Landslide Hazard and Disaster Management in Laos

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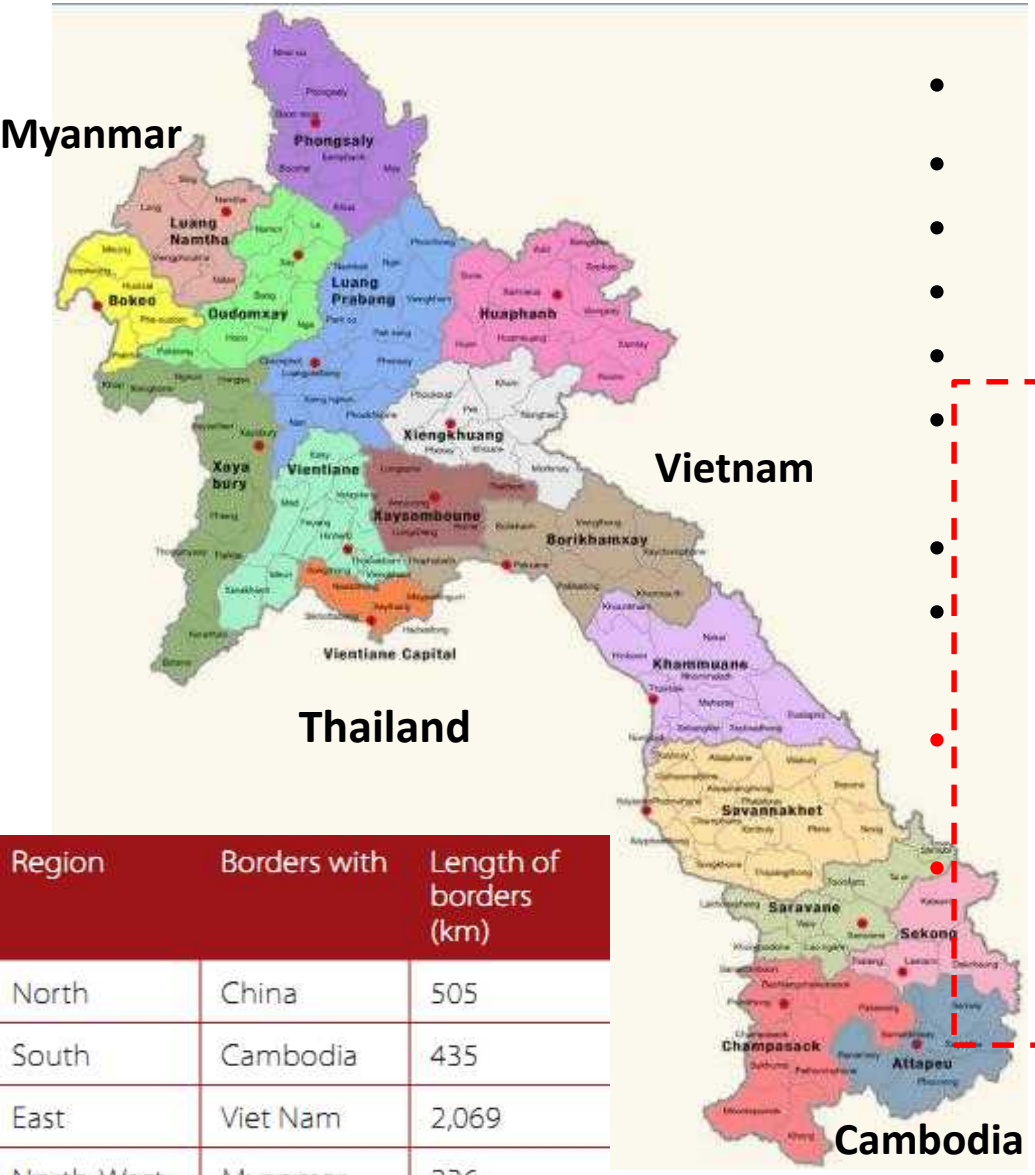
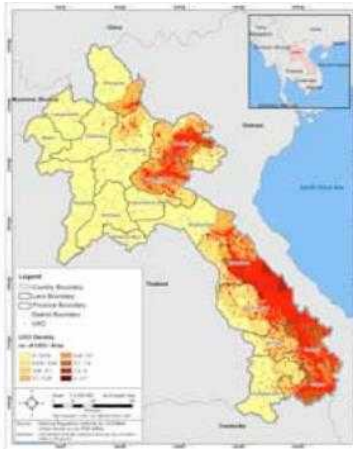
1.Lao PDR Profile

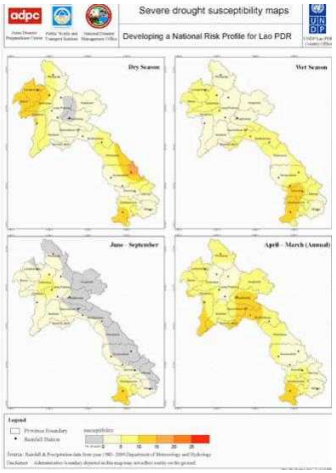


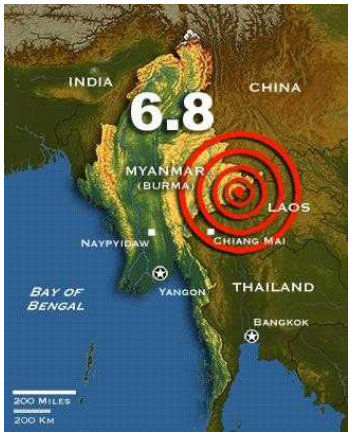
Region	Borders with	Length of borders (km)
North	China	505
South	Cambodia	435
East	Viet Nam	2,069
North-West	Myanmar	236
West	Thailand	1,835

- **Populations: 7,163,000 (2016)**
- **Land area: 236,800 km2**
- **Density: 30 persons/km2**
- **Seasons: Rainy and dry**
- **Share border with 5 countries**
- **From 1970-2010, there were 33 Hazard events**
- **9 million people affected**
- **$400 million in economic losses (MPI, 2012)**
- **2.8-3.6% of the country's GDP Losses from floods account.**
- **2.7% of the government's total spending annually (World Bank, 2014).**

2.Disasters in Lao PDR







1.Natural disaster

- Flood (Flash flood and river flood)
- Drought
- Typhoon(Storm)
- Landslide
- Epidemic
- Pest and
- Earthquake

2.Man-made disaster

- UXO
- Fire and
- Accident.

Natural Disasters in Lao PDR

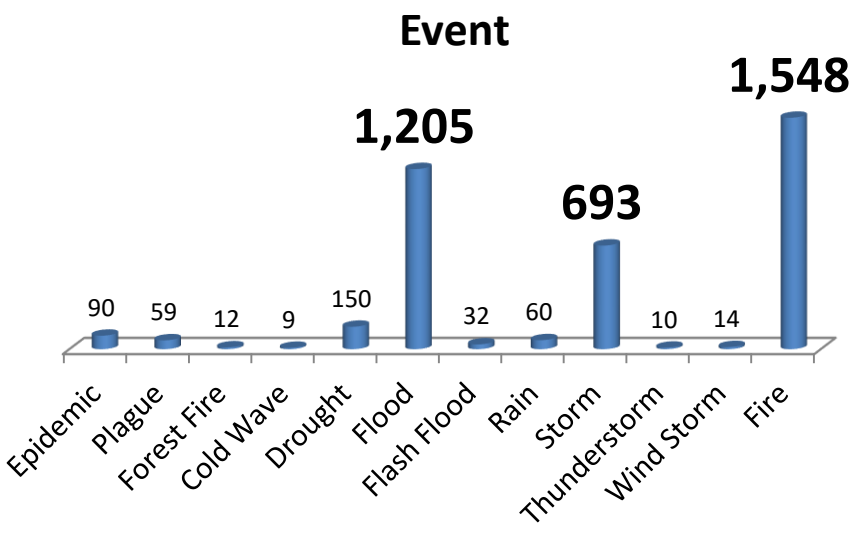
- **Flashflood and Landslide in Xayabouly,Borkeo provinces,2016**
- **Flashflood in southern part,2016**
- **Flashflood, flood and Landslide in Borkeo,Bolikhamxay provinces,2015**
- **Flashflood in Norther, Central and southern, 2014**
- **Drought, Luang Prabang province,2013**
- **Flash Flooding, Oudomxay 2013**
- **Typhoon Haima, Northern and Central portions, 2011**
- **Typhoon Ketsana, Southern provinces ,2009**
- **Flooding, Vientiane, 2008**

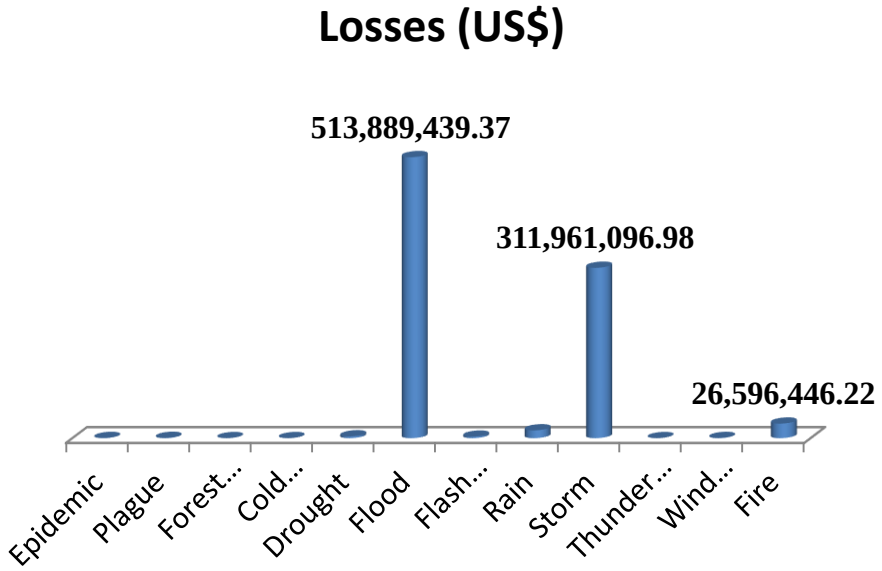
3.Disasters and losses 1992-2012

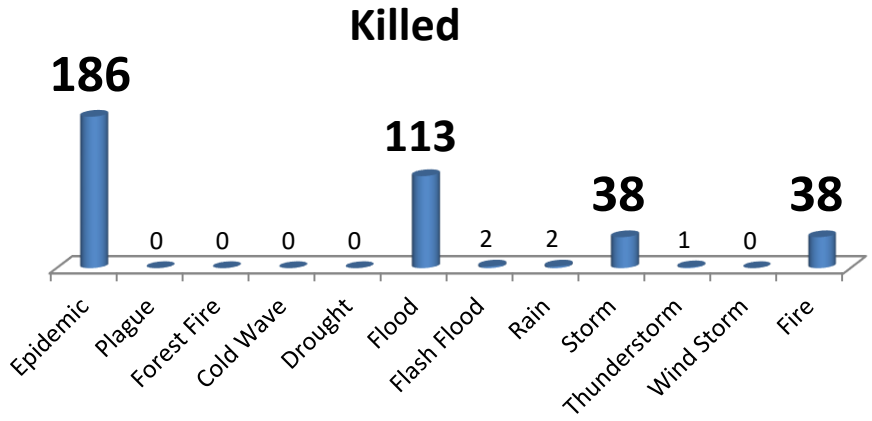
Hazardous	Event	Killed	Total affected	Losses (US$)
Epidemic	90	186	8,080	260,401.22
Plague	59	0	199,805	388,801.75
Forest Fire	12	0	677	85,885.75
Cold Wave	9	0	670	28,018.75
Drought	150	0	487,763	3,218,563.21
Flood	1,205	113	3,496,846	513,889,439.37
Flash Flood	32	2	2,269	2,687,010.13
Rain	60	2	2,625	14,221,132.04
Storm	693	38	550,415	311,961,096.98
Thunderstorm	10	1	248	24,194.13
Wind Storm	14	0	3,259	264,976.69
Fire	1,548	38	44,887	26,596,446.22
Total	3882	380	4,797,544	873,625,966.23

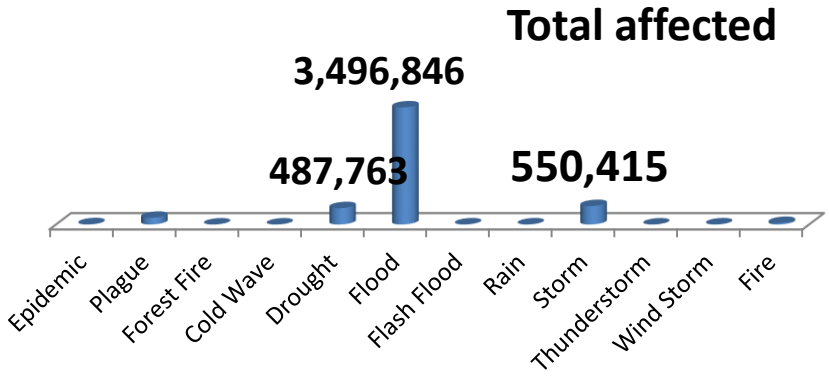
Source: DesInventar Data Lao PDR 2012 (1992 – 2012)

Disasters and losses from 1992-2012

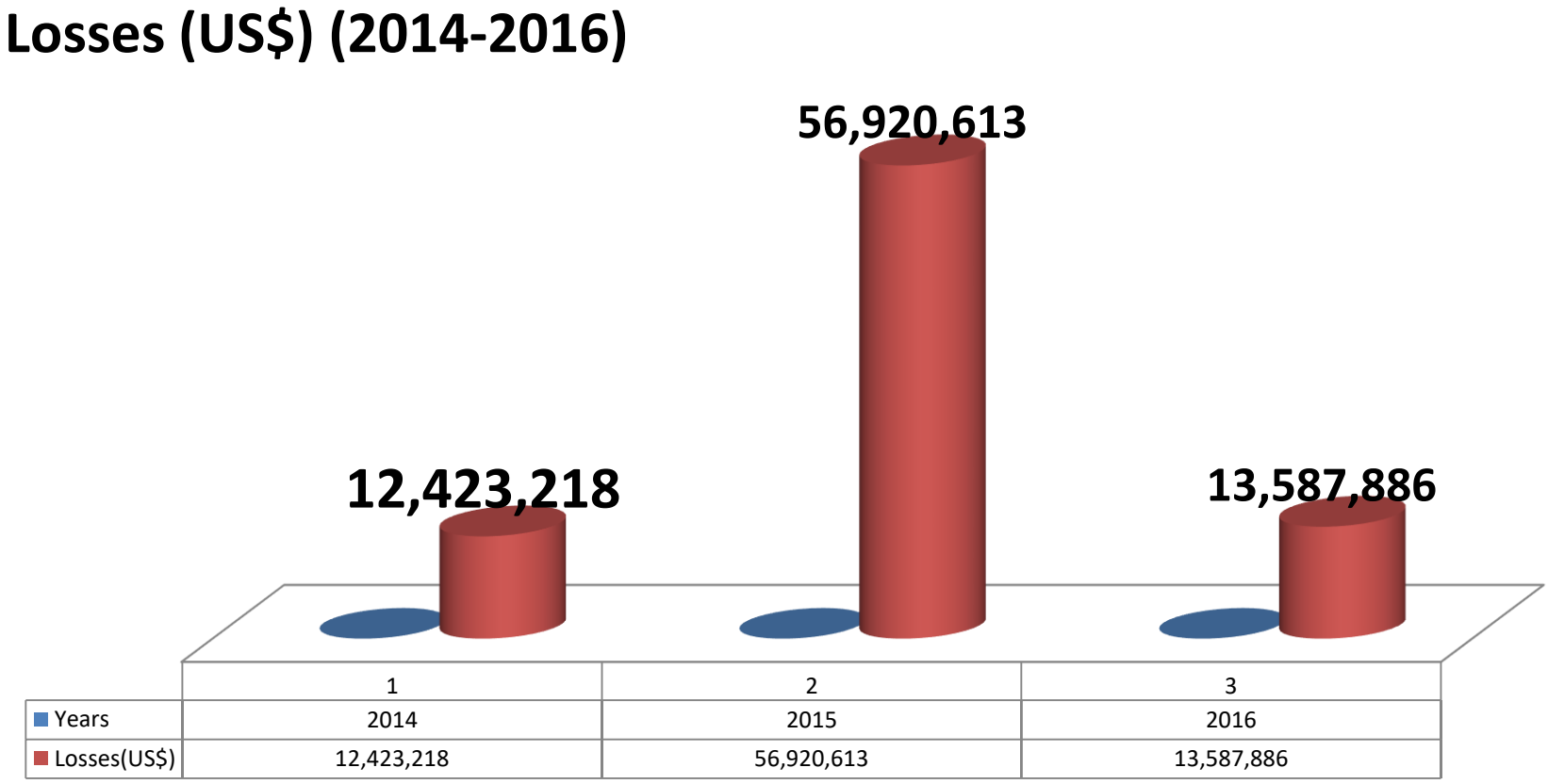








Disasters and losses in 2014-2016



	1	2	3
Years	2014	2015	2016
Losses(US$)	12,423,218	56,920,613	13,587,886

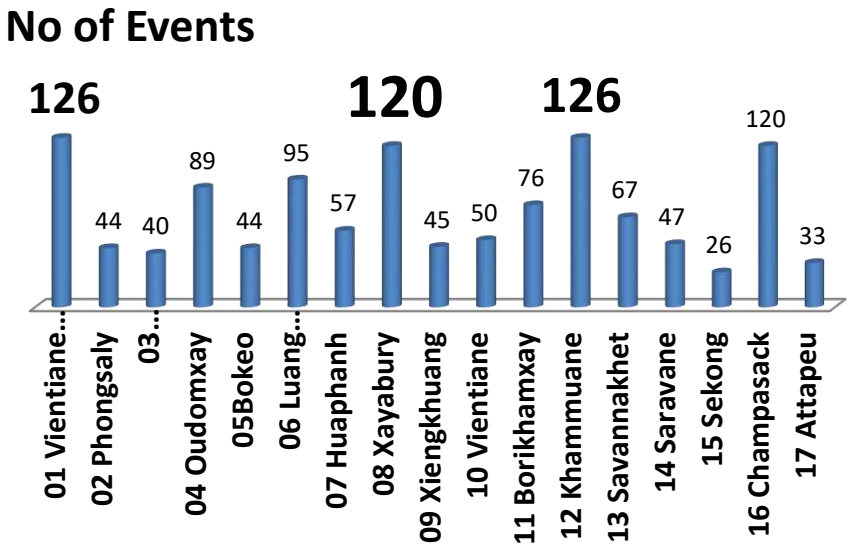
Source: Department of Disaster management and Climate Change, MONRE

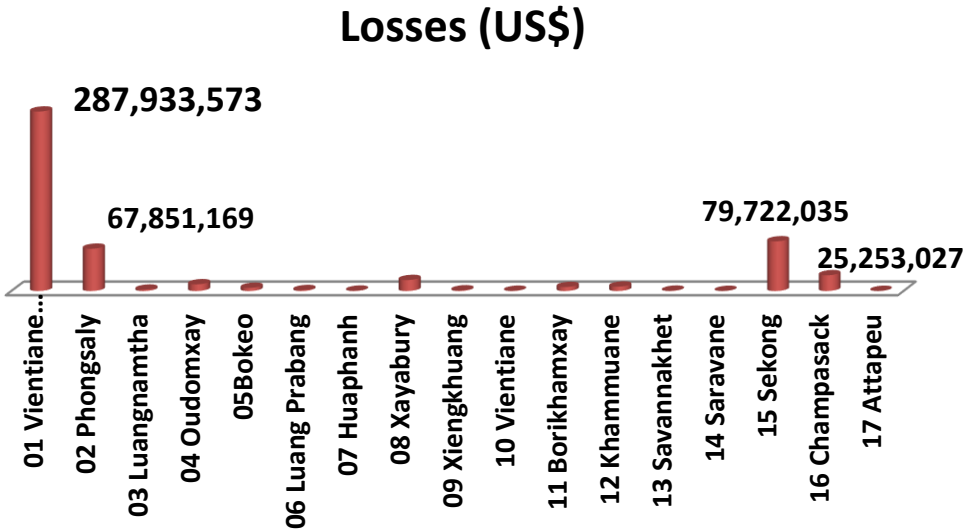
Flood loss in the provinces in 1992 – 2012

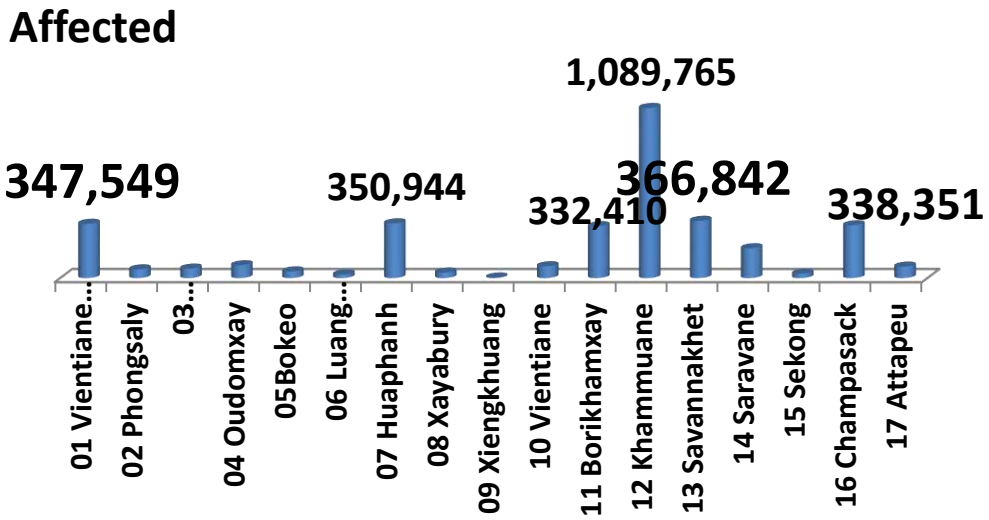
Provinces	Event	Affected	Deaths	Houses Destroyed	Houses Damaged	Losses (US$)
Vientiane Cap	126	347,549	12	145	13,203	287,933,573
Phongsaly	44	55,846	1	30	108	67,851,169
Luangnamtha	40	60,725	-	1,369	13	2,174,283
Oudomxay	89	82,007	2	119	656	10,778,470
Bokeo	44	42,651	-	11	106	5,047,816
Luang Prabang	95	23,327	11	38	112	1,453,189
Huaphanh	57	350,944	6	28	4,581	568,743
Xayabury	120	35,656	33	1,776	1,286	17,608,119
Xiengkhuang	45	3,538	6	94	1	998,769
Vientiane	50	75,948	4	92	4,256	327,792
Borikhamxay	76	332,410	5	10,688	796	6,391,510
Khammuane	126	1,089,765	5	-	1,906	7,030,155
Savannakhet	67	366,842	4	39	24,165	453,090
Saravane	47	190,917	2	176	78	143,570
Sekong	26	27,224	18	766	4,049	79,722,035
Champasack	120	338,351	4	16	385	25,253,027
Attapeu	33	73,146	-	69	222	154,128
Total	1,205	3,496,846	113	15,456	55,923	513,889,439

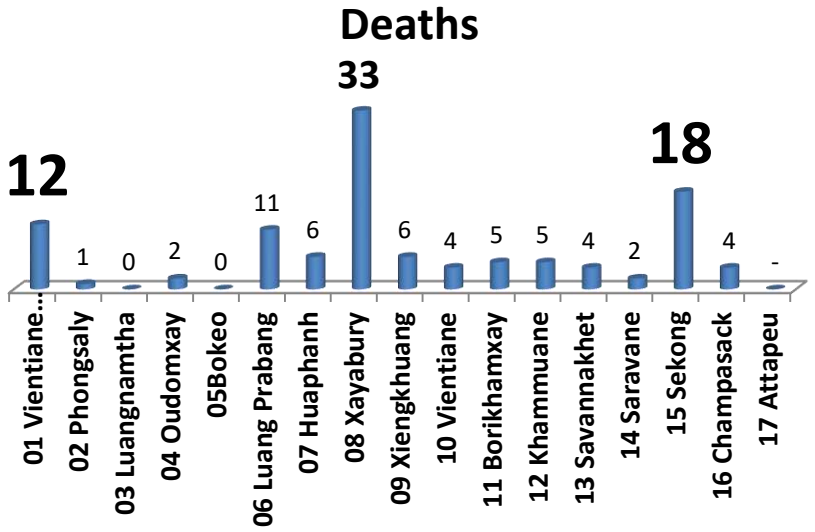
Source: DesInventar Data Lao PDR 2012 (1992 – 2012)

Provinces and Losses 1992-2012







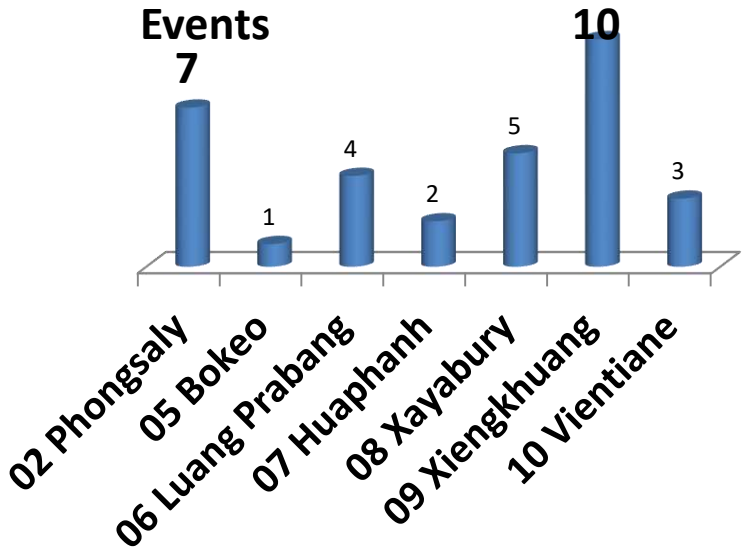


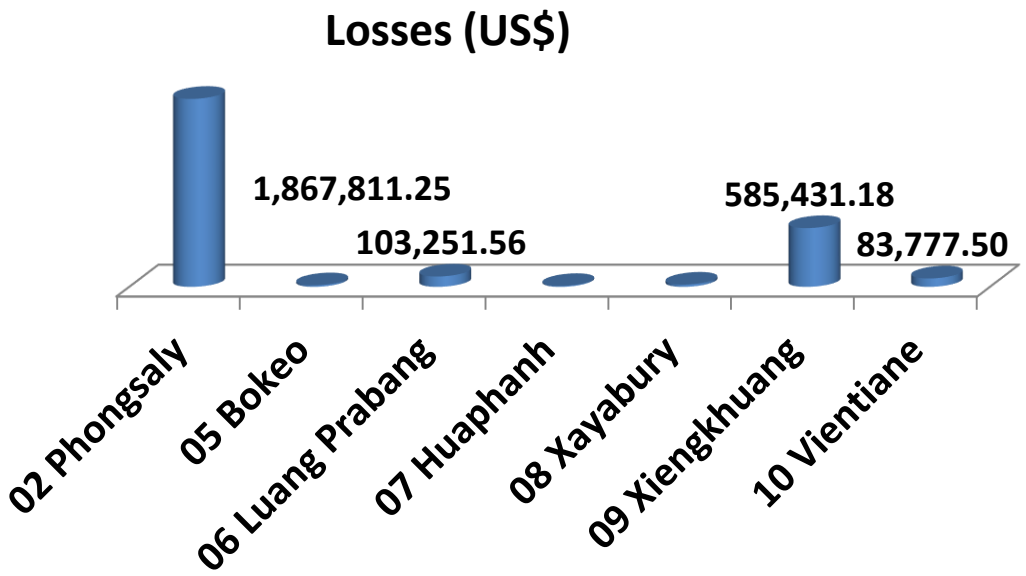
Flashflood and loss in the provinces from 1992-2012

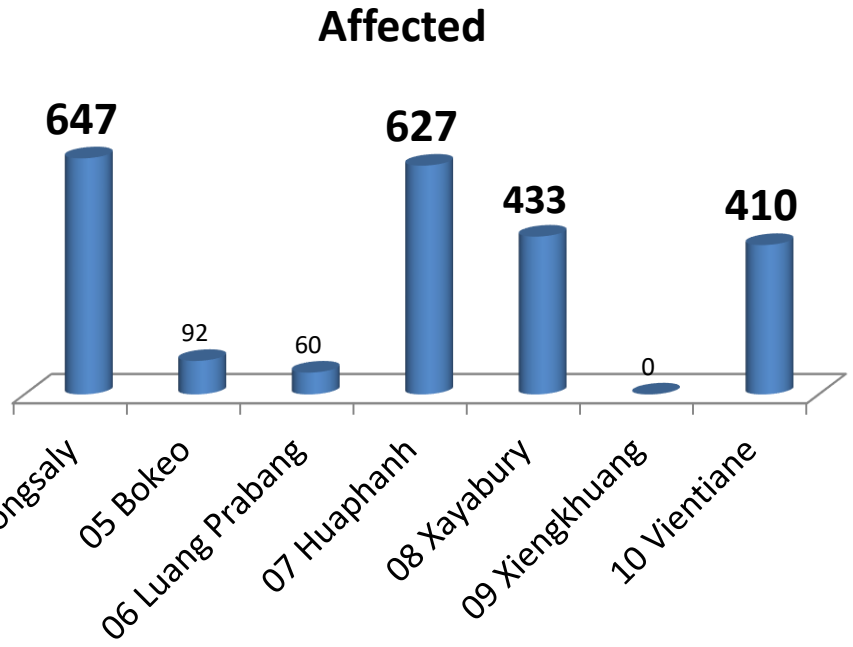
Provinces	Event	Affected	Deaths	Houses Destroyed	Houses damaged	Damaged crops Ha	Losses (US$)
Phongsaly	7	647	0	0	0	641	1,867,811.25
Bokeo	1	92	0	0	0	0	15,635.50
Luang Prabang	4	60	0	9	0	0	103,251.56
Huaphanh	2	627	0	0	0	0,30	8,750.00
Xayabury	5	433	2	11	8	47	22,353.13
Xiengkhuang	10	0	0	0	0	142	585,431.18
Vientiane	3	410	0	0	65	0	83,777.50

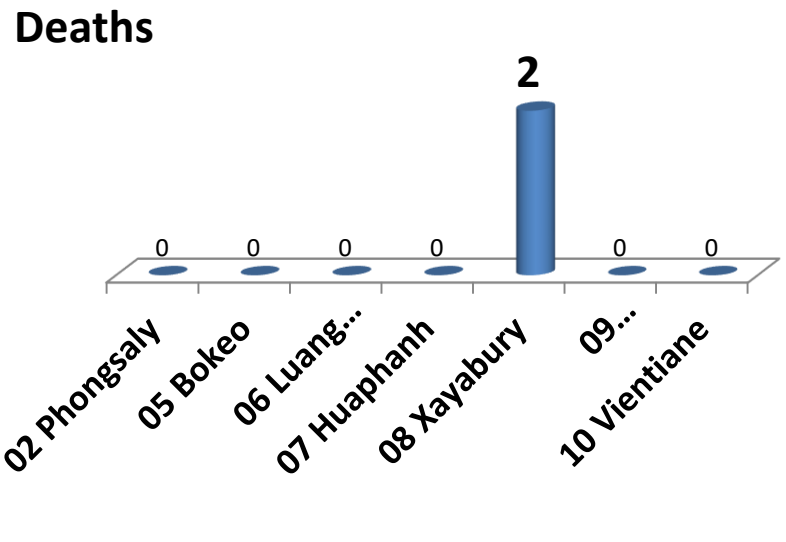
Source: DesInventar Data Lao PDR 2012 (1994 – 2012)

Flashflood and Losses









Landslides and floods 2014-2016

Landslides and floods in 2014

No	Year	Provinces	Type of Disaster	Losses (US$)	Impacts
1	August	1.Phongsaly,2.Luangnamtha, 3.Luangprabang,4.Huaphan, 5.Xiengkhuang,6.Khammouan,7.Savannakhet,8.Salavanh, 9.Xekhong,10. Champasack, 11.Attapeu	Flash floods landslides and others	6,978,982	❖ 48 districts,650 Villages, 26,688 households 90,109 people,. ❖ 3 deaths includes: 1 in Xayabouly Province and 2 in Champasack province. ❖ Schools,roads and bridge were damaged.
2	August	Xayabouly	Flash floods	2,419,188	❖ 6 Districts, 61 Villages, ❖ 2475 families, 9127 affected people. ❖ 1 Death in Phieng District
3	August	Huaphan and Xiengkhuang	Flash floods	1,516,946	❖ 4 districts, ❖ 13 Villages, 214 families
1	July-Sept	Phongsaly	Land slides	3,689,790	❖ Road, Irrigation,Schools and agricultural land.
2	July-Sept	Xayabouly	Land slides	237,500	❖ 55 km of road,2 Houses, ❖ 1 Death ❖ 2 Irrigations

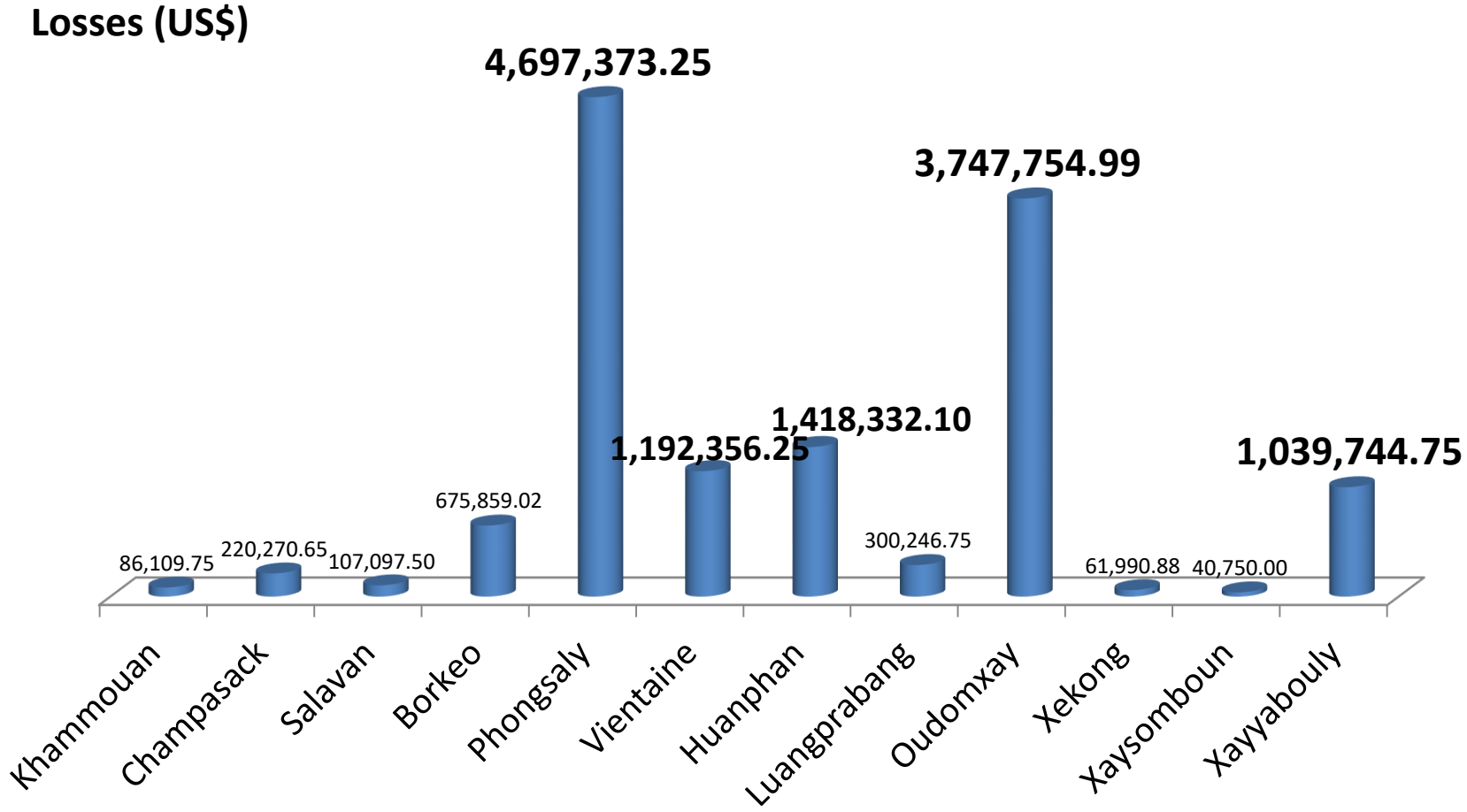
Landslide and floods in 2015

	Year	Provinces	Districts	Hazardous	Losses (US$)	Impacts
1	Aug-Sept,	Borkeo	Topheung	Landslides	14,716,758	❖ 7 villages, 2 houses. ❖ 7.12 km along the Mekong River was eroded with 4 locations
		Borkeo	Houaysay	Landslides	15,253,722	❖ 4 villages ❖ 8.65 km along the Mekong River was landslide with 3 locations
		Borkeo	Meung	Landslides	81,764	❖ 22kv transmission line at Xiengkok-Xiengdao
2	11Sept	Bolikham xay	Thaphabath	Landslides	201,159	❖ 6 houses eroded at Mekong River ❖ 16 risky houses were risk to slide. ❖ 8.65 km along the Mekong River was eroded with 3 locations
3	2015	Northern, central and southern part		Floods, typhoons, storm, monsoon, fire…	26,868,369	❖ Houses, schools, temples, Offices, roads, bridges, health care centers, agricultural land

Hazardous losses in 2016

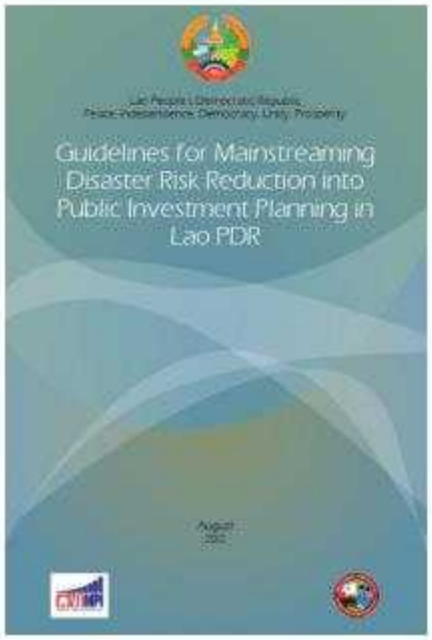
No	Provinces	Hazards	Losses (US$)
1	Khammouan	Typhoons	86,109.75
2	Champasack	Typhoons	220,270.65
3	Salavan	Fire	107,097.50
4	Borkeo	Typhoons, flashfloods, landslides	675,859.02
5	**Phongsaly**	**Cold waves**	4,697,373.25
6	Vientaine	Typhoons, flashfloods	1,192,356.25
7	Huanphan	Typhoons, flashfloods, cold waves	1,418,332.10
8	Luangprabang	Typhoons, flashflood, drought	300,246.75
9	Oudomxay	Typhoons, flashflood, cold waves	3,747,754.99
10	Xekong	Typhoons,flashflood,drought	61,990.88
11	Xaysomboun	Typhoons, flashflood, drought	40,750.00
12	Xayyabouly	Typhoons, flashflood, Landslides	1,039,744.75

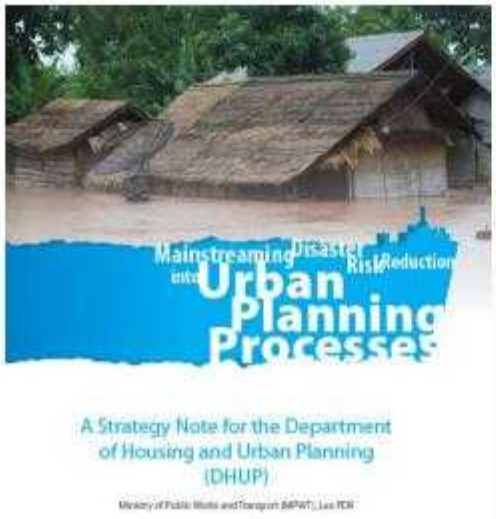
Losses in 2016

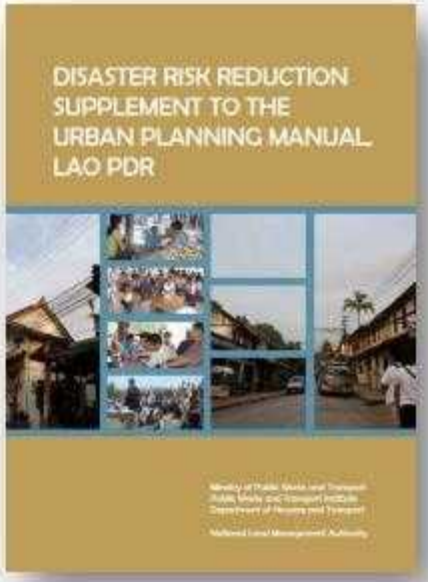


4.Government Policy on Disaster Risk Management.

1. **The Govt. Decree No 158/PM dated 22 August 1999.**
2. **The National Disaster Management Committee (NDMC) assignment No 097/MLSW dated 30 June 2000.**
3. **The Country Strategy Note on Disaster Management No 1139/MLSW dated 18 April 2003.**





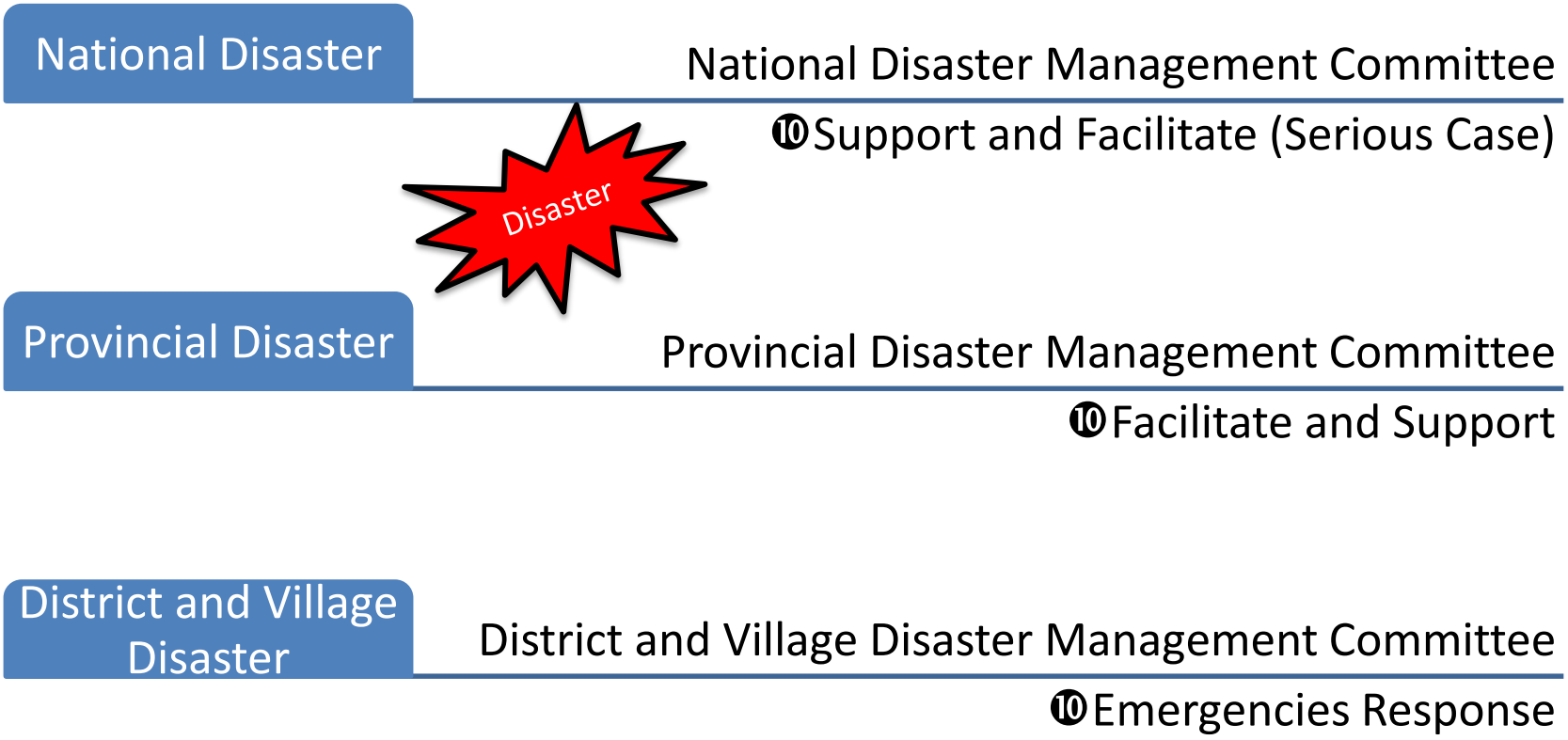


4.1.National Disaster Management Framework in Lao PDR

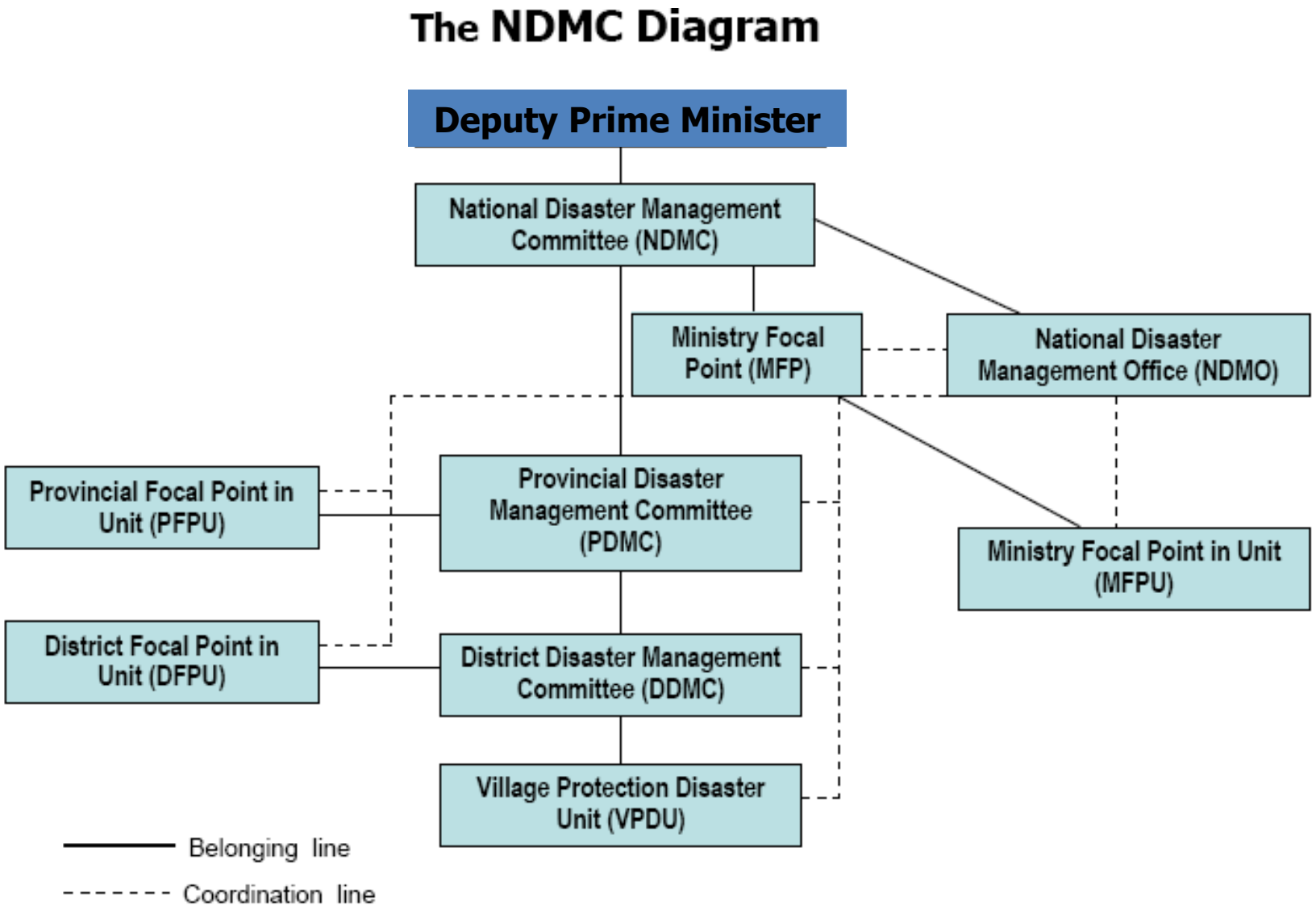
Legal Framework

1. National Disaster Management Committee
2. National Disaster Management Office Provincial
3. Disaster Management Committee District
4. Disaster Management Committee Focal point at all levels
5. Strategic Plan on Disaster Risk Management

National Policy for Emergency Response



4.2.National Disaster Management Committee



4.3.Roles and responsibilities of NDMC

1. **Responsible for disaster preparedness and management as a center of coordination in national disaster management.**
2. **Study and plan policies on disaster management then process to Lao Government.**
3. **Research, collect data and statistic on disaster victims and make requests for assistance.**
4. **Mobilization from individuals, organizations, internal and external in kinds and money for disaster management**

4.4.Roles and responsibilities of NDMC

5. **Public awareness about disaster in order to prevent disaster hazards and incidence that may occur. Consider to put disaster management, environment and natural conservation into school curriculums.**
6. **Direct relief operation, disaster preparedness, response and rehabilitation by using government budget and the contribution of concerned agencies, international organizations and non-governmental organizations. Regularly report to the Government.**
7. **Coordinate and enhance provincial governors to establish provincial and district disaster management committee. Improve capacity of this matter.**

5.Conclusions and Recommendations

- **More Landslide protection in risky area and do research to promote broadly in universities, relevant parts and NGOs.**
- **Landslide prevention, mitigation, preparedness should have early warning system and practical action.**
- **Non-structural and structural measures need be to integrated and worked closely.**
- **Community-based disaster risk reduction.**
- **Prediction of each weather station should include the prediction of landslide.**
- **Environmental and social Impacts (EIA) should be disseminated to protect the environment for instance: forest, land and water.**

5.Conclusions and Recommendations

- **Implement a policy on research and prevention of natural disasters (early warning systems, response action and emergency assistance and recovery systems) in an efficient and effective manner across the country.**
- **Establish a management and prevention plan against natural disasters (systems for early warning, response, assistance, emergency evacuation, and assets and recovery) that is efficient and effective across the country.**
- **Budgets and human resource should be prepared and adequate.**

Thank you very much for your attention