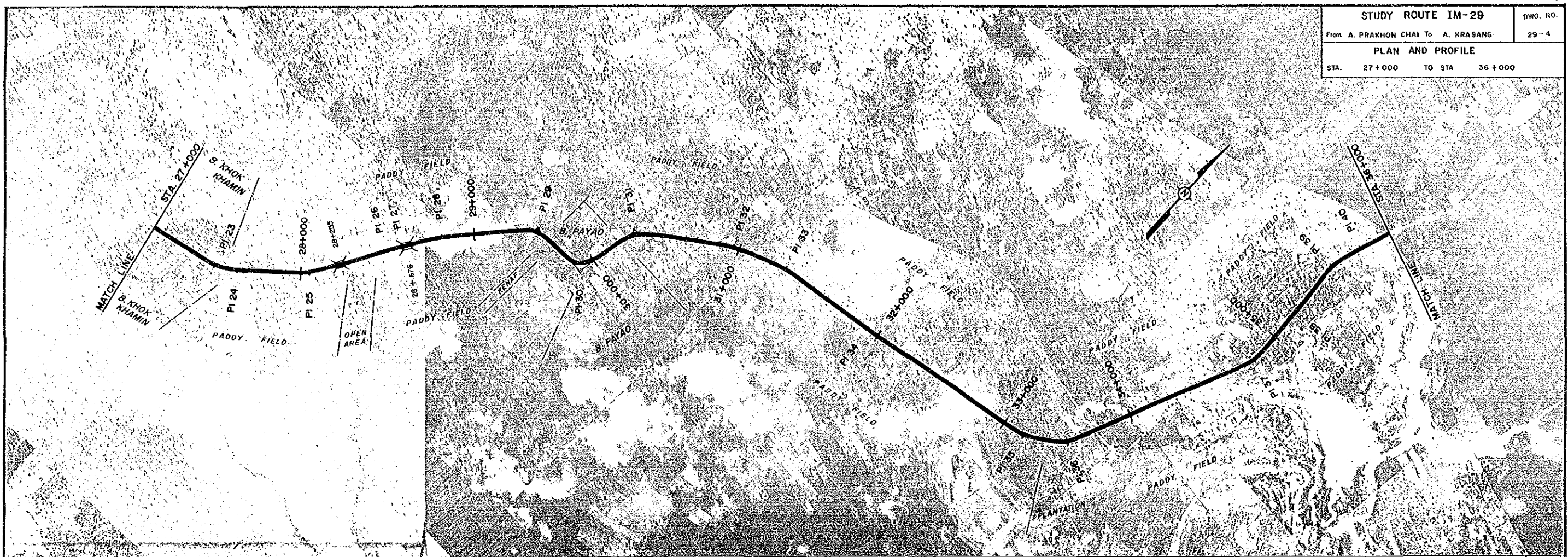
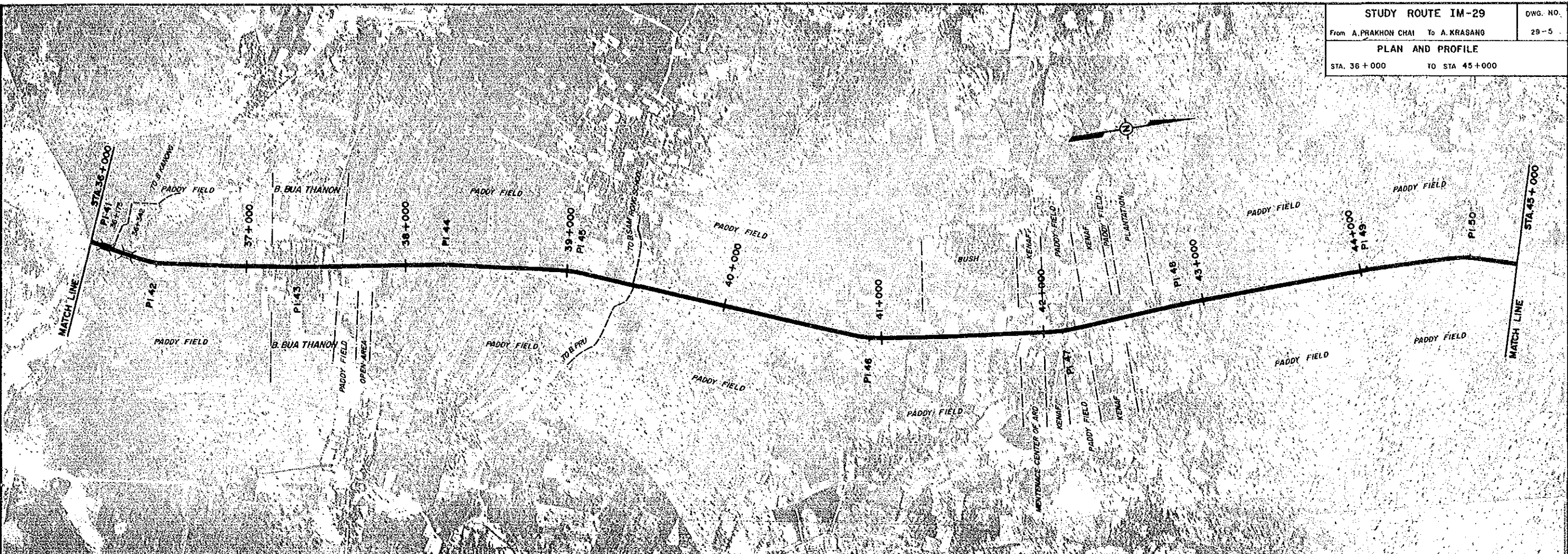


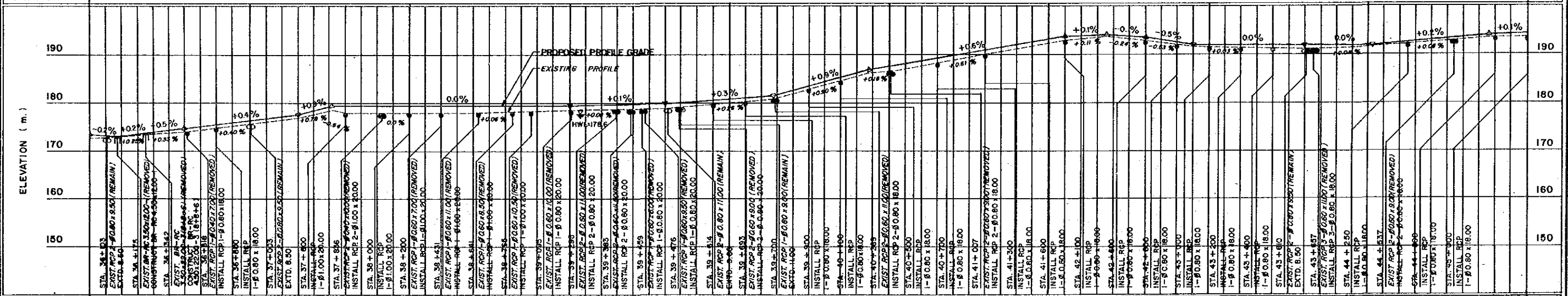
TERRAIN	FLAT										
PAVEM'T	Type	LATERITE	ST	LATERITE							
	Condition	GOOD			FAIR						
FLOODING	Length (m.)			600							
	Height (m.)			0.30							
RIGHT OF WAY (m.)	35.00	22.00	35.00	14.00	35.00						
ROUTE NO. AGENCIES	DOH. ROUTE NO. 2208										
CURVA-TURE BAND	Existing Alignment	L=162 R=328	L=160 R=142		L=105 R=133.9						
	Proposed Alignment	L=162 R=328	L=160 R=142		L=105 R=133.9						
ELEVATION (m.)		<p>PROPOSED PROFILE GRADE</p> <p>EXISTING PROFILE</p> <p>0.00% 0.10% 0.20% 0.30% 0.40% 0.50% 0.60% 0.70% 0.80% 0.90% 1.00% 1.10% 1.20% 1.30% 1.40% 1.50% 1.60% 1.70% 1.80% 1.90% 2.00% 2.10% 2.20% 2.30% 2.40% 2.50% 2.60% 2.70% 2.80% 2.90% 3.00% 3.10% 3.20% 3.30% 3.40% 3.50% 3.60% 3.70% 3.80% 3.90% 4.00% 4.10% 4.20% 4.30% 4.40% 4.50% 4.60% 4.70% 4.80% 4.90% 5.00%</p> <p>170 160 150 140 130</p>									
STATION (Km.)		18+000	19+000	20+000	21+000	22+000	23+000	24+000	25+000	26+000	27+000



TERRAIN	FLAT			FLAT			ROLLING																		
PAVEM'T	Type	LATTERITE																							
	Condition	GOOD			FAIR			GOOD																	
FLOODING	Length (m.)	2050																							
	Height (m.)	0.50																							
RIGHT OF WAY (m.)	14.00	35.00																							
ROUTE NO. AGENCIES	A R D																								
CURVA-TURE BAND	Existing Alignment	L=152 R=487		L=72 R=329		L=73 R=227		L=24 R=16		L=101 R=2604		L=103 R=235		L=141 R=211		L=28 R=98		L=92 R=531		L=148 R=1093		L=41 R=142		L=152 R=929	
	Proposed Alignment	L=152 R=487		L=72 R=329		L=73 R=227		L=24 R=16		L=101 R=2604		L=103 R=235		L=141 R=211		L=28 R=98		L=92 R=531		L=148 R=1093		L=41 R=142		L=152 R=929	



TERRAIN	FLAT	
PAVEM'T	Type	LATERITE
	Condition	GOOD
FLOODING	Length (m.)	300
	Height (m.)	0.40
RIGHT OF WAY (m.)	35.00	
ROUTE NO. AGENCIES	ARD	
CURVA-TURE BAND	Existing Alignment	L=187 R=275
	Proposed Alignment	L=187 R=275
CURVA-TURE BAND	Existing Alignment	L=180 R=4407
	Proposed Alignment	L=180 R=4407
CURVA-TURE BAND	Existing Alignment	L=218 R=3907
	Proposed Alignment	L=218 R=3907
CURVA-TURE BAND	Existing Alignment	L=143 R=851
	Proposed Alignment	L=143 R=851
CURVA-TURE BAND	Existing Alignment	L=90 R=1332
	Proposed Alignment	L=90 R=1332
CURVA-TURE BAND	Existing Alignment	L=85 R=601
	Proposed Alignment	L=85 R=601
CURVA-TURE BAND	Existing Alignment	L=165 R=2261
	Proposed Alignment	L=165 R=2261
CURVA-TURE BAND	Existing Alignment	L=281 R=4982
	Proposed Alignment	L=281 R=4982
CURVA-TURE BAND	Existing Alignment	L=236 R=4775
	Proposed Alignment	L=236 R=4775
CURVA-TURE BAND	Existing Alignment	L=160 R=841
	Proposed Alignment	L=160 R=841
STATION (Km.)	36+000	45+000





TERRAIN	FLAT	
PAVEMENT	Type	LATERITE ASPH.
	Condition	GOOD
FLOODING	Length (m.)	
	Height (m.)	
RIGHT OF WAY (m.)	35.00	14.00
ROUTE NO.	ARD	
AGENCIES		
CURVA-TURE BAND	Existing Alignment	L = 183 R = 1051
	Proposed Alignment	L = 183 R = 1051
<p>ELEVATION ( m. )</p> <p>STATION (km) 45+000 46+000 47+000</p>		

STUDY ROUTE NO. IM - 31

Changwat : Buri Ram

B. Nong Pha Ong - A. Nong Ki (J.R.24)

Length : 52.6 KM.

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**SUMMARY**

**STUDY ROUTE IM-31**

**General**

Changwat : Buri Ram  
 Origin and Destination : B. Nong Pha Ong—A. Nong Ki  
 Connected Road Network : 2162—24  
 Amphoe on Route :  
 Number of Related Villages : 9

**Influence Area**

Area : 448 km<sup>2</sup>  
 Cultivated Area Ratio to Total Land Area in % : 93  
 Population in 1983 : 51,800  
 Main Crops : Paddy & Cassava  
 Number of Public Activities :  
 Public Health Service Centers : -  
 Hospitals Changwat Level : -  
 Amphoe Level : 2  
 Schools Primary : 13  
 Secondary : 2

Traffic (ADT) : 1984—183 1988—319  
 1994—469 2002—805

**Nomenclature of Study Route**

Total Length : 52.6 km  
 Improvement Section : 52.6 km  
 DOH Road : 52.6 km  
 ARD Road : -  
 Other Road : -  
 New Construction Section : -  
 Design Standard Employed : F4

**Construction Cost in Baht**

Financial : 79,741,000  
 Economic : 66,668,000

**Economic Indicators**

IRR : 19.2% Ranking: 3

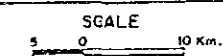
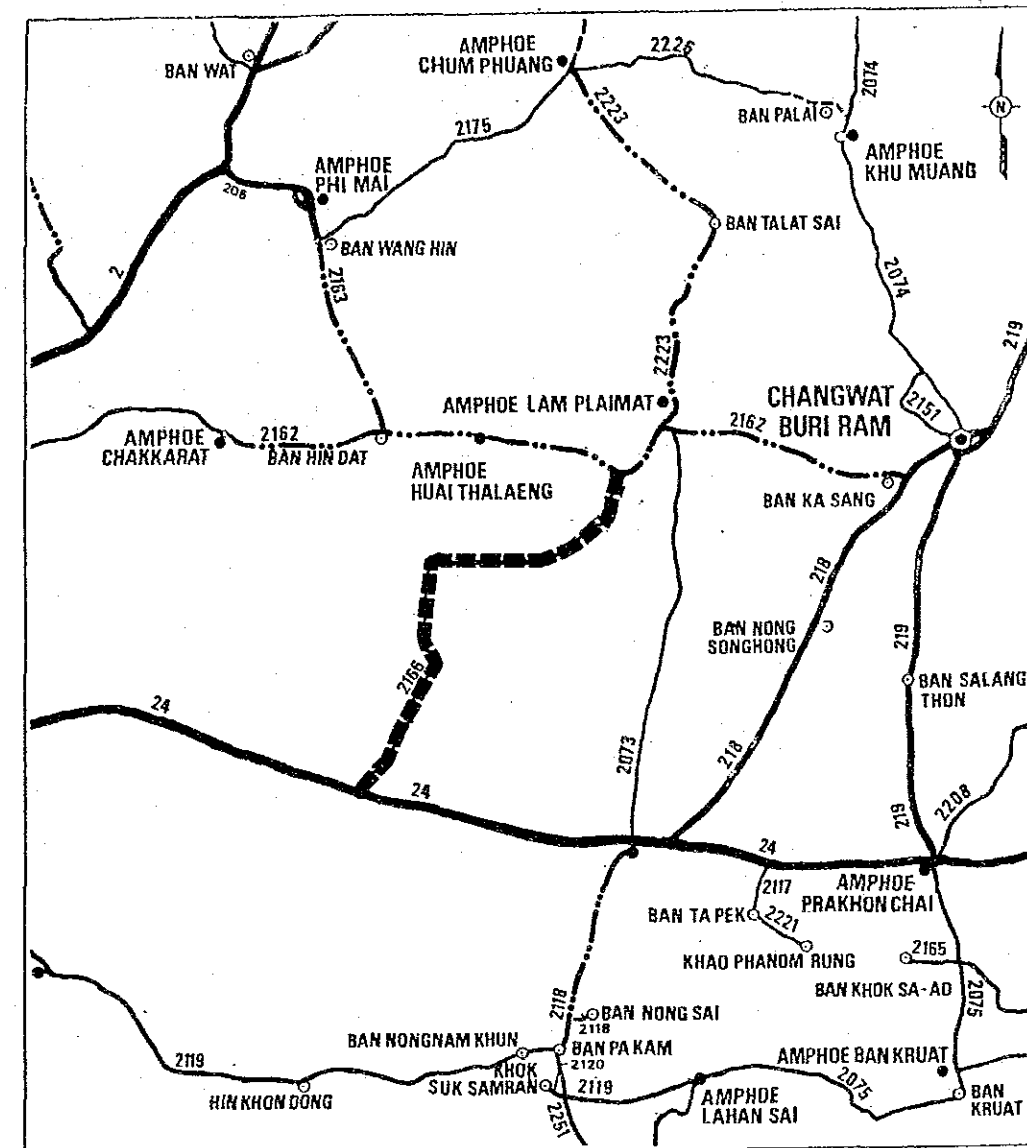
**Social Impact**

Social B/C Ratio : 0.261 Ranking: 6

**Recommendations**

Opening Year : 1990 Overall Ranking: 2

**LOCATION OF STUDY ROUTE**



**LEGEND**

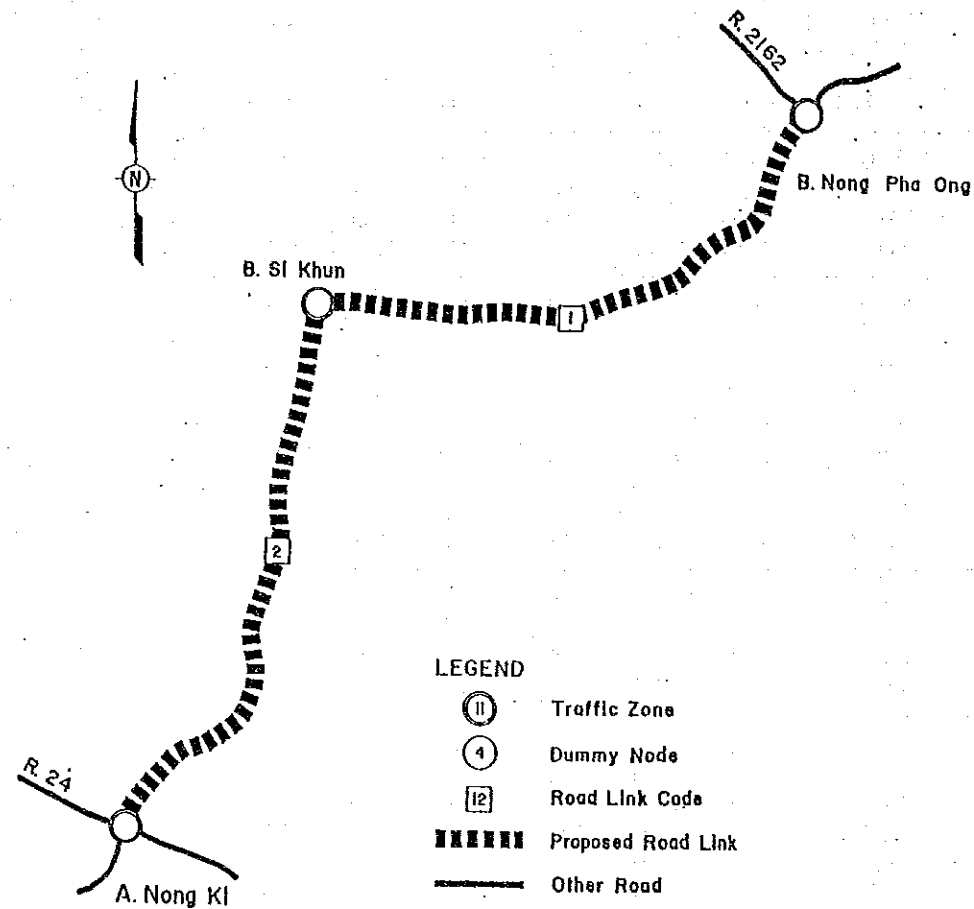
- STUDY ROUTE
- NATIONAL HIGHWAYS ( PAVED )
- PROVINCIAL HIGHWAYS ( PAVED )
- PROVINCIAL HIGHWAYS ( TO BE PAVED, COMMITTED IN 5th PLAN )
- PROVINCIAL HIGHWAYS ( UNPAVED )
- OTHER ROAD

### 31. TRAFFIC

#### 31.1.1 Method Employed in Traffic Forecasting

The growth rate method was employed in forecasting traffic because no diverted traffic after improvement was expected on this study route.

#### 31.1.2 Assumed Road Link



#### 31.1.3 Traffic Forecast

- 1) Items necessary for forecasting traffic were:
  - Traffic volume in base year
  - Passenger and freight movement in base year
  - Growth rates of passenger and freight movement
  - Rate of induced and developed movement
  - Traffic composition

TRAFFIC VOLUME IN BASE YEAR

LINK	TYPE OF VEHICLE								ADT	M/C	TOTAL
	P/C	L/B	M/B	H/B	F/P&T	4/T	6/T	10/T			
1	29	10	81	1	64	8	16	14	223	186	409
2	2	2	52	0	61	13	16	2	148	106	254
AVE.	15	6	66	0	62	11	16	8	183	143	326

PASSENGER AND FREIGHT MOVEMENT IN BASE YEAR

PROPOSED ROAD LINK	PASSENGER MOVEMENT (TRIPS PER DAY)	FREIGHT MOVEMENT (TONNAGE PER DAY)		
		NON-AGRI.	AGRI.	TOTAL
1	2259	97.1	48.1	145.2
2	1388	44.8	22.2	67.1

GROWTH RATE OF PASSENGER MOVEMENT

(UNIT : % P.A.)

YEAR	PER CAPITA INCOME	POPULATION	PASSENGER MOVEMENT
1984 - 1988	3.1	2.0	6.4
1988 - 1994	3.1	1.7	6.2
1994 - 2002	3.1	1.5	5.9

GROWTH RATE OF FREIGHT MOVEMENT

(UNIT : % P.A.)

YEAR	NON-AGRI. FREIGHT	AGRI. FREIGHT	FREIGHT MOVEMENT
1984 - 1988	8.0	0.3	5.6
1988 - 1994	7.6	0.3	5.9
1994 - 2002	7.3	0.3	6.2

RATE OF INDUCED AND DEVELOPED MOVEMENT

(UNIT : %)

YEAR	INDUCED		DEVELOPED		
	LINK		PASSENGER	NON-AGRI.	AGRI.
	1	2	MOVEMENT	FREIGHT MOVEMENT	FREIGHT MOVEMENT
1988	15.0	15.0	0.0	0.0	0.5
1994	15.0	15.0	0.0	0.0	3.9
2002	15.0	15.0	0.0	0.0	7.1

TRAFFIC COMPOSITION

(UNIT : %)

LINK NO.	YEAR	PASSENGER					FREIGHT			
		P/C	P/P	L/B	M/B	H/B	P/T	4/T	6/T	10/T
1	1984	20.8	38.7	4.4	35.7	0.4	20.8	16.7	33.3	29.2
	1988	24.8	38.5	4.1	30.7	1.9	19.1	15.4	37.0	28.5
	1994	30.9	38.3	3.6	23.1	4.1	16.5	13.5	42.6	27.4
	2002	39.0	38.0	3.0	13.0	7.0	13.0	11.0	50.0	26.0
2	1984	2.3	59.7	1.4	36.6	0.0	22.5	32.5	40.0	5.0
	1988	10.5	54.9	1.8	31.3	1.6	20.4	27.7	42.2	9.7
	1994	22.7	47.6	2.3	23.5	3.9	17.2	20.6	45.6	16.7
	2002	39.0	38.0	3.0	13.0	7.0	13.0	11.0	50.0	26.0

- 2) The following were output:  
 - Forecasted ADT  
 - Traffic volumes

AVERAGE FUTURE TRAFFIC ON PROPOSED ROUTE

YEAR	TYPE OF VEHICLE									ADT	M/C	TOTAL
	P/C	L/B	M/B	H/B	P/P&T	4/T	6/T	10/T				
1988	49	8	80	5	129	12	23	12	317	331	648	
1994	109	12	92	16	180	12	33	17	472	388	860	
2002	271	21	90	49	278	12	55	29	805	465	1270	

TRAFFIC VOLUME ON ROUTE IM- 31 LINK COUNT= 2

LINK	YEAR	1988			1994			2002		
		1	2	AVR.	1	2	AVR.	1	2	AVR.
P/C	N+D	70	18	42	134	61	95	297	182	236
	I	11	3	6	20	9	14	45	27	35
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	81	21	49	154	70	109	341	210	271
L/B	N+D	12	3	7	16	6	11	23	14	18
	I	2	0	1	2	1	2	3	2	3
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	13	4	8	18	7	12	26	16	21
M/B	N+D	87	55	70	100	63	80	99	61	79
	I	13	8	10	15	9	12	15	9	12
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	100	63	80	115	73	92	114	70	90
H/B	N+D	5	3	4	18	10	14	53	33	42
	I	1	0	1	3	2	2	8	5	6
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	6	3	5	20	12	16	61	38	49
P/P&T	N+D	120	105	112	180	136	157	307	186	242
	I	18	16	17	27	20	23	46	28	36
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	138	121	129	207	157	180	353	214	278
4/T	N+D	9	12	10	11	10	10	15	7	10
	I	1	2	2	2	1	2	2	1	2
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	11	13	12	13	11	12	17	8	12
6/T	N+D	22	18	20	35	22	28	66	31	47
	I	3	3	3	5	3	4	10	5	7
	DV	0	0	0	0	0	0	1	0	0
	TOTAL	25	20	23	41	25	33	77	36	55
10/T	N+D	17	4	10	23	8	15	35	16	25
	I	3	1	2	3	1	2	5	2	4
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	19	5	12	26	9	17	40	19	29
ADT	N+D	342	217	275	517	316	410	894	529	699
	I	51	33	41	78	47	61	134	79	105
	DV	0	0	0	1	0	1	1	1	1
	TOTAL	393	250	317	596	364	472	1030	609	805
M/C	N+D	346	280	311	406	335	368	485	409	445
	I	20	20	20	20	20	20	20	20	20
	DV	0	0	0	0	0	0	0	0	0
	TOTAL	366	301	331	426	355	388	506	430	465
TOTAL	N+D	688	498	586	923	651	778	1380	938	1144
	I	72	53	62	98	68	82	154	100	125
	DV	0	0	0	1	1	1	2	1	1
	TOTAL	760	551	648	1022	719	860	1536	1039	1270

NOTE

N : NORMAL TRAFFIC      D : DIVERTED TRAFFIC  
 DV : DEVELOPED TRAFFIC      I : INDUCED TRAFFIC

## **31.2 AGRICULTURAL DEVELOPMENT**

### **31.2.1 Present Condition**

Almost all of the cultivated land in the influence area is covered by paddy fields. Among the major crops planted in upland fields in the 1983 crop year, cassava ranked first followed by beans, maize, kenaf, groundnuts and sugarcane.

Land use and capability conditions in the area are shown in Table 31.2.1 and Figure 31.2.1. A typical cropping calendar in the area is shown in Figure 31.2.2.

### **31.2.2 Development Projection**

Future agricultural development in the area of influence was projected for the two cases of "with and without project". The projected planted area, unit yields by crop, and the consequent production amount are shown in Table 31.2.2.

Based on the above projected production amount, farmgate prices and production costs estimated separately, net production value (NPV) was obtained as shown in Table 31.2.3. The difference in NPV between the two cases is deemed to be the development benefit of the study route.



FIGURE 31.2.1 LAND USE AND CAPABILITY OF INFLUENCE AREA

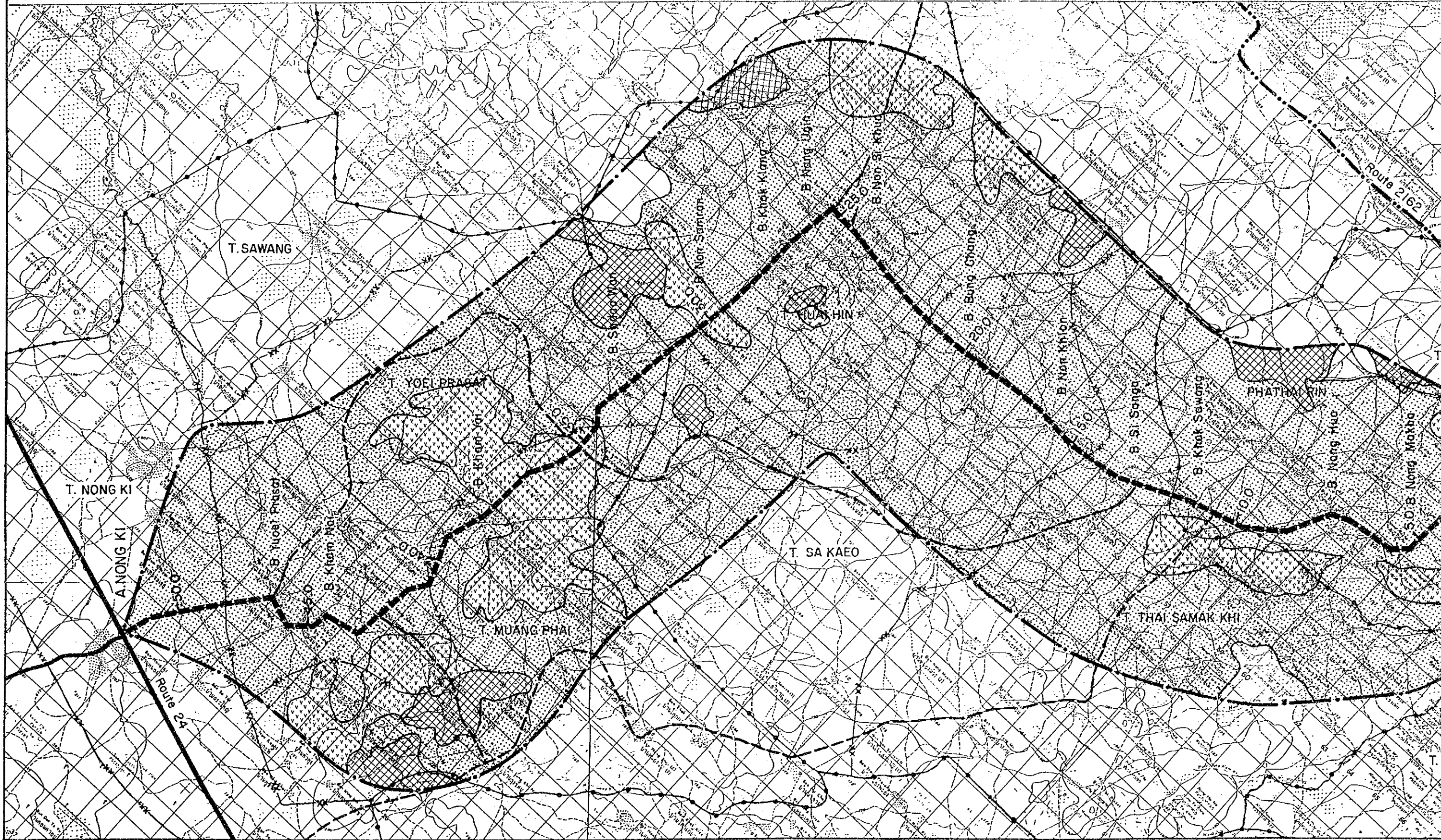


FIGURE 31.2.1

LAND USE AND CAPABILITY OF INFLUENCE AREA

STUDY ROUTE NO. IM-31

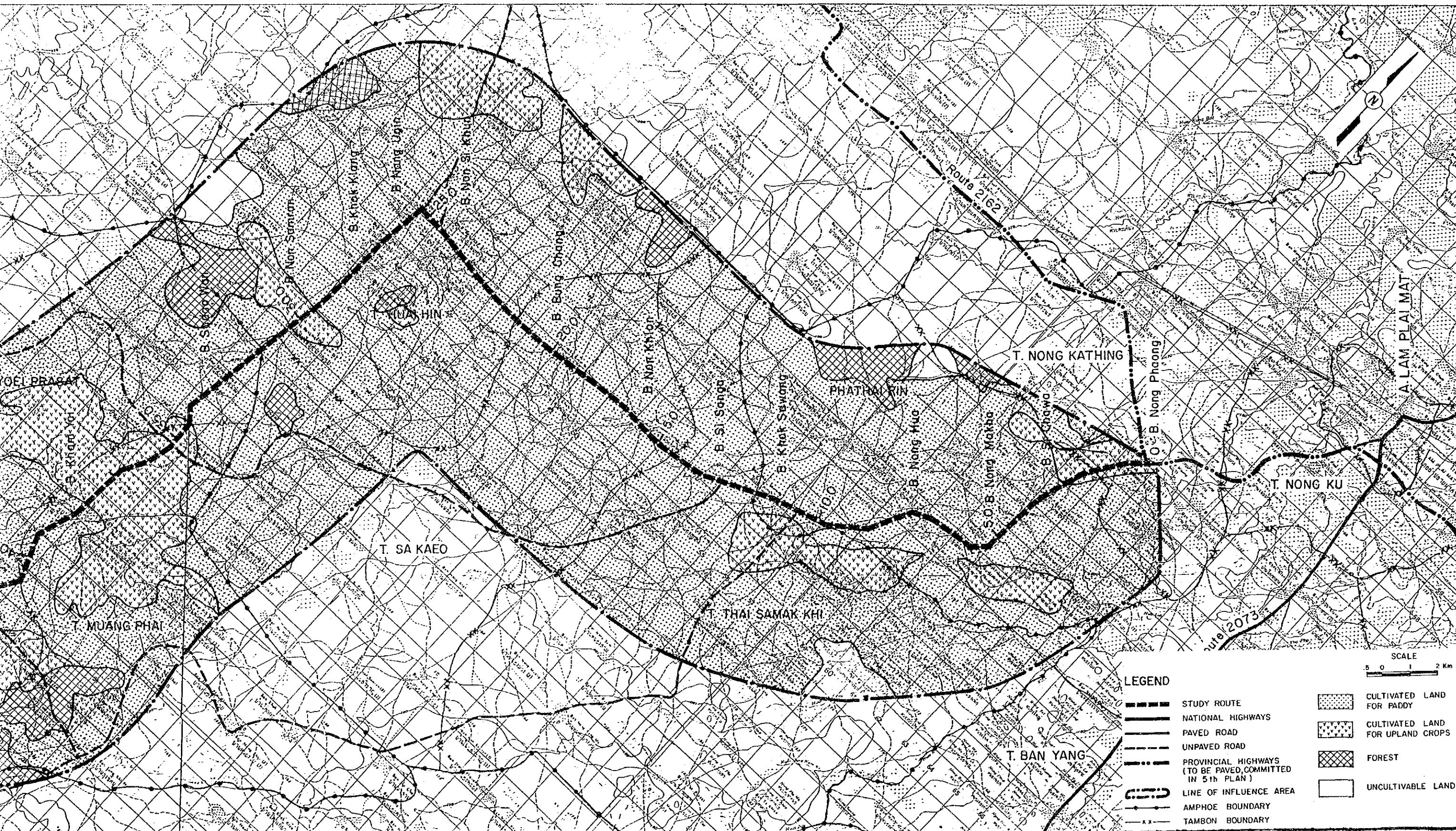
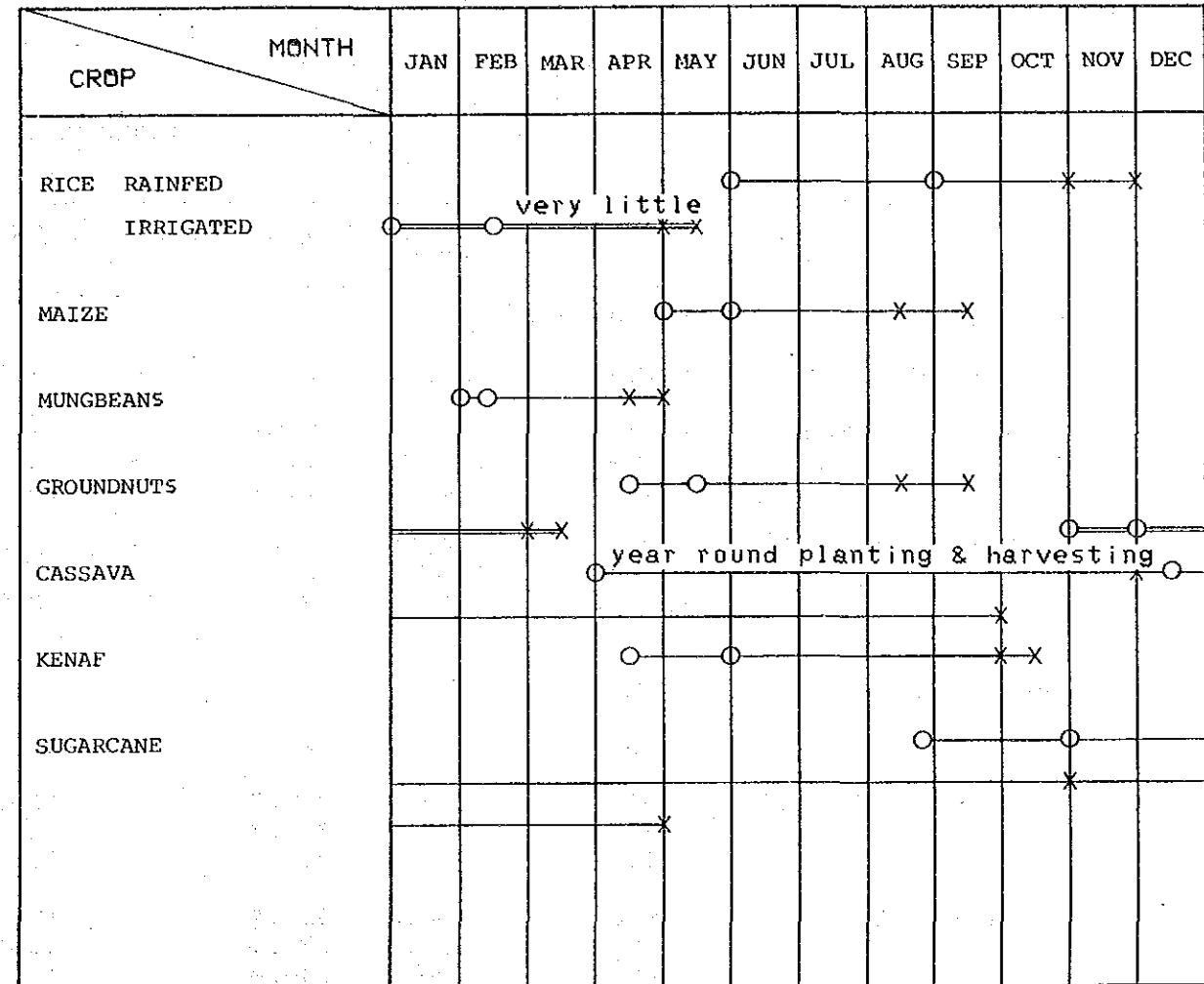


FIGURE 31.2.1 CROPPING CALENDAR

ROUTE IM- 31

Related Amphoes: 1406 Lam Plai Mat  
1407 Nong Ki  
1413 K. Nong Hong



Note:

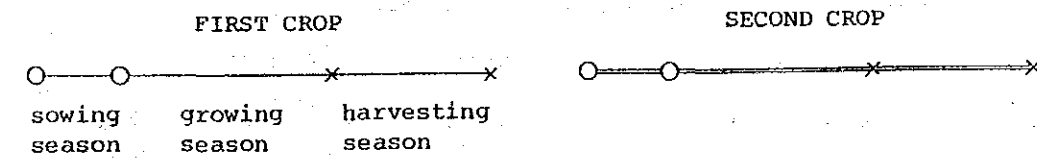




TABLE 31.2.1 CULTIVATED LAND

[ UNIT : 1000 RAI (KM2) ]

CHANGWAT	AMPHOE	CULTIVATED LAND		
		PADDY FIELD	UPLAND FIELD	TOTAL
BURI RAM	LAM PLAI MAT	37.00 ( 59.20)	3.50 ( 5.60)	40.50 ( 64.80)
	NONG KI	60.31 ( 96.50)	14.88 ( 23.81)	75.19 (120.30)
	NONG HONG	132.81 (212.50)	10.12 ( 16.19)	142.93 (228.69)
TOTAL		230.12 (368.19)	28.50 ( 45.60)	258.62 (413.79)

TABLE 31.2.2 CROP PRODUCTION

ITEM		RICE (PADDY)	MAIZE	SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE	COTTON	CASTOR BEANS	UPLAND TOTAL	TOTAL
PLANTED AREA		(1000 RAI)											
BASE YEAR	(1983)	226.21	2.07	-	2.18	0.12	7.19	1.48	0.07	-	-	13.11	239.32
WITHOUT PROJECT	(1988)	226.21	2.37	-	2.41	0.13	7.46	1.59	0.08	-	-	14.03	240.24
	(1994)	226.21	2.79	-	2.71	0.14	7.80	1.73	0.08	-	-	15.25	241.46
	(2002)	226.21	3.47	-	3.17	0.16	8.28	1.93	0.09	-	-	17.10	243.31
WITH PROJECT	(1988)	226.21	2.42	-	2.44	0.13	7.51	1.61	0.08	-	-	14.18	240.39
	(1994)	226.21	3.19	-	3.01	0.15	8.17	1.87	0.09	-	-	16.48	242.69
	(2002)	226.21	3.96	-	3.53	0.17	8.67	2.09	0.10	-	-	18.53	244.74
CROP YIELD		(KG/RAI)											
BASE YEAR	(1983)	266.0	324.1	-	125.2	174.1	1996.4	220.5	5879.2	-	-	-	-
WITHOUT PROJECT	(1988)	267.3	325.7	-	125.8	175.0	2006.4	220.5	5967.9	-	-	-	-
	(1994)	268.9	327.7	-	126.6	176.0	2018.5	220.5	6076.1	-	-	-	-
	(2002)	271.0	330.3	-	127.6	177.4	2034.7	220.5	6223.5	-	-	-	-
WITH PROJECT	(1988)	268.5	326.4	-	126.3	175.3	2008.4	220.5	5979.8	-	-	-	-
	(1994)	277.5	332.3	-	130.2	178.5	2032.6	220.5	6161.5	-	-	-	-
	(2002)	290.0	340.4	-	135.5	182.8	2065.4	220.5	6412.3	-	-	-	-
CROP PRODUCTION AMOUNT		(TON)											
BASE YEAR	(1983)	60,172	671	-	273	21	14,354	326	412	-	-	16,057	76,229
WITHOUT PROJECT	(1988)	60,467	772	-	303	23	14,974	350	448	-	-	16,869	77,337
	(1994)	60,824	914	-	343	25	15,753	381	496	-	-	17,911	78,735
	(2002)	61,303	1,145	-	405	28	16,855	426	568	-	-	19,427	80,730
WITH PROJECT	(1988)	60,741	789	-	309	23	15,088	354	454	-	-	17,016	77,757
	(1994)	62,778	1,060	-	392	27	16,611	412	545	-	-	19,047	81,825
	(2002)	65,601	1,349	-	478	31	17,917	461	634	-	-	20,870	86,471

NOTE : SYMBOL "--" MEANS ZERO OR NEGLIGIBLE

TABLE 31.2.3 NET PRODUCTION VALUE

ITEM		RICE (PADDY)	MAIZE	SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE	COTTON	CASTOR BEANS	UPLAND TOTAL	TOTAL
FARMGATE PRICE (BAHT/TON)													
WITHOUT PROJECT	(1983 - 2002)	3,926	2,678	-	7,725	10,300	639	4,192	381	-	-		
WITH PROJECT	(1988 - 2002)	3,953	2,705	-	7,752	10,327	657	4,246	399	-	-		
CROP PRODUCTION COST (BAHT/RAI)													
BASE YEAR	(1983)	704	516	-	488	1,019	794	790	2,144	-	-		
WITHOUT PROJECT	(1988)	707	518	-	488	1,019	796	790	2,160	-	-		
	(1994)	710	520	-	488	1,019	798	790	2,178	-	-		
	(2002)	715	523	-	488	1,019	801	790	2,202	-	-		
WITH PROJECT	(1988)	709	518	-	488	1,019	796	790	2,161	-	-		
	(1994)	726	523	-	488	1,019	801	790	2,187	-	-		
	(2002)	750	531	-	498	1,024	806	790	2,224	-	-		
NET PRODUCTION VALUE (1000 BAHT)													
WITHOUT PROJECT	(1988)	77,465	840	-	1,165	101	3,621	213	9	-	-	5,949	83,414
	(1994)	78,186	997	-	1,327	111	3,832	232	11	-	-	6,510	84,696
	(2002)	78,935	1,253	-	1,578	127	4,128	259	16	-	-	7,361	86,296
WITH PROJECT	(1988)	79,727	882	-	1,200	103	3,933	235	17	-	-	6,370	86,097
	(1994)	83,934	1,199	-	1,569	125	4,367	274	24	-	-	7,558	91,492
	(2002)	89,662	1,545	-	1,947	146	4,779	306	33	-	-	8,756	98,418
NET VALUE ADDED (1000 BAHT)													
	1988	2,262	42	-	35	2	312	22	8	-	-	421	2,683
	1994	5,748	202	-	242	14	535	42	13	-	-	1,048	6,796
	2002	10,727	292	-	369	19	651	47	17	-	-	1,395	12,122

NOTE : SYMBOL "-" MEANS ZERO OR NEGLIGIBLE