

Progress of Water Environment Governance in the Lao PDR – National Strategy and Adaptation Program of Action to Climate Change

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General Situation

- Generally, impacts of climate change causes the more frequently flood and drought, including flash flood, in some prone areas of the country:
 - According to national statistics on disasters that have occurred over the last three decades, it has been observed that both the severity and frequency of floods and droughts have increased;
 - Floods and droughts have significant impacts on agriculture, forestry, water resources, health and economic growth, and therefore on the livelihood of the Lao people.

General Situation

- According to data and statistics from the Department of Meteorology and Hydrology (DMH):
 - From 1995 – 2005 drought conditions were characterized by higher and irregular increases in temperature.
 - In particular, the high temperatures experienced in 1996 triggered the occurrence of drought in specific areas of the country.
 - In 1998, a drought was experienced and during the dry season the temperature was abnormally high.

General Situation

- In 2003, a severe drought occurred which could not be attributed to El Niño, but rather was thought to be attributed to the impacts of climate change in the region as well as the world.
- Consequently, rivers, streams, lakes and ponds dried up at a faster rate than normal.
- In addition to the severe droughts that occurred on these three occasions, large floods were also experienced that covered vast areas of the central and southern parts of the country.
- There were also flash floods in the northern mountainous areas and eastern region in 1995, 1996, 2000, 2002 and 2005.

General Situation

- Recent studies in 2008 have shown that:
 - Annual precipitation for the Mekong Basin as a whole by 2030 will increase by 13.5% from the historical average of 1,509 mm to 1,712 mm;
 - The greatest changes are projected for the wet season months of May to September, then the 2030 median shows increased monthly precipitations ranging from 16 mm in May to 56 mm in September;
 - The range in modeled precipitation is large for the wet season months, with decreases of up to 27% in some months or increased as large as 88% in others.

General Situation

- The projected changes in dry season precipitation are much smaller, but the median project indicates small decreases (<3 mm) in mean monthly precipitation in February, March and November;
- No change in precipitation is projected for January and December, and a small increase of 2 mm or 3% is projected in April;
- The Drier extremes of the model projections indicate precipitation decreasing in all months in the dry season, with decreased of up to 25% from historic values;
- Other projections indicate precipitation increases in dry months of up to 22%.

Challenges

- Number of research topics is limited and mostly done indirectly, regarding scope and objectives of the “Strategy on Climate Change of the Lao PDR, March 2010” and the “National Adaptation Programme of Action to Climate Change, April 2009”. However, the impact is possible existed.
- Limited data monitoring on climate change parameters in water bodies.
- Limited monitoring facilities;
- Flood can cause water pollution; drought can cause high residue intensity in water bodies;
- Increased risk in flood and drought prone areas in the middle and southern parts of the countries;
- Steeply mountains areas in the northern part and central-eastern and south-eastern valleys of the country, where prone to flash flood;

Institutional Arrangement

- **National Steering Committee for Climate Change**, chaired by Deputy Prime Minister, Chairman of National Environment Committee;
- **National Disaster Management Committee**, chaired by the Deputy Prime Minister, Minister for National Defense;
- **Water Resources and Environment Administration** takes the leading role on risk management from climate change, including strategic responding and early warning actions;
- **The Ministry of Labor and Social Welfares** takes the leading role on climate change impact recovery and relief;
- **Disaster Management Offices** at provincial and district levels;
- **Pilot River Basin Committees**: Nam Ngum RBC and Nam Theun Nam Kading RBC.

Policy Implication

- Relevant Strategies:
 - National Environmental Strategy;
 - Forestry Strategy;
 - Agriculture Strategy;
 - Draft Strategy for Water Resources Management;
 - National Disaster Prevention Strategy;
 - National Environmental Standard: Noise, Air and Water
 - Ambient and Effluent Water Quality Standard
 - Etc.

Policy Implication

- The National Adaptation Plan of Action (NAPA), April 2009, identifies sectors of priority for climate change adaptation, namely:
 - Agriculture,
 - Forestry,
 - Water Resources, and
 - Public Health.

Policy Implication

- Some relevant cross-sectoral priority adaptation actions:
 - Improve and construct crop and animal disease laboratories at central and local levels;
 - Develop appropriate bank erosion protection systems for agriculture land and flood prone areas;
 - Promote integrated pest management (IPM) and use herbal medicines in pest management and livestock treatment;
 - Promote and establish tree nurseries to provide saplings to areas to high risk from flooding or drought;

Policy Implication

- Develop agro-forestry systems for watershed protection and erosion reduction in steep areas;
- Mapping of flood prone areas;
- Establish an early warning system for flood prone areas, and improve and expand meteorology and hydrology networks and weather monitoring systems;
- Survey underground water sources in drought prone areas;
- Study, design and build multi-use reservoirs in drought prone areas;

Policy Implication

- Improve systems for sustainable use of drinking water and sanitation with community participation in flood and drought prone areas;
- Improve and standardize the quality of drinking water;
- Expand epidemic disease diagnostic laboratories at regional and provincial levels;
- Develop a timely and accurate reporting system for epidemic diseases;
- Capacity building for concerned agencies and risky groups.

Recorded floods and drought in 1965-1995 in Lao PDR

Year	Natural disaster	Estimated cost (US \$)	Region(s) affected
1966	Large flood	13,800,000	Central
1968	Flood	2,830,000	Central
1969	Flood	1,020,00	Central
1970	Flood	30,000	N/A
1971	Large flood	3,573,000	Central
1972	Flood	40,000	Southern
1973	Flood	3,700,000	Northern
1974	Flood	180,000	N/A
1976	Flash flood	9,000,000	Central
1978	Large flood	5,700,000	Central
1980	Flood	3,000,000	N/A
1981	Flood	682,000	Oudomxay province
1984	Flood	3,343,000	N/A
1985	Flash flood	1,000,000	Central
1986	Flood and drought	2,000,000	Central
1990	Flood	100,000	Central C
1991	Flood and drought	3,650,000	entral/Southern
1992	Flood and drought	N/A	Central/Southern
1993	Flood and drought	21,000,000	Central
1994	Flood and drought	21,150,000	Central/Southern
1995	Large flood	N/A	Central/Southern
1996		21,000,000	Central
1998		3,500,000	Central/Southern
2000		5,000,000	Central/Southern
2002		3,500,000	North/Ctr./South

Source: Government of Lao People's Democratic Republic, 1996
 Preparation of flood loss prevention and management plan
 Data collected by Department of Meteorology and Hydrology
 National Sector Reviews 2004

Damages caused by flood in Lao PDR 2000

Provinces	People affected	Flooded Rice field (hectare)	Rice field damaged (hectare)
1. Phongsaly	670	30	20
2.		960	350
3. Capital	10,350	3,650	250
4. Bolikhamsay	19,400	3,710	1,290
5. Khammuan	125,360	23,640	14,000
6. Savannakhet	96,460	23,640	14,000
7. Saravan	16,500	4,740	1,400
8. Champasack	117,940	22,730	12,060
9. Attapeu	12,080	1,930	1,070
Total	398,760	85,030	44,440

Source: Department of Irrigation, Ministry of Agriculture and Forestry of Lao PDR

Low land rice field damaged by flood in Lao PDR

No.	Province	Flooded area(ha)			
		1999	2000	2001	2002
	Northern	0	20	240	1,810
1	Phongsaly		20		962
2	Luangnamtha				157
3	Oudomxay				110
4	Bokeo				377
5	Luangprabang			10	64
6	Huaphan				140
7	Sayyabouly			230	
	Central	4,965	8,350	20,193	24,151
8	Capital	395	1,290	5,080	5,493
9	Xiengkhuang	160		50	57
10		70	350	1,100	761
11	Bolikhamxay		250	8,370	5,644
12	Khammouane		4,000	4,440	7,040
13	Savannakhet	4,340	2,460	1,153	5,156
14	Saysomboun special zone				
	Southern	3,935	4,530	1,790	8,103
15	Saravan	1,575	1,400		222
16	Sekong				
17	Champasack	995	2,060	1,790	7,432
18	Attapeu	1,365	1,070		449
	Total	8,900	12,900	22,223	34,064

Thank You