

III-4 LAND USE PLANNING

III-4.1 Current Land Use

Lao PDR is a mountainous country with a total land area of 236,800 km³. Approximately 80% of the country is mountainous, the north being very rugged, covered by forest and often inaccessible. Also the country is rich in forest, water, biodiversity, mineral and land resources. However, the overall land resource base is fragile, with the majority of land susceptible to degradation because of less fertile soils, steep terrain, and traditional land-use practices.

1) Topographic Feature

The Study area is located in the central to southern part of the country with a total land of 3,808,000 hectares in two provinces (based on GIS data in 2000). Undulation of the mountain range flows from the northwest towards the southeast with the highest elevation at more than 2,000 m. The two provinces in SKR show difference in the topographic features. Khammouan consists of 60% of mountainous topography; about 50% of the province land is over 500 m in altitude and has more than a 8-degree slope. Savannakhet is a fairly flat lowland province, about 60% of which is under 200 m in altitude and more than 50% of the area has under 2% degree, which makes this province unique in the mountainous country.

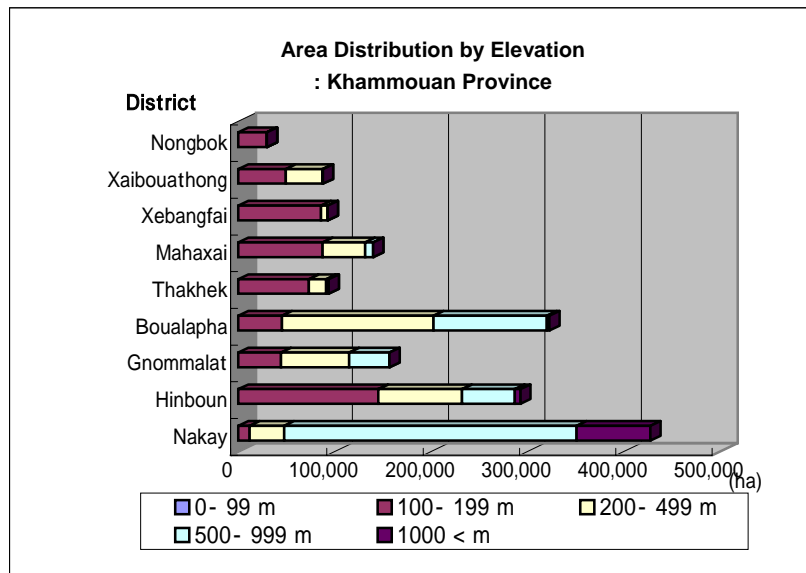


Figure III4-1 Area Distribution in Khammouan

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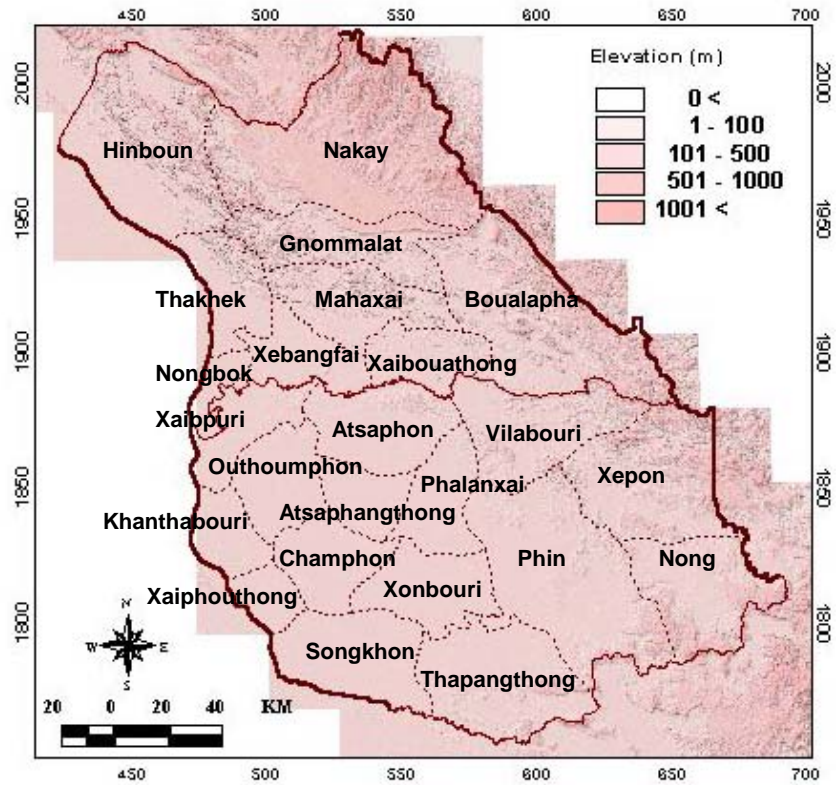


Figure III4-2 Elevation Feature in SKR

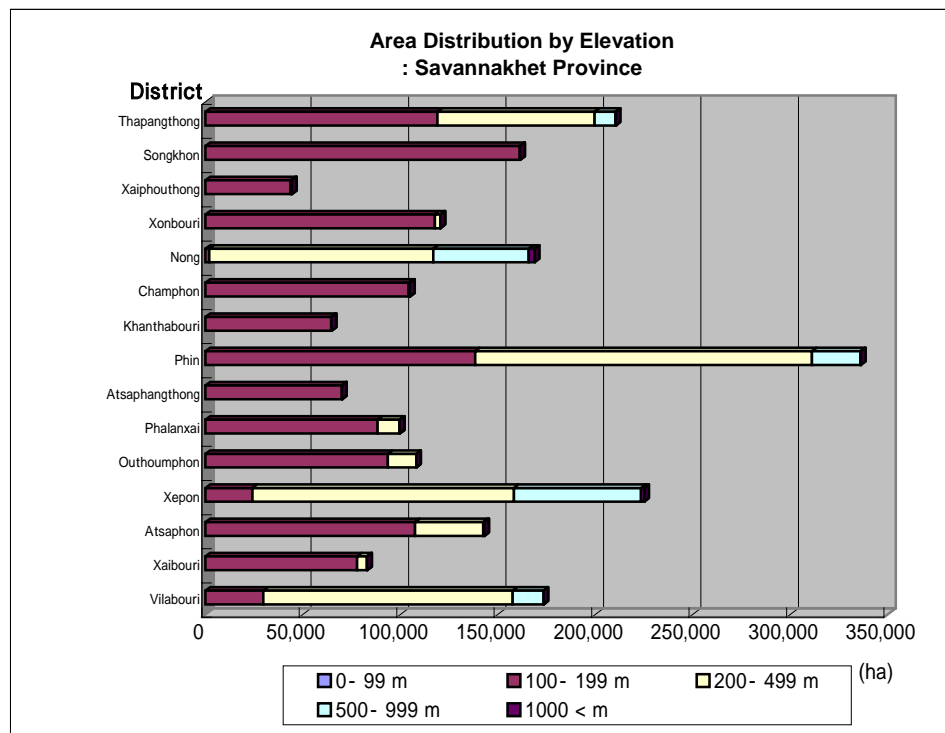


Figure III4-3 Area Distribution in Savannakhet

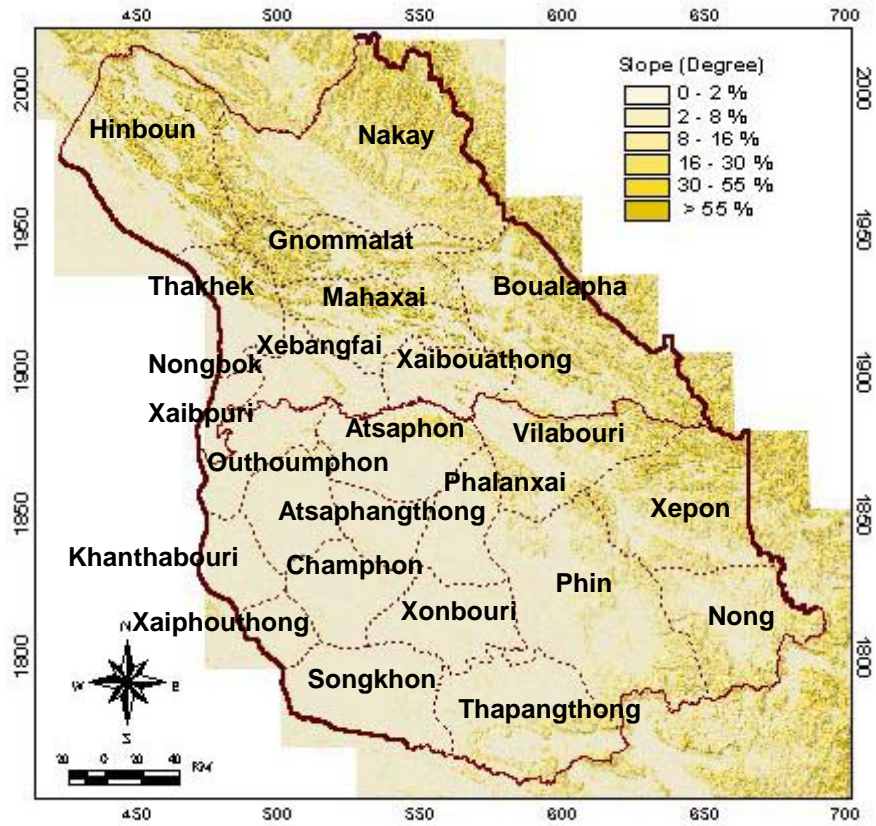


Figure III4-4 Slope Feature

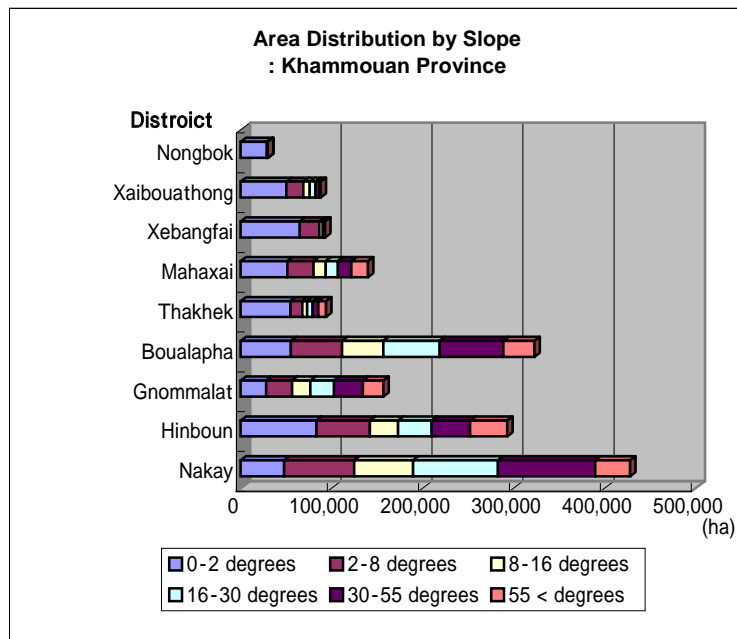


Figure III4-5 Area Distribution by Slope: Khammouan

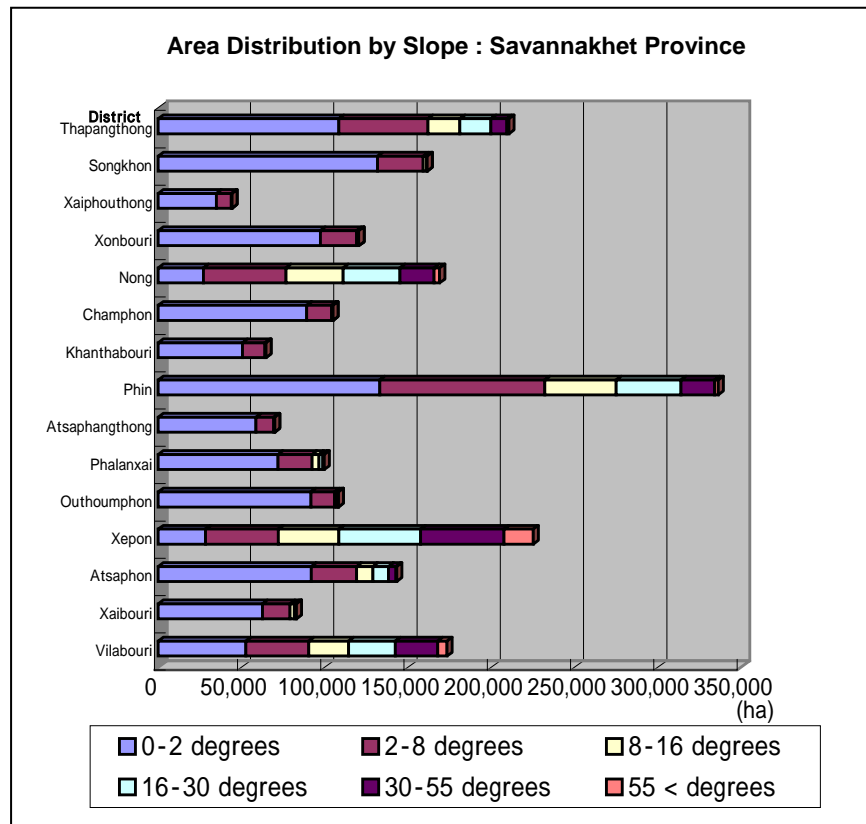


Figure III4-6 Area Distribution by Slope: Savannakhet

2) Current Land Use

Based on the GIS data (2000), the SKR area has 49.40% as High Forestry area, 28.18% as Potential Forest, and 3.65% as Other Wooded area. Due to the topographic feature, Rice Paddy area, which has most of its share in Permanent Agricultural Area, shows a difference between the two provinces, 7.97% in Khammouan and 13.55% in Savannakhet. Both provinces show a fairly small share of Urban Area (0.06% in Khammouan and 0.14% in Savannakhet). Ray (mostly Shifting Cultivation area) also shows difference between two provinces. Savannakhet has a large portion (1.54%) while Khammouan has a smaller area (0.78%) on mountainous side.

Most of agricultural and human activity is seen along the Mekong river. The population of Khammouan province is 294,831 with a density of 17 people per km². The population in Savannakhet is 675,582 with a density of 31 people per km². In this land use situation, 86% of the population (1997) are living in the rural area and are heavily dependent on the natural resource for their subsistence. The

average villager earns 60% of the household's income from them. (LECS 1997/1998)

A private forest plantation program covering an area of up to 50,000 hectares in northwestern Khammouan has just started. Eucalyptus is intended to be grown on a seven-year rotation for pulp and paper production.

Lao PDR retains one of the highest proportions of relatively intact forests in Asia, which, however, has decreased 20% between 1940-1990. In SKR, High Forest has decreased from 55.33% to 49.40% and been mostly converted to Potential Forest. The main causes are deforestation due to shifting cultivation, illegal logging, excessive logging, expansion of agricultural area in the lowland area, and poor management (regulation and monitoring).

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Table III4-1 Land Use in Khammouan

Year:		1982*		1990		2000	
Land Use and Vegetation Types		[1000ha]	%	[1000ha]	%	[1000ha]	%
1. Current Forest	CF	1,037	62.12	914	54.80	817	48.98
Dry Dipterocarp	DD	54	3.23	70	4.20	74	4.44
Lower Dry Evergreen	LDE	39	2.31	1	0.06	2	0.12
Upper Dry Evergreen	UDE	180	10.80	262	15.71	209	12.52
Lower Mixed Deciduous	LMD	176	10.53	111	6.65	71	4.26
Upper Mixed Deciduous	UMD	503	30.18	388	23.26	376	22.54
Gallery Forest	GE	2	0.12	0	0.00	0	0.00
Coniferous	S	7	0.41	7	0.42	1	0.06
Mixed Con./Broadl.	MS	76	4.54	75	4.50	84	5.04
2. Potential Forest	PF	248	14.84	315	18.88	399	23.92
Bamboo	B	20	1.17	8	0.48	2	0.12
Unstocked	T	207	12.40	294	17.62	386	23.14
Ray	RA	21	1.27	13	0.78	11	0.66
3. Other Wooded Area	OW	231	13.88	83	4.98	88	5.28
Savannah/ Open Woodland	SH	18	1.09	1	0.06	6	0.36
Heath, Scrub Forest	SR	213	12.79	82	4.92	82	4.92
4. Permanent Agriculture	PA	55	3.32	125	7.49	135	8.09
Rice Paddy	RP	55	3.32	125	7.49	133	7.97
Agriculture Plantation	AP	0	0.00	0	0.00	0	0.00
Other Agriculture Land	OA	0	0.00	0	0.00	2	0.12
5. Other Non-Forest Land	NF	97	5.84	231	13.85	229	13.73
Barren Lands / Rock	R	72	4.34	198	11.87	197	11.81
Grassland	G	10	0.61	3	0.18	2	0.12
Urban Area	U	3	0.16	1	0.06	1	0.06
Swamps	SW	2	0.12	19	1.14	19	1.14
Water	W	10	0.61	10	0.60	10	0.60
TOTAL		1,668	100	1,668	99.994	1,668	100

Source: 1982 Data: National Reconnaissance survey
1990 Data: Sida-NAFRI GIS Survey
2000 Data: JICA/Sida-NAFRI GIS Survey

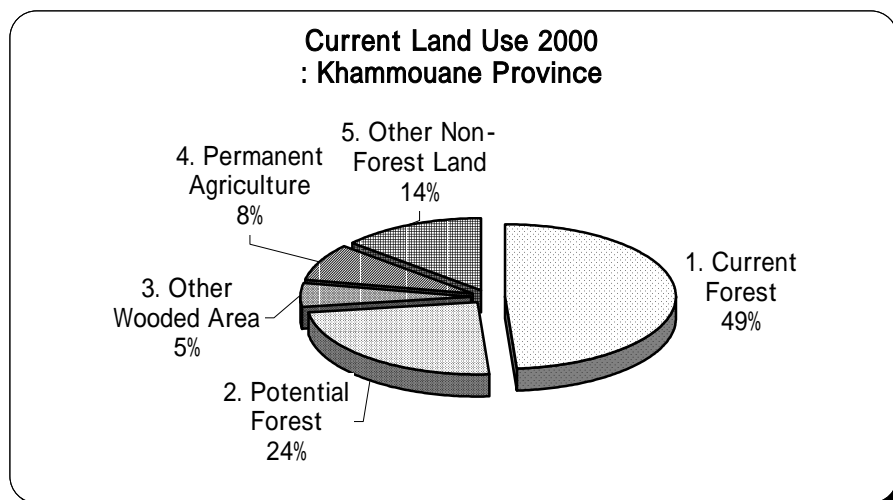


Figure III4-7 Land Use in Khammouan

Table III4-2 Land Use in Savannakhet

Province: Savannakhet		NRS*		GIS			
Year:		1982		1990		2000	
Land Use and Vegetation Types		[1000ha]	%	[1000ha]	%	[1000ha]	%
1. Current Forest	CF	1,214	56.68	1204	56.26	1,076	50.28
Dry Dipterocarp	DD	591	27.60	627	29.30	640	29.91
Lower Dry Evergreen	LDE	13	0.60	4	0.19	3	0.14
Upper Dry Evergreen	UDE	20	0.91	36	1.68	28	1.31
Lower Mixed Deciduous	LMD	168	7.85	133	6.21	65	3.04
Upper Mixed Deciduous	UMD	409	19.11	394	18.41	336	15.70
Gallery Forest	GE	13	0.61	10	0.47	4	0.19
Coniferous	S	0	0.00	0	0.00	0	0.00
Mixed Coniferous/Broadleaved	MS	0	0.00	0	0.00	0	0.00
2. Potential Forest	PF	488	22.80	630	29.44	674	31.50
Bamboo	B	82	3.85	57	2.66	9	0.42
Unstocked	T	375	17.51	540	25.23	607	28.36
Ray	RA	31	1.44	33	1.54	58	2.71
3. Other Wooded Area	OW	208	9.73	32	1.50	51	2.38
Savannah/ Open Woodland	SH	189	8.83	19	0.89	38	1.78
Heath, Scrub Forest	SR	19	0.90	13	0.61	13	0.61
4. Permanent Agriculture Land	PA	172	8.05	232	10.84	292	13.64
Rice Paddy	RP	170	7.96	232	10.84	290	13.55
Agriculture Plantation	AP	1	0.03	0	0.00	0	0.00
Other Agriculture Land	OA	1	0.06	0	0.00	2	0.09
5. Other Non-Forest Land	NF	58	2.74	42	1.96	47	2.20
Barren Lands / Rock	R	4	0.21	3	0.14	3	0.14
Grassland	G	15	0.69	18	0.84	10	0.47
Urban Area	U	14	0.66	3	0.14	3	0.14
Swamps	SW	3	0.15	3	0.14	13	0.61
Water	W	22	1.03	15	0.70	18	0.84
TOTAL:		2,140	100.00	2,140	100	2,140	100

Source: 1982 Data: National Reconnaissance Survey

1990 Data: Sida-NAFRI GIS Survey

2000 Data: JICA/Sida-NAFRI GIS Survey

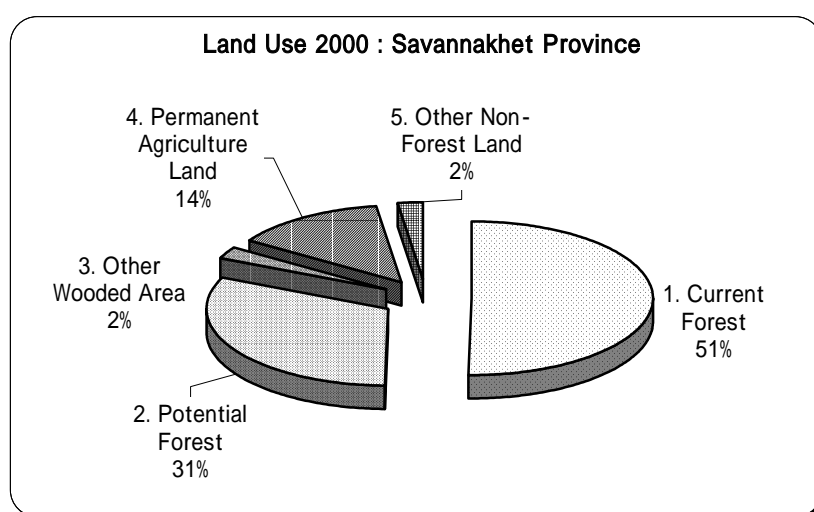


Figure III4-8 Land Use in Savannakhet

Table III-3 Land Use in SKR

Province: Khammouan+Savannakhet							
Year:		1982*		1990		2000	
Land Use and Vegetation Types		[1000ha]	%	[1000ha]	%	[1000ha]	%
1. Current Forest	CF	2,251	59.08	2118	55.62	1893	49.71
Dry Dipterocarp	DD	645	16.93	697	18.30	714	18.75
Lower Dry Evergreen	LDE	52	1.35	5	0.13	5	0.13
Upper Dry Evergreen	UDE	200	5.26	298	7.83	237	6.22
Lower Mixed Deciduous	LMD	344	9.02	244	6.41	136	3.57
Upper Mixed Deciduous	UMD	912	23.96	782	20.54	712	18.70
Gallery Forest	GE	15	0.40	10	0.26	4	0.11
Coniferous	S	7	0.18	7	0.18	1	0.03
Mixed Con./Broadl.	MS	76	1.99	75	1.97	84	2.21
2. Potential Forest	PF	736	19.31	945	24.82	1073	28.18
Bamboo	B	102	2.68	65	1.71	11	0.29
Unstocked	T	582	15.27	834	21.90	993	26.08
Ray	RA	52	1.37	46	1.21	69	1.81
3. Other Wooded Area	OW	440	11.54	115	3.02	139	3.65
Savannah/ Open Woodland	SH	207	5.44	20	0.53	44	1.16
Heath, Scrub Forest	SR	233	6.10	95	2.49	95	2.49
4. Permanent Agriculture	PA	227	5.98	357	9.38	427	11.21
Rice Paddy	RP	225	5.93	357	9.38	423	11.11
Agriculture Plantation	AP	1	0.02	0	0.00	0	0.00
Other Agriculture Land	OA	1	0.03	0	0.00	4	0.11
5. Other Non-Forest Land	NF	154	4.10	273	7.17	276	7.25
Barren Lands / Rock	R	75	2.02	201	5.28	200	5.25
Grassland	G	25	0.65	21	0.55	12	0.32
Urban Area	U	17	0.44	4	0.11	4	0.11
Swamps	SW	5	0.14	22	0.58	32	0.84
Water	W	32	0.85	25	0.66	28	0.74
TOTAL		3,808	100.00	3808	100.00	3808	100.00

Source: 1982 Data: National Reconnaissance Survey
1990 Data: Sida-NAFRI GIS Survey
2000 Data: JICA/Sida-NAFRI GIS Survey

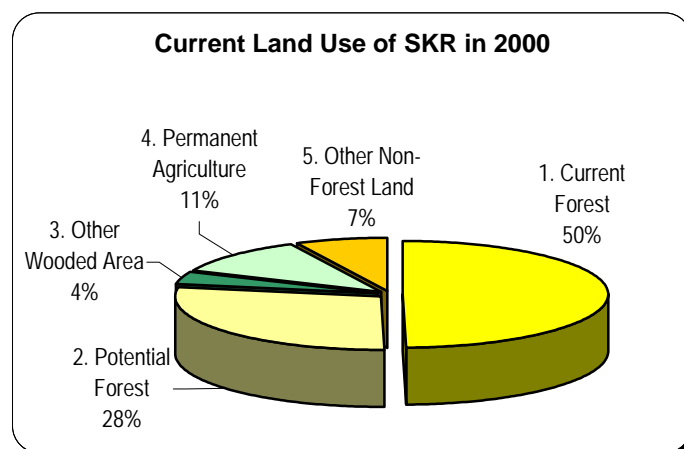


Figure III-9 Land Use in SKR

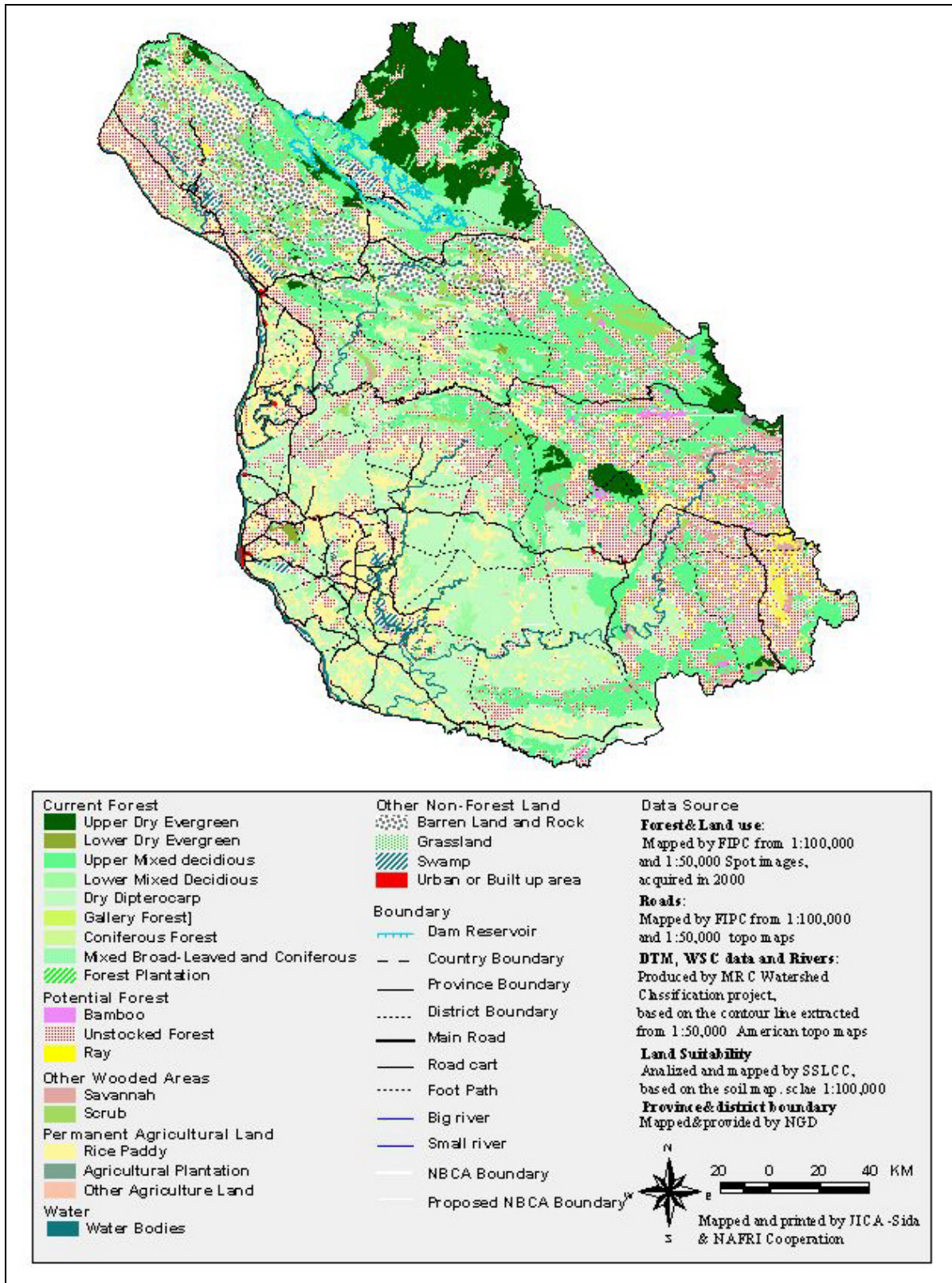


Figure III4-10 Land Use in SKR (2000)

3) Current Environmental / Land Use Management

In 1993, the Government published the National Environmental Action Plan (NEAP). Since that time, National Biodiversity Conservation Areas (NBCAs) have been established throughout the country, including seven NBCAs in SKR. In addition, five National Protection Forests have been set up in Savannakhet as well as several provincial protection areas. A preliminary environmental inventory was undertaken in 1997 for Khammouan Province by the World Conservation Union (IUCN Laos 1997) on behalf of Lao PDR.

NBCAs in Khammouan cover about 648,000ha, and three NBCAs in Savannakhet about 363,000 ha. In addition, two more NBCA migration corridors of 65,000ha have been proposed between the existing NBCA in Khammouan and 7,000ha extension of Phou Sang Hai NBCA in Savannakhet, which will be proclaimed early in 2001. In these NBCAs, all logging activity, official and private, is prohibited. These current and proposed NBCAs cover 42.79% of the total area of Khammouan and 17.32% of Savannakhet.

There are five National Protection Forests in Savannakhet (covering 295,700ha) and six Provincial Reservations (101,300 ha). There is no official regulation and boundary over these protection forestry of about 397,000 ha in two provinces, which covers 10.42% of the SKR area.

In Khammouan at Dong Phou Xoi and in Savannakhet at Dong Sithouane, the government, together with the World Bank and Finnish Aid, has established village forest management areas under the national Forest Management and Conservation Program (FOMACOP). Under this program, local communities in partnership with district and provincial foresters sustainably manage their natural forests and land use. The forests remain under state ownership, but villagers keep the net revenue after paying royalties and other taxes. A principal objective of FOMACOP is low impact logging undertaken at frequent intervals. This system aims to gradually build up the average growing stock from about 70 m³/ha in Savannakhet to a target of 175 m³/ha and hence to a larger sustainable off-take. Also, it can be a tourist attraction and provides services to the tourist industry.

An international body called the Forest Stewardship Council has accepted this management scheme. As a result, international buyers are prepared to pay a 25% premium and export wood products, which will be certified as coming from sustainable sources. This is a potentially large market opportunity arising from environmentally sustainable practices.

In 1999, the Environmental Protection Law (EPL) was enacted, and is now in the process of compiling rules for environmental assessments when undertaking projects and programs. All aspects of development are covered under EPL. On the other hand, the water law became effective in March 1997. The land law is still in the stage of an unofficial draft.

III-4.2 Constraints and Issues over Land Use

Over the next 20 years, the population will increase by about 60% and per-capita income may increase substantially. This increase has to be achieved by sustainable growth rather than by mining resources.

1) Forestry : Protection and Production

The natural resources of Khammouan and Savannakhet, particularly forests and water, are one of the region's greatest assets. Both forests and water are renewable resources, but they can be depleted if not managed in a sustainable way. Recognizing the benefit of such resources, the government has created biodiversity conservation areas and forest protection and watershed protection areas in this region.

The natural forests are also a principal source of wood and other forest products. They are important for development of the region and the benefit of the nation. Commercial forests cover about 0.8 million hectares and if managed in a sustainable and environmentally sound way, they could be able to meet the entire local demand and have a considerable surplus for export.

For this future sustainable usage of the forest resources including non-timber forest product (NTFP) such as edible and inedible wild plants, the illegal logging and unpractical logging methodology should be abandoned or improved. For the proper use of the timber and NTFP resources, the relationship between forestry and villagers is another key issue. To this end, a project like FOMACOP should be extended.

2) Agriculture : Population Increase and Shifting Cultivation

The government intends to curtail shifting cultivation. Some of the practitioners of this system are in or near biodiversity or protection areas. Alternatives to shifting cultivation include agro-forestry, planting permanent crops such as fruit, coffee and tea, rehabilitating degraded areas through improved management including planting trees in various ways (inter-planting, under-planting, reforestation etc.)

and expanding off-farm opportunities (e.g., eco-tourism, cottage industry development).

In order to ensure that the resources of the region are managed properly and in an environmentally sound way, land use planning should be used. The environmental protection and land use management will not only help achieve sustainable development, but will ensure that renewable resources are available for future generations. With better management of land and indigenous forests, preferably with the active participation of local population, as well as rehabilitation of the unstocked and other wooded areas, it is possible to attain the government target to make 60% of its land covered by forest. This is also attainable if concerted efforts are made to raise agricultural productivity and thus reduce the demand for new agricultural land to meet increased food demand.

3) Unexploded Ordnance (UXO)

The mountainous districts in SKR are stated to be the most UXO-impacted area in the country. Four areas impacted by UXO are defined in Savannakhet province, e.g., Xepon, Vilabuly, Nong, and the roads used by the traffic along the Ho Chi Minh Trail (Routes 28a and 9). Route 28b is the most affected area in Savannakhet. The area along the Trail entering the province via Boualapha district in Khammouan and continuing down to Vilabuly was intensely bombed. The eastern district of Boualapha is one of the most severely contaminated districts in all of Laos. The clearance of UXO is critical to the any development in future. The heavily contaminated area is concentrated in the forestry areas. The activity in forests should be disarmed if any development and management program is proposed.

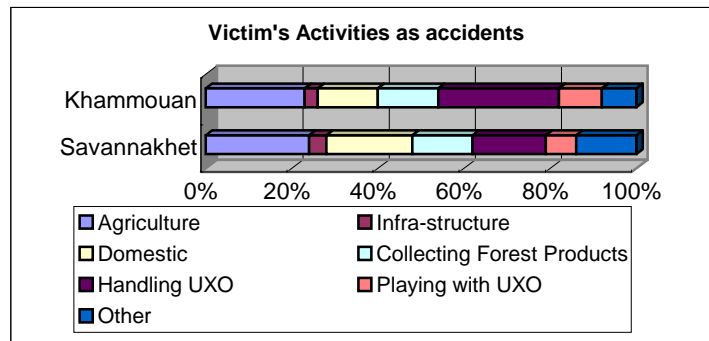
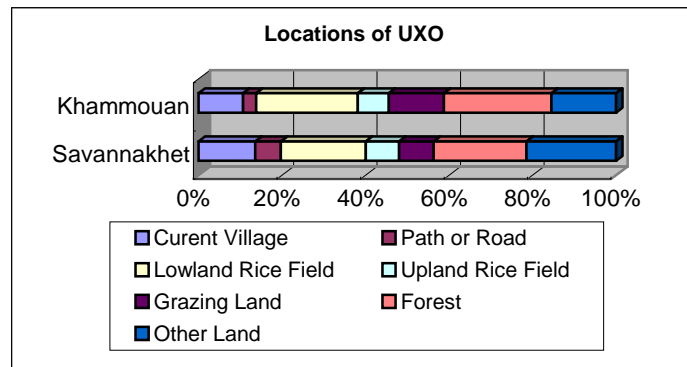


Figure III4-11 Locations of UXO and Victim's Activities in SKR

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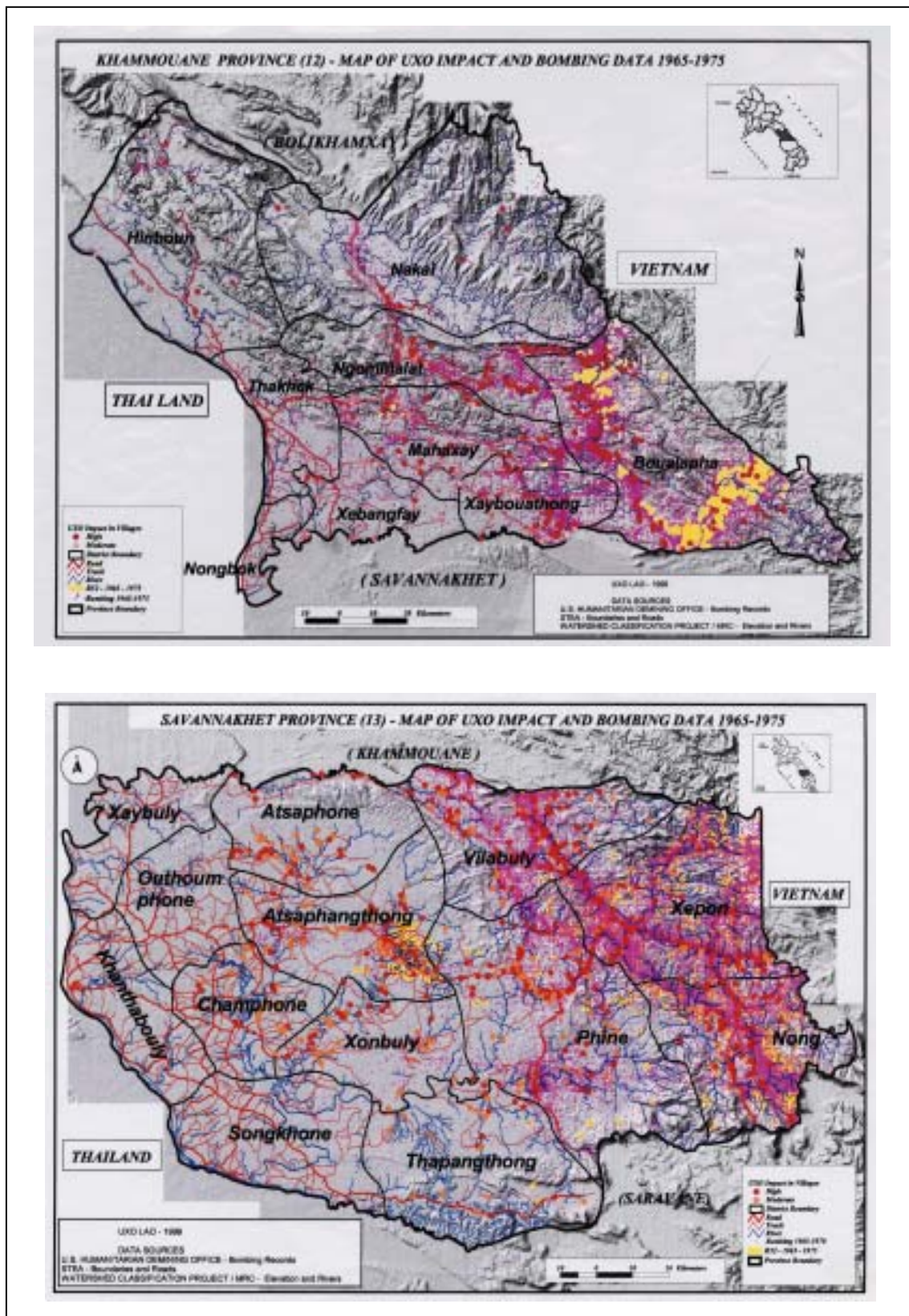


Figure III4-12 Current Situation of UXO in SKR