

National Disaster in Lao PDR

**Third Annual Mekong Flood Forum
07-08 April 2005**

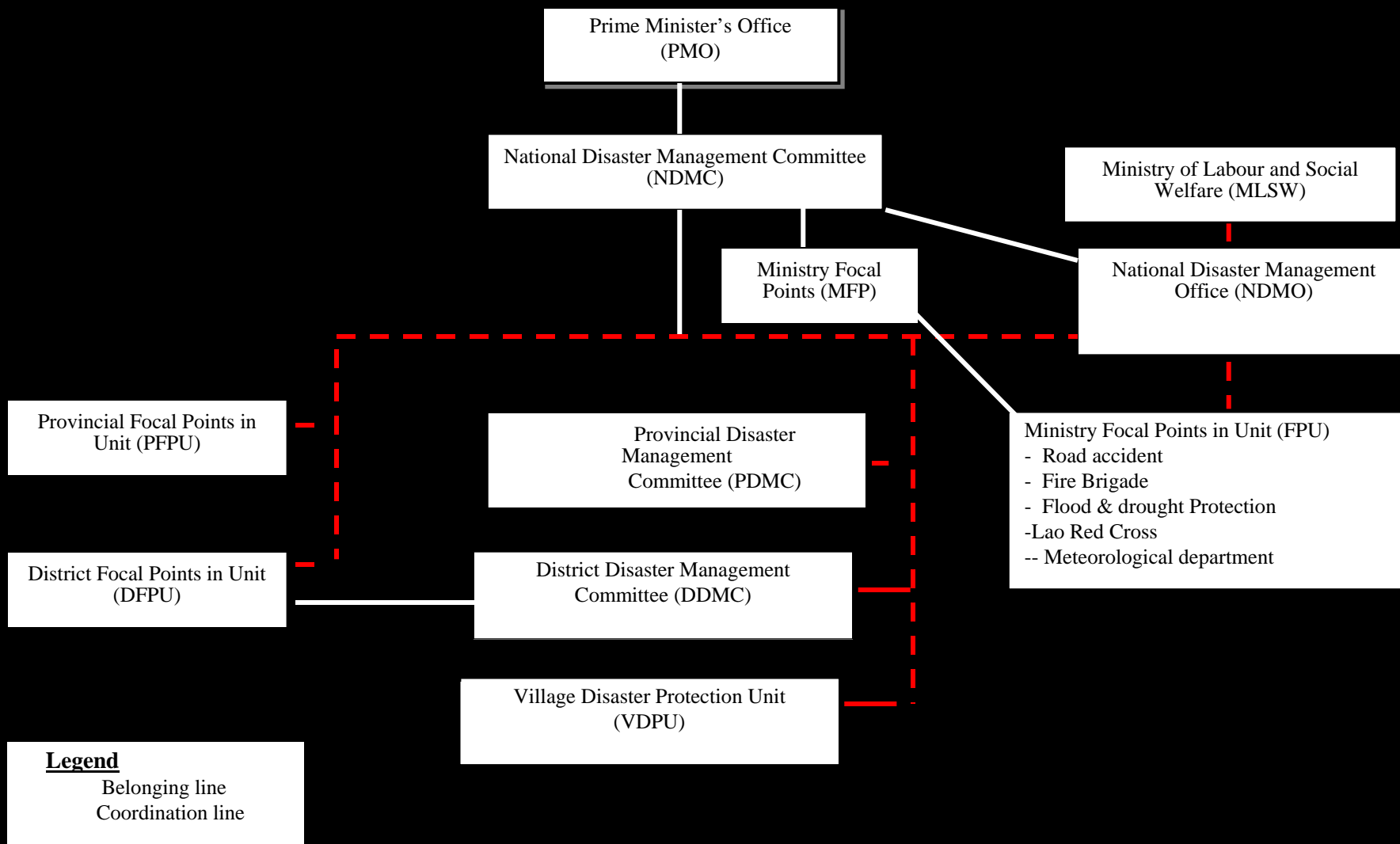
Topics

- I. Government policy on disaster risk management
- II. Strategy plan of Govt.
- III. District Vulnerability Analysis
- IV. Impact of the Natural Disaster on the Agriculture Sector
- V. Preliminary measure to counter the flood and to resolve the problems of losses
- VI. Lessons Learned

I. Government policy on disaster risk management

- Since Lao PDR Inaugurated 1975 - Govt.'s Policy on Social Welfare:
 - Help after war migration (Permanent Resettlement)
 - Relief people affected by natural disaster (food, shelter and basic need).
- Prior to 1995, the operational responsibility for national disaster issues rested with the Ministry of Agriculture and Forestry;
- 1995, MLSW took responsibility – Mitigation and Relief Activities widely implemented with NGOs partners. (post Disaster).
- In the process of developing its capacity to perform this role, NDMO was established in 1997, supported from UNDP.

Organization Chart for Disaster Management in Lao PDR



NDMO role and responsibilities are:

• A. Taking care about coordination and cooperation disaster management activities within country and outsider:

- Providing expert advice to the NDMC.
- Promoting coordination with ministerial focal points and with partners.
- Promoting disaster mitigation and preparedness activities at the local level.
- Implementing community awareness activities (including of projects).
- Providing training, guidelines and plans to make disaster risk management more effective.
- Establishing disaster management implementation teams at the national, provincial and district level.



- Beside coordinating disaster risk management activities within the government sector, the NDMO is an implementing partner of the World Food Programme (WFP) and a number of disaster preparedness, prevention and mitigation projects of International and Non-Government Organizations such as Asian Disaster Reduction Center (ADRC), Asian Disaster Preparedness Center (ADPC), Care International Laos, Concern World Wide Laos, World Vision Laos, Oxfam CAA and MRC.

II. Strategy plan of Govt.

To reduce disaster risks and contribute to poverty eradication, the Government set to achieve the following targets by 2005-2010-2020:

The aims to 2020 are:

- Making Lao society safer and minimizing the impact of disaster to people life, country economy, government's and population property.
- To timely assist to the victims of disaster helping they mitigate disaster impact and quick return to normalcy.
- Building completed legal system on disaster management and prevention of disaster impact to individual, community, society and country economy.
- Making disaster management concept and environmental protection as unique to development and becoming cultural perception of society.



The Goals to 2010 are:

- Establishment of DDMC at all districts.
- Establish DM focal points and contact persons in all major government agencies, units, privates, factories and other.
- Develop early warning information receiving points at risky to disaster villages.
- Establish storages at provinces and some vulnerable to disaster districts.
- Continue sustainable public awareness and education programs through media.
- Expand DM training in all sectors at various levels.
- Organizing drills and simulation exercises with participation of emergency rescue teams of sectors and population.
- Enhance capability on cooperation with ASEAN, region and international on exchanging of expertise, information on DM and joint implementing projects, simulation exercises and relief drills.

The Goals 2005 are:

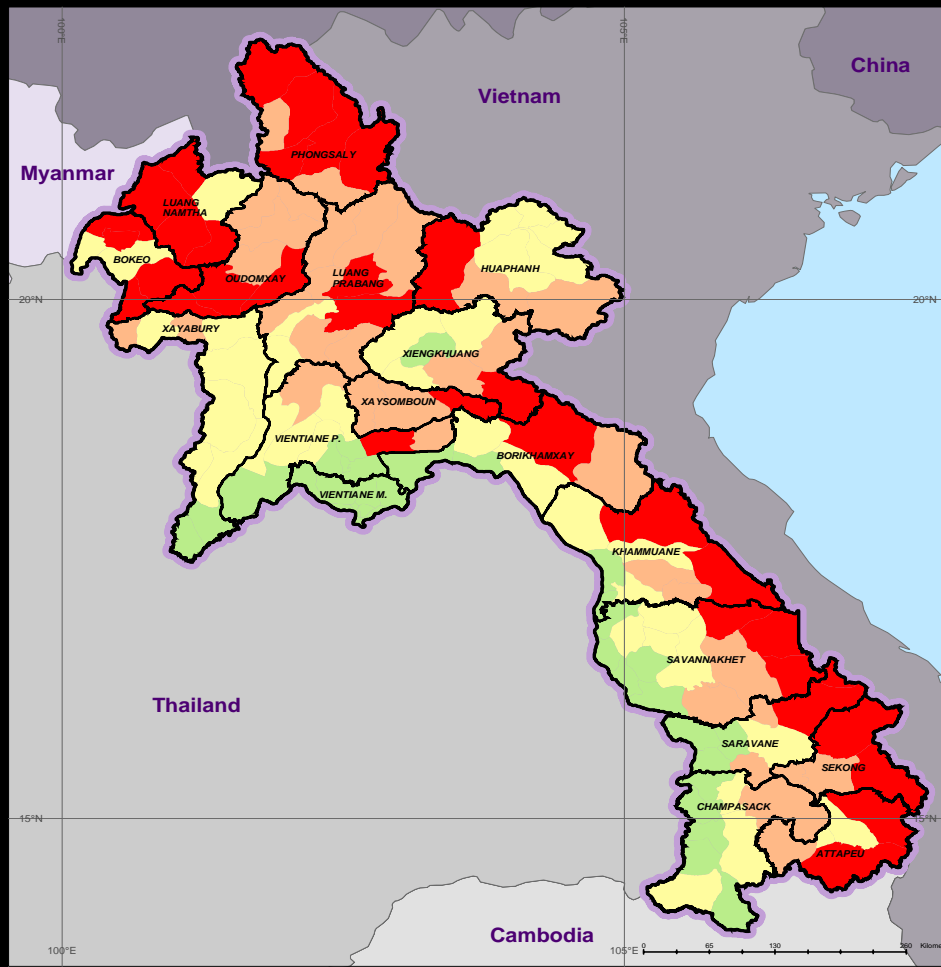
- Establish DDMC with created their role and responsibility at 80% of total districts through out country.
- Establish DM focal points and contact persons as appropriate at :
 - 10% of total primary school
 - 20% of junior secondary school
 - 30% of upper secondary school
 - 50% of professional school
 - 80% of military division
 - 40% of factory.
- Develop DM regulation and code.
- Enhance and establish information dissemination system and receiving at 30% of total 142 districts in country. Establish information dissemination at 30% of vulnerable village.

Annually organize 4 DM training courses for government officials and privates at provincial and district levels and 4 other courses for village leaders.

- Establish rescue and relief teams at VTE MUN, provinces base on manpower of military, police, schools and Lao Red Cross volunteer.
- Develop hazards and risk map of Lao PDR.
- Establish DM information exchange centre at the NDMO and urban disaster information at the Urban Research Institute (URI).
- Organize 2 rescue drills or simulation exercises on annual basic
- Integrating DM concept into other projects of urban and rural development with focused on flood, drought, fire, land management, bank erosion, water management, protection of environment, forest and other natural resources. NDMO is a center focal point on implementation.



Lao PDR: WFP Vulnerability Analysis (142 Districts)



Legend

Vulnerability Index

- Very Vulnerable
- Vulnerable
- Medium
- Better Off

Map Produced by VAM-Unit Lao PDR 2003
Vulnerability Analyses undertaken by
VAM Unit - 2001

Spatial Files from Global Discovery Digital
Mapping by Europa Technology LTD 2001,
ESRI World Data 2002, in-country files from
the National Geographic Department

Geographic Coordinate System
North American Datum 1927

III. District Vulnerability Analysis

A district level vulnerability analysis was undertaken by the VAM unit in 2001 that incorporated the commissioned results of studies undertaken by the National Statistics Center on food security, poverty and the like to select appropriate indicators of food security.

Considerable efforts were made to select a small number of relevant indicators so to ensure the resulting vulnerability index was simple and easy to understand.

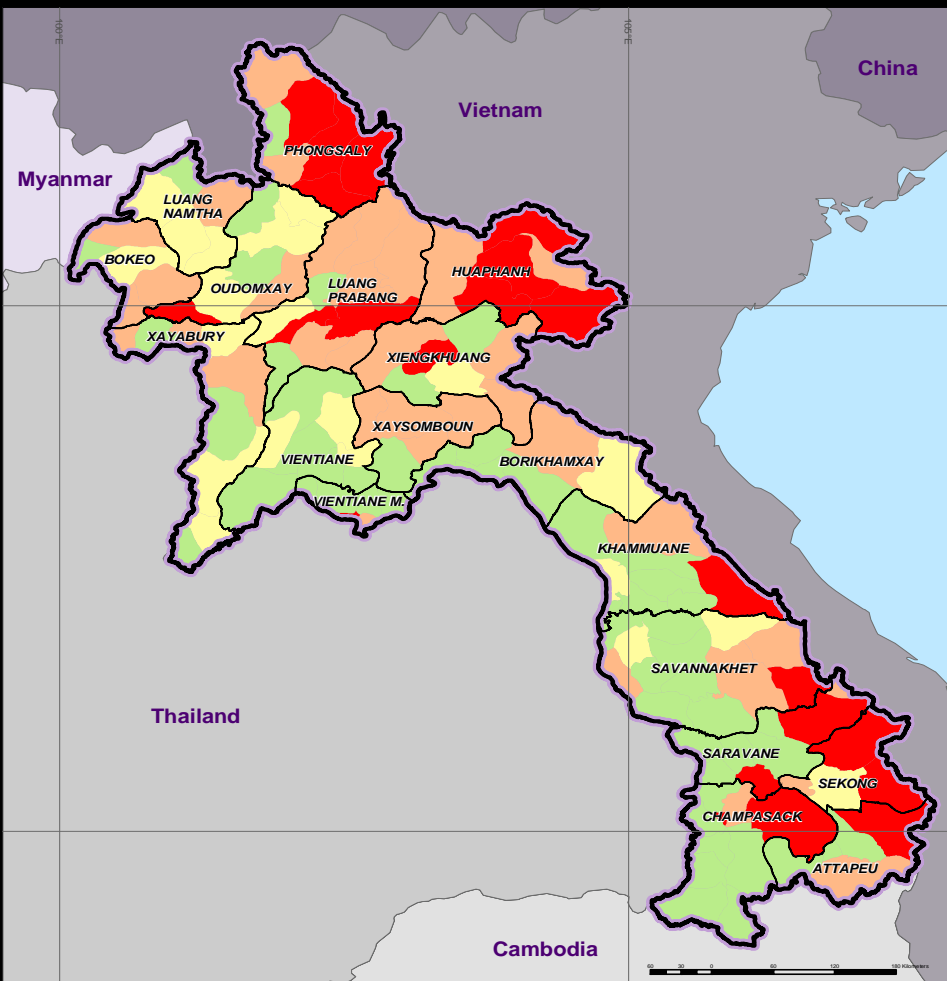
Six indicators of food security were selected: (rice production per capita, villages' distance to road, access to forest, livestock, education, and health) and these were reduced to a single index of vulnerability using data reduction techniques that ranked each district according to vulnerability to food insecurity.

Data Sources for Indicators



1. Rice Production per capita (Ag. Census 98/99)
2. Livestock (cattle & buffalo) per hh (Ag. Census 98/99)
3. Forest area (hectares) per hh (MRC 1997)
4. % of villages within 6 km of main road (NGD 1998)
5. % population with no education (Pop Census 1995)
6. Crude death rate (Pop Census 1995)

Lao PDR: Rice per Capita



Legend

Rice per Capita

- Deficit (less than 8 months)
- Sufficient to deficit (8-11 months)
- Sufficient (11-13 months)
- Sufficient - surplus (13+ months)

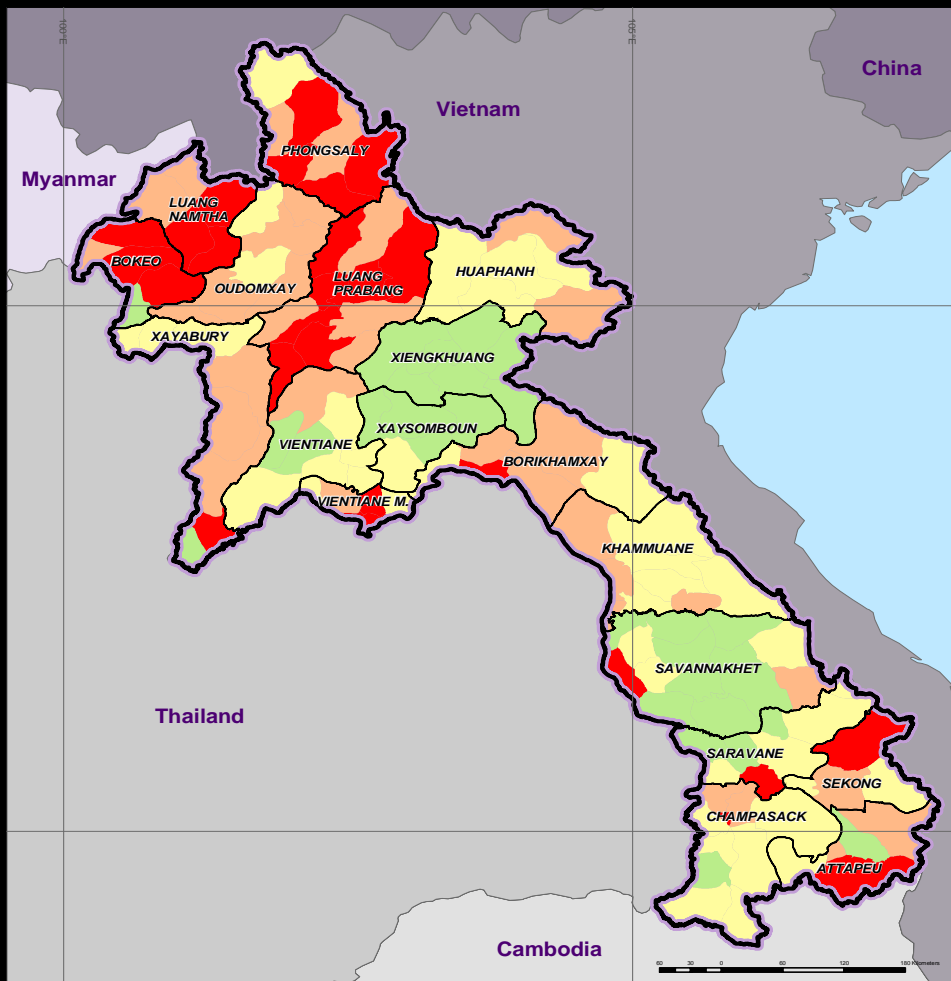
Map Produced by VAM-Unit Lao PDR
January 2003

Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by National Geographic Department, Rice Production figures from the Ag. Census 98/99

Projected Coordinate System
UTM, WGS 84, Zone 48N

Rice Production per Capita

- *Rice self-sufficiency is the key indicator of household poverty in Lao PDR (CPC/ADB 2000)*
- *A total of 24 of the 134 districts (red) have access to less than 8 months of rice per capita – under the assumption of an 180 kg rice requirement per capita (Ag Census 1998/99)*
- *62 districts produce less than the average annual requirement - red and orange (Ag Census 1998/99)*
- *It is only in the last few years that Laos has achieved a self-sufficiency status in national rice production.*
- *This is a very recent milestone, as importation rate for rice were been 0% for only four years since 1961 when FAO started monitoring the trade in rice (FAO 2003)*



Legend

Large Animal

Red	< 1.6 per HH
Orange	1.61 - 2.50 per HH
Yellow	2.51 - 3.50 per HH
Green	> 3.5 per HH

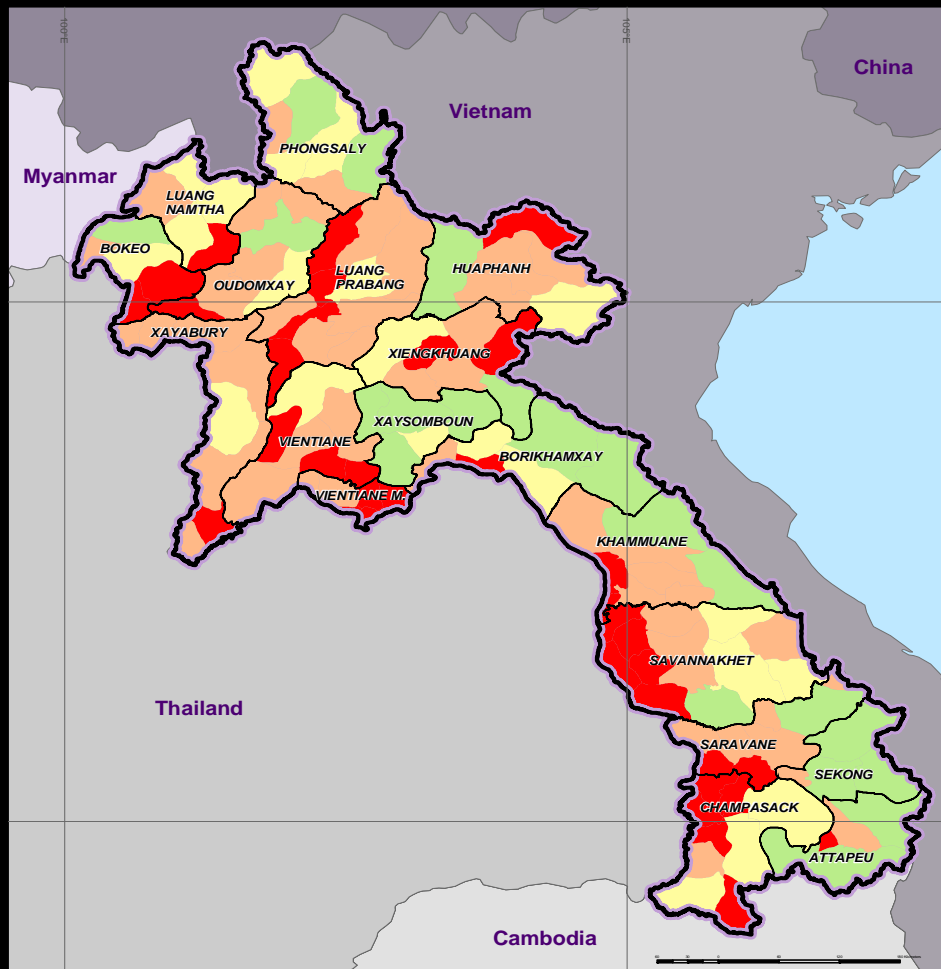
Map Produced by VAM-Unit Lao PDR
January 2003

Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by National Geographic Department, National Average is 2.6 cattle/buffalo per HH.

Projected Coordinate System
UTM, WGS 84, Zone 48N

Livestock per Household

- *Owning livestock (especially large animals such as cattle and buffalo) is a key indicator of wealth for rural households. Livestock can be considered as a 'savings mechanism' or a 'bank account' to be accessed in difficult times - rather than a resource for pure consumption*
- *Income from livestock sales in upland areas can range from 25-50% of total household income*
- *The national average is 2.6 cattle and buffaloes per household.*
- *Over 70% of agricultural holdings have chickens, 48% buffalo, 49% pigs and only 31% have cattle*



Legend

Forest Areas

- Less than 10 ha
- 10 - 30 ha
- 30 - 50 ha
- More than 50 ha

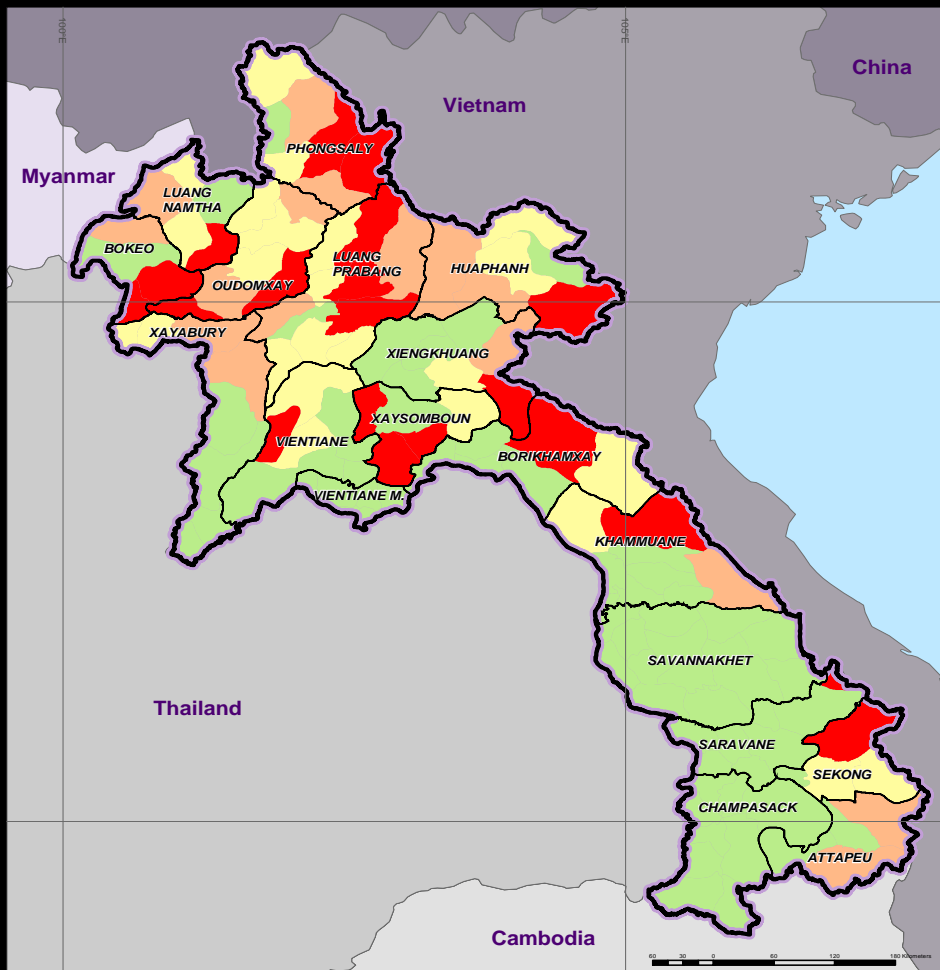
Map Produced by VAM-Unit Lao PDR
January 2003

Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by National Geographic Department, Forested Areas are calculated as the ha equivalent to high density forest per HH.

Projected Coordinate System
UTM, WGS 84, Zone 48N

Forest Area per Household

- *Forested areas are considered as the hectare equivalent of high-density forest per household (these figures include a range of land cover classes)*
- *NTFPs such as bamboo and rattan shoots, fish, wild animals and vegetables are important sources of food, especially for rural households in remote areas*
- *NTFPs provide essential welfare and safety net functions; they are often collected when sources of food or income are deficient*
- *Field surveys in 1996 showed that 90 % of income is derived from NTFPs among the poorest households (IUCN/DoF 1996)*



Legend

Road Access (6km)

- Less than 30%
- 30 - 50%
- 50 - 70%
- More than 70%

Map Produced by VAM-Unit Lao PDR
January 2003

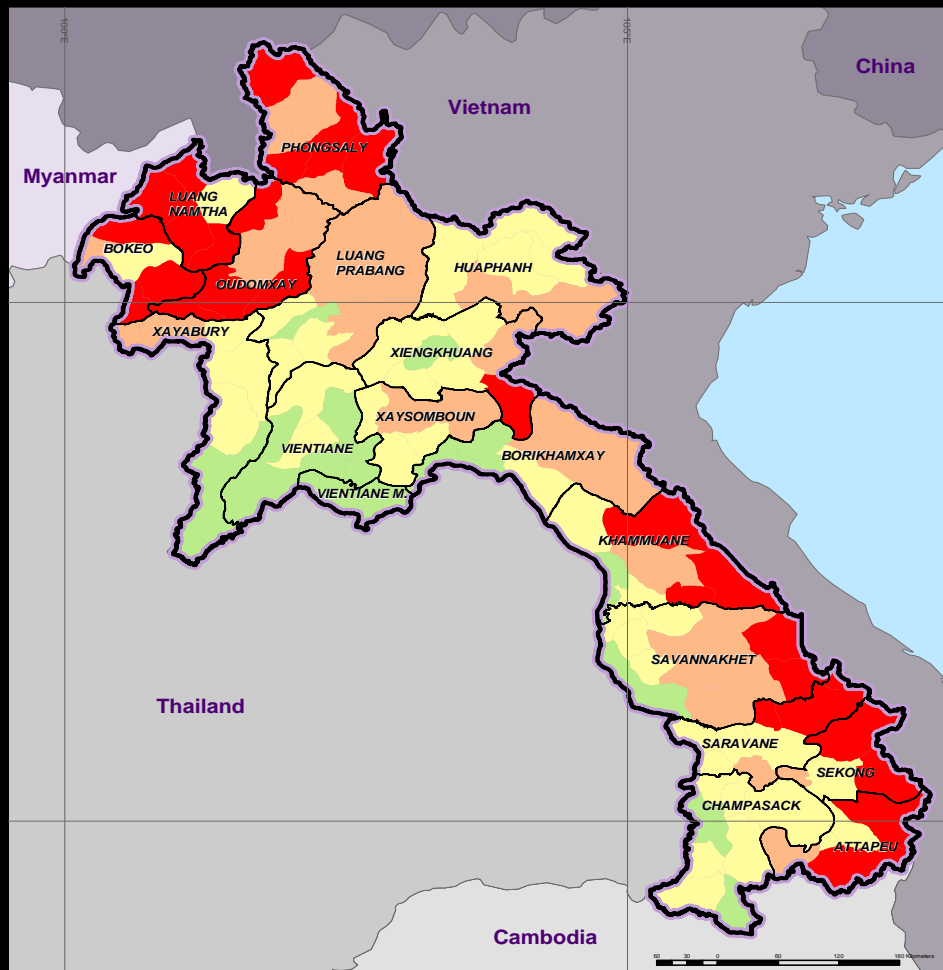
Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by National Geographic Department, Rice Production figures from the Ag. Census 98/99

Projected Coordinate System
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Village Access to Roads

- *The road infrastructure plays a major role in facilitating a community's access to basic services – these include health, education, communications and access to market services, (thus providing opportunities for income and dietary diversification).*
- *60% of the villages in the north and 54% of the villages in the south are “inaccessible” in the rainy season (LECS II).*
- *Road access is a significant indicator of poverty. 50% of the population considered as poor reside in areas that cannot be accessed by road. Comparatively, 25% of people classified as poor can be accessed by roads (NSC-WFP 2000, not published).*

Lao PDR: No Education



Legend

No Education

- Less than 35%
- 35 to 50%
- 50 to 65%
- More than 65%

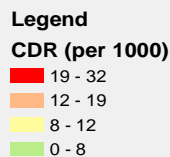
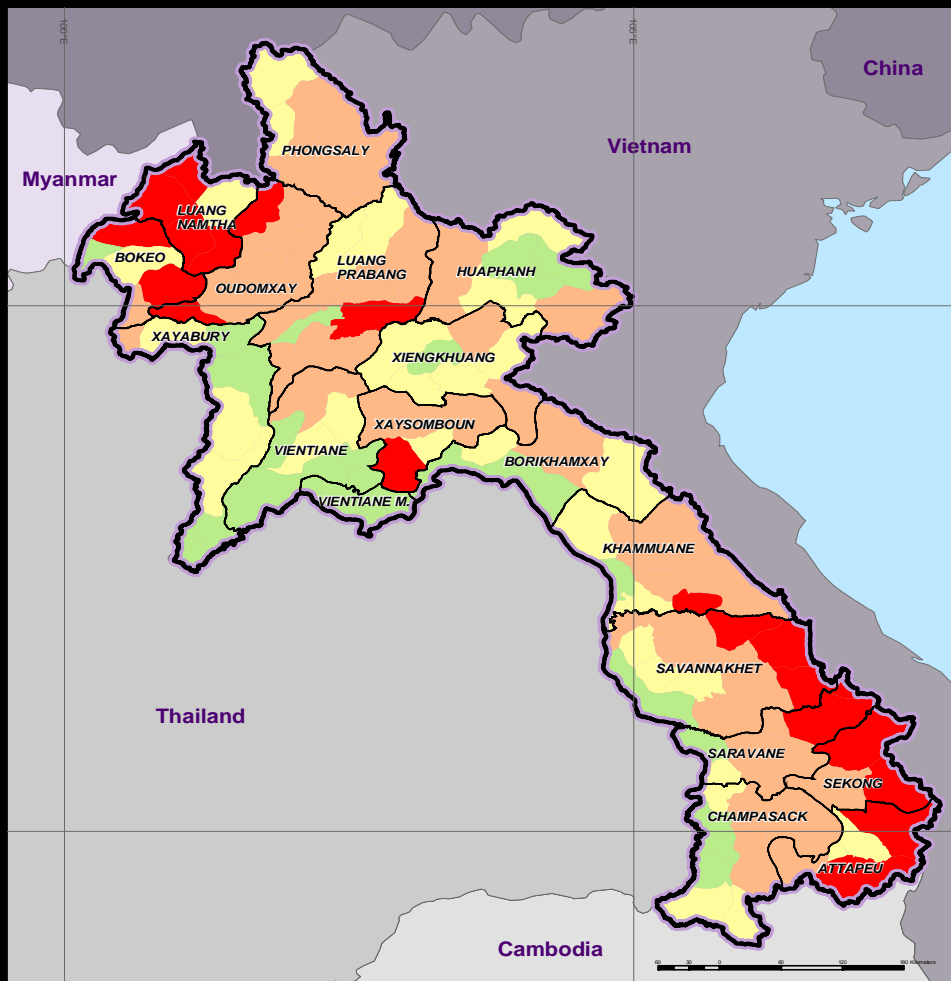
Map Produced by VAM-Unit Lao PDR
January 2003

Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by the National Geographic Department. Education data taken from the Census 95

Projected Coordinate System
UTM, WGS 84, Zone 48N

Population with No Education

- Overall, 37 % of the population have never attended formal or informal classes (LRHS 2001)
- Over 55% of the villages nationwide do not have a “complete primary school”. In some Provinces (Phongsaly, Luang Namtha, Oudomxay, Sekong) as much as 80-90% of villages do not have a complete primary school (LECS II)
- Education of the head of the household is correlated to poverty (LECS 97/98) and education of females is correlated to levels of child malnutrition (Kaufmann, 1997). The education of males correlates to the successful adoption of new agricultural techniques



Map Produced by VAM-Unit Lao PDR
January 2003

Spatial Files from Global Discovery Digital Mapping by Europa Technology LTD 2001, and ESRI World Data 2002. In country files produced by National Geographic Department, The CDR is the only nation wide health indicator.

Projected Coordinate System
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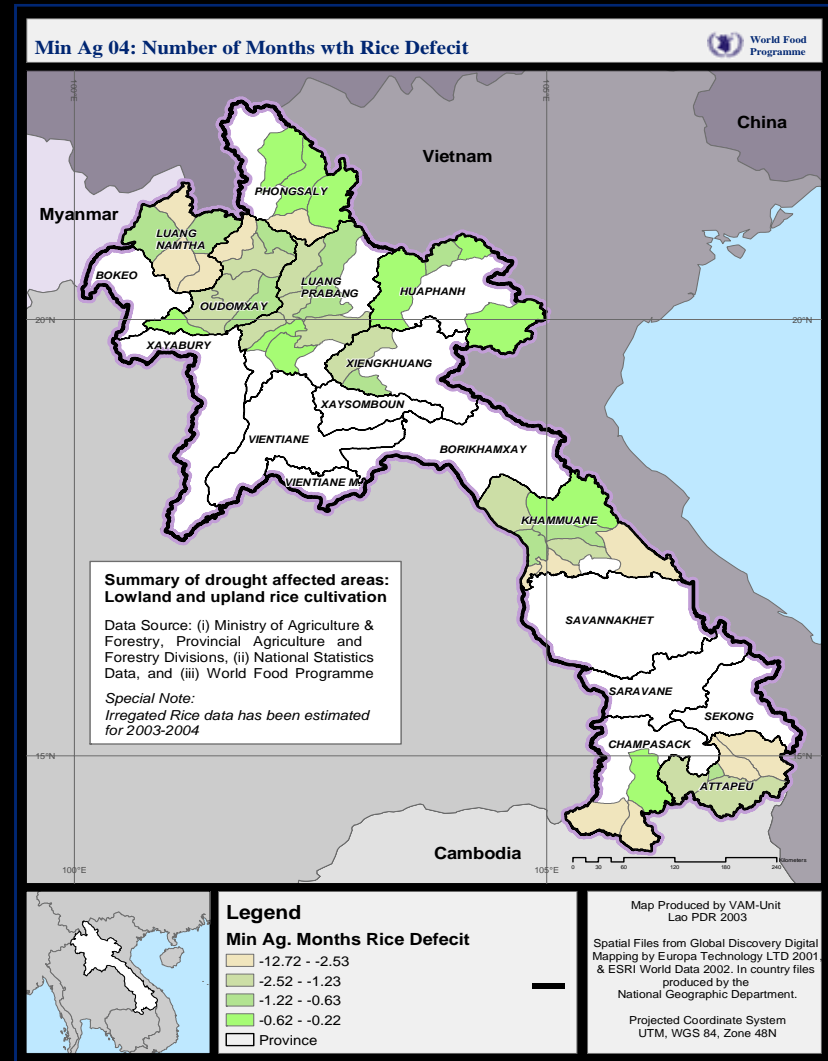
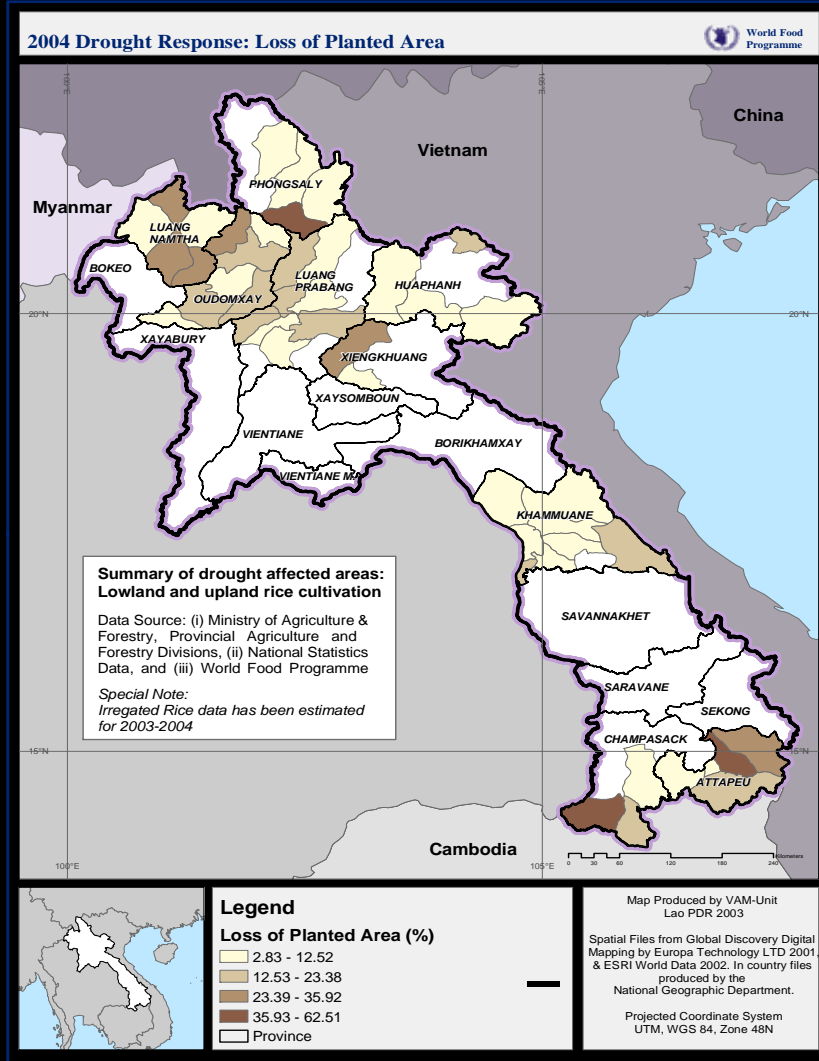
Crude Death Rate

- *The crude death rate was the only countrywide health indicator available at district level in 2001*
- *Infant mortality rate are 82 per 1,000 live births while the under five-mortality rate is 107 per 1,000. Maternal mortality is 530 per 100,000 (LRHS 2001).*
- *Immunization programmes have been carried out in 87 % of the villages. In some provinces, the figures are as high as 100 % in Xayaboury and Champasack and as low as 34 % in Sekong (LECS II)*

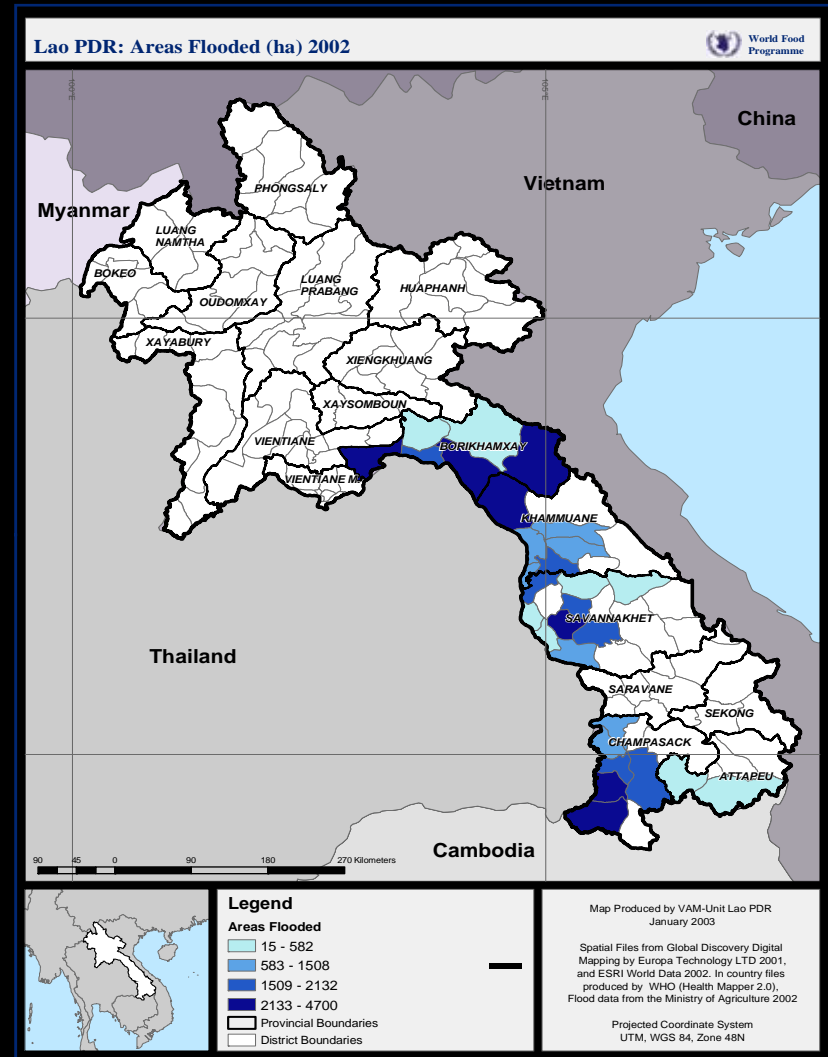
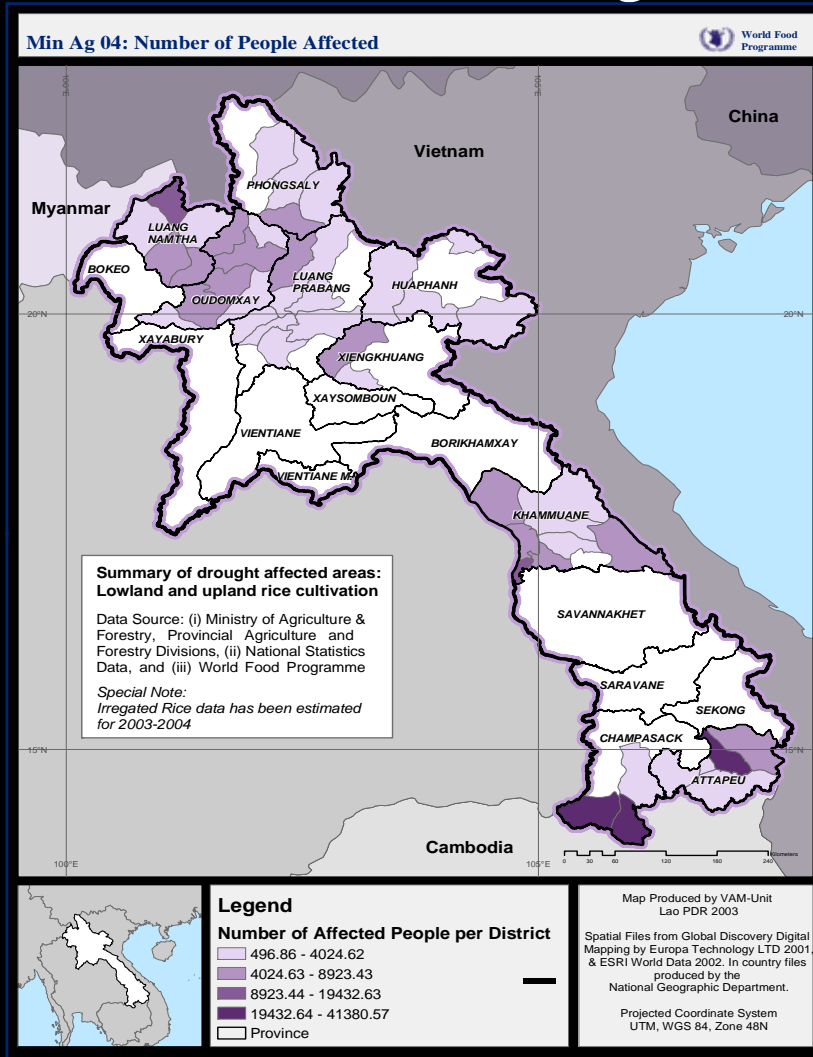
IV. Impact of the Natural Disaster on the Agriculture Sector

Drought & Flooding

using data from the MLSW



Drought & Flooding using data from the MLSW



Agricultural Yields

using data from the MAF

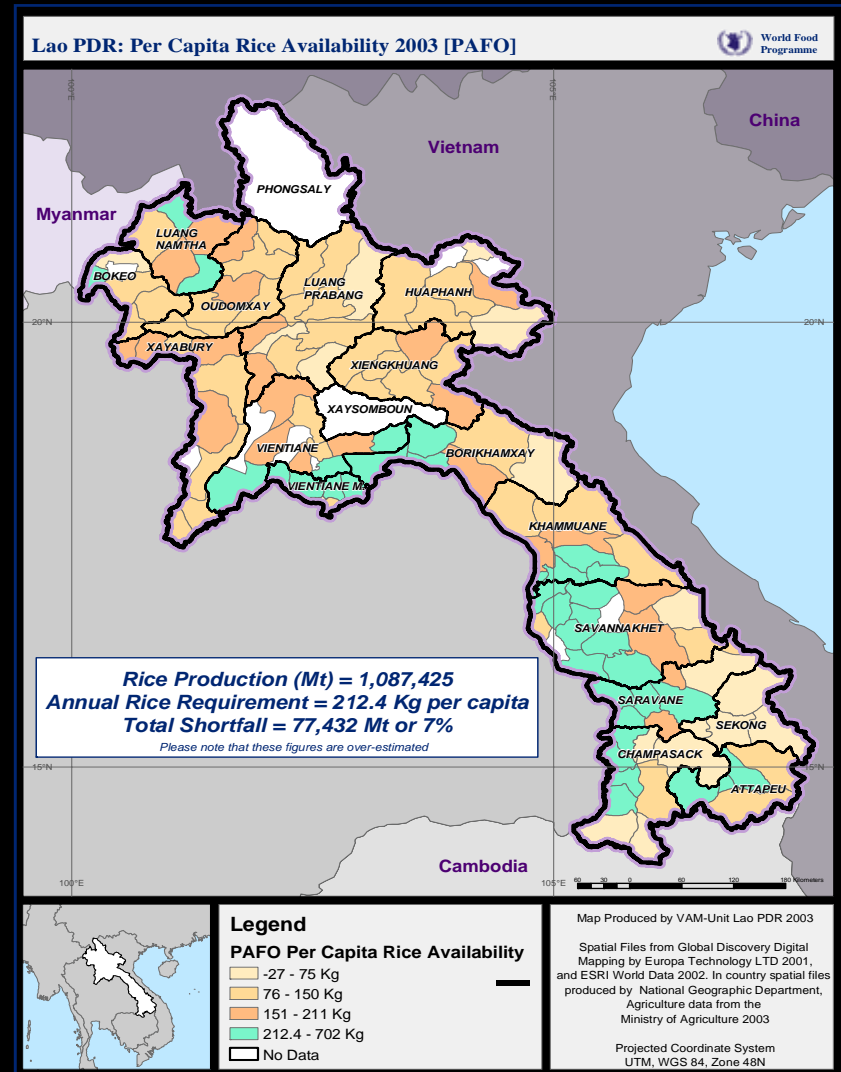
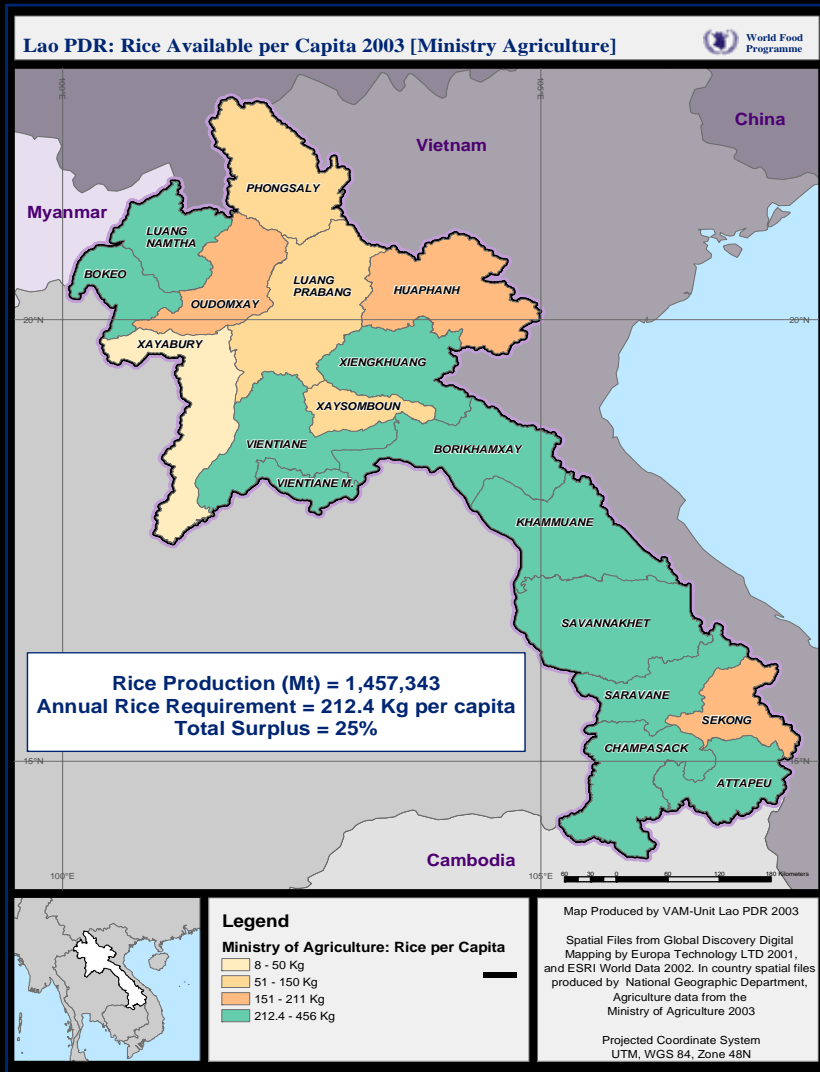


Table: Flood destroyed Area

No Province

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Northern	<u>1500</u>	<u>1215</u>	<u>255</u>	<u>0</u>	<u>161</u>	<u>20</u>	<u>240</u>	<u>1,810</u>	<u>207</u>	<u>357</u>
2 Phongsaly	10	184				20	-	962	-	-
3 Luangnamtha	135					-	-	157	-	-
4 Oudomxay			15			-	-	110	-	-
5 Bokeo	102	136				-	-	377	-	-
6 Luangprabang	579	178	40		3	-	10	64	-	25
7 Huaphanh	28	668	180		32	-	-	140	5	100
8 Xayabury	646	49	20		126	-	230		202	232
Central	<u>55,061</u>	<u>42,350</u>	<u>26,370</u>	<u>-</u>	<u>4,792</u>	<u>28,350</u>	<u>30,193</u>	<u>24,151</u>	<u>607</u>	<u>13,078</u>
1 Vientiane.C	15687	210	2800		390	11,290	5,080	5,493	90	1,488
9 Xiengkhuang							50	57	102	
10 Vientiane	9651	131	3400		430	350	1,100	761	34	1,140
11 Borikhamxay	9188	3436	5070		202	250	8,370	5,644		1,150
12 Khammuane	13498	17430	6900			4,000	4,440	7,040		6,200
13 Savannakhet	6790	21038	8200		3770	12,460	11,153	5,156	350	3,100
18 Xaysomboon	247	105							31	
Southern	<u>5,759</u>	<u>23,981</u>	<u>6,750</u>	<u>-</u>	<u>3,549</u>	<u>14,530</u>	<u>11,790</u>	<u>8,103</u>	<u>-</u>	<u>960</u>
14 Saravan		2110	800		1883	1,400	-	222	-	550
15 Sekong		350	50			-	-	-	-	-
16 Champasack	5759	19194	5700		466	12,060	11,790	7,432	-	410
17 Attapeu		2327	200		1200	1,070		449	-	-
Grand Total	62,320	67,546	33,375	-	8,502	42,900	42,223	34,064	814	14,395

Table: Destroyed Area by Drought

No Province

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Northern	<u>2,605</u>	<u>1,416</u>	<u>5,650</u>	<u>11,478</u>	<u>749</u>	<u>0</u>	<u>10</u>	<u>0</u>	<u>1,598</u>	<u>50</u>
2 Phongsaly	120			374		-	-	-	101	5
3 Luangnamtha	180			4		-	10	-	63	-
4 Oudomxay	150		4,810	3,529		-	-	-	1,342	-
5 Bokeo		71				-	-	-	-	45
6 Luangprabang	1,255	179	200			-	-	-	-	0
7 Huaphanh	900	35	640	3,851	549	-	-	-	40	0
8 Xayabury		1,131		3,720	200	-	-	-	52	0
Central	<u>4,160</u>	<u>20,333</u>	<u>110</u>	<u>11,926</u>	<u>960</u>	<u>-</u>	<u>25</u>	<u>-</u>	<u>42</u>	<u>342</u>
1 Vientiane.C	60	189	60	352		-	-	-	-	142
9 Xiengkhuang				902	80	-	25	-	-	-
10 Vientiane	200	686	30	421	470	-	-	-	-	200
11 Borikhamxay	3,200	9		200	40	-	-	-	-	-
12 Khammuane	100	4,962		160		-	-	-	-	-
13 Savannakhet		14,468	20	9,891	370	-	-	-	-	-
18 Xaysomboon	600	19				-	-	-	42	-
Southern	<u>300</u>	<u>263</u>	<u>50</u>	<u>5,798</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>8,168</u>
14 Saravan				4,549		-	-	-	-	550
15 Sekong				802		-	-	-	-	1640
16 Champasack		78	50	154		-	-	-	-	3878
17 Attapeu	300	185		293		-	-	-	-	2100
Grand Total	<u>7,065</u>	<u>22,012</u>	<u>5,810</u>	<u>29,202</u>	<u>1,709</u>	<u>-</u>	<u>35</u>	<u>-</u>	<u>1,640</u>	<u>8,560</u>

Table: Destroyed Area by pests

No Province	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Northern	<u>512</u>	<u>646</u>	<u>2640</u>	<u>3123</u>	<u>2838</u>	<u>60</u>	<u>70</u>	<u>52</u>	<u>26</u>	<u>303</u>
2 Phongsaly	63	2	800			-	-	-	-	15
3 Luangnamtha		1	45	55	10	10	30	50	-	-
4 Oudomxay	50		205	1,094	2,696	-	-	-	-	-
5 Bokeo	56					-	-	-	-	-
6 Luangprabang	100	9	300			30	40	2	-	100
7 Huaphanh	148	604	1,200	1,974	62	-	-	-	26	150
8 Xayabury	95	30	90		70	20	-	-	-	38
Central	<u>3,042</u>	<u>1,756</u>	<u>2,185</u>	<u>291</u>	<u>479</u>	<u>840</u>	<u>-</u>	<u>3,961</u>	<u>1,783</u>	<u>210</u>
1 Vientiane.C	117	169		130		-	-	-	-	-
9 Xiengkhuang	768			100	90	20	-	759	-	-
10 Vientiane	78	81	1,300	20	142	0	-	32	-	210
11 Borikhamxay	1,525	647	800		127	10	-	-	12	-
12 Khammuane	49	564				230	-	3170	1771	-
13 Savannakhet	347	243	85	41	120	580	-	-	-	-
18 Xaysomboon	158	52				-	-	-	-	-
Southern	<u>544</u>	<u>813</u>	<u>200</u>	<u>65</u>	<u>1,075</u>	<u>50</u>	<u>-</u>	<u>180</u>	<u>-</u>	<u>12</u>
14 Saravan	102	10			1075	10	-	-	-	-
15 Sekong	37	802	200	6		40	-	164	-	-
16 Champasack	57	1		59		-	-	-	-	12
17 Attapeu	348					-	-	16	-	-
Grand Total	4,098	3,215	5,025	3,479	4,392	950	70	4,193	1,809	525

Table: Rainfed Rice Area damaged by Natural Disaster

	Total Planted Area	Affected Area		Loss of Production	Damages (Thousand US\$)		
	(Ha)	(Ha)	(%)	(Tons)	Direct	Indirect	Total
1995	440,783	73,483	17%	214,600	34,336	N/A	
1996	455,873	92,773	20%	274,600	43,936	N/A	
1997	465,310	44,210	10%	136,600	21,856	N/A	
1998	462,881	32,681	7%	94,700	15,152	N/A	
1999	491,803	14,603	3%	46,000	7,360	N/A	
2000	519,320	43,850	8%	143,400	25,095	N/A	
2001	529,098	42,328	8%	140,900	24,658	N/A	
2002	557,727	38,257	7%	132,800	23,771	N/A	
2003	569,223	4,263	1%	13,700	2,466	N/A	
2004	596,856	23,480	4%	70,200	12,987	N/A	

Other Damages to agriculture, cattle raising and fishing

Direct damages

- Damages or destruction of Irrigation Schemes (201 Sites) or equivalent of (3,058,000 US\$)
- Damages or destruction of fish farming ponds (382 ponds) or equivalent 1,650.850 US\$.
- Losses in animal stock
 - 76 dead Buffaloes
 - 17 dead cattles
 - 50 dead pigs
 - 3,840 dead birds
- Indirect damages (No data)

V. Preliminary measure to counter the flood and to resolve the problems of losses

- To set up a National Committee to relief the consequence of the flood headed by the Minister of Agriculture and Forestry (MAF);
- Effort have been made jointly among the different Ministries coupled with the assistance from different embassies, UN organization and NGO and the mobilization of the students to upgrade the flood protection dike;
- The MAF together with the Ministry of LSW, Finance, Commerce, SPC and the Agricultural Promotion Bank sent their staff to make the preliminary assessment of the flood and its damaged. These teams have worked closely with each province and plan how to maintain properly the remaining crops and concentrate on the dry season cropping after the flood to substitute the losses

V. Preliminary measure to counter the flood and to resolve the problems of losses (Continue..)

- Meanwhile, the evacuation of equipment's, fertilizers, seed from the stations in lower areas were being made together the evacuation of households and other properties;
- Repair damaged irrigation schemes, such as: water pumps, structures, canals, etc.in guaranteed operational conditions for the forthcoming dry season rice cultivation in due time;

V. Preliminary measure to counter the flood and to resolve the problems of losses (Continue..)

- High coverage and timely vaccination of animals against potential post-flood epidemics;
- Coordination between the Ministry of Commerce and import-export companies for the importation of necessary crop varieties, chemical fertilizer, pesticide, animal feed, animal medicines, etc. in time for the production season.
- Source of funds: Mobilization of domestic sources of funds from the population has not suffered from the flood, from the private sector, companies and acquisition of international assistance for the improvement of the flood victim's living conditions, investment in production, maintenance of damaged constructions, buildings, irrigation canals, roads, bridges, etc. back to normal condition

VI. Lessons Learned

- Focus on human resources development
- Optimum combination of survey methods
- Need linkages with national and local authorities
- Promote mitigation policies and risk management beyond response to prevention
- Improvement and expansion of methodology in social and environmental aspects
- Long-term perspectives & phased approach
- Cooperation with international donors

THANK YOU!

khob Chai!