

**CHAPTER 2**  
**SOCIO-ECONOMIC FRAMEWORK**  
**& IMPACTS**

## **CHAPTER 2 SOCIO-ECONOMIC FRAMEWORK AND IMPACTS**

### **2.1 Introduction**

The Study Team found that a great disparity exists in the socioeconomic conditions of the Study area. Generally, the west half of the Study area is comparatively prosperous than the east half. The west has a larger population, more paddy land, larger vehicle ownership per capita, more tourism potential, less UXO impacts, higher literacy rates, fewer ethnics. Road improvements in the west half of the Study area will produce a greater economic return and contribute further socioeconomic development more quickly.

Champasack province is relatively more developed than the other three of southern region. Pakse, Champasack provincial capital, functions as a core city in the southern region. Communications between Pakse and the north and south of the country are being transformed by the paving of the main north-south highway NR13S from Savannakhet south to the Cambodian border, which was completed in the middle of 2002. This project, together with the opening of the Pakse Bridge financed by Japanese Government in November 2000 and the improvement of NR16W connecting it to the Thai border, should provide a springboard for the development of the whole of the southern region.

Saravan and Sekong have been connected with Pakse, core city in the southern region, by all-weather national road i.e., Route 1H +Route 20 and Route 16 respectively. Attapeu which had been remained land-locked for a long period, is being connected with Sekong by Route 1H which will be under improvement to all-weather national road. However, Saravan, Sekong and Attapeu are amongst the least developed province.

On the other hand, west part of the Mekong River has until now lacked all-weather connections to the national road network even though it has high economic potential due to existing nature, culture, social and agriculture potential.

### **2.2 Socio-Economic Framework**

#### **2.2.1 Traffic Analysis Zone and Administrative District**

##### **(1) Objectives of the Socio-Economic Framework Formulation**

Formulating socio-economic framework is important in order to forecast the traffic demand and to examine how the road improvement contributes to the life of the residents and development of the study area. Among many relevant issues, this report deals with population, land use, economic growth, and vehicle ownership by district. These data processed in this

section are used for the analysis of “Traffic Demand.” These data and forecasts gives general picture of the each district i.e., Traffic Analysis Zone.

## (2) Traffic Analysis Zone

The spatial unit of the socioeconomic framework is Traffic Analysis Zone (TAZ). In this study, administrative districts are treated as TAZs. Districts are the smallest unit for public administration and very few data are readily available at the smaller level i.e. village. There are 42 districts in the study area (15 in Savannakhet, 8 in Saravan, 4 in Sekong, 10 in Champasack, and 5 in Attapeu). Since the Study copes with National road network, the size of districts is appropriate for the analysis of socioeconomic issues as well as traffic volume.

### 2.2.2 GDP

In 1986 a New Economic Mechanism was introduced to transform the economy from a centrally planned system to an open market system. GDP growth averaged 5.5 per cent during Socio-Economic Development Plan I 1981-1986; 4.5 per cent in the Second Plan 1986-1991; 6.4 per cent in Plan III 1991-1996; and 6.2 per cent in the Fourth Plan 1996-2001. The Plan IV growth target of 8.0-8.5 per cent was not achieved, primarily as a result of very high inflation and an unstable exchange rate in the period 1997-1999 following the collapse of the Thai economy. Inflation peaked in March 1999 at a year-on-year rate of 167 per cent. It is now under 10 per cent.

GDP per capita in dollar terms has fluctuated considerably with the exchange rate: US\$414 in 1985, US\$211 in 1990, US\$380 in 1995 and US\$330 in 2000.

The economy remains predominantly based on subsistence agriculture, which with fisheries accounted for 85 per cent of employment in the 1995 census and contributed an estimated 51 per cent of GDP in 2000. Half of the villages are isolated during the rainy season and rural income levels are low. There is widespread poverty, apart from the area around Vientiane. The poverty levels in each region in 1997/98 are shown in Table 2.2.1.

**Table 2.2.1 Population Living in Poverty 1997/98 (in %)**

Region	Urban	Rural	Total
Southern	35.8	38.7	38.4
Central	27.7	35.9	34.9
Northern	43.3	53.5	52.5
Vientiane	16.7	4.5	12.2
<b>National</b>	<b>26.9</b>	<b>41.0</b>	<b>38.6</b>

Source: *Country Economic Review* ADB August 2001

Since 1985, there has been a significant decline in the contribution to GDP of agriculture and forestry and a growth in the importance of the other sectors, as shown in Table 2.2.2. Annual growth rates by sector for the last five years are given in Table 2.2.3. The trend is forecast to continue: the sector shares in 2005 are from Socio-Economic Development Plan V.

**Table 2.2.2 Sectoral Contributions to GDP (in %)**

Sector	1985	1990	1995	2000	2005
Agriculture and forestry	70.7	60.7	54.3	51.3	47.0
Industry and handicrafts	10.9	14.4	18.8	22.6	26.0
Services	18.4	24.9	26.9	26.1	27.0

Source: Socio-Economic Development Strategy Government, February 2001

**Table 2.2.3 Sectoral Growth 1996-2000 (in %)**

Sector	1996	1997	1998	1999	2000
Agriculture and forestry	2.8	7.0	3.1	8.2	5.1
Industry and handicrafts	17.3	8.1	9.2	7.9	7.5
Services	8.5	7.5	5.5	6.9	6.2
GDP	6.9	6.9	4.0	7.3	5.9
GDP/capita \$ (current)	397	364	262	284	330

Source: Country Economic Review ADB August 2001

Rice is produced in all provinces, but the study area has a relatively high share, with 2000 production of 0.56 million tons, 25.3 per cent of the total crop. Its yield of 3.23 tons per ha was a little above the national average. Rice accounted for 87 per cent of national agricultural production (in tons) in 2000.

There is very little industry, with most of it handicrafts. There are only 665 establishments employing more than 10 people. Of these, 101 were located in the study area, half of them in Champasack.

Lao PDR is particularly rich in hydro-electric power potential and is already a substantial exporter of power to Thailand. Electricity was the second most important merchandise export in 2000, with earnings of \$112 million, 29 per cent of the total. Wood products earned \$120 million. Tourism is the major services sector foreign exchange earner. The number of visitors increased by 72 per cent 1996-2000 to reach 0.72 million.

A balanced approach to development is targeted in the *Socio-Economic Development Strategy*, with an indicative rate of GDP growth to 2020 of around 7 per cent per annum.

For master planning purposes, forecasts should be relatively conservative, given the current uncertain international situation. The Study Team has therefore considered the Strategy target to represent the top end of the forecasting range. The annual GDP growth rates used for

vehicle fleet forecasting are given in Table 2.2.4.

**Table 2.2.4 GDP Forecasts to 2020 (in % per annum)**

Case	1999-2010	2010-2020
High	7.0	7.5
Central	6.0	6.0
Low	5.0	5.0

Source: Consultants

Table 2.2.5 and 2.2.6 provide the most recent basic data for the 17 provinces and the Xaisomboun special zone. The share represented by the four study provinces excluding Savannakhet Province, is shown for each indicator.

**Table 2.2.5 Basic Statistics by Province (1)**

No. Province	Area Sq.Km.	Population Mid-2000	Density Pop/SqKm	Vehicle Registrations Mid-2000			Road Length End-2000 Km.				Metre Paved+Gravel/		Vehicles/ Km. Paved
				M/Cycles	Motor Veh.	Total	Paved	Gravel	Earth	Total	Sq.Km.	000 Pop.	
1 Vientiane Municipality	3,920	597.8	152.5	81,307	25,748	107,055	380	1,197	342	1,918	402	2.6	282
2 Phongsali	16,270	174.4	10.7	775	196	971	134	322	172	628	28	2.6	7
3 Luang Namtha	9,325	130.9	14.0	992	340	1,332	142	163	593	898	33	2.3	9
4 Oudomxai	15,370	239.8	15.6	1,747	444	2,191	321	65	976	1,362	25	1.6	7
5 Bokeo	6,169	129.6	21.0	1,911	318	2,229	16	121	495	632	22	1.1	136
6 Luang Prabhang	16,875	416.1	24.7	5,518	1,134	6,652	413	492	463	1,368	54	2.2	16
7 Houaphan	16,500	279.1	16.9	1,301	296	1,597	318	295	952	1,565	37	2.2	5
8 Sayaburi	16,389	332.8	20.3	1,075	270	1,345	51	255	1,636	1,942	19	0.9	26
9 Xiangkhouang	15,880	228.8	14.4	2,860	854	3,714	237	261	1,197	1,695	31	2.2	16
10 Vientiane	15,927	326.9	20.5	6,901	1,840	8,741	335	743	476	1,554	68	3.3	26
11 Borkhamxai	14,863	186.6	12.6	1,349	327	1,676	340	352	760	1,451	47	3.7	5
12 Khammouan	16,315	310.8	19.0	6,302	1,371	7,673	195	624	702	1,521	50	2.6	39
13 Savannakhet	21,774	766.2	35.2	21,486	4,638	26,124	866	1,166	1,818	3,850	93	2.7	30
14 Saravane	10,691	292.3	27.3	1,788	161	1,949	105	673	2,233	3,011	73	2.7	19
15 Sekong	7,665	73.2	9.5	476	131	607	52	70	766	888	16	1.7	12
16 Champassak	15,415	571.9	37.1	14,283	2,484	16,767	417	815	1,105	2,337	80	2.2	40
17 Attapeu	10,320	99.4	9.6	537	131	668	29	259	917	1,204	28	2.9	23
18 Xaisomboun	7,105	61.7	8.7	84	65	149	0	235	680	915	33	3.8	n.a.
Total	236,773	5,218.3	22.0	150,692	40,748	191,440	4,351	8,107	16,280	28,738	53	2.4	44
Study Area	44,091	1,036.8	23.5	17,084	2,907	19,991	603	1,816	5,021	7,440	55	2.3	33
Study Area as % of Total	18.6	19.9	106.7	11.3	7.1	10.4	13.9	22.4	30.8	25.9	104.3	97.7	75.4

Sources: Basic Statistics of Lao PDR 2000 and MCTPC

Table 2.2.6 Basic Statistics by Province (2)

No.	Province	Population 000			H'hlds 000	Persons/	Rice Production			Veg/Beans	Establish.	Visits '000
		Mid-2000	Urban % *	Rural % *	1998 Est.	Household	Area Ha'000	Yield T/Ha	000 T.	000 T.	>10 Pers.	in 2000
1	Vientiane Municipality	597.8	62.8	37.2	89.41	6.37	70.75	3.72	263.1	103.2	189	486.6
2	Phongsavali	174.4	6.9	93.1	25.57	6.50	21.74	2.05	44.5	1.8	3	na
3	Luang Namtha	130.9	17.1	82.9	20.28	6.15	19.22	2.40	46.2	12.6	9	24.8
4	Oudomxai	239.8	16.7	83.3	35.82	6.38	29.43	2.24	65.9	23.1	30	na
5	Bokeo	129.6	4.9	95.1	21.97	5.62	11.98	3.01	36.1	6.0	21	25.3
6	Luang Prabhang	416.1	10.1	89.9	63.58	6.23	43.71	2.19	95.7	39.5	9	165.2
7	Houaphan	279.1	6.4	93.6	35.91	7.40	26.69	2.37	63.2	9.0	5	na
8	Sayaburi	332.8	7.3	92.7	51.3	6.18	37.58	2.67	100.3	26.2	36	7.5
9	Xiangkhouang	228.8	6.3	93.7	36.85	5.91	25.01	2.59	64.7	16.5	12	na
10	Vientiane	326.9	16.4	83.6	51.77	6.01	46.83	3.32	155.5	69.8	61	na
11	Borkhamxai	186.6	5.7	94.3	29.83	5.96	38.49	2.95	113.6	77.9	53	35.7
12	Khammouan	310.8	14.7	85.3	52.14	5.68	43.16	3.38	145.9	65.1	31	13.7
13	Savannakhet	766.2	13.2	86.8	114.47	6.37	126.65	3.42	433.7	92.7	101	109.0
14	Saravane	292.3	5.8	94.2	46.6	5.97	56.06	3.18	178.1	26.2	22	na
15	Sekong	73.2	15.8	84.2	10.59	6.58	7.13	2.43	17.3	4.9	19	na
16	Champassak	571.9	11.9	88.1	87.46	6.23	91.68	3.41	312.7	56.6	51	34.8
17	Attapeu	99.4	5.1	94.9	17.66	5.36	17.32	2.81	48.7	3.9	9	na
18	Xaisomboun	61.7	7.7	92.3	8.07	7.28	6.08	2.72	16.5	1.1	4	na
	Total	5,218.3	16.7	83.3	799.3	6.22	719.51	3.06	2201.7	636.0	665	902.6
14-17	Study Area	1,036.8	9.8	90.2	162.3	6.08	172.19	3.23	556.8	91.5	101	na
	Study Area as % of Total	19.9	na	na	20.3	97.8	23.9	105.7	25.3	14.4	15.2	na

Source: Basic Statistics of Lao PDR 2000

Note: \* as of mid-1997

## 2.2.3 Population

### (1) Population Forecast

The last national census was held in March 1995, recording a population of 4.575 million. With the estimated mid-2000 figure 5.218 million, population has been growing at an annual average rate of 2.54 per cent since the census. The population is relatively young, with an estimated 54.2 per cent aged under 20 in mid-2000. Two National Statistical Center population forecasts were prepared on the basis of the 1995 census data: Alternative 1 with a continuation of fertility and mortality rates unchanged and Alternative 2, with a gradual decline in both fertility and infant mortality. Fertility does now seem to be declining: in mid-2000 685,000 were aged 0-4 years compared with 807,000 aged 5-9 years.

Table 2.2.7 shows the Alternative 1 and 2 forecasts as well as the Government's *Socio-Economic Development Strategy* paper of February 2001, at five-yearly intervals.

**Table 2.2.7 Population Forecast to 2020**

Forecast	Forecasted Population						Growth Rate % per Annum				
	1995	2000	2005	2010	2015	2020	1995-00	2000-05	2005-10	2010-15	2015-20
Alternative 1	4,575	5,193	5,916	6,752	7,694	8,738	2.57	2.64	2.68	2.64	2.58
Alternative 2	4,575	5,146	5,763	6,415	7,069	7,687	2.38	2.29	2.17	1.96	1.69
Socio-Economic Strategy Feb. 2001	4,575	5,218	5,900	6,700	na	8,300	2.67	2.49	2.58	na	na
Consultants' High	4,575	5,218	5,930	6,730	7,600	8,500	2.67	2.59	2.56	2.46	2.26
Consultants' Central	4,575	5,218	5,900	6,660	7,450	8,300	2.67	2.49	2.45	2.27	2.18
Consultants' Low	4,575	5,218	5,860	6,520	7,200	7,900	2.67	2.35	2.16	2.00	1.87

The Study Team's high, central and low forecasts to 2020 are also given in Table 2.2.7. For master planning purposes, the same growth rates have been applied for each province and district. The forecast of provincial populations and district one in the study area is given in Table 2.2.8 and Table 2.2.9 respectively.

**Table 2.2.8 Population Forecast - Study Area (in '000)**

Province	2000	2005	2010	2015	2020
Saravan	292.3	330.5	373.1	417.4	464.9
Sekong	73.2	82.8	93.4	104.5	116.4
Champasack	571.9	646.8	730.0	816.7	909.7
Attapeu	99.4	112.4	126.9	141.9	158.1
<b>Total</b>	<b>1037</b>	<b>1173</b>	<b>1323</b>	<b>1480</b>	<b>1649</b>
Index 2000=100	100.0	113.1	127.6	142.7	159.0

Source: Study Teams' central forecast

Table 2.2.9 Population Forecast by District

Code	Province & District	1995	2001	2007	2020
<b>13</b>	<b>Savannakhet</b>				
1301	Khanthabouly	124,896	143,237	180,997	293,075
1302	Outhoomphone	69,025	77,769	88,235	112,114
1303	Atsaphangthong	48,743	54,918	62,308	79,171
1304	Phine	40,994	46,187	52,403	66,584
1305	Sepone	35,731	40,258	45,675	58,036
1306	Nong	16,723	18,842	21,377	27,162
1307	Thapangthong	24,011	27,053	30,693	39,000
1308	Songkhone	81,864	92,235	104,647	132,968
1309	Champhone	86,550	97,515	110,637	140,579
1310	Xonbuly	34,602	38,986	44,232	56,202
1311	Xaybuly	42,936	48,375	54,885	69,739
1312	Vilabuly	24,560	27,671	31,395	39,892
1313	Atsaphone	64,108	72,230	81,950	104,127
	Province Total	694,743	785,276	909,436	1,218,649
<b>14</b>	<b>Saravane</b>				
1401	Salavane	66,096	78,409	99,079	160,431
1402	Ta oi	19,799	23,031	25,811	31,706
1403	Toomlarn	16,262	18,916	21,200	26,042
1404	Lakhonepheng	30,480	35,455	39,735	48,810
1405	Vapy	26,755	31,122	34,879	42,845
1406	Khongxedone	46,252	53,802	60,296	74,067
1407	Lao ngarm	42,938	49,947	55,976	68,760
1408	Samuoi	7,649	8,898	9,972	12,249
	Province Total	256,231	299,579	346,945	464,909
<b>15</b>	<b>Sekong</b>				
1501	Iamarm	18,237	21,633	27,336	44,263
1502	Kaleum	13,746	15,977	17,820	21,595
1503	Dakcheung	16,949	19,700	21,973	26,627
1504	Thateng	15,238	17,711	19,754	23,939
	Province Total	64,170	75,021	86,883	116,424
<b>16</b>	<b>Champassak</b>				
1601	Pakse	65,220	77,365	97,760	158,295
1602	Sanasamboon	55,716	64,995	74,229	95,980
1603	Bachiangchaleunsook	34,354	40,075	45,769	59,181
1604	Pakxong	44,518	51,932	59,310	76,690
1605	Pathoomphone	43,142	50,327	57,477	74,319
1606	Phonthong	73,704	85,979	98,194	126,968
1607	Champasack	49,242	57,443	65,604	84,828
1608	Sukhuma	38,051	44,388	50,694	65,549
1609	Moonlapamok	32,228	37,595	42,937	55,518
1610	Khong	65,212	76,073	86,880	112,339
	Province Total	501,387	586,173	678,853	909,667
<b>17</b>	<b>Attapeu</b>				
1701	Xaysetha	25,691	29,879	33,689	42,085
1702	Samakhixay	19,331	22,907	28,945	46,869
1703	Sanaxay	19,627	22,826	25,737	32,151
1704	Sanxay	12,252	14,249	16,066	20,070
1705	Phouvong	10,328	12,012	13,543	16,918
	Province Total	87,229	101,872	117,980	158,093
	Study Area Total	1,603,760	1,847,922	2,140,097	2,867,742

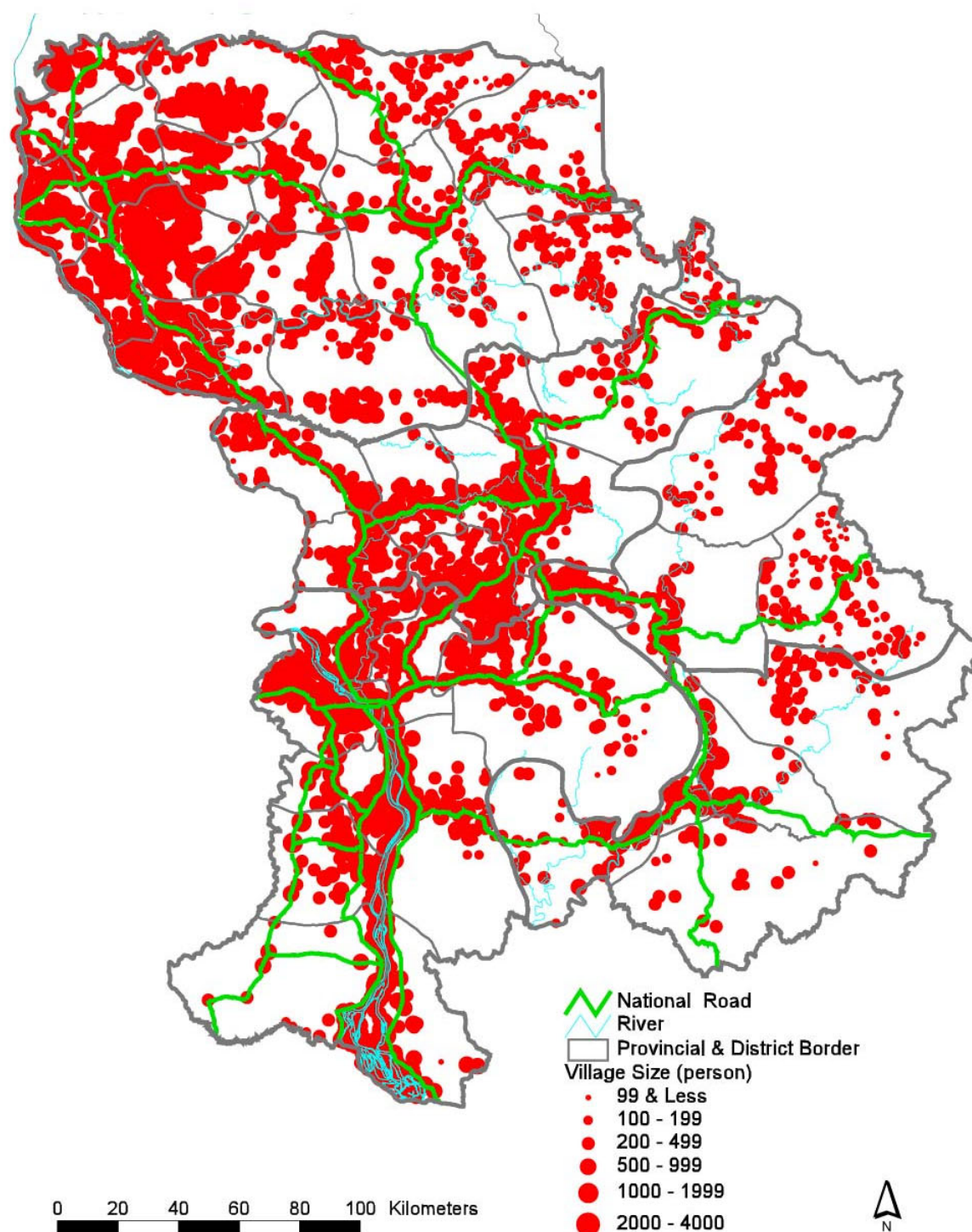


## **(2) Population Distribution in the Study Area**

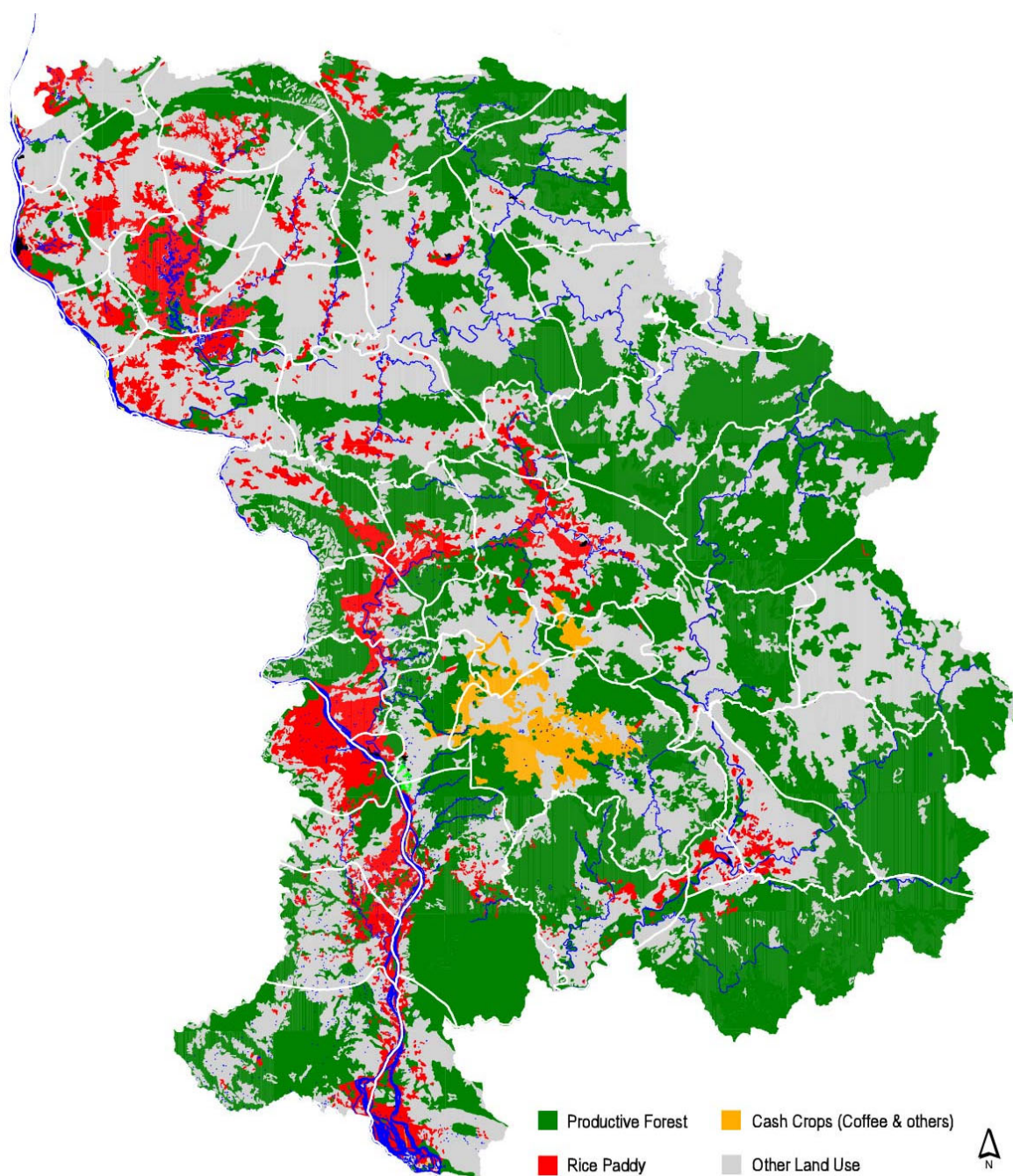
Figure 2.2.1 illustrates the spatial distribution of population. Each red spot indicates a village, and scale of the spot represents the size of village. More concentration of population is observed in the western part of the study area, where there are bigger rivers and plains. Green lines represent national roads. Improvement of a national road where more red spots are concentrated can benefit more beneficiaries.

Figure 2.2.2 shows the present land use of the study area. Red area in this map specifies rice paddy. As agriculture, especially, rice cultivation is the main producing activity; more paddy land can feed more population. A clear correlation observed is in the spatial distribution of population and paddy land.

The ethnic Lao, rather than ethnic minorities, focus on rice production. Comparison of the spatial distribution of rice paddy (Figure 2.2.2), ethnic Lao (Figure 2.6.7) and ethnic minorities (Figure 2.6.6) shows an interesting result. Distribution of rice paddy clearly corresponds with that of the ethnic Lao population. On the other hand, no clear correspondence is observed between paddy land and ethnic minority population.



**Figure 2.2.1 Distribution of Total Population in the Study Area**



**Figure 2.2.2 Present Land Use of the Study Area**

## 2.2.4 Vehicle Ownership

The composition of the vehicle fleet by province in mid-2000 is given in Table 2.2.10. Motorcycles and tuk-tuks accounted for 79 per cent of the fleet. Vientiane is an order of magnitude more motorized than the rest of the country, with 43 motor vehicles vehicle (motorized four-wheeled) per thousand population (179 including motor-cycles and tuk-tuks), compared with 6 (34) per thousand in Savannakhet, the next highest province. The study area average is just 3 (19) per thousand. Pick-ups are the most numerous motor vehicle type, accounting for 35 per cent of motor vehicle registrations, compared with 25 per cent trucks and 22 per cent cars. There were, however, 10 motorcycles registered for each pick-up.

**Table 2.2.10 Vehicle Fleet by Province Mid-2000**

No.	Province	Motor Cycle	Tuk -Tuk	Car	Pick -Up	Van	Jeep	Truck	Bus	Total	Veh/000 Pop.	Veh/000 Pop.*
1	Vientiane Municipality	78,980	2,377	7,214	8,215	1,182	2,109	5,870	1,108	107,055	179	43.0
2	Phongsali	745	30	9	105	16	44	18	4	971	6	1.1
3	Luang Namtha	982	10	13	156	21	70	70	10	1,332	10	2.6
4	Oudomxai	1,735	12	15	317	17	51	41	3	2,191	9	1.9
5	Bokeo	1,907	4	12	194	10	33	56	13	2,229	17	2.5
6	Luang Prabhang	5,357	161	169	568	60	206	117	14	6,652	16	2.7
7	Houaphan	1,295	6	16	86	8	79	103	4	1,597	6	1.1
8	Sayaburi	1,056	19	13	147	13	12	71	14	1,345	4	0.8
9	Xieng Khouang	2,775	85	129	159	35	139	356	36	3,714	16	3.7
10	Vientiane	6,729	172	116	687	82	142	694	119	8,741	27	5.6
11	Borikhamxai	1,284	65	49	94	12	23	133	16	1,676	9	1.8
12	Khammouan	6,108	194	223	279	49	112	593	115	7,673	25	4.4
13	Savannakhet	20,850	636	444	2,353	240	533	942	126	26,124	34	6.1
14	Saravane	1,774	14	9	48	12	15	66	11	1,949	7	0.6
15	Sekong	464	12	17	34	8	13	46	13	607	8	1.8
16	Champassak	13,872	411	327	801	86	372	733	165	16,767	29	4.3
17	Attapeu	514	23	9	30	6	16	56	14	668	7	1.3
18	Xaisomboun	80	4	5	21	6	11	17	5	149	2	1.1
	Total	146,507	4,235	8,789	14,294	1,863	3,980	9,982	1,790	191,440	37	7.8
14-17	Study Area	16,624	460	362	913	112	416	901	203	19,991	19	2.8
	Study Area as % of Total	11.3	10.9	4.1	6.4	6.0	10.5	9.0	11.3	10.4	52.6	36.0

Source: MCTPC

Note: \* excluding motorcycles and tuk-tuks.

Table 2.2.11 shows the development of the fleet by type of vehicle. Growth in the period 1990-1999 totaled 84 per cent for motor vehicles and 152 per cent for motorcycles and tuk-tuks, an overall fleet growth of 134 per cent. The growth in GDP for the period was 74 per cent. This gives elasticity to GDP for 1990-1999 of 1.14 for motor vehicles and 2.06 for motorcycles and tuk-tuks. With Vientiane being a special case, it is also necessary for

forecasting purposes to consider the development of the non-Vientiane fleet separately. This is shown in Table 2.2.12.

**Table 2.2.11 National Vehicle Fleet 1990-2000 (in '000)**

Class of Vehicle	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
Car	5.73	6.13	6.36	6.63	7.02	7.59	7.80	8.06	8.29	8.62	8.79
Pick-Up	5.98	6.46	6.96	7.64	8.39	9.86	10.65	11.67	12.71	13.64	14.29
Jeep	1.09	1.17	1.28	1.47	1.72	2.10	2.44	2.74	3.17	3.74	3.98
Van	0.47	0.50	0.55	0.69	0.81	0.96	1.08	1.22	1.41	1.69	1.86
Truck	7.86	7.95	8.09	8.16	8.50	7.71	8.12	8.47	8.86	9.50	9.98
Bus	^	^	^	^	^	1.67	1.67	1.69	1.72	1.78	1.79
Sub-total	21.14	22.21	23.24	24.58	26.44	29.90	31.77	33.86	36.16	38.96	40.70
Motor-cycle	57.88	64.69	71.73	78.57	90.52	104.88	120.37	132.55	141.68	143.85	146.51
Tuk-tuk	0.90	0.94	0.99	1.79	2.68	3.83	4.16	4.22	4.24	4.24	4.24
Sub-total	58.78	65.64	72.73	80.35	93.19	108.71	124.54	136.77	145.91	148.08	150.74
Total	79.91	87.85	95.97	104.94	119.64	138.61	156.30	170.63	182.07	187.04	191.44
As Indices 1990 = 100.0:											
Motor vehicles	100.0	105.1	110.0	116.3	125.1	141.4	150.3	160.2	171.1	184.3	192.5
Motor-cycles/Tuk-tuks	100.0	111.7	123.7	136.7	158.6	185.0	211.9	232.7	248.3	251.9	256.5
All vehicles	100.0	109.9	120.1	131.3	149.7	173.4	195.6	213.5	227.8	234.1	239.6
GDP	100.0	104.0	111.2	117.8	127.4	136.4	145.9	156.0	162.1	173.9	183.9
Cumulative Elasticity to GDP:											
Motor vehicles	na	1.27	0.89	0.92	0.92	1.14	1.10	1.07	1.14	1.14	1.10
Motor-cycles/Tuk-tuks	na	2.92	2.12	2.06	2.14	2.33	2.44	2.37	2.39	2.06	1.86
All vehicles	na	2.48	1.79	1.76	1.81	2.02	2.08	2.03	2.06	1.81	1.66

Source: MCTPC

Note: \* mid-year, other figures end-year

The fleet growth 1990-1999 excluding Vientiane was higher: 98 per cent for motor vehicles, 204 per cent for motorcycles and tuk-tuks and 179 per cent overall. Elasticity to GDP was 1.33 for motor vehicles and 2.76 for motorcycles and tuk-tuks.

**Table 2.2.12 Vehicle Fleet Excluding Vientiane 1990-1999 (in '000)**

Class of Vehicle	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Car	0.95	1.02	1.06	1.10	1.17	1.27	1.36	1.45	1.63	1.55
Pick-Up	2.38	2.57	2.77	3.00	3.30	3.89	4.30	5.04	5.80	5.82
Jeep	0.49	0.53	0.58	0.65	0.74	0.87	1.07	1.36	1.68	1.77
Van	0.19	0.20	0.23	0.26	0.29	0.34	0.38	0.46	0.61	0.62
Truck	3.22	3.25	3.31	3.34	3.49	3.17	3.33	3.50	3.82	3.92
Bus	^	^	^	^	^	0.67	0.69	0.64	0.66	0.68
Sub-total	7.23	7.58	7.94	8.35	8.99	10.21	11.13	12.44	14.19	14.35
Motor-cycle	22.11	24.72	27.41	30.02	34.55	44.99	53.25	62.18	68.57	66.46
Tuk-tuk	0.34	0.36	0.38	0.68	1.01	1.64	1.83	1.85	1.87	1.86
Sub-total	22.46	25.08	27.78	30.70	35.56	46.63	55.08	64.03	70.44	68.32
Total	29.69	32.65	35.72	39.05	44.55	56.84	66.21	76.48	84.63	82.66
As Indices 1990 = 100.0:										
Motor vehicles	100.0	104.8	109.8	115.4	124.3	141.3	153.9	172.1	196.2	198.4
Motor-cycles/Tuk-tuks	100.0	111.7	123.7	136.7	158.4	207.7	245.3	285.2	313.7	304.2
All vehicles	100.0	110.0	120.3	131.5	150.1	191.5	223.0	257.6	285.1	278.5
GDP	100.0	104.0	111.2	117.8	127.4	136.4	145.9	156.0	162.1	173.9
Cumulative Elasticity to GDP:										
Motor vehicles	na	1.20	0.87	0.87	0.89	1.13	1.18	1.29	1.55	1.33
Motor-cycles/Tuk-tuks	na	2.92	2.12	2.06	2.13	2.96	3.17	3.31	3.44	2.76
All vehicles	na	2.50	1.82	1.77	1.83	2.51	2.68	2.81	2.98	2.41

Source: MCTPC



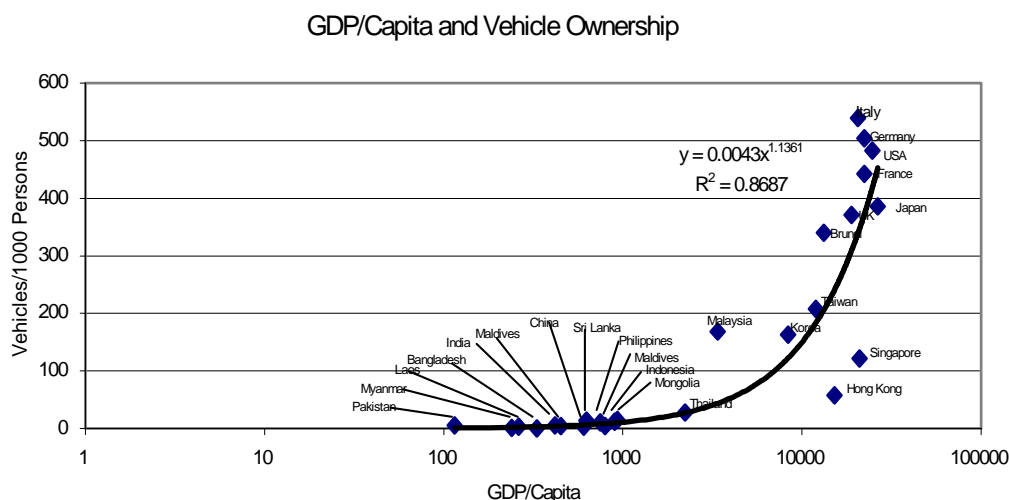
A General Traffic Forecast 1998-2010 was prepared in 1998 as part of the Third Highway Improvement Project, under a TA to the Planning and Technical Division of the Department of Roads. This related fleet growth to GDP growth rates of 5.0 per cent (low); 6.0 per cent (medium) and 8.0 per cent (high). Elasticity to GDP of 2.0 for motorcycles, 1.3 for cars and 1.05 for trucks were assumed.

The Study Team has developed vehicle fleet forecasts to 2020 on a similar basis. A neighboring country, Vietnam's development is earlier than Laos and Vietnam will approach saturation in motorcycle and tuk-tuk ownership during the forecasting period. It is also expected to have lower elasticity for motor vehicles. In the other provinces, the substantial improvements to the road system recently completed or underway are expected to stimulate motor vehicle fleet growth from its existing very low base level.

Elasticity to GDP has been increased only slightly after 2010. GDP per capita outside Vientiane (including in the study area) will not (during the forecasting period) reach the level at which explosive growth<sup>1</sup> in motor vehicle ownership can occur. By 2020 GDP per capita is forecast to be US\$810.

Table 2.2.13 presents the Study Team's GDP forecasts, the assumed elasticity and the

<sup>1</sup> GDP/capita and vehicle ownership are related. As GDP/capita increases from US\$1,000 to US\$10,000, an explosive growth in the vehicle fleet is expected. Vehicle ownership grows much faster than GDP/capita, in other words, elasticity of vehicle ownership to GDP/capita increases. However, in the study area, GDP/capita does not reach the explosive point at all. A graph shown below illustrates the relation between GDP/capita and vehicle ownership. Lao PDR is in a group of low GDP where elasticity is rather stable. Forecast elasticity for every five years until 2020 is given in Table 2.2.13. The forecast vehicle fleet growth rate is also given in Table 2.2.13.



resulting vehicle forecasts for motor vehicles and for motor-cycles / tuk-tuks. The number of vehicles per thousand populations is also shown, for the central population forecast. The elasticity is related to the GDP growth rate: higher GDP growth will result in a higher elasticity, for the same level of vehicle ownership. The combined impact of GDP and elasticity results in a large range between the low and the high forecasts by 2020, particularly for the non-Vientiane fleet.

**Table 2.2.13 GDP and Vehicle Fleet Forecast to 2020**

Item	Growth	1999 2005 2010 2015 2020					Growth Rate % pa				Forecast Vehicle Fleet '000					Vehicles/000 Population *				
		1999	2005	2010	2015	2020	1999-05	2005-10	2010-15	2015-20	1999	2005	2010	2015	2020	1999	2005	2010	2015	2020
GDP Index 1999=100.0	High	100.0	150.1	210.5	302.2	433.8	7.0	7.0	7.5	7.5										
	Central	100.0	141.9	189.8	254.0	340.0	6.0	6.0	6.0	6.0										
	Low	100.0	134.0	171.0	218.3	278.6	5.0	5.0	5.0	5.0										
Elasticity to GDP:																				
Vientiane Motor Vehicles	High	na	1.10	1.10	1.20	1.20	7.6	7.6	8.8	8.8	24.6	38.2	55.1	83.9	127.7	42.1	56.5	72.2	98.3	134.4
	Central	na	1.05	1.05	1.10	1.10	6.3	6.3	6.5	6.5	24.6	35.4	48.0	65.9	90.4	42.1	52.4	62.9	77.2	95.1
	Low	na	1.00	1.00	1.05	1.05	5.0	5.0	5.2	5.2	24.6	33.0	42.1	54.3	70.1	42.1	48.8	55.2	63.7	73.8
Vientiane M/cs Tuk-tuks	High	na	1.00	0.90	0.70	0.50	7.0	6.4	5.5	4.0	79.7	119.6	163.0	212.7	259.0	136.5	177.0	213.6	249.3	272.6
	Central	na	1.00	0.90	0.75	0.65	6.0	5.5	4.6	4.1	79.7	113.1	147.5	184.9	225.6	136.5	167.3	193.3	216.8	237.4
	Low	na	0.95	0.90	0.80	0.75	4.8	4.5	4.1	3.8	79.7	105.5	131.7	160.8	194.1	136.5	156.0	172.6	188.5	204.3
Elasticity to GDP:																				
Non-Vientiane Motor Vehicles	High	na	1.40	1.40	1.50	1.50	9.3	9.4	10.6	10.6	14.4	24.4	38.2	63.1	104.3	3.2	4.7	6.5	9.6	14.2
	Central	na	1.30	1.30	1.40	1.40	7.5	7.6	8.1	8.1	14.4	22.2	31.9	47.0	69.3	3.2	4.2	5.4	7.1	9.4
	Low	na	1.20	1.20	1.30	1.30	5.9	5.9	6.3	6.3	14.4	20.2	26.9	36.6	49.7	3.2	3.9	4.6	5.5	6.8
Non-Vientiane M/cs Tuk-tuks	High	na	2.10	2.10	2.00	1.90	12.7	13.0	13.4	12.8	68.3	140.2	258.6	484.0	884.6	15.1	26.8	43.9	73.4	120.4
	Central	na	2.10	2.10	2.10	2.00	11.1	11.3	11.3	10.9	68.3	128.4	219.5	375.5	629.5	15.1	24.6	37.2	56.9	85.6
	Low	na	2.10	2.10	2.10	2.10	9.4	9.6	9.6	9.6	68.3	117.1	185.1	292.4	462.1	15.1	22.4	31.4	44.3	62.9
Total Motor Vehicles	High						8.2	8.3	9.5	9.6	39.0	62.6	93.2	147.0	232.0	7.6	10.6	14.0	19.7	28.0
	Central						6.7	6.8	7.2	7.2	39.0	57.6	79.9	112.9	159.6	7.6	9.8	12.0	15.2	19.2
	Low						5.3	5.3	5.7	5.7	39.0	53.2	69.0	90.9	119.8	7.6	9.0	10.4	12.2	14.4
Total M/cs and Tuk-tuks	High						9.8	10.2	10.6	10.4	148.0	259.8	421.6	696.7	1143.6	29.0	44.0	63.3	93.5	137.8
	Central						8.5	8.7	8.8	8.8	148.0	241.4	367.0	560.4	855.0	29.0	40.9	55.1	75.2	103.0
	Low						7.0	7.3	7.4	7.7	148.0	222.6	316.8	453.2	656.2	29.0	37.7	47.6	60.8	79.1

Source: Consultants

Note: \* With central population forecast

Assuming that the study area fleet grows at the same rate as that of the non-Vientiane fleet, the fleet forecast would be as given in Table 2.2.14.

**Table 2.2.14 Study Area Vehicle Fleet Forecast (in '000)**

Item	1999	2005	2010	2015	2020
<b>Motor vehicles</b>					
High	2.78	4.71	7.37	12.2	20.1
Central	2.78	4.29	6.16	9.1	13.4
Low	2.78	3.90	5.19	7.1	9.6
<b>Vehicles per 1,000 population:</b>					
Central	2.7	3.7	4.7	6.1	8.1
<b>Motor-cycles / Tuk-tuks:</b>					
High	16.8	34.4	63.5	118.9	217.6
Central	16.8	31.5	53.9	92.3	154.7
Low	16.8	28.8	45.5	71.9	113.5
<b>Vehicles per 1,000 population</b>					
Central	16.6	26.9	40.7	62.3	93.8

Information on vehicle registration is available by province, but data at district level is not readily available. Table 2.2.15 shows the result of a vehicle fleet estimation at district level. The methodology adapted is as follows.

For Champasack province, total registered vehicles have been distributed to the ten districts proportionally with a ratio defined by a manual count from the most recent vehicle registration record. The Study Team compared this result with district GDP ( $[\text{GDP/capita}] \times [\text{district population}]$ ) and found that the vehicle share of the provincial capital (Pakse District) is 30% more than its GDP share in the province. Vehicle shares for the remaining nine districts are closely correlated with their GDP shares. This happens because the provincial capital is a center for market, industry, services, public administration. For provinces other than Champasack, this rule or assumption has been applied to estimate the vehicle fleet at district level. Provincial capitals take 30% more than their GDP share, and the remaining districts take the rest of the vehicles in proportion to their GDP shares.



Table 2.2.15 Vehicle Fleet Estimation by District

Code	Savannakhet	Motorbike	Tuk-tuk	Sedan	Pick-up	Mini-bus	Jeep	big bus	track	total
1301	Khanthabouly	18,797	556	399	2,203	242	531	864	113	23,704
1302	Outhoomphone	495	15	11	58	6	14	23	3	625
1303	Atsaphangthong	350	10	7	41	5	10	16	2	441
1304	Phine	74	2	2	9	1	2	3	0	93
1305	Sepone	64	2	1	8	1	2	3	0	81
1306	Nong	15	0	0	2	0	0	1	0	19
1307	Thaphangthong	86	3	2	10	1	2	4	1	109
1308	Songkhone	588	17	12	69	8	17	27	4	741
1309	Champhone	621	18	13	73	8	18	29	4	783
1310	Xonbuly	124	4	3	15	2	4	6	1	157
1311	Xaybuly	154	5	3	18	2	4	7	1	194
1312	Vilabuly	22	1	0	3	0	1	1	0	28
1313	Atsaphone	115	3	2	13	1	3	5	1	145
Province Total		21,505	636	456	2,520	277	607	989	129	27,119
Code	Saravane	Motorbike	Tuk-tuk	Sedan	Pick-up	Mini-bus	Jeep	big bus	track	total
1401	Saravane	1,261	10	7	35	10	13	48	9	1,392
1402	Ta oi	7	0	0	0	0	0	0	0	7
1403	Toomlarn	11	0	0	0	0	0	0	0	12
1404	Lakhonepheng	81	1	0	2	1	1	3	1	90
1405	Vapy	71	1	0	2	1	1	3	1	79
1406	Khongxedone	123	1	1	3	1	1	5	1	136
1407	Lao ngam	229	2	1	6	2	2	9	2	253
1408	Samuoi	5	0	0	0	0	0	0	0	6
Province Total		1,788	14	9	50	14	18	67	13	1,974
Code	Sekong	Motorbike	Tuk-tuk	Sedan	Pick-up	Mini-bus	Jeep	big bus	track	total
1501	Lamarm	311	8	12	24	5	9	32	11	411
1502	Kaleum	8	0	0	1	0	0	1	0	11
1503	Dakcheung	10	0	0	1	0	0	1	0	14
1504	Thateng	147	4	5	11	3	4	15	5	195
Province Total		477	12	18	36	8	14	49	17	631
Code	Campasack	Motorbike	Tuk-tuk	Sedan	Pick-up	Mini-bus	Jeep	big bus	track	total
1601	Pakse	9,625	277	285	603	83	367	376	133	11,872
1602	Sanasomboon	764	22	11	48	5	0	34	1	883
1603	Bachiangchaleunsouk	488	14	6	28	7	16	0	5	583
1604	Paksong	1,252	36	6	71	0	27	103	17	1,502
1605	Pathoomphone	206	6	0	27	0	0	57	3	283
1606	Phonthong	929	27	28	44	0	5	137	9	1,104
1607	Champasack	498	14	0	21	0	0	34	1	553
1608	Sukhuma	171	5	0	1	0	0	0	0	174
1609	Moonlapamok	43	1	0	0	0	0	0	0	44
1610	Khong	290	8	0	14	2	5	34	0	333
Province Total		14,266	411	336	858	98	421	775	167	17,332
Code	Attapeu	Motorbike	Tuk-tuk	Sedan	Pick-up	Mini-bus	Jeep	big bus	track	total
1701	Saysettha	34	2	1	2	0	1	4	1	43
1702	Samakhixay	433	19	8	26	6	15	48	13	543
1703	Sanamxay	26	1	0	2	0	1	3	1	33
1704	Sanxay	33	1	1	2	0	1	4	1	41
1705	Phouvong	7	0	0	0	0	0	1	0	9
Province Total		533	24	9	31	7	18	59	16	668
Study Area Total		38,569	1,097	828	3,496	404	1,079	1,939	341	47,724

## 2.3 Regional Development

There are some important projects planned or under implementation in the Study area. Five major projects discussed here are;

- (1) **Urban Development Project,**
- (2) **Focal Site Project,**
- (3) **Rice Irrigation Project, and**
- (4) **Hydrological Power Plant Development, and**
- (5) **Boloven Plateau Agriculture Development.**

Among them, (1), (3) and (5) facilitate further development of already-prosperous areas, while (2) and (4) spur the improvement rather disadvantaged and isolated areas.

Route 1J relates with (1), (2) and (4). Route 1H relates with (1) and (2). Route 14A relates with (1),(2) and (3). Route 16A encourages (5). Route 18A relates with (1),(2) ,(3)and (4).

In addition to the above regional development project, a potential project related with the Study area is “Emerald Triangle Plan.” This plan is initiated by Tourism Authority of Thai (TAT) aiming to link the three countries, Thai, Laos and Cambodia under the slogan "Tourism Route Linkage of Kumer Civilization" which consist of Phanom Rung (in Buriram, Thai), Wat Phou (in Champasack, Lao PDR), and Angkor Wat (in Siam Reap, Cambodia). An informal meeting was held on 13<sup>th</sup>-14<sup>th</sup> February 2002 in Ubon Rachathani (Thai) to exchange opinions among representatives from the three countries. Another meeting is expected to further develop the concept of this plan.

Wat Phou, a world heritage site in Champasack province, is important element of this tourism route. Ensuring all weather transportation is essential for the facilitation of tourism in the Study area. In this context, improvement of Route 14A correspond with the trend of the regional tourism development.

### 2.3.1 Urban Development

As the growth of manufacturing and service industries is accelerated extensively, cities grow and offer better access to employment, education, health care, and other public services to more population. Social and industrial infrastructure of the urban areas will be improved by the initiative of the Department of Urbanism and Housing of MCTPC. They are trying to slow down the rapid migration from rural area to the biggest cities by improving the core city in each area. Table 2.3.1 shows a national plan of urban improvement targeted 2005.

**Table 2.3.1 Urban Infrastructure and Service Target for 2005**

Level	Towns	Water Supply	Sanitation	Solid Waste
1	Capital	95% by house connection	75% improved on-site systems 50% serviced manually	90% household by public +100% commerce serviced
2	Regional Centers (Secondary Towns) Khanthabouri(Savannakhet) Pakse(Champasack)	90% by house connection	75% improved on-site systems 50% serviced manually	90% household by public +100% commerce serviced
3	Provincial Capitals  Sarawan Laman (Sekong)	80% by house connection	50% improved on-site systems 50% serviced manually	50% household by public +100% commerce serviced
4	Small Towns (+5,000 population) Outhoumphon (SV) Songkhon (SV) Vapi (SRV) Champsack (CPK) Thateng (CPK)	80% by house connection 25% by public/shared supply	50% improved on-site systems 50% serviced manually	30% household by public +100% commerce serviced

Source: Urban Sector Strategy Study, ADB July 1998

The two major projects to achieve the goal are Secondary Town Urban Improvement Project and Small Towns Development Project. In the southern Lao, Savannakhet and Pakse city are in the category of **Secondary Towns** and under renovation. Upgrading of streets, drainage system, solid waste disposal as well as riverbank protection in the rural core cities facilitate growth of the rural economy. City functions of **Pakse** in the Study area will rapidly be improved as a core city in the southern region.

On the other hand, Small Towns Development Projects, which is also financed by ADB, involves local towns with more than 5,000 populations. By its definition, towns in the category 3 and 4 in Table 2.3.1 are included in **Small Towns**. These towns are often provincial or district capitals and offer various services and market places to their surrounding areas. Table 2.3.2 lists these small towns by each district in the Study area. This program consists of two approaches i.e. Development Management and Community Planning, and is still at its planning stage.

These towns have been developed at the connecting points of the road links, and distributed rather evenly over the road network system of the Study area. Therefore, these urban development projects will not bring partial benefit to specific road links.

**Table 2.3.2 Small Towns in the Study Area**

Province	District Code	Small Town	Population of Urban Area	Related Road Link
Savannakhet	1302	Outhoomphone	16,109	
	1303	Atsaphanggthong	5,097	
	1305	Sepone	6,537	
	1308	Songkhone	9,204	
	1309	Champhone	9,741	
Saravane	1401	Saravane	11,062	1H, (15, 15east)
	1406	Khongxedone	6,000	(15)
	1407	Lao Ngarm	6,540	
Sekong	1501	Lamarm (Sekong)	8,317	(1i)
Champasack	1604	Paksong	5,577	(16A)
	1608	Sukhuma	5,915	14A, 14C1
	1606	Phonthong	9,491	14A1
Attapeu	1702	Samakhixay (Attapeu)	8,171	18A, 1J, (18B)
	1701	Xaysettha	7,600	(18B)

Source: Technical Report No.2 Small Town Development Strategy, ADB, Nov.2001

### 2.3.2 Focal Site Project

Population of Lao P.D.R. is sparsely dispersed. This makes public services to the local population very difficult. The government has been recognize that this local population has problems in food security, infrastructure, shifting cultivation, access to services, rural development. Focal site project, which began in 1994, is a trail to attack these problems in an integrated manner.

The first type of the focal site is resettlement of ethnic minority for the remote mountainous area to the flat area. Services that have been never accessible in the remote area are available in the focal site. This has been an effective way to improve the food security, education, health, and to let ethnic minorities to participate the market economy. Not all the focal sites have been successful, because relocation and change of livelihood often caused great difficulties to adapt to the “new life.” Some groups are reported to have return to their previous village. This resettlement type of focal site was the main stream in the early stage of the program.

The second type of focal site is integrated improvement of existing villages. Even in flat area, still many villages have insufficient food security, accessibility, and public services. Focal sites are expected to facilitate poverty alleviation and to reduce the development disparity among areas through market oriented agricultural production, livestock activities, human resource development, income generation activities, and accessibility to education and primary health care.

The Leading Committee for Rural Development (LCRD) in the Prime Minister's Office coordinates this project. At provincial and district levels, this project has a priority. Village volunteers from outside and inside of the villages support the site management. Government dispatches one officer for economic affairs and one officer for social affairs as deputy village leaders to support the activities of each village.

Table 2.3.3 show the focal sites in the Study area. This project will improve the quality of life on the remote area. Related road links are Route 1H, 14A, 1J and 18A.

**Table 2.3.3 List of Focal Sites in the Study Area**

Province		District		Focla Site Name	Household	Ethnicity		Total Population	Related Road
						Lao Loum	Lao Theung		
13	Savannakhet	1303	Atsaphongthong	Phonggarm	1,237	50	6,887	6,937	
		1305	Sepong	Lago	111	0	2,215	2,215	
		1312	Vilabuly	Angkham-Namchalo	528	2,001	1,384	3,385	
		1307	Thaphangthong	Phommalue-Sekue	894	0	4,369	4,369	
		Province Total			2,770	2,051	14,855	16,906	
14	Saravane	1404	Lakhonepheng	Lao-Thai Border	4,769	20,706	2,542	23,248	-
		1402,08	Ta Oi-Samoui	Lao-Vietnam Border	1,729	701	6,670	7,371	(16east)
		1407	Lao Ngarm	Porkhem	629	0	3,459	3,459	(20)
		Province Total			7,127	21,407	12,671	34,078	
15	Sekong	1504	Thateng	Torklork	593	0	4,405	4,405	1H
		1503	Daccheung	Lao-Vietnam Border	1,127	0	5,206	5,206	(16east)
		1502	Kaleum	Lao-Vietnam Border	374	0	2,758	2,758	-
		Province Total			2,094	0	12,369	12,369	
16	Champasack	1608	Sukhuma	Ban Heang	957	4,494	0	4,494	14A
		1609	Moonlapamok	Ban Pel	483	66	2,769	2,835	
		1604	Pakxong	Heauy Khong	1,705	452	7,072	7,524	-
		1606	Phonthong	Vernxaysakmaung	2,407	13,667	0	13,667	-
		Province Total			5,552	18,679	9,841	28,520	
17	Attapeu	1704	Sansay	Nampaam	291	0	1,280	1,280	-
		1705	Phouvong	Phouvong	456	0	2,505	2,505	1J
		1703	Sanaxay	Xepian	420	0	2,321	2,321	18A
		Province Total			1,167	0	6,106	6,106	
Study Area Total					18,710	42,137	55,842	97,979	

Source: Secretariat for Leading Committee for Rural Development

### 2.3.3 Rice Irrigation

National food security had been one of the most important national goals for long years. In the last five years Ministry of Agriculture and Forestry have made an intensive effort for pump irrigation along major rivers such as Mekong, Se Don, and Se Kong. The “National Pump Installation and Management Project” installed more than 7,000 units of pump units and increased rice production from 1.4 million tons (in 1996) to 2.2 million tons (in 2000).<sup>2</sup> This drastic increase in rice production made the nation food sufficiency.

The southern area of the nation, i.e. Study area, has little traditional irrigation system. And the irrigation system including maintenance operation is not well established. The rice-plant-area in 2001/2002 has recorded a significant decrease, which is becoming a big issue in agricultural policy. This decrease is said to be due to high water charge to the farmers and unsuccessful maintenance of pumps imported from China. Falling rice price makes it very difficult to obtain enough profit with irrigated rice cultivation.

National food sufficiency is very important issue and irrigation area will be increasing with some fluctuation. However, the growth of rice irrigation has limitation. There are some reasons. First, once Lao farmer themselves become self-sufficient with rice, the growth of rice consumption can be easily overcome by the growth of yield. Second, International rice price is very unstable, and has decreased a lot in these years. Rice of Lao PDR has little competitive advantage both in price and quality to participate in international market. So it is doubtful if market oriented farmers are continuously interested in further development of rice irrigation. Data on rice harvested area, rice production, and rice yield of last five years by province are available in the *Yearly Statistic Report 2000, Ministry of Agriculture and Forestry*. The same data for 1998/9 is available in the Agricultural Census.

On the contrary to the focal sites project, irrigation project will promote further improvement of the water-rich area, where paddy field has been developed in a large scale. The improved Road 13 is the main artery to accommodate increasing traffic of this project. Other than this, Route 14A, and 18A has some concentration of large irrigation sites along them.

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<sup>2</sup> Master Plan Study on Integrated Agricultural Development in Lao P.D.R, Aug.2001, JICA

### 2.3.4 Hydroelectric Power Plant Development

Since the Boloven Plateau and its surroundings have abundant precipitation, this is one of the best areas for hydroelectric power plant. Besides a few existing dams and plants for power generation, there are several plans for dam and plant construction in the Study area. Tease constructions have impacts on regional development. The electricity can earn foreign currency, improve the local life, and facilitate industry. The reservoir is good for aquaculture in a bigger scale and tourism development besides irrigation. The dam and plant construction is also a good chance to improve the access road for neighboring villages. Existing and proposed hydroelectric power plants site are shown in the Table 2.3.4.

**Table 2.3.4 Major Hydroelectric Power Development in the Study Area**

Province	Code	District	Name of Dam	Year of Completio	Capacity (Mw)	Resavoir Area	Related Road Link
Saravane	1407	Lao Ngam	Xeset	1991	45		
Champasack	1602	Sanasomboun	Xelabam	1970	2		
	1602	Sanasomboun	Xelabam	1994	3		
Attapeu	1702	Samakhixay	Houay Ho	1999	150		
Savannakhet	1305	Xepon	Xepon	2012	75	29.5	(9)
Saravan	1401	Saravan	Xeset-2	2005	69	1.5	(20)
	1401	Saravan	Xeset-3	2008	16	1.3	(20)
Sekong	1502	Kaleum	Xekong-5	2014	258	70.0	(15east)
	1502	Kaleum	Xekong-4	2014	451	160.4	(16east)
	1504	Thteng	Houaylamphan	2010	60	3.5	(16)
Champasack	1610	Khong	Tha Kho	2008	36	0.0	(13)
Attapeu	1703	Sanamxay	Xepian-Xenamnoy	2010	392	43.5	18A
	1704	Sanxay	Xekaman-1	2010	469	220.0	-
	1704	Sanxay	Xekaman-3	2012	308	12.0	(16east)
	1705	Phouvong	Nam Kong-1	2012	238	12.1	-
	1705	Phouvong	Nam kong-3	2016	34	36.9	1J
	1705	Phouvong	Xexou	2020	59	112.9	(18B)

Source: Electricity Department, Ministry of Industry and Handicraft

Hydroelectric power had been considered to be a most emerging export item until 1997, when a big monetary crisis attacked the Thailand. Price of electricity severely influences the feasibility of the planned projects. In other words, EIRR of the hydroelectric power plant projects become smaller, which negatively affects the project implementation. However, electricity will keep its status as one of the most important exporting items. It is recommended that dams and reservoirs be used multi-purposely so that the positive impact of the dam construction to the regional socio-economy could be maximized.

Among the road links within the Study scope, Route18A, and 1J will have impacts from hydroelectric power plant development. These links could be improved, as access roads to the plants, in the same way as Route 16A has been so.

### **2.3.5 Agriculture Development in Boloven Plateau**

The Boloven Plateau is one of the most promised area for agricultural development in the Greater Mekong Region. This highland was formulated by the volcano activities and has moderate altitude and temperature, ample precipitation, and extensive flat land for crops. Cash crops such as coffee, tea, vegetable, and spices are grown here. Farmers sell these commodities and buy rice for their own consumption. This area has a big population of ethnic minorities, therefore, development of the plateau also contributes to economic disparity between ethnic Lao and minorities.

Coffee plantation is leading the agriculture of the plateau. Coffee harvesting land area counts 29,260ha, with an average growing rate is 7.74% per year from 1996 to 2000. Laos exported 12,000 tons of coffee in 1998. This is rather small comparing with its competitors such as Indonesia (358,000 tons), Vietnam (382,000 tons) and Thailand (66,000 tons), but a leading commodity of the agriculture in Laos. Most of the coffee is grown and dried by individual farmers and sold to the dealers from Thailand. Problems of this coffee plantation at the moment are (1) variety of coffee species, (2) lack of access road and (3) small size of each farming unit.

A French organization is assisting the farmers to change their coffee species from Robusta to Arabica. The latter type of variety produces much better yield and sells for significantly higher price. There are some plans of improving feeder road of the plateau, mainly for the transportation of the harvested coffee and for the daily life of the local population. Cooperation of the farmers is also a big issue. The buyers from Thailand take initiative of the coffee bean pricing. Individual farmers do not have enough knowledge concerning international price of the crops and have no way to negotiate for an advantageous price. It is said that farmers would get much more (two to three times) benefit if they could cooperate each other to bring their coffee to Thailand.

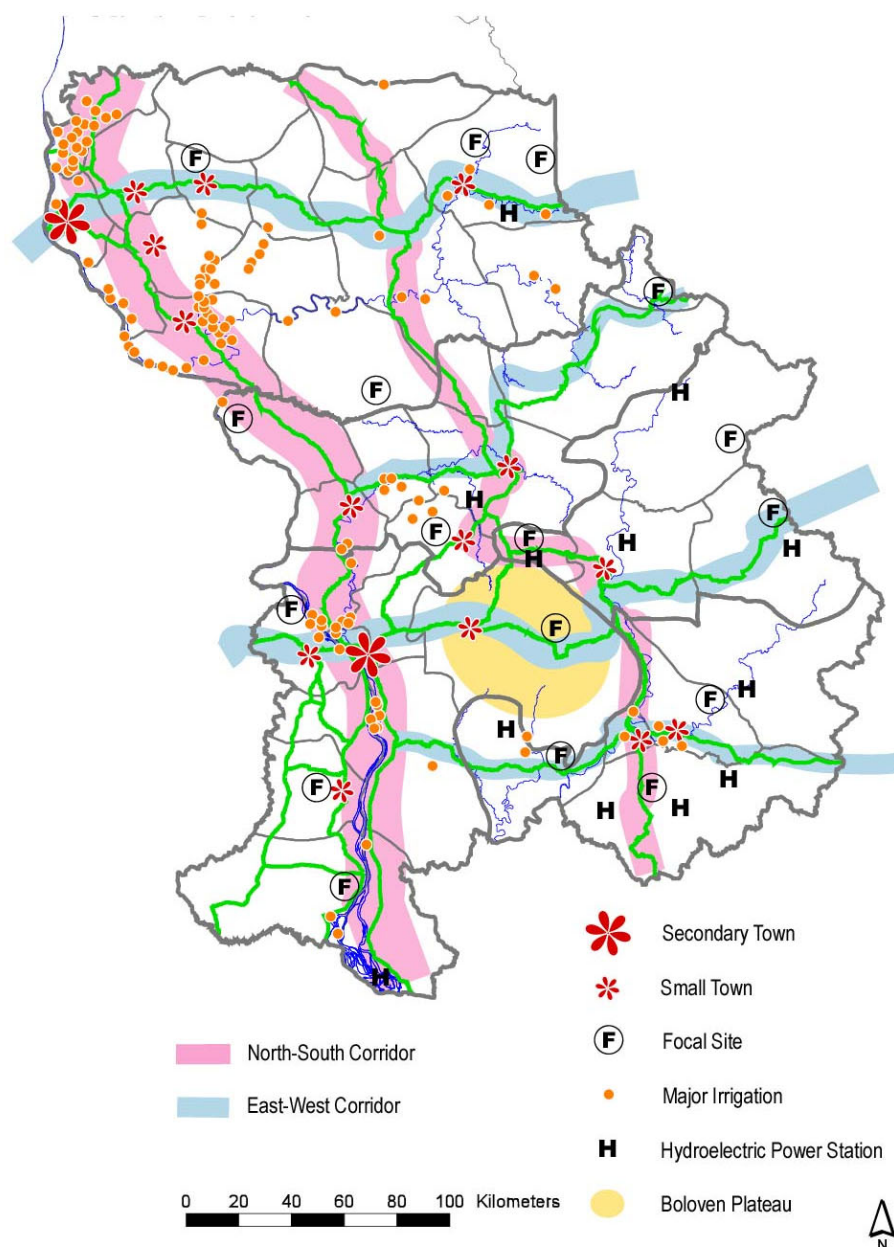
Other than coffee bean, this plateau is famous for tea, spice, and vegetable. They are all market-oriented products and bring considerable income to the farmers.

Ministry of Agriculture and Forestry, Provincial Government of Champasack as well as donors are focusing in the agriculture development of the area. Improvement of Route 16A will encourage this trend so that crops could be transported efficiently to Pakse and Thailand as well as Vietnam via Route 18B.



### 2.3.6 Spatial Distribution of Major Development

Figure 2.3.1 shows spatial distribution of the above-mentioned projects. National road network as corridor or axis for well-balanced development should be developed.



**Figure 2.3.1 Spatial Distribution of Major Development Projects and National Roads**

### **2.3.7 Development Scenario of the Southern Region**

The most preferable scenario of the southern Laos is as shown below;

#### **(1) Development of Growing Cores**

##### **(1-1) Industry and Commerce**

Southern region of Laos needs growing cores. The super core is Pakse city and its surroundings, with satellite cores like Saravan, Sekong, and Attapeu. These centers lead the economic development of the southern region and the nation. More and more public and private investment shall be implemented for a better return in the sector of industry and commerce. The area along the Mekong River would be the pole of economic growth. This artery leads the economic growth and drives the region to the next stage.

##### **(1-2) Agriculture and Tourism**

Sufficient agricultural products are the very basis of the prospective economic development. Pakse and its surroundings can produce stable agricultural surplus (mostly rice) that can support the development of the whole southern Laos. More investment and improved management is required for advanced agriculture.

In addition, major tourism resources are concentrated in Champasack Province. Efficient organization and arrangement of area tourism have a big possibility to bring in significant amount of foreign currency.

##### **(1-3) Public Investment for Infrastructures**

Roads and electric power plants shall be constructed or improved as soon as possible. However, the most important criteria for prioritizing is a cost-benefit performance. Concentrated road improvement and electric power distribution in the growing cores will effectively enhance the development of the centers.

##### **(1-4) International Trade**

International trade could drastically change the local economy either positively or negatively. The international connection between core cities of the Southern Region and Vietnam/Thailand via Route 15east, Route16, and Route 18B will extensively vitalize the economic conditions of the southern region. International transportation system should be improved to achieve the prosperity of the region, which brings great benefits.

#### **(2) Focus on Remote Area**

While encouraging the growing core, poverty reduction in remote areas is one of the most important issues of the nation. Food security, primary school, health care, access road should

be improved to the acceptable stage. Since the resource allocation for the social development is, relevant projects should employ community participation methods.

**(3) Market Oriented Agriculture, Fishery and Livestock**

As farmland and yield are growing, farmers expect more and more product surplus. To connect this to further development, farmers should be more price-conscious. This will facilitate farmers to get rid of subsistence agriculture. Cash crops of the Boloven Plateau will lead this effort.

**(4) Road Network Improvement**

Road network to connect every district capital each other with all-weather roads should be a goal of mid-long term development plan. This expensive attempt includes not only national roads but also provincial ones. However, MCTPC and DCTPC should carefully examine the prioritization for the improvement under budgetary constrains.

**(5) Sustainable Forestry**

In year 2000, timber and furniture earn US\$26,293,738 and covers 77.9% of the total value exported from the provinces in the southern region. Deforestation or selling forest concession to the private sector is one of the easiest ways to get revenue to the government account. Nevertheless, forestry should be managed in the most conservative manner. Since long years are required to grow a tree for timbers and many of the local communities are rely on the forest, mainly on the non-wood forest products. Forestry needs long-term and premeditated investment, and if appropriately be managed this sector brings sustainable income to the area.

## 2.4 Methodology of Socio-Economic Analysis on Regional Development

### 2.4.1 Introduction

Socio-economic analysis is important to examine how the improvement of national road links contributes to the economic development and people's quality of life.

The study Team focused on four economic aspects and four social aspects based on the regional development.

#### **Economic Aspects:**

- (1) Economic Efficiency
- (2) Tourism Potential,
- (3) Network Connectivity
- (4) Unexploded Ordnance

#### **Social Aspects:**

- (1) Rice Product per Person
- (2) Literacy and Education
- (3) Ethnic Minorities
- (4) Accessibility

### 2.4.2 Eight Socio-Economic Criteria

The following is a summary of the eight criteria selected for socio-economic analysis. **First group** (1, 2, 3, 4) clarifies economic aspects of the study area and road links. Higher economic efficiency, more tourism resource, and better connectivity, all require better roads. In addition, more investment in roads provide a good return if demand is high enough. With these aspects, road links in more prosperous districts achieve a higher score. The basic concept of the evaluation with these economic criteria is as follows;

- +++ There is a major economic demand for road improvement
- ++ Road improvement will facilitate economic development
- + Road improvement may contribute to the area economy to some extent
- 0 Road improvement has very little economic potential to develop the area economy
- Minus score is applied only for UXO presence. Road links with “-” score have significant UXO impact.

**(1) Economic Efficiency (Criterion 1)**

Economic efficiency consists of three factors i.e. GDP/capita (Criterion 1-1), work force in industrial & service sectors (Criterion 1-2), and population impacted per road length (Criterion 1-3). These factors, i.e. prosperity (capital), human resource, and dense population are competitive advantages for economic development.

**(2) Tourism Potential (Criterion 2)**

Tourist resources, if appropriately facilitated, can generate considerable business opportunities. A road link with potentially high tourist traffic can effectively serve the development of this emerging industry.

**(3) Network Connectivity (Criterion 3)**

Road links that facilitate international traffic or secure inter-provincial connections will notably promote the area economy.

**(4) Unexploded Ordnance (UXO) (Criterion 4)**

Road links with heavy UXO impacts have constraint with road construction as well as with land development along the improved road. UXO impact is evaluated negatively.

**Second group** (5,6,7,8), i.e. social criteria, are tools to examine the social aspects of the study area and road links. There are significant gaps between well-off areas and poor areas. Generally, poor areas are suffering from low food security, low literacy, low accessibility and so on. On the other hand, it is a well-known fact that good roads can notably facilitate social development. At this moment, there is little economic demand for road investment in the poorer areas, however, good road would facilitate socio-economic development and generate economic demand. In this context, road investment in poorer areas might not immediately produce a good return. Notwithstanding, this road improvement is necessary for social or political reasons. Balanced development and national integration are the keywords. The basic evaluation concept for these economic criteria is as follows;

+++	Road improvement will significantly contribute to improving social condition.
++	Road improvement will moderately contribute to improving social condition
+	Road improvement will contribute to improving the situation to some extent
0	Road improvement will contribute little to improving the situation. Or considerable road improvement has already been implemented, therefore, investment priority should be given to other road links.

**(5) Rice Product per Person (Criterion 5)**

This is a criterion concerning food security. Road improvement in an area of rice insufficiency will facilitate alternative income generation in addition to improving the rice productivity. Areas of lower food security need more road improvement.

**(6) Literacy & Education (Criterion 6)**

Literacy and education are basic indicators for level of human resource development. Road improvement may positively promote accessibility to schools, efforts of public administration in education.

**(7) Ethnic Minorities (Criterion 7)**

Generally, ethnic minorities are living in worse social conditions than ethnic Lao (ethnic majority). A greater presence of ethnic minorities infers more poverty in the area. The presence of minority population helps government to target poverty with infrastructure investment.

**(8) Accessibility (Criterion 8)**

Areas with worse accessibility need more road improvement. Road development can directly improve the poor accessibility.