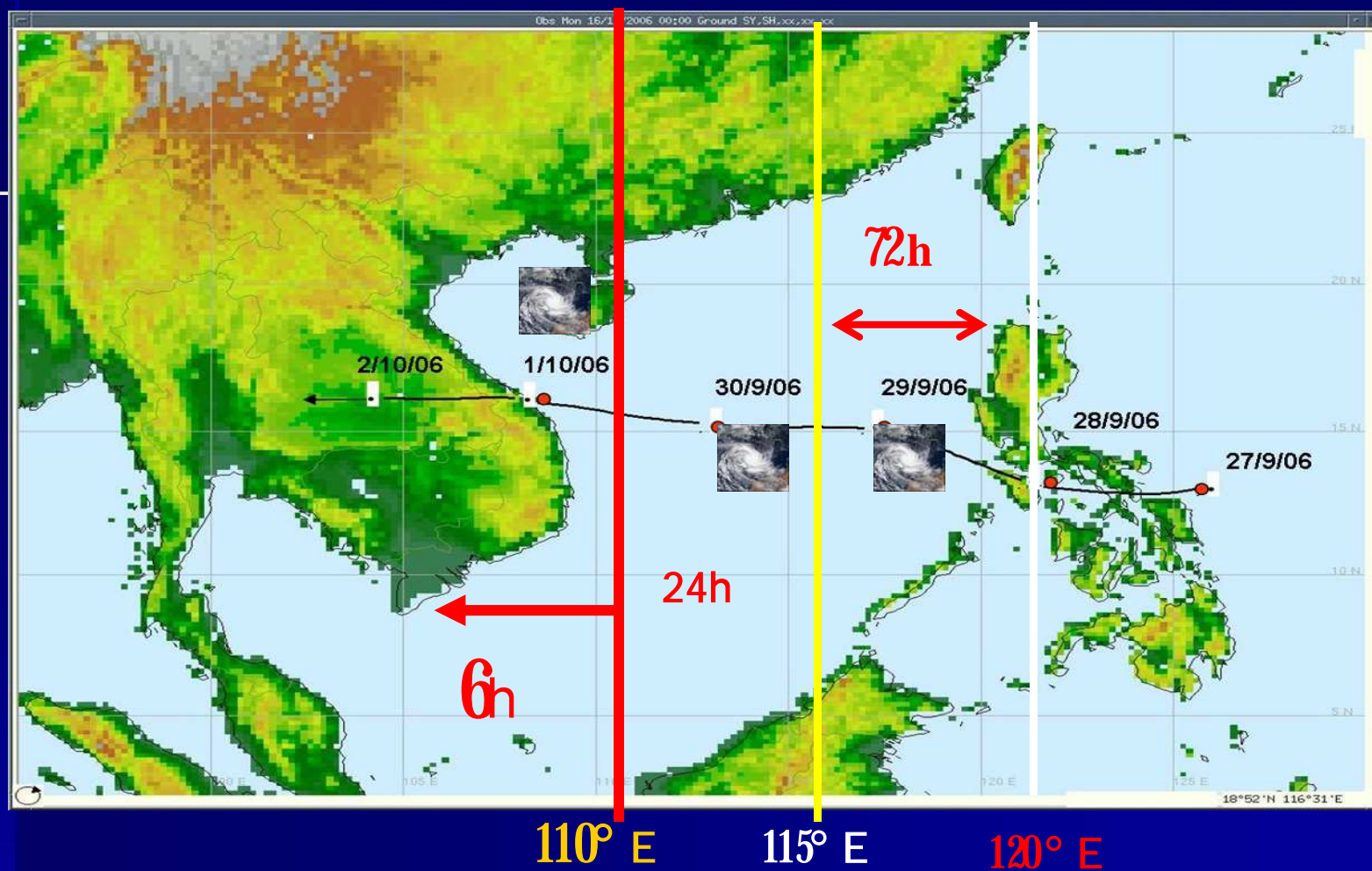
When a storm wind reaches 35 kts or greater

Far warning: This is issued one time a day
(valid for 24 or 48 hours) when a TS is located
between $115^{\circ} - 120^{\circ} \text{ E}$

Near warning: This is issued two time a day
(valid for 24 hour) when a TS is located between
 $110^{\circ} - 115^{\circ} \text{ E}$

Urgent warning: This issued every 6 hours when
TS is located nearest western of 110° E .

Warning areas for tropical cyclone



Urgent
warning every
6 hours

Near
warning valid
for 24 hour

Far warning
valid for 24
or 48 hours

LAO PEOPLE'S DEMOCRATIC REPUBLIC
Peace Independence Democracy Unity Prosperity

*Ministry of Natural Resources and Environment
Department of Meteorology and Hydrology*

WARNING No25.....

Tropical Cyclone and flood Warnings

Warning issued by DMH at: 10:00 am 12 October, 2013

The strong SW monsoon from bay Bengal over Laos and is associated with Ty over south China sea(16.8 N/107.0 E) at 07:00 am 24 September is forecast to move northwest about 10 kt and estimated landfall to Vietnam this evening and will be moved over Central part of Laos at 16.5N/105.2E in mid-night. Heavy rain with speed wind 15-20mps will be expected at Bolikhamxay, Khammoune and Saravanne provinces. Light to moderate rain with thunders over Xekong, Champassack and Attapeu provinces. Therefore inhabitant within these above mentioned areas are advised to be aware of damages which may be caused by flash flood.

For today water level at 07:00 am Thakhek station is 12.54 m(warning level is 13.00 m and danger level is 14.00 m), due to heavy rainfall the water level forecast must be exceeded warning level on tomorrow morning. The latest water level forecast for tomorrow morning at Thakhek station is 13.70 m and for day after tomorrow is 14.25 m therefore inhabitants who live at low – lying areas are advised to be aware of damages which may be caused by flood.

Please follow next warning for the necessary action taking

*Vientiane, 12 October,, 2013
Director General of DMH*

Flood Warning

DMH also divided the flood warning criteria, which consists as the following:

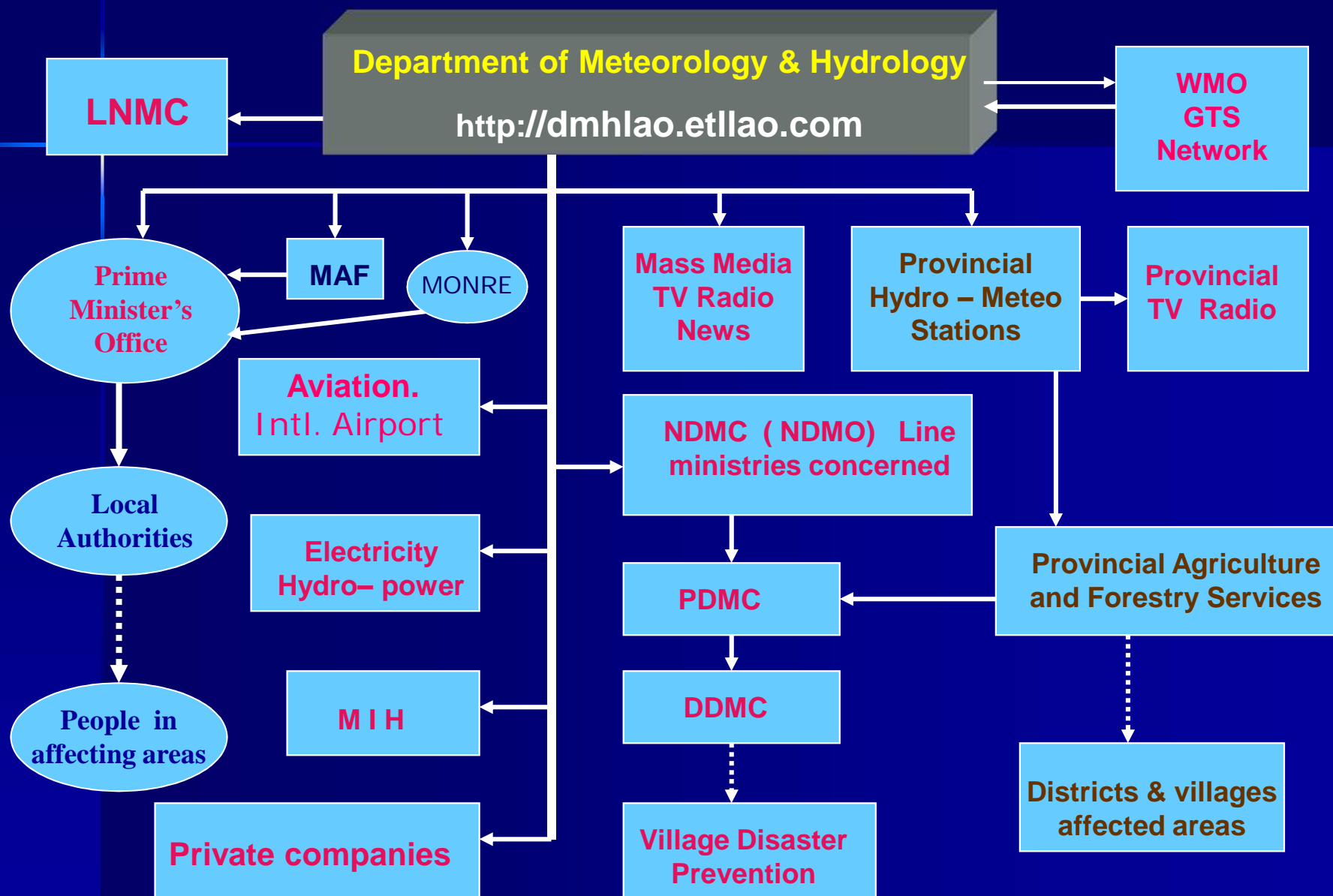
- Nearly warning: In case the water level forecast at that station will expect below 0.50 m below to Warning level. DMH have to provide the warnings and timely delivering to users.
- Urgent warning: In case the water level exceeds the warning level, DMH have to provide the urgent warning and rapidly sent to focus areas.

Institutional Coordination

Coordination with Disaster Management Authorities:

- *DMH Service coordinates with disaster management authorities to improve our warnings and advisories which DMH organized the meeting on dissemination information of early warning system and invited NDMC, NDMO, MONRE, MAF and other line agency to be provided these information to the effective areas on time and explanation to the people could understand word of warning criteria.*
- *DMH set up the Forecast and Warning Dissemination frame work.*
- **Partnership and Coordination with Media**
- *DMH Service coordinates with media to broadcast warnings and advisories promptly, in these warning staffs of Weather Forecasting and Aeronautical Division by real voice broadcasted to radio and for television sent by Fax and E-mail and upload to the internet DMH web site*

Forecast & Warning Dissemination in Laos



Summary

- *Lao PDR is a country that is affected by extreme weather every year and one to three tropical cyclone per year across and it is bringing natural disaster to damages infrastructures , agricultural sectors, houses and e.g.....*
- *The extreme weather monitoring and accurate of forecasts and warning at DMH Lao is a great importance to assist the Government and public users to take prevention activities*
- *Tropical cyclone warning is very important in order to disaster prevention and reduction, therefore warning information issued must be urgently provided to the peoples that effective areas and training is one way able to make local staffs understand and how to transfer to the people and know how to protect people life and properties of peoples from disaster on time.*
- *The monitoring of tropical cyclogenesis and issuance of TD warnings the challenges of DMH is still lack of methodology and practical skill therefore need expert mission to assist operation task of Typhoon analyzing and forecasting.*
- *Sharing of Meteorological and Hydrological information with mass-media and concerned line agencies.*



Kobchai Thank You