First Southeast Asia Water Forum

IFNET

DROUGHTS AND FLOODS

in the Lao People's Democratic Republic

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Report on Droughts and Flood

In The Lao People's Democratic Republic

Waterways Administration Division

Department of Roads

Ministry of Communication Transport Post and Construction

Vientiane, November 2003

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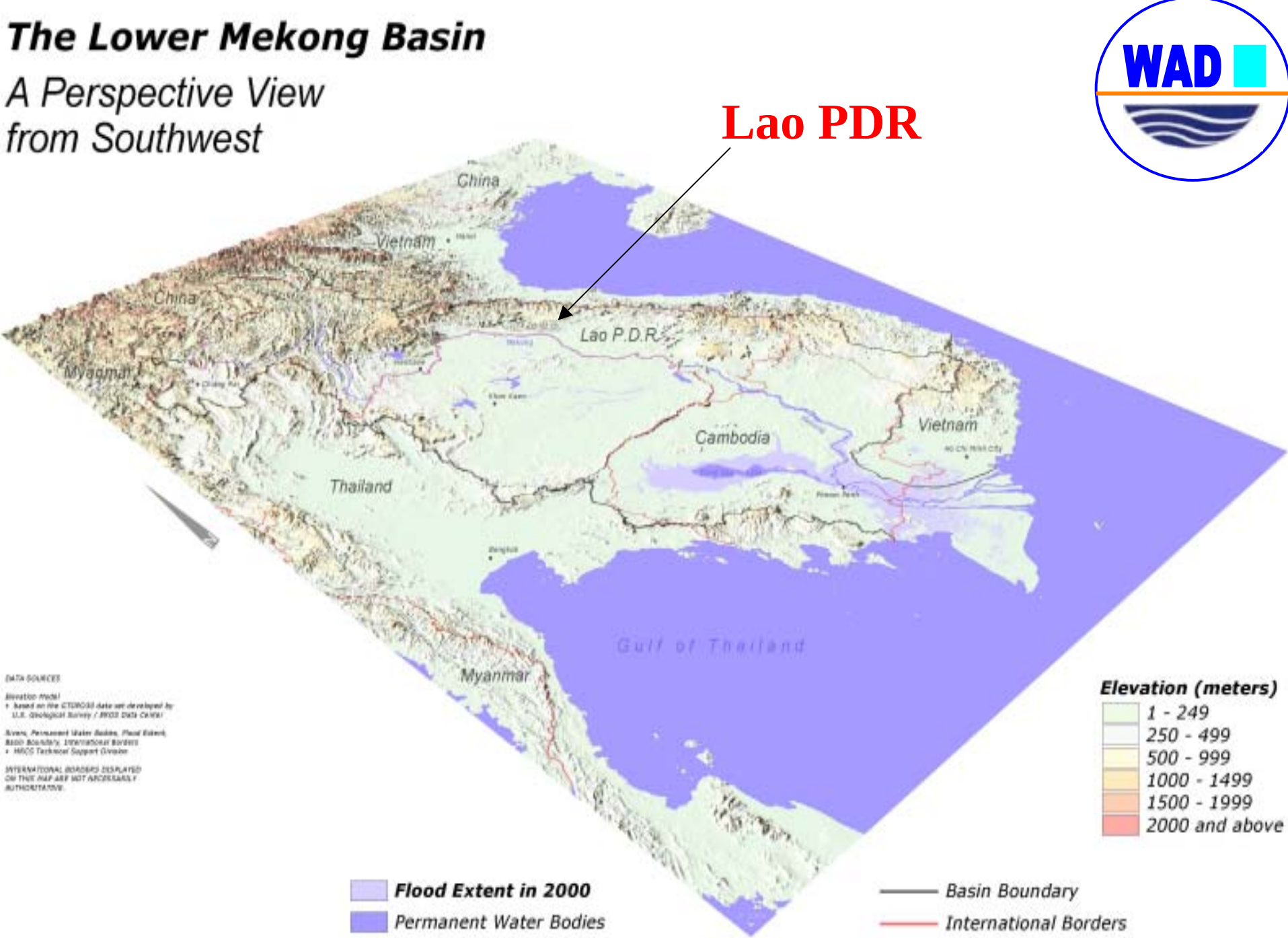
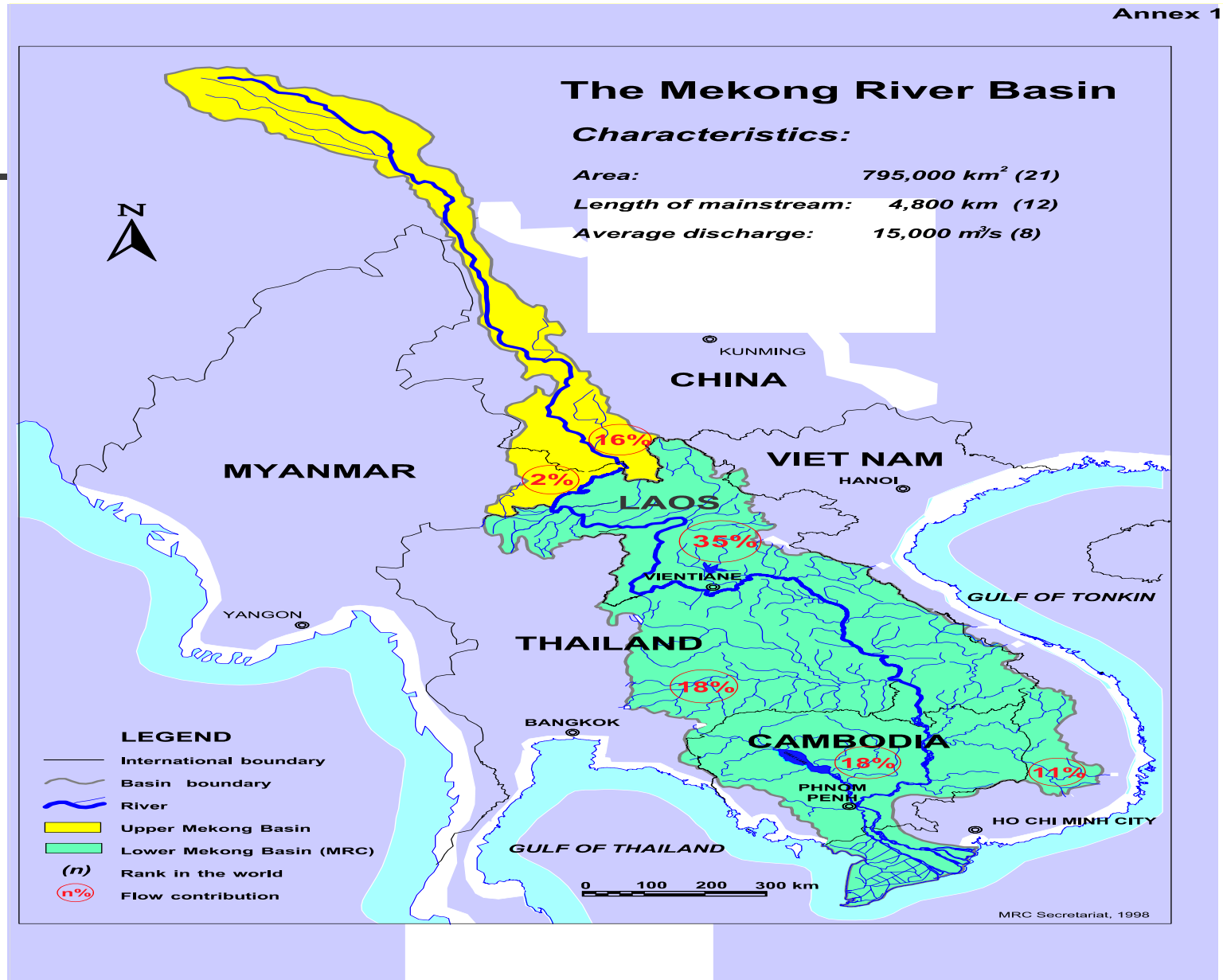
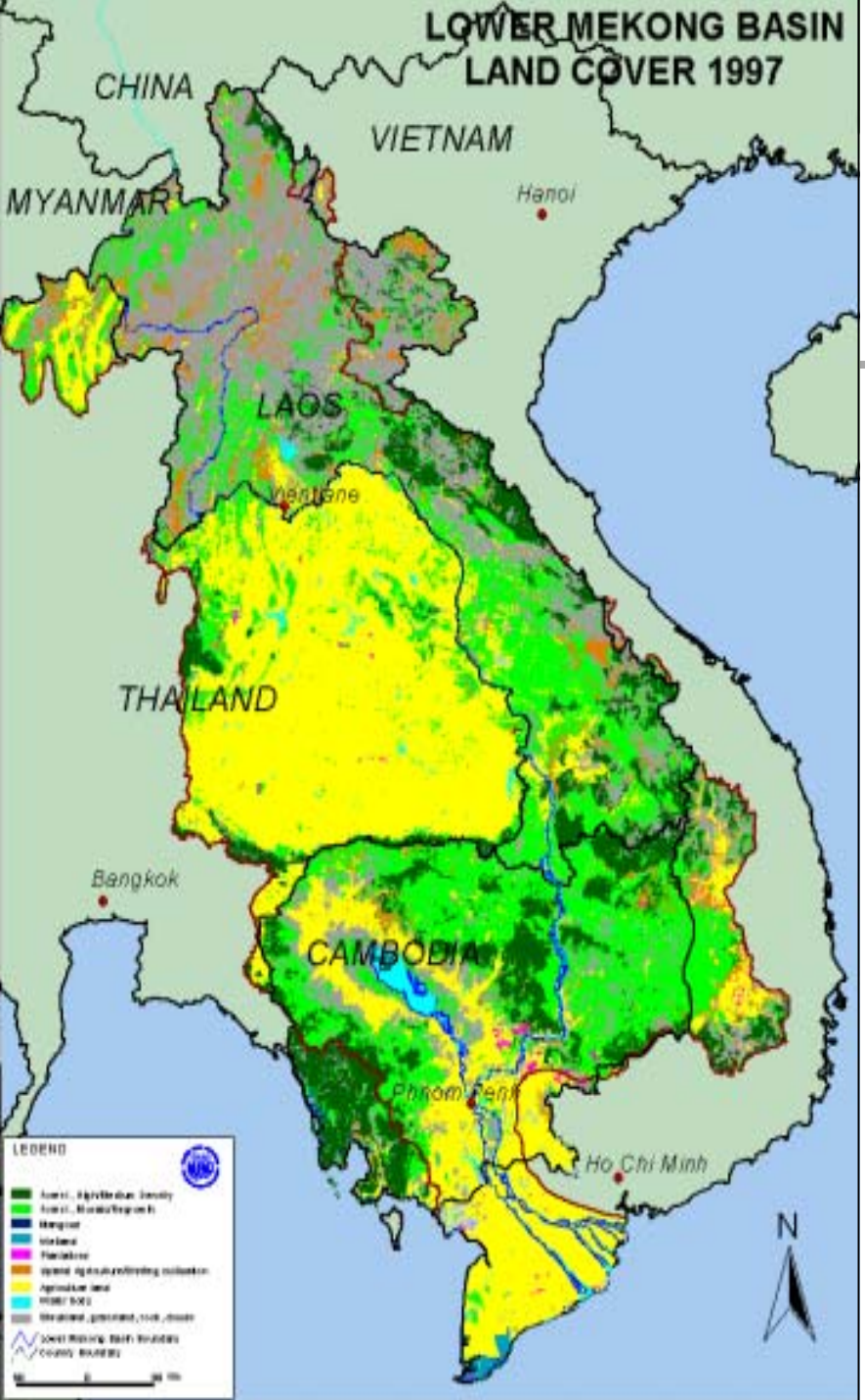

The Lower Mekong Basin
A Perspective View
from Southwest
Lao PDR
China
Vietnam
China
Lao P.D.R.
Myanmar
Cambodia
Vietnam
Thailand
Gulf of Thailand
Myanmar
Elevation (meters)
1 - 249
250 - 499
500 - 999
1000 - 1499
1500 - 1999
2000 and above
Flood Extent in 2000
Permanent Water Bodies
Basin Boundary
International Borders

The Mekong River basin





Lao in brief

- **Area: Land locked,236,800 sq km.**

  75% mountainous

- **Population: 5.2 million (2000).**
- **Capital city: Vientiane.**
- **Bordering: China, Myanmar, Thailand, Cambodia and Vietnam.**
- **Altitude: 1,500 m above MSL.**
- **Mekong River: 1898 km and 22 main tributaries**

Climate conditions

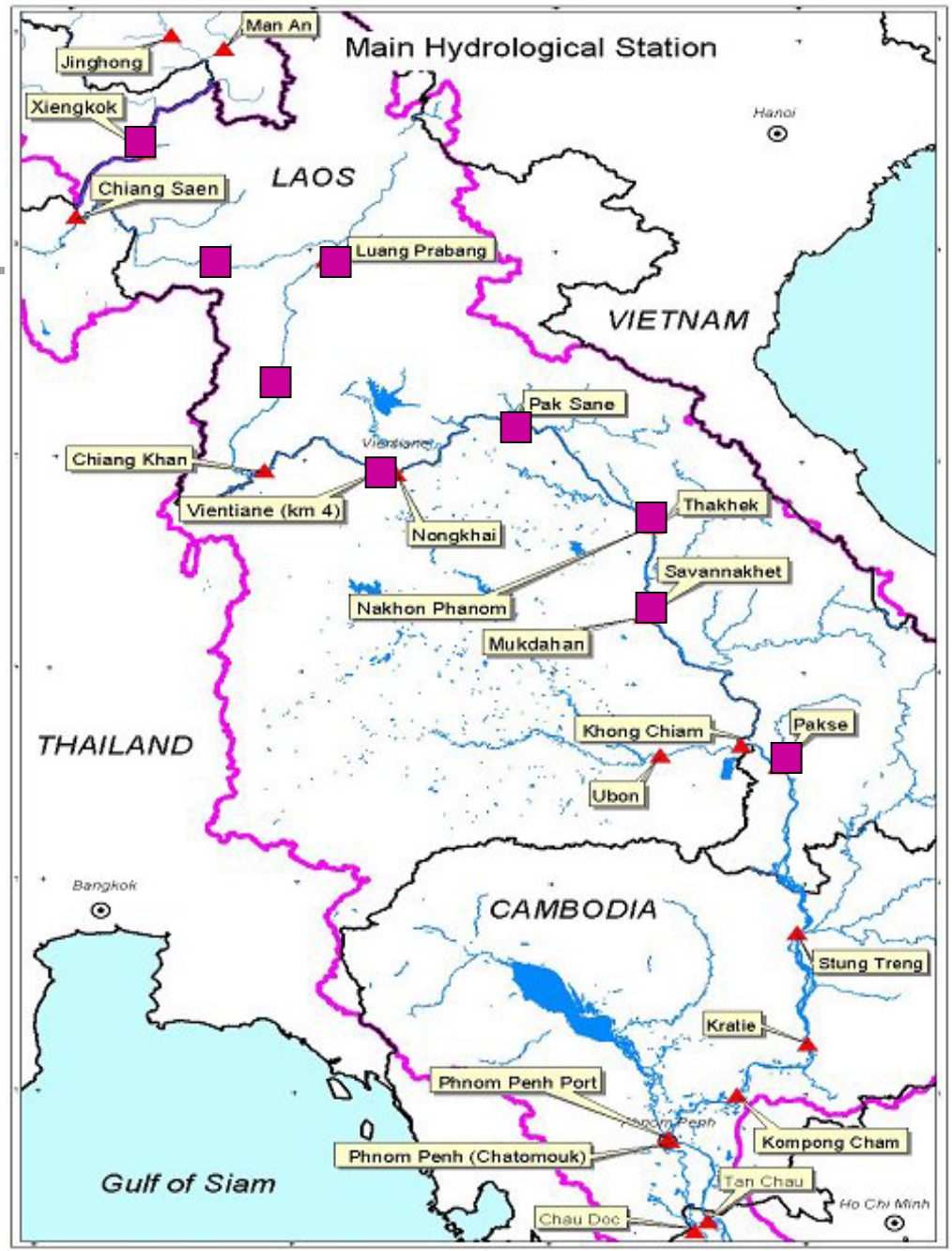
- **Warm, tropical climate zone and dominate by two monsoon**
- **The South-West monsoon: Mid May-Mid October, heavy and frequent rainfall and high humidity,wind, warm and wet.**
- **The North-East monsoon: November-Mid March, the atmospheric pressure is high,low temperature and humidity,cool dry air.**
- **Rainfall: 1,000-3,000 mm,**
- **Temperature: 15°C to 38°C**

Some characteristics of the monsoon

- Clear distinct between wet and dry season,
- Drought can occur during the wet season,
- The small dry season in June July,
- Rainy days can occur in the dry season,
- Typhoon are major cause of flooding,
- Maximum typhoon effect from 15^{o} N upward,
- Peak typhoon month is September, October

Main hydrological stations at the Mekong River in Laos

1. Xieng Kok
2. Pak Beng
3. Luang Prabang
4. Pak Lay
5. Vientiane
6. Paksane
7. Thakhek
8. Savannakhet
9. Pakse



2. Drought damages

- Year: 1961, 1966, 1971, 1978, 1984,1994, 1995, 1996.
- Where: Vientiane Mun., Vientiane, Bolikhamxai, Khammoun, Savannakhe, Champasak
- River : Mekong river and 22 tributaries.
- When: August till November, during the monsoon
- Why: Heavy tropical storms, typhoons.
- Damages:

The Drought in Lao PDR for the year 2002 has not occurred

2. Flood damages

- **Year: 1961, 1966, 1971, 1978, 1984, .**
- **Where: Vientiane Mun., Vientiane, Bolikhamxai, Khammoun, Savannakhe, Champasak**
- **River : Mekong river and 22 tributaries.**
- **When: August till November, during the monsoon**
- **Why:Heavy tropical storms, typhoons.**

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2. Flood damages

- Year: Damages:

  In 1994 damaged 28,000 hectares

  In 1995 damaged 87,300 hectares

  In 1996 damaged 76,000 hectares, 260 hectares of fishponds were destroyed.

2. Flood damages

- Flood in year 2002 was heavy and Vongfong-14 storm from Southeast Monsoon
  - Flash flood - 3days in Northern & Centre (LouangNamtha, Phongsaly and Bolikhamxay)
  - Plain areas - 2 weeks in Low land (Bokeo,

2. Flood damages

- **LouangPhabang, Vientiane, Borikhamxay, Khammoune, Savanakhet, Saravanh, Champasack and Attapeu**

Flood affected 12 provinces; 43 Districts; 1,000 villages; 30,000 families; 8,556 household damages and 03 person died

Affect to Agricultural land:

Planting Area = 563.400 ha

Flooded Area = 58.890 ha

Loss Area = 37.300 ha

Cost Estimated = 33 bill.KIPS (3,3mill.$)

Affect to irrigation system:

389 of Irrigation Project

Cost Estimated = 37,3 bill.Kips (3,73mill.$)

Irrigation Channel System Damaged

2.630 m of Irrigation Channel- Damages
Cost estimated= 37,3 bill.Kips (3,73mill.$)

Affect to Livestock & Fishery

76 of buffaloes and 17 of cows
151 of pigs and 3,840 of poultry

382 of domestic fishponds (265 ha)
58 of nursery ponds (13 ha or 450.000)

Cost estimated= 17 bill.Kips (1,7mill.$)

Other Affect

Roads, Hospitals, Schools, , Factories, Etc.

(no obvious data)

Flash flood

Phongsaly :

4D, 68V, 2280F, 12405pp

LouangNamtha:

1 Districts, 2 Villages, 94 Families, 480 people

Oudomxay Province:

2 D, 37 V, 947 F, 5.537 PP

Xiengkhouang Province:

3 D, 27 V, 176F, 556 pp

Borikhamxay Province:

5 D, 93V,5666F, 28.028pp

Flooded along the Mekong River

Lungprabang Province:

5 D, 39 V, 3507 F, 2046 PP

Vientiane Province:

2 D, 4 V, 80 F, 709 PP

Vientiane City

9 D , 95 V, 4.132F , 21.405pp

Borikhamxay Province:

5 D, 93V,5666F, 28.028pp

Droughts and floods

Khammoune Province:

2 D, 69 V, 1.483 F, 7.860 PP

Savanakhet Province:

7 D, 120 V, 11.977 F, 46.333 PP

Champasak Province:

8D, 392V, 13679F, 79009pp

Attapu Province:

2 D, 28 V, 1682F, 6028 pp

3. Structural measures

Flood protection dike

- Vientiane City: 74 km
- Paksane town: 2.5 km
- Thakhek town: km
- Savannakhet town: km
- Champasak town: 5 km

3. Structural measures (cont.)

Water gate

- Vientiane City: 2
- Paksane town: 3
- Thakhek town: 4
- Savannakhet town: 2
- Champasak town: 3

3. Structural measures (cont.)

Pumping station

- **Vientiane City:**
- **Paksane town:**
- **Thakhek town:**
- **Savannakhet town:**
- **Champasak town:**

3. Structural measures (cont.)

Drainage canal

- **Vientiane City: 16.612 km**
- **Paksane town:**
- **Thakhek town:**
- **Savannakhet town:**
- **Champasak town:**

4. Non-Structural measures

The National Disaster Management Committee

- **Minister of Ministry of Labour and Social Welfare, Chairman,**
- **Vice Minister of Ministry of Agriculture and Forestry, Vice chairman.**
- **Director General of the Cabinet of the Ministry of foreign Affair, Member,**
- **Director General of the Cabinet of the Ministry of Defense, Member**

Droughts and floods

- **Director General of the Cabinet of the Ministry of Security, Member**
- **Director of the Budget Department of the Ministry of Foreign Affair, Member,**
- **Director General of the Department of Transport of The Ministry of Communication Transport Post and Construction, Member,**
- **Director of the Industry Department of the The Ministry of Industry and Handicraft, Member,**

Droughts and floods

- **Director of Hygiene and Prevention Department of the Ministry of Public Health.**
- **Director of the Mass Media Department of the Ministry of Information and Culture, Member,**
- **Director General of the Cabinet of The Ministry of Education , Member,**
- **Chairman of the Lao Red Cross Society , Member,**
- **Director of the Social Welt fare Department of the Ministry Labour and Social Welfare, Member,**

Flood defense committee

1. Under Supervision of the PMO

- **Ministry of Labor and Social Welfare**
- **Ministry of Agriculture and Forestry**
- **Ministry of Industry and Handicraft**

2. Ad Hoc FM Committee Flow Chart

Flood mitigation measures

Flood cannot control ;but FMC should carry out :

1.Preparedness for social lives

- **Work closely with line agencies concerned**
- **Check the flood protection sluice**
- **Install pumping stations**
- **Manage embankment and dykes**
- **Manage Nam Ngum Dam operation**
- **Lay down the sandbags**
- **Help Villagers (in case emergency)**

Flood Response

MAF, MLSW, NDMC have worked closely with Provincial and Local Authorities:

- **Got data & information on flood situation (whole country)**
- **Provided seed for farmers/Villagers after flood withdraw**
- **Requested for assistance from Donors**
- **Arrange technical staff, tools and equipment for helping flood victims**

Activities carried out during & after flood2002 Flood Response

A. Problem solved

- Authorities concern visited flood areas
- Send technical staff to flood areas to collecting data & information on social economic damage
- Preparing the second crops, nursery, ponds etc
- Coordinate with local authorities to help flood victims as drinking water and food

Recommendation

A.Immediate future :2005-2010

- Civil construction & infrastructures build on the location higher than flood water level
- Agricultural production :
  - Cultivation will be started once flood withdraw
  - Cropping patterns & varieties change will be applied to double crops:October to July
- Selection of appropriate crop pattern that flood risk can be prevented(managed)

Droughts and floods

- **For frequently flooded areas along Mekong river & its tributaries, optimum solution is "Stay with flood"**
- **Residential accommodation works & industrial zone will be removed to higher locations**
- **Flood forecast & flood warning will be reached to community on time**
- **Improve & extend communication system**
- **Relief flood victims**

Droughts and floods

B. Long term period after 2010

- Construction of dike, sluice & drainage pumping station required to control & mitigate floodwater from Mekong river & tributaries
- Embankment & dyke system to control early flood
- Water logging drainage structures will be constructed in combination with flood control structures
- Build on-farm drainage system in specific areas

Droughts and floods

- **Meteo-hydrological stations should be completed including rain-gauge stations**
- **Information & data need to be collected & update annually on losses and damage caused by flood, flood marks, flood duration, flooded areas etc….These will be synthesized to assess flood reasons**
- **Residential areas will be removed to the upper areas**

National policy on flood management and mitigation

- Consolidating and further strengthening the institutional arrangements and capacity building of the LNFMMS.
- Developing effective disaster risk management plans and capacity at provincial and district level.
- Developing a community response capacity at the village level.

National policy on flood management and mitigation

- Enhancing the capacity of the Lao National Flood Management & Mitigation Sub-committee authorities concerned through relevant training and development.
- Developing more effective early warning system for flood and droughts.
- Improving communication and information systems
- LNFMMS-Lao National Flood Management & Mitigation Sub-committee.

Flood forecasting and warning

Hydrological stations

Waterways Administration Division response: 53

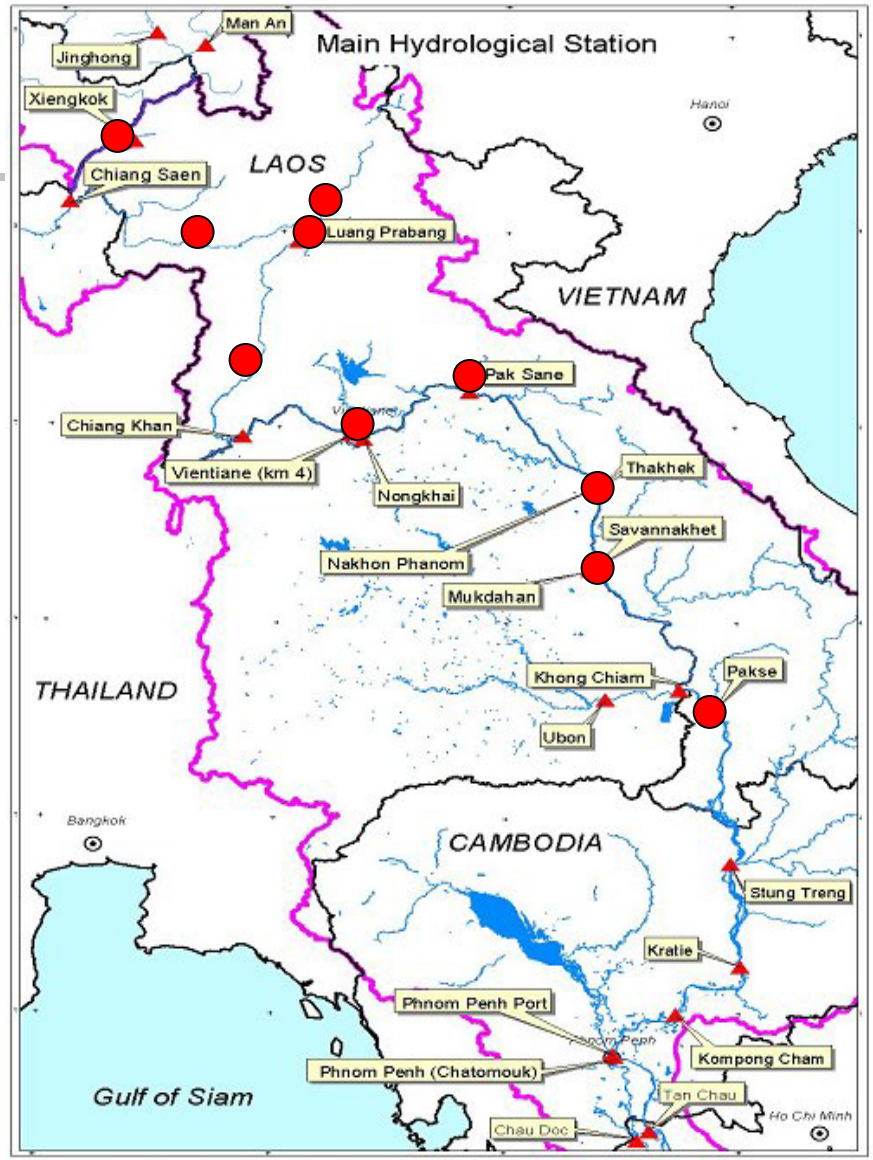
- **Manual reading 44**
- **Automatic reading 7**
- **AHNIP 2**

Department of Meteorological and Hydrology: 56

- **Manual reading 36**
- **Automatic reading 20**

Present forecasting stations

1. Xieng Kok
2. Pak Beng
3. Nam Ou (M. Ngoy)
4. Luang Prabang
5. Pak Lay
6. Vientiane
7. Paksane
8. Thakhek
9. Savannakhet
10. Pakse



Flood in Khammoun province

Flood in Khammoun province

Flood in Khammoun province

Strategy for national action plan

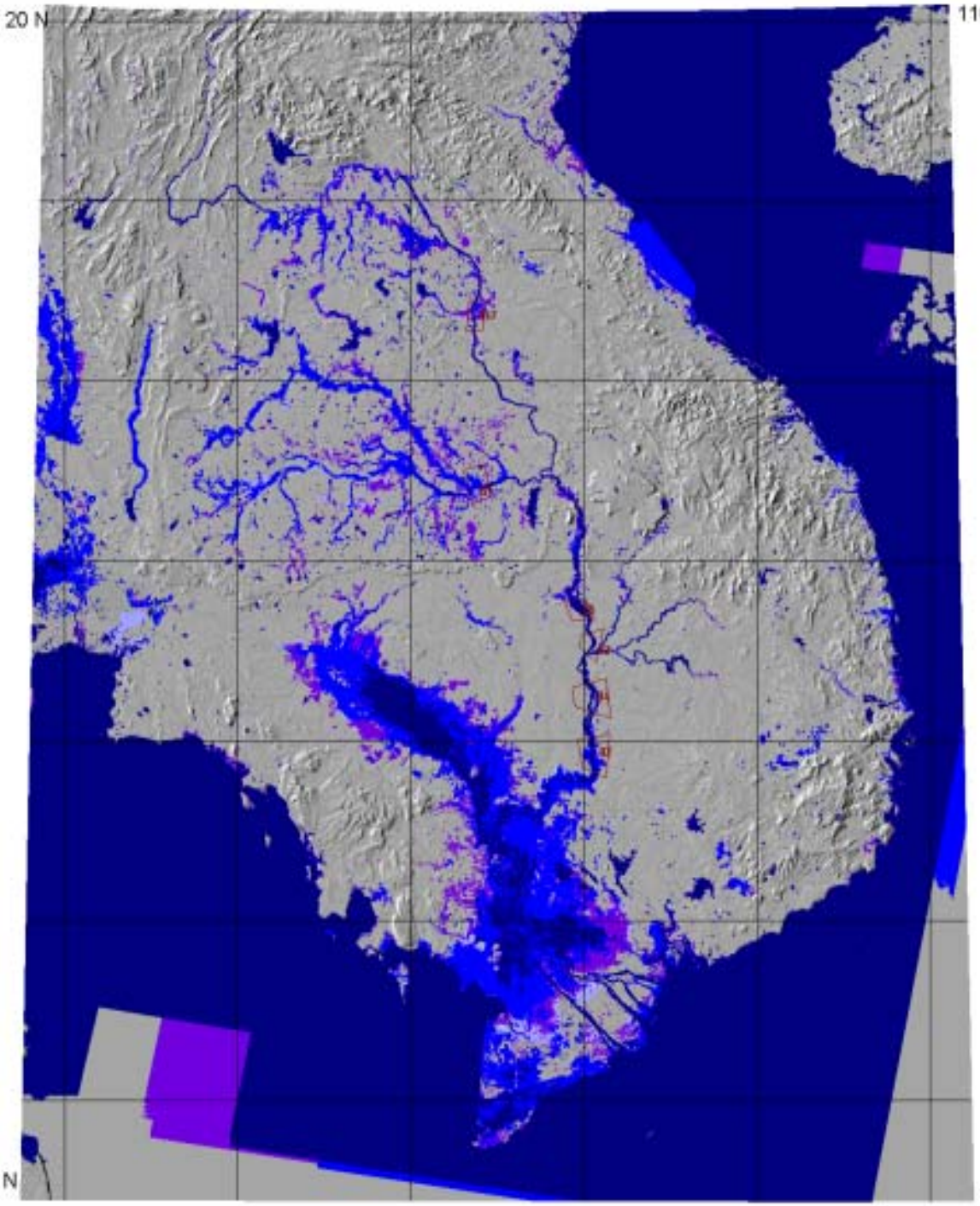
- Formation of LNFMMS,
- Revision of existing Policies and Plans,
- Study of International Models Practice,
- Participatory Planning with stakeholders,
- Identification of effected areas,
- Interim National Plan Report circulated for comment,
- Policy Forum on Flood Management & Mitigation.

Strategy for national action plan

- Final National Plan Report Prepared for approval.
- National Workshops and Training.
- Implementing an effective flood protection and mitigation strategy.
- Diversification of water resources for irrigation and management for sustainable utilization.
- Maintain watershed and mitigate environmental degradation.

5. Regional cooperation

- **Establish a regional flood information center,**
- **More and better exchange of information and experience,**
- **Support a regional flood warning system,**
- **Support flood mapping at community level,**
- **Support collection and transmission of reliable and accurate real time data,**
- **Support dissemination and understanding of forecasts,**



Dartmouth Flood Observatory
Dartmouth College
Hanover NH 03755 USA
G. R. Brakenridge
Elaine Anderson
Work supported by NASA grant NAG5-9470

Universal Transverse Mercator
UTM Zone 48 North; WGS 84
Graticule: 200 km UTM

SYMBOLOGY KEY

MODIS Reference Water

Satellite Gaging Reach

Flooded Lands

2002
2001
2000
1999

First Southeast Asia Water Forum

Thank you

For your kind attention