



Department of Civil Engineering | Faculty of Engineering
National University of Laos (NUOL)

DISASTER MANAGEMENT IN LAOS

Douangmala KOUNSANA, D. Eng.

Department of Civil Engineering, Faculty of Engineering
National University of Laos, Vientiane Capital, Lao PDR

I. ABOUT LAO P.D.R



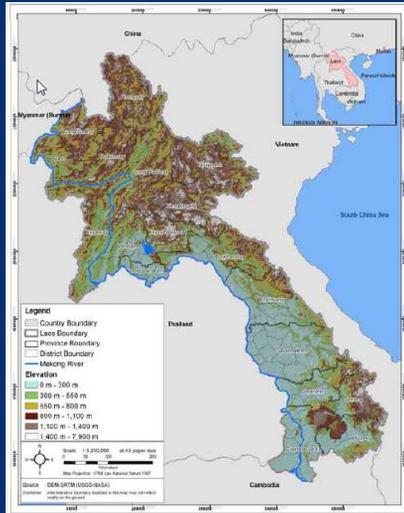
- + Area: 236,800 km²
- + 18 Political provinces, 139 district, 10,552 Villages.
- + Population: 6.5million (2012)
- + Density: 26.7/km² (2012)
- + Located in Southeast Asia
- + Language: LAO

Table1. Border of Lao PDR

Region	Borders with	Length of Borders (km)
North	China	505
South	Cambodia	435
East	Vietnam	2,069
North-West	Myanmar	236
West	Thailand	1,835

(source: www.discoveryindochina.com; UNDP, Developing a National risk profile of Lao)

II. CLIMATE AND TOPOGRAPHY OF LAOS



(source: UNDP: Developing a national risk profile of Lao)

The topography of Lao PDR is dominated by mountainous area and alluvial plain. **About two-third of Laos is mountainous** and thickly forested, **Laos has a tropical monsoon climate; the climate is hot and tropical, with the rainy season** between May and October when temperatures are at their highest. The cool dry season runs from November through February and a **hot dry season** in March and April.

The Mekong River flows along the border between Laos and such countries as Thailand and Burma, **The length of the river on the Laotian territory is 1,850 km.**

II. HAZARDS AND DISASTERS IN LAOS

❑ Natural Disasters:

- (1) Epidemic
- (2) Drought
- (3) Flood
- (4) Wind Storm and Typhoon
- (5) Landslide
- (6) Earthquake (negligible earthquake risk)



❑ Man-made Events:

- (1) UXO
- (2) Fire
- (3) Traffic Accidents



(source: EM-DAT, 2010; Ministry of Communications, Transport, Post, and Construction; ministry-issues-nationwide; <http://www.uxolao.org>; www.laotimes.com)

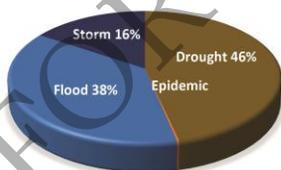
III. NATURAL DISASTER IN LAOS

Table2. Natural disaster profile of Lao PDR

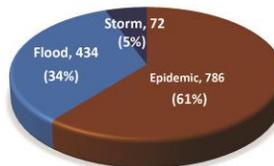
Disaster		Number of Events	Killed	Total Affected	Damage (000 US\$)
Drought	Drought	5	-	4,250,000	1000
Epidemic	Unspecified	3	44	9,685	-
Epidemic	Bacterial Infectious Diseases	2	534	8,244	-
	Viral Infectious Diseases	3	208	2,000	-
Flood	Unspecified	10	76	1,878,600	2,480
	General flood	8	358	1,569,740	37,128
Storm	Unspecified	2	8	38	302,301
	Tropical Cyclone	3	64	1,397,764	103,650

(source: EM-DAT,2010; UNDP: Developing a national risk profile of Lao)

NATURAL DISASTER IN LAOS, 2010

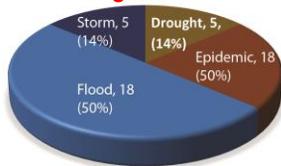


(a) Total Affected

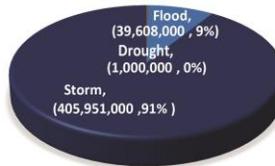


(b) People Killed

Among the few of natural hazards in the country, flood hazard has been regularly reported and become a major concern in Lao PDR due to vicinity major rivers like Mekong and Xekong Rivers.



(c) Number of Events



(d) Damage (US\$)

Fig1. Natural Disasters in Laos (EM-DAT,2010)

FLOOD AND DROUGHT DISASTER

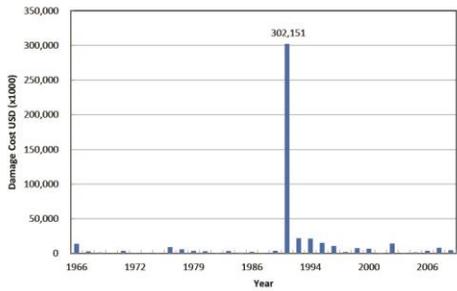


Fig2. Damage Caused by Flood in Lao (1966-2008)

Total: 473,381,000 USD (42 Years)

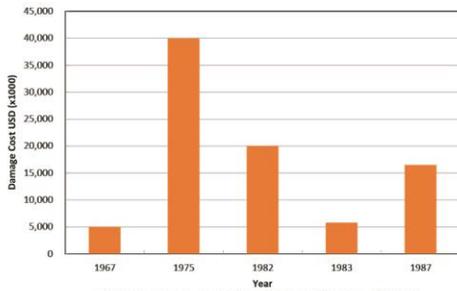
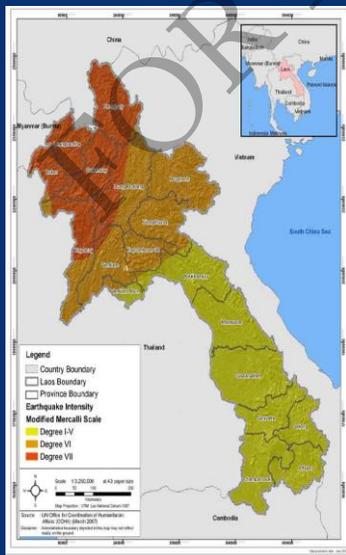


Fig3. Damage caused by Drought in Lao (1967-1987)

Total: 92,412,000 USD (36 Years)

IV. EARTHQUAKE HAZARD ASSESSMENT



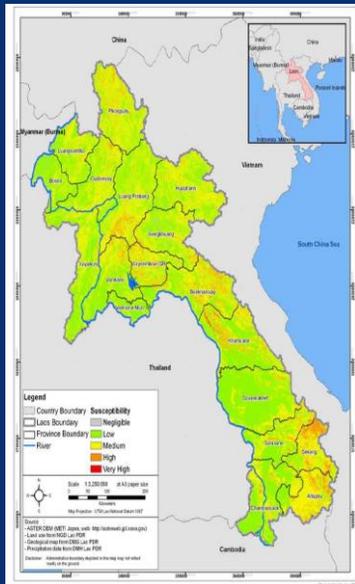
- Lao is prone to moderate to negligible earthquake risk.
- Laos has witnessed several small and moderate scale earthquakes in past in northern and western part of the country. Only one event of more than seven magnitude has been reported in past

● The map further shows geographical coverage of negligible, low and medium seismic zones.

Zone	MMI Range	Color
Negligible	I-V	yellow
Low	VI	Orange
Moderate	VII	Red

(source: EM-DAT,2010; UNDP: Developing a national risk profile of Lao)

IV. LANDSLIDE HAZARD ASSESSMENT



Landslide hazard susceptibility in Lao PDR is classified into 5 zones.

Landslide inventory database for Lao PDR does not exist for whole country. Specific rating system for landslide susceptibility in Lao also has not been developed. Therefore this assessment used a rating system (semi quantitative approach) for landslide susceptibility assessment.

Fig 5. Landslide hazard susceptibility map of Lao PDR

(source: UNDP: Developing a national risk profile of Lao)

IV. MAN-MADE EVENTS IN LAOS

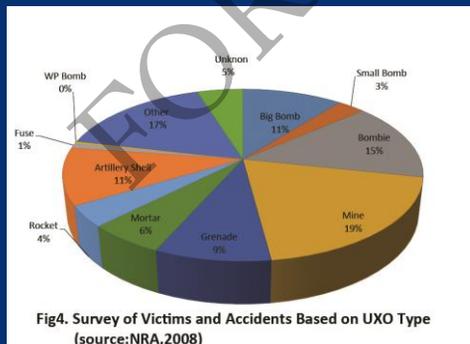


Fig4. Survey of Victims and Accidents Based on UXO Type (source:NRA,2008)

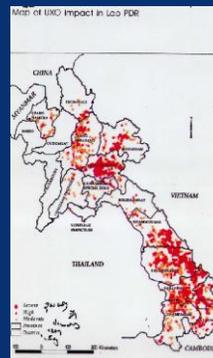
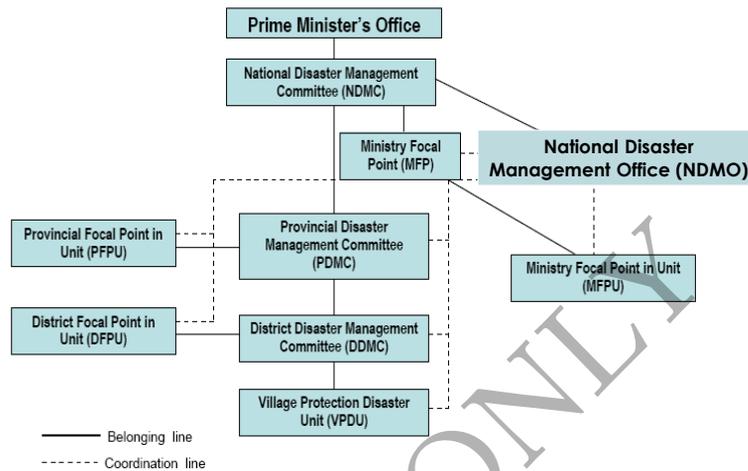


Fig5. Map of UXO Impact in Lao PDR. (source: www.uxolao.org)

Throughout the second Indochina war(1964-1973),more than 580,000 bombing missions dropped over **two million tons** of explosive ordnance on the territory of Lao PRD, and **around 30% failed to explode and remain to live**, making it per capita the most heavily bomb nation in the world (NRA,2008).

V. ORGANIZATION CHARD ON DISASTER MANAGEMENT OF LAOS

The NDMC Diagram



(source: Ministry of Labor & Social Welfare; UNDP: Developing a national risk profile of Lao)

VI. DISASTER PREPAREDNESS

1. Disaster early warning
2. Preparedness
3. ASEAN Standby Arrangements for disaster relief and emergency.

(source: Ministry of Labor & Social Welfare; UNDP: Developing a national risk profile of Lao)

VII. POLICY AND DISASTER MANAGEMENT SYSTEM IN LAOS

To reduce the damage of disaster

Developed the National Disaster Risk Strategic plan 2003 up to 2020 With aims to :

- 1.1 *Safeguard sustainable development and reduce the damage of natural or manmade disasters to community, society and country economy.*
- 1.2 *Shift strategy from relief and mitigation after disaster impact to community, society and economy of government organizations to preparedness before disaster strike emphasizing on flood, drought, landslide and fire parallel with continuing mitigate in post disaster period.*

(source: Ministry of Labor & Social Welfare; UNDP: Developing a national risk profile of Lao)

1.3 Turn from responsibility of only government agency to people centered in dealing with disaster by building capability for community

1.4 Promote forever protection of the environment and country rich such as: forest, land and water.

- ❖ *developing the National Disaster Risk Management Plan from 2012 up to 2015 to follow the Hyogo Framework for Action plan (HFA) as the overall framework to guide the response of stakeholders in addressing the impact of the disaster.*

(source: Ministry of Labor & Social Welfare; UNDP: Developing a national risk profile of Lao)

- ❖ At the same time, the Lao PDR has made good progress and achievements in the implementation of the National Strategic Plan on Disaster Risk Management which is in line with the Hyogo Framework of Action (HFA) and ASEAN Agreement on Disaster Management and Emergency Response (AADMER). Some of its recent achievements are:
 - legislation and disaster risk management and reduction mechanism have been improved and developed at national and local levels;
 - risk mapping and profiling has been conducted at the national level → works will be continued in other provinces with high risk to natural disasters
 - disaster data collection, data base and information management system have been improved.

(source: Ministry of Labor & Social Welfare; UNDP: Developing a national risk profile of Lao)

VIII. RIVERBANK PROTECTION WORK USING MATRESS SYSTEM

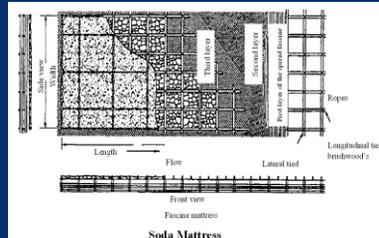
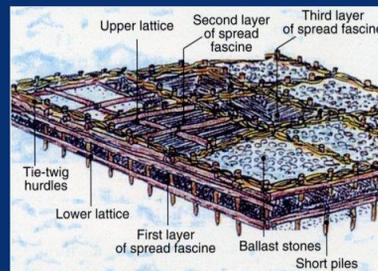


Fig6. Soda Mattress

(Source: Ministry of Communications, Transport, Post, and Construction; the Project on Riverbank Protection Works at Bolikhamxay Province & Bokeo Province)

MAIN CONSTRUCTION WORKS



Rock Deposition

- + Volume: 4,500m³
- + Rock Size: Ø450mm



Soda Mattress

- + Assembling on Bamboo Float
- + Unit : Two (Size: 10m*6m*0.9m)



Cobble Stone Fascine

- + Slope Area: 4290 m²
- + Rock Size: Ø450,Ø250 mm

Use natural material from locality:
 sand, red soil, gravel, rock or slates,
 bamboo, straw rope, wooden pile, wooden
 peg, willow branch

Fig7. Tools and Materials

(Source: Ministry of Communications, Transport, Post, and Construction; the Project on Riverbank Protection Works at Boikhamxay Province & Bokeo Province)

