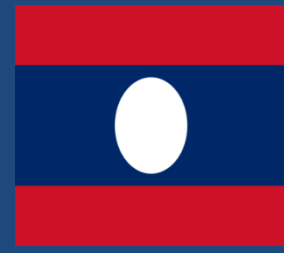




Current Status of Weather Forecasting and Warning System in Lao PDR



Contents

I. Climatological Characteristics of Lao PDR.

II. Tropical Cyclone monitoring

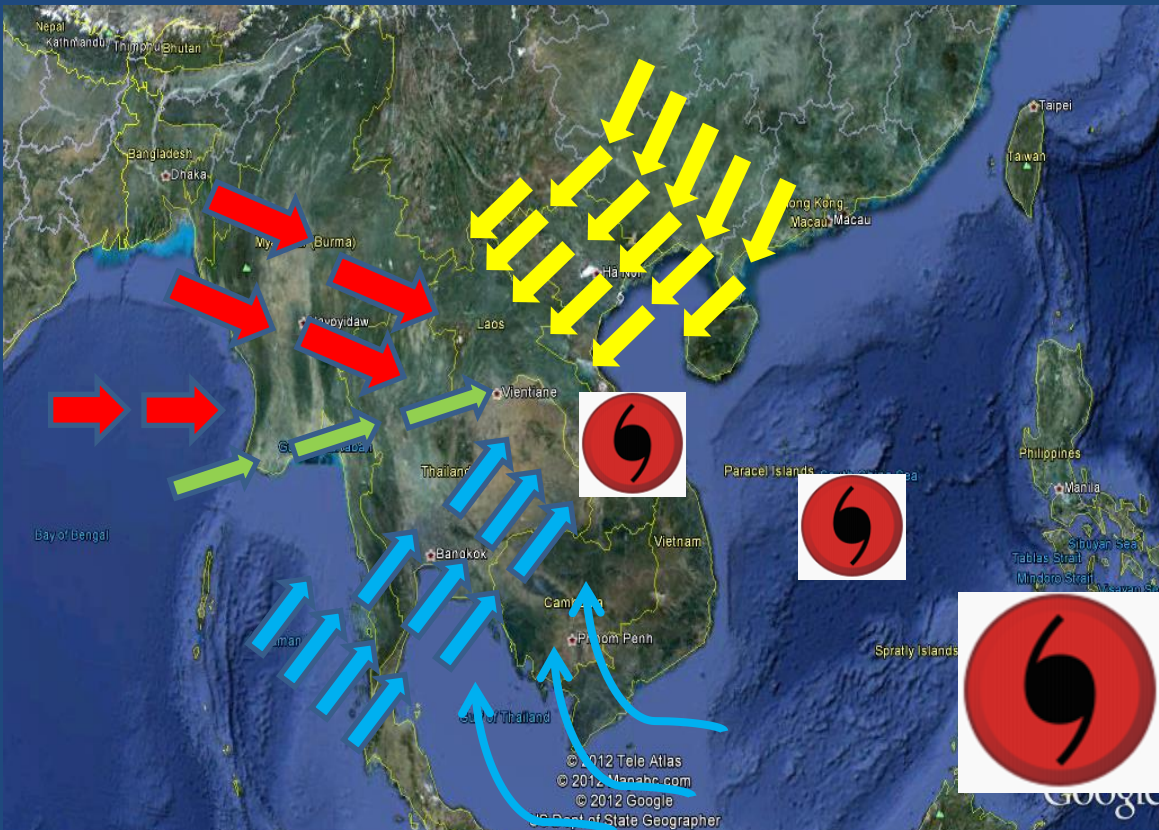
III. Main function of DMH Lao PDR.

IV. Forecast and Warning Dissemination

V. DMH's Organization

VI. Conclusion

Climate Characteristics



- Tropical monsoon climate
- 2 seasons: wet and dry seasons

Dry season: mid Oct – mid May

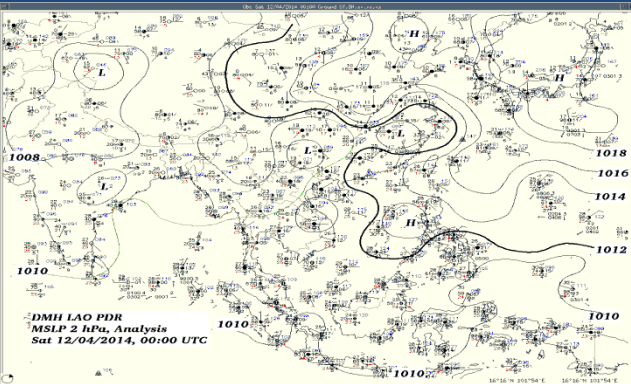
- Northeast monsoon
- Coldest period: Dec – Jan, Northdry air and less rain

- Hottest period: April – May
- Local storm, strong wind, thunderstorm, hail,

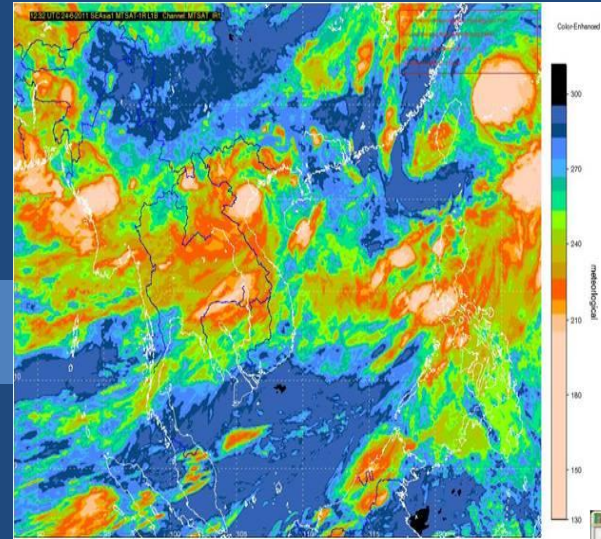
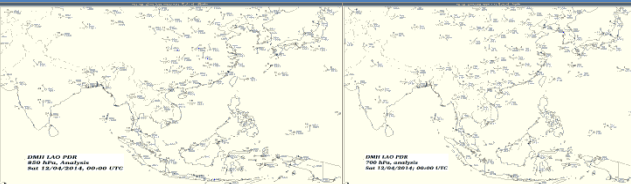
- Wet season: mid May – mid October
- Southwest monsoon associated with direct or indirect tropical cyclone over North Western Pacific region.
- During flood season: from June – October: 85 – 95% , from November – May: 10 – 15%

Data Display

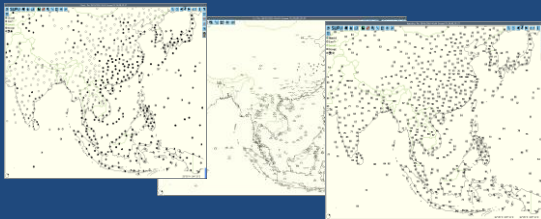
Satellite / Radar



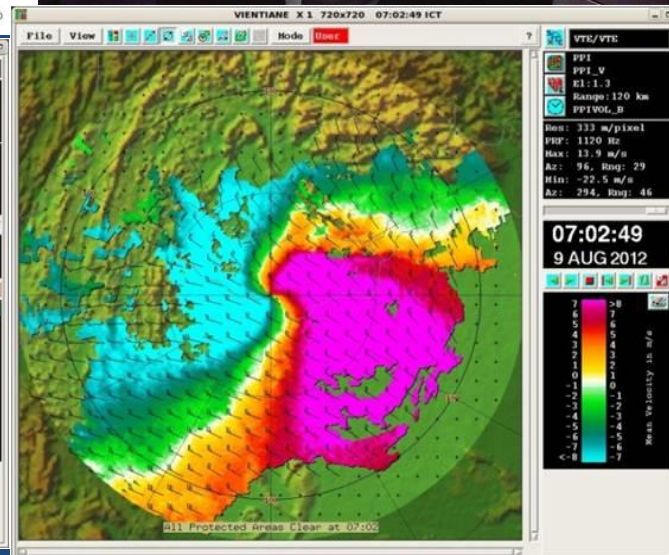
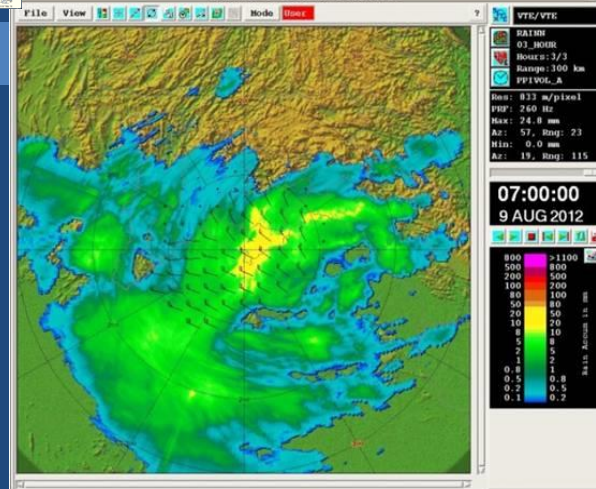
Surface Chart Analysis



Upper air Chart Analysis



Cloud coverage / Humidity



Tropical Cyclone Monitoring

DMH is monitored by:

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

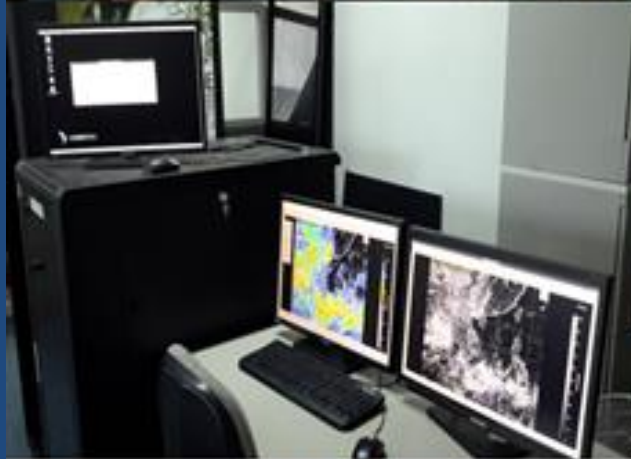


ສະຖານີຮັບສັນຍານດາວທຽມອຸຕຸນິຍົມ

COMS-1

CMACast

Himawari-8



ສ. ເກົາຫຼີ

ສປ ຈີນ

ຍີ່ປຸ່ນ

International level

- Data from other countries can be selected by GTS link from Bangkok RTH in order to fulfill the task of weather forecast and warning on Hydro-meteorological severe event.

Types of weather forecast in Laos

- Daily water level forecast (issued Ministry of agriculture and Forestry, Lao National Mekong Committee, Mekong river commission, National Disaster Management Office, Electricity, Department. etc)
- 3 day city forecast
- Weekly weather forecast for Agricultural , Hydropower and construction Sectors
- One and 3 months weather forecast (Rainfall probabilistic)
(for Agricultural , Hydropower and flood management program)
- Typhoon warning
- Heavy rainfall warning
- Flood Warning
- Flash flood warning

Forecast and Warning Dissemination in Laos

- The Ministry of Natural Resources and Environment Administration has responsible for the Government to take in account the important task of meteorological and hydrological service, to applied information for reducing caused by natural hazard by using intensively Meteorological information. The activities are such as:
 - Carry out the operational Hydro-Meteorological forecasting dissemination all the forecast bulletins, warning and other meteorological and Hydrological information
 - Daily weather forecast issued through radio, television, news paper , provincial Hydro – meteorological , National Disaster Management Office (NDMO) and line agency concerned .
 - Weekly weather forecast for Agricultural , Hydro power and for flood Management sectors
 - Long range weather forecast for Agricultural , Hydro power and for flood Management sectors.

Weather forecasting

DMH issued:

- Daily weather forecast issued two times per day
- Three-day city forecast for six cities
- Weekly forecast updated every Monday
- One month and three-month forecast



Disseminate forecast and warning to flood at risk communities

- In Lao PDR Radio is the most powerful for public awareness on weather , flood forecast and warning .
- Television has less coverage in the country due to the network is not yet cover all territory .
- The internet services are available in most urban areas.
- People who living in the remote areas can obtain the weather and flood forecasts ,warning information via radio network.
- The remote areas people can receive warning and announcement through local authority.

Forecaster Support System

DATA HANDLING

- Data transmission and data collection from different sources
- decodes observations and plotting
- Analysis , Briefing and forecasts

DATA VISUALISATION

- User configurable display of Observations, Radar, Satellite
- User configurable display of Weather Model Data
- Multiple layer overlays

Forecaster Support System

✿ PRODUCT GENERATION

- Using Dream Weaver to create a statistic web page of meteorological and Hydrological information.
- Incorporates with mass - media in publishing of meteorological and Hydrological information and Early Warnings to users

Synergie Version 3.4.0 for Met. Service of Laos

The menu window appears when SYNERGIE is started.

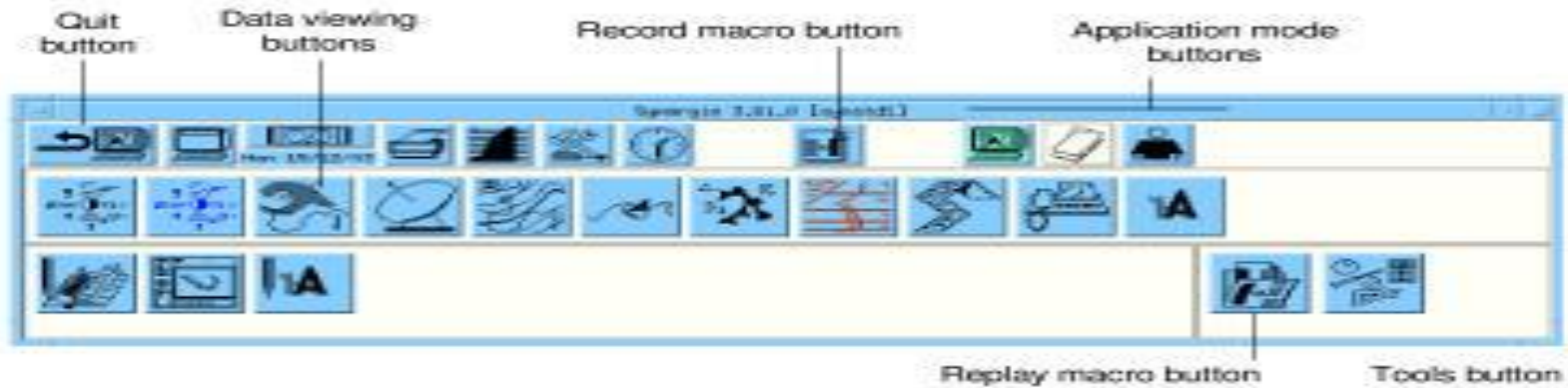
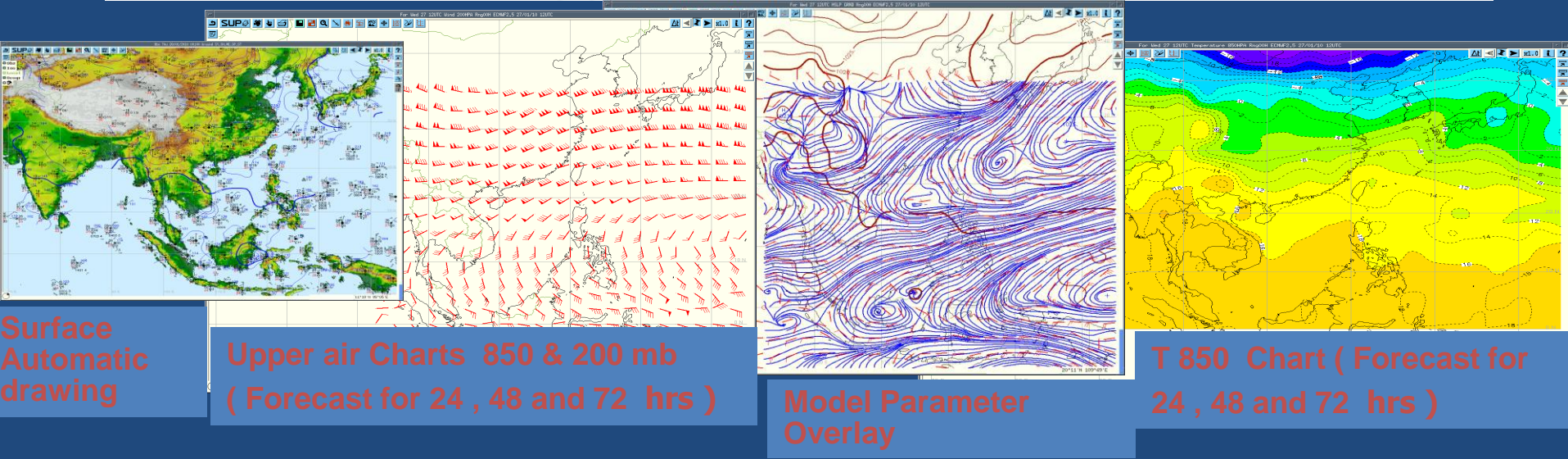


Figure 1-3: SYNERGIE Menu



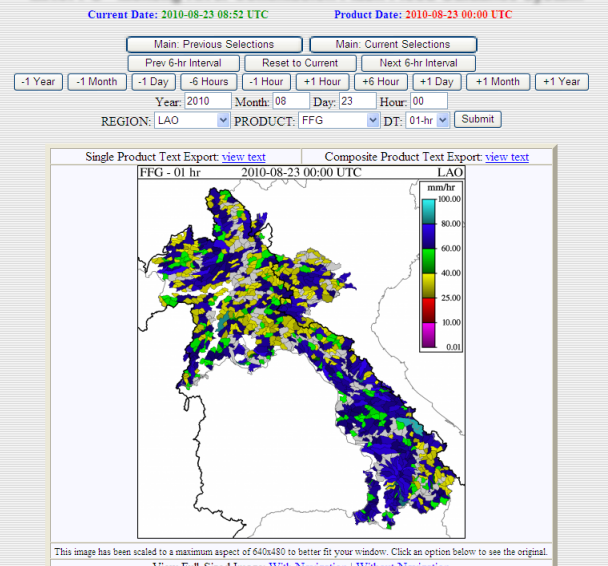
NWP products from ECMWF for Severe Weather monitoring and forecasting in Laos

National Outreach – MRC Flash Flood Guidance

Flash Flood Guidance System implementation in MRC member countries, (Cambodia, Lao PDR, Thailand and Vietnam) through funding from USAID office of US Foreign Disaster Assistance (OFDA)



MRCFFG - Mekong River Commission Flash Flood Guidance System



Forecaster interface

- Designed for quick access and easy navigation to regional and country products

The occurrence of series extreme weather disturbances in Lao PDR consists as follow

- *Local storms (whirlwind)*
- *Drought*



Major Natural Disaster in Lao PDR

- *Flood*
- *Local Heavy Rain*
- *Typhoon*
- *Hail*



The occurrence of series extreme weather disturbances in Lao PDR consists as follow

- *Torrential Rains (flash flood)*
- *Landslide*
- *Earthquake*



Department of Meteorology and Hydrology (DMH)



**Doppler Weather Radar Located in Headquarter,
Vientiane C-band Intensity mode 400 km Doppler mode
120 km**

V. Main activities to be performed are as follows

Carry out the operational Hydro-Meteorological observations, monitoring, real time measurement and forecasting.

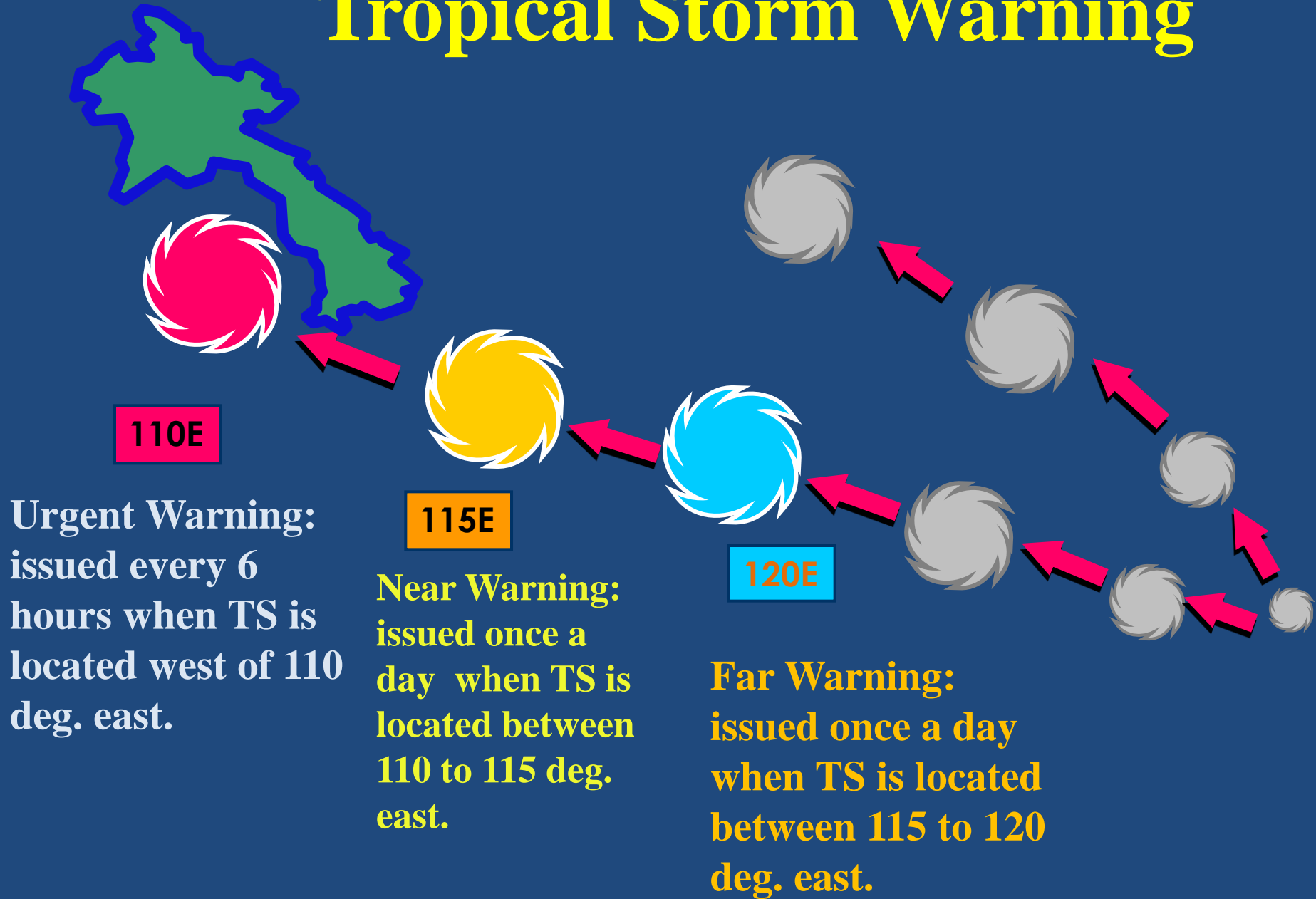
Data collection and dissemination nationally, regionally and globally.

Issue weather forecast, water level and flood forecasts, warnings on severe conditions and disastrous events.

Provide routine services to main users such as Aviation, Hydro-power Sector and Agriculture sector.

Disseminate forecasts and warnings through various media to the public and especially to the community of disaster risk areas.

Tropical Storm Warning



110E

Urgent Warning:
issued every 6
hours when TS is
located west of 110
deg. east.

115E

Near Warning:
issued once a
day when TS is
located between
110 to 115 deg.
east.

120E

Far Warning:
issued once a day
when TS is located
between 115 to 120
deg. east.

WARNING No01.....

Tropical Cyclone and flood Warnings

Warning issued by DMH at: 10:00 am 2 October , 2017

The strong SW monsoon from Bay Bengal over Laos and is associated with STS oversouth China sea (17.6 N/107.2E) at 07:00 am 02/10/2017 is forecast to move northwest about 8 kts and estimated over land of Vietnam this afternoon and move over northern of Laos at 20.0N/103.0 E in mid – night.

Heavy rain with speed winds 10 – 15 mps will be expected at Bolikhamxay and Khammuane and Saravane areas. Light rain with thunders over Xekong , Champasack and Attapeu . Therefore inhabitants 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 at Pakxan station is 13.15 m (warning level is 13.50 m and Danger level is 14.50 m). In addition by local heavy rainfall the water level forecast must be exceeded warning level on tomorrow morning . The latest water level forecast for tomorrow morning at Pakxan station is 13.96 m and for day after tomorrow is 14.46 m. Therefore inhabitants who lives 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, 05/07/2017
Director General of DMH

During Tropical Cyclone HAIMAI (0411) DMH issued 3 times Warnings

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດຖຸບາດຖານອຸ່ມ

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ເຕືອນໄພພະຍຸ ແລະ ຝົນຕົກຫັກ

ເລກທີ: 2/ ສຕ.ສກ 11

ອອກຄ່າວເລກ 10.50 ໂມງ ວັນທີ: 24/ 06/2011

ໃນວັນທີ 24/06/2011 ເວລາ 7.00 ໂມງເຊົ້າໃນປະເທດລາວພະຍຸ ສາຍມາ (HAIMA) ທີ່ວິທີ 04 ມີຈຸດໃຈກາງເພິ່ນສະໜາມທີ 20.7 ອົງສາເໜືອ ແລະ ເພິ່ນແວງ 108.2 ອົງສາຕາເວັນອອກ ພວມເຄື່ອນທີ່ໄປທາງທິດຕາເວັນຕົວຍຄວາມໄວ 10 ກິໂລແມັດຕໍ່ຊົ່ວໂມງ. ຄາດວ່າພະຍຸສົ່ງຜົນຈະເຄື່ອນເຂົ້າສູ່ພາກເໜືອຂອງປະເທດຫວຽດນາມໃນຕອນກາງຄືນຂອງວັນທີ 24/06/11, ວົງລັດສະເໝີຂອງພະຍຸສົ່ງຜົນຈະກວມເອົາພາກເໜືອທາງພາກກາງຂອງລາວ. ຈາກສະພາບດັ່ງກ່າວຈະເຮັດໃຫ້ມີຝົນຕົກພັກຄ່ອນອາຍໃນລະດັບປານກາງຫາຕົກຫັກ ພ້ອມມີລົມແຂງເປັນບາງຄັ້ງຢູ່ບໍລິເວນແຂວງ ຫົວພັນ, ຊຽງຂວາງ, ໄຊຍະບູລີ, ແຂວງວຽງຈັນ, ນະຄອນຫຼວງວຽງຈັນ, ບໍລິຄໍາໄຊລົງຫາຄໍາມ່ວນ, ຊຶ່ງໂອກາດຈະເກີດມີນໍ້າຖ້ວມາະຫັນພັນ, ດິນເຈືອຍຢູ່ບໍລິເວນເຂດສ່ວນພູຂອງແຂວງຊຽງຂວາງ, ແຂວງວຽງຈັນ, ບໍລິຄໍາລົງຫາຄໍາມ່ວນ. ສະນັ້ນສາກົນລູດູນິມ ແລະ ອຸຕິກກະສາດຈຶ່ງແຈ້ງເຕືອນເຖິງອາພາດການເປົກຄອງ, ພໍ່ແມ່ປະຊາຊົນອາໄສຢູ່ບໍລິເວນແຂວງທີ່ກ່າວມາຂ້າງເທິງ, ໂດຍສະເພາະປະຊາຊົນທີ່ອາໄສຢູ່ເຂດສ່ວນພູຈຶ່ງມີສະຕິລະໂມດລະບັງຕໍ່ສະພາບລົມແຂງ, ຝົນຕົກຫັກ ແລະ ນໍ້າຖ້ວມກະສັນພັນທີ່ອາດຈະເກີດຂຶ້ນໃນຂ້າງເທິງ ແລະ ຂໍໃຫ້ຕິດຕາມຄ່າວພະຍາກອນອາກາດຈາກກົມລູດູນິມ ແລະ ອຸຕິກກະສາດເປັນປະຈຳ.

ເຕືອນໄພ ພະຍຸ ແລະ ຝົນຕົກຫັກ

ສະບັບທີ: 3/ ສຕ.ສກ 11

ອອກຄ່າວເລກ 11.30 ໂມງ ວັນທີ: 25/ 06/2011

ລົມພະຍຸ ສາຍມາ (HAIMA) ທີ່ວິທີ 04 ໄດ້ເຄື່ອນທີ່ເຂົ້າສູ່ປະເທດຫວຽດນາມທາງຕອນເໜືອໃນເວລາ 19 : 00 ໂມງຂອງໃນປະເທດລາວຂອງວັນທີ 24/06/2011, ໄດ້ກາຍເປັນລົມພະຍຸ ດີພຼຸສົງ (Depression) ແລະ ໃນວັນທີ 25/06/2011 ເວລາ 7.00 ໂມງມີຈຸດໃຈກາງຢູ່ເພິ່ນສະໜາມທີ 20 ອົງສາເໜືອ ແລະ ເພິ່ນແວງ 105.0 ອົງສາຕາເວັນອອກ ຈະເຄື່ອນທີ່ໄປທາງທິດຕາເວັນຕົກ-ຕາເວັນຕົກສູງໄດ້ດ້ວຍຄວາມໄວ 20 ກິໂລແມັດຕໍ່ຊົ່ວໂມງ ຈະເຄື່ອນເຂົ້າລະຫວ່າງແຂວງຫົວພັນ ແລະ ຊຽງຂວາງຕໍ່ກວມແຂວງຫຼວງພະບາງຫາໄຊຍະບູລີ. ວົງລັດສະເໝີຂອງພະຍຸສົ່ງຜົນຈະກວມເຂດແຂວງພາກເໜືອອົງສາຂອງຄໍາມ່ວນ, ຈາກສະພາບດັ່ງກ່າວຈະເຮັດໃຫ້ມີຝົນຕົກພັກຄ່ອນອາຍ, ຝົນຕົກຫັກ, ລົມແຂງເປັນບາງຄັ້ງຄາດ ຢູ່ເຂດແຂວງຫົວພັນ, ຊຽງຂວາງ, ຫຼວງພະບາງ, ໄຊຍະບູລີ, ແຂວງວຽງຈັນ, ນະຄອນຫຼວງວຽງຈັນ, ບໍລິຄໍາໄຊ ແລະ ແຂວງຄໍາມ່ວນ, ຊຶ່ງໂອກາດ ຈະເກີດມີນໍ້າໄຫຼແຂງ, ດິນເຈືອຍ ຢູ່ບໍລິເວນສົງເຂດດັ່ງກ່າວຂອງແຂວງພາກເໜືອ ຫາ ແຂວງວຽງຈັນ. ສະນັ້ນສາກົນລູດູນິມ ແລະ ອຸຕິກກະສາດຈຶ່ງແຈ້ງເຕືອນເຖິງອາພາດການເປົກຄອງ, ພໍ່ແມ່ປະຊາຊົນໃນພາກເໜືອທາງໃນປາ ແລະ ຫຼີ້ອາໄສຢູ່ໃກ້ເຂດສ່ວນພູ ຈຶ່ງມີສະຕິລະໂມດລະບັງຕໍ່ສະພາບດັ່ງກ່າວ ແລະ ຈົ່ງຕິດຕາມຄ່າວພະຍາກອນອາກາດຈາກກົມລູດູນິມ ແລະ ອຸຕິກກະສາດເປັນປະຈຳ.

ເຕືອນໄພພະຍຸ ແລະ ຝົນຕົກຫັກ

ເລກທີ: 2/ ສຕ.ສກ 11

ອອກຄ່າວເລກ 10.50 ໂມງ ວັນທີ: 24/ 06/2011

ໃນວັນທີ 24/06/2011 ເວລາ 7.00 ໂມງເຊົ້າໃນປະເທດລາວພະຍຸ ສາຍມາ (HAIMA) ທີ່ວິທີ 04 ມີຈຸດໃຈກາງຢູ່ເພິ່ນສະໜາມທີ 20.7 ອົງສາເໜືອ ແລະ ເພິ່ນແວງ 108.2 ອົງສາຕາເວັນອອກ ພວມເຄື່ອນທີ່ໄປທາງທິດຕາເວັນຕົວຍຄວາມໄວ 10 ກິໂລແມັດຕໍ່ຊົ່ວໂມງ. ຄາດວ່າພະຍຸສົ່ງຜົນຈະເຄື່ອນເຂົ້າສູ່ພາກເໜືອຂອງປະເທດຫວຽດນາມໃນຕອນກາງຄືນຂອງວັນທີ 24/06/11, ວົງລັດສະເໝີຂອງພະຍຸສົ່ງຜົນຈະກວມເອົາພາກເໜືອທາງພາກກາງຂອງລາວ. ຈາກສະພາບດັ່ງກ່າວຈະເຮັດໃຫ້ມີຝົນຕົກພັກຄ່ອນອາຍໃນລະດັບປານກາງຫາຕົກຫັກ ພ້ອມມີລົມແຂງເປັນບາງຄັ້ງຢູ່ບໍລິເວນແຂວງ ຫົວພັນ, ຊຽງຂວາງ, ໄຊຍະບູລີ, ແຂວງວຽງຈັນ, ນະຄອນຫຼວງວຽງຈັນ, ບໍລິຄໍາໄຊລົງຫາຄໍາມ່ວນ, ຊຶ່ງໂອກາດຈະເກີດມີນໍ້າຖ້ວມາະຫັນພັນ, ດິນເຈືອຍຢູ່ບໍລິເວນເຂດສ່ວນພູຂອງແຂວງຊຽງຂວາງ, ແຂວງວຽງຈັນ, ບໍລິຄໍາໄຊລົງຫາຄໍາມ່ວນ. ສະນັ້ນສາກົນລູດູນິມ ແລະ ອຸຕິກກະສາດຈຶ່ງແຈ້ງເຕືອນເຖິງອາພາດການເປົກຄອງ, ພໍ່ແມ່ປະຊາຊົນທີ່ອາໄສຢູ່ບໍລິເວນແຂວງທີ່ກ່າວມາຂ້າງເທິງ, ໂດຍສະເພາະປະຊາຊົນທີ່ອາໄສຢູ່ເຂດສ່ວນພູຈຶ່ງມີສະຕິລະໂມດລະບັງຕໍ່ສະພາບລົມແຂງ, ຝົນຕົກຫັກ ແລະ ນໍ້າຖ້ວມກະສັນພັນທີ່ອາດຈະເກີດຂຶ້ນໃນຂ້າງເທິງ ແລະ ຂໍໃຫ້ຕິດຕາມຄ່າວພະຍາກອນອາກາດຈາກກົມລູດູນິມ ແລະ ອຸຕິກກະສາດເປັນປະຈຳ.

ກົມລູດູນິມ ແລະ ອຸຕິກກະສາດ



ສັນຕິ ສຸດທິຈິກ

ກົມລູດູນິມ ແລະ ອຸຕິກກະສາດ
ບ້ານສາກາດ, ຫອນບູນຊາຍຸນີ ວຸ ປ.ບ. 2903, ສາມລຽງວຽງຈັນ, ສປປ ລາວ
ໂທ: (856-21) 219010, 263657, ອີເມວ: (856-21) 520038
ຮິດເວັບ: www.dmh.gov.la, www.dmh.gov.la, ວີເບີ: <http://www.dmh.gov.la>



ກົມລູດູນິມ ແລະ ອຸຕິກກະສາດ ຫົວໜ້າກອງພະຍາກອນອາກາດ ແລະ ອຸດຖານປັນ

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ກົມລູດູນິມ ແລະ ອຸຕິກກະສາດ

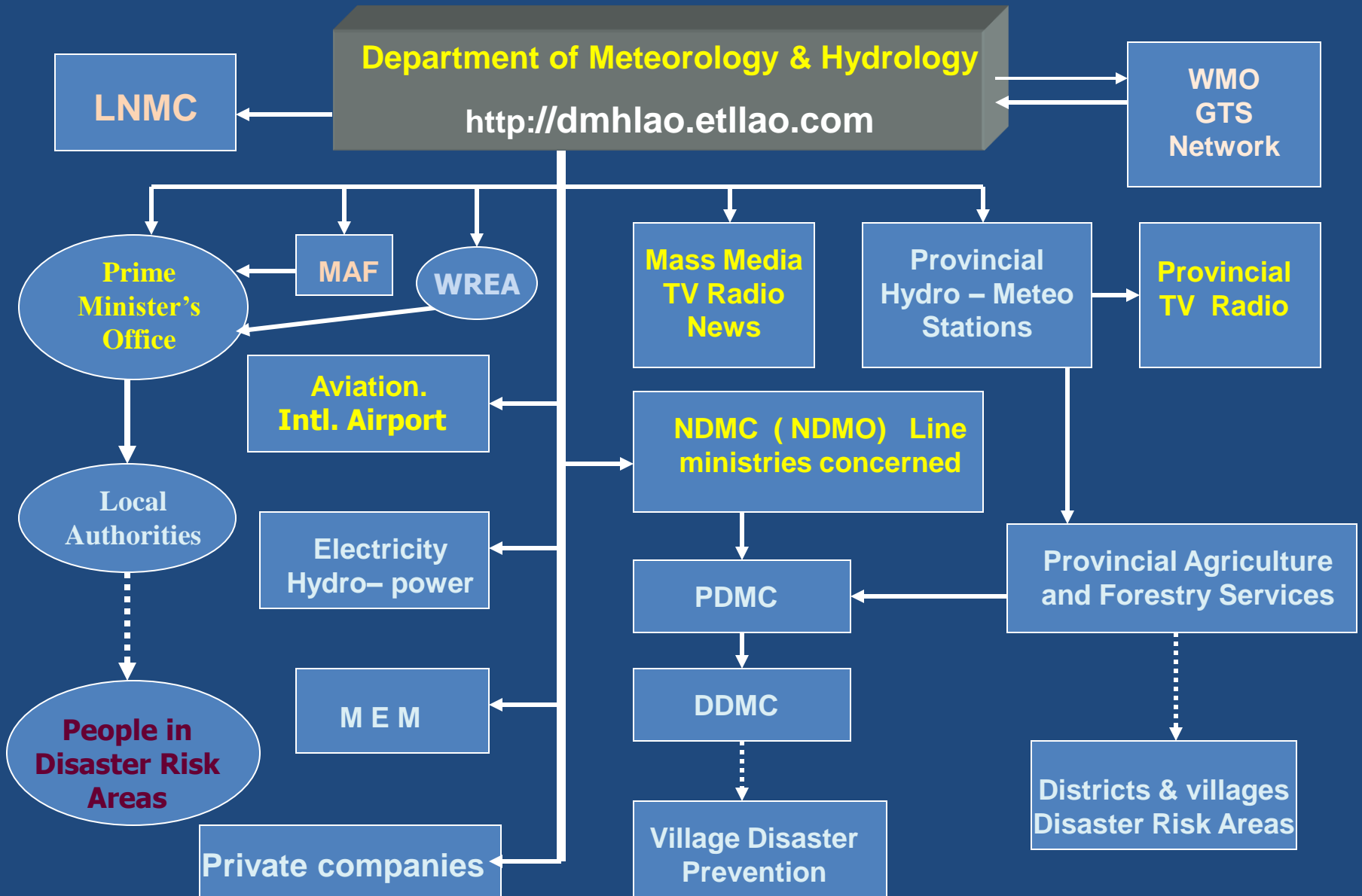


ສັນຕິ ສຸດທິຈິກ

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Forecast & Warning Dissemination in Laos



Conclusion

In Lao PDR, almost big cities are located in flat plains along the Mekong River and its tributaries, which comprising 50 % of the total population.

Climate change will intensify the impacts of natural disasters and to focus more attention on:

- Warning on inundation through the **heavy rainfall** flood forecasting , warning and Telecommunication Systems
- Increase the frequency of issuing forecasts and warnings through mass media to public and directly to concerned end users.
- Enhancement of awareness and preparedness of residents and have plan to timely response before flood.
- Forecast verification need to improve
- The timely of flood forecasting and warning dissemination provided by DMH was very helpful.



Thank you for your attention

