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KINGDOM OF THAILAND MINISTRY OF COMMUNICATIONS DEPARTMENT OF HIGHWAYS

ROAD DEVELOPMENT STUDY IN THE NORTHEASTERN REGION (PHASE II)

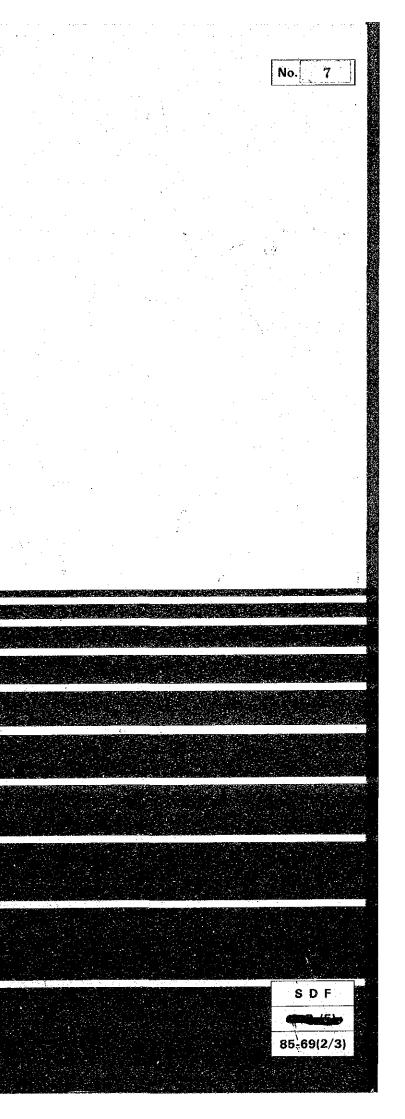
FINAL REPORT APPENDICES (VOLUME 2)

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MINISTRY OF COMMUNICATIONS

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KINGDOM OF THAILAND MINISTRY OF COMMUNICATIONS DEPARTMENT OF HIGHWAYS

ROAD DEVELOPMENT STUDY IN THE NORTHEASTERN REGION (PHASE II)

FINAL REPORT APPENDICES (VOLUME 2)

JULY, 1985 JAPAN INTERNATIONAL COOPERATION AGENCY



国際協力事業団 愛入 '87.5.20 <u>4/22</u> 月日 登録 No. 16418 <u>SDF</u>



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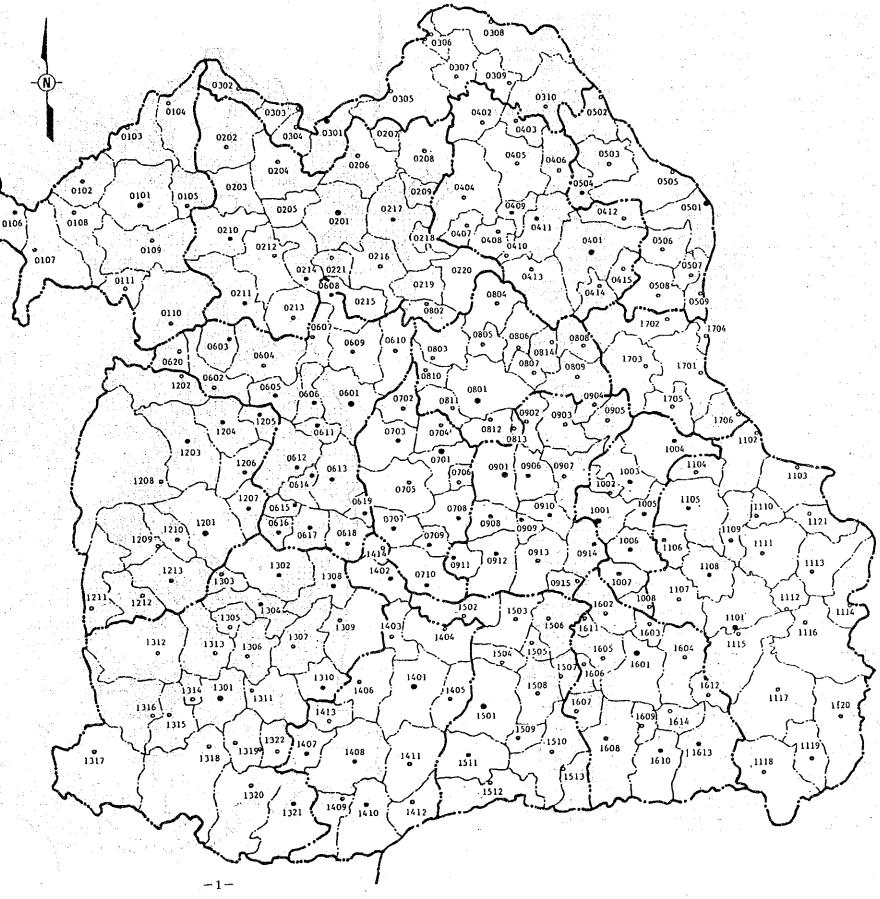
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CHANGWATS AND AMPHOES IN THE REGION APPENDIX 2.2.1

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1205 Ban Thaen 1206 Kaeng Khlo 1207 Khon Sawan 1208 Nong Bua Daeng 1209 None Bua Rahueo 1210 Ban Khwao 1211 Thep Satit 1212 Bannet Narong 1213 Chatturat 1301 N. Nakhon Ratchasima 1302 Bua Yai 1303 Ban Luan 1304 Khong 1305 Kham Sakae Saeng 1306 Nong Sung 1307 Phimai 1308 Prathai 1309 Chum Phuang 1310 Huai Thalaeng 1311 Chakkaraj 1312 Dan Khun Thot 1313 Non Thai 1314 Kham Thalse So 1315 Sung Noen 1316 Sikhiu 1317 Pak Chong 1318 Pak Thong Chai 1319 Chok Chai 1320 Khon Buri 1321 Soeng Sang 1322 None Bunnak 1401 H. Buri Ram 1402 Phutthaisong 1403 Khu Muang 1404 Satuk 1405 Krasang 1406 Lam Plai Mat 1407 Nong Ki 1408 Nang Rong 1409 Pa khom 1410 Lahan Sai 1411 Prakhon Chai 1412 Ban Kruat 1413 Nong Hong 1414 Na Pho 1501 M. Surin 1502 Chumphon Buri 1503 Tha Tum 1504 Chom Phra 1505 Sariom 1506 Rattanaburi 1507 Samrong Thap 1508 Sikhoraphum 1509 Lamduan 1510 Sangkha 1511 Prasat 1512 Kap Choeng 1513 Bua Chet 1601 H. SI Sa Ket 1602 Rasi Salai 1603 Yang Chum Noi 1604 Kanthararom 1605 Uthumpon Phisai 1606 Huai Thao Than 1607 Prang Ku 1608 Khukhan 1609 Phrai Bung 1610 Khun Han 1611 Bung Boon 1612 Non Koon 1613 Kanthararak 1614 Sri Pattana 1701 Mukdahan 1702 Dong Lunng 1703 Khamcha-L 1704 Wan Yai 1705 Nikhom Kham Sol 1706 Don Tan



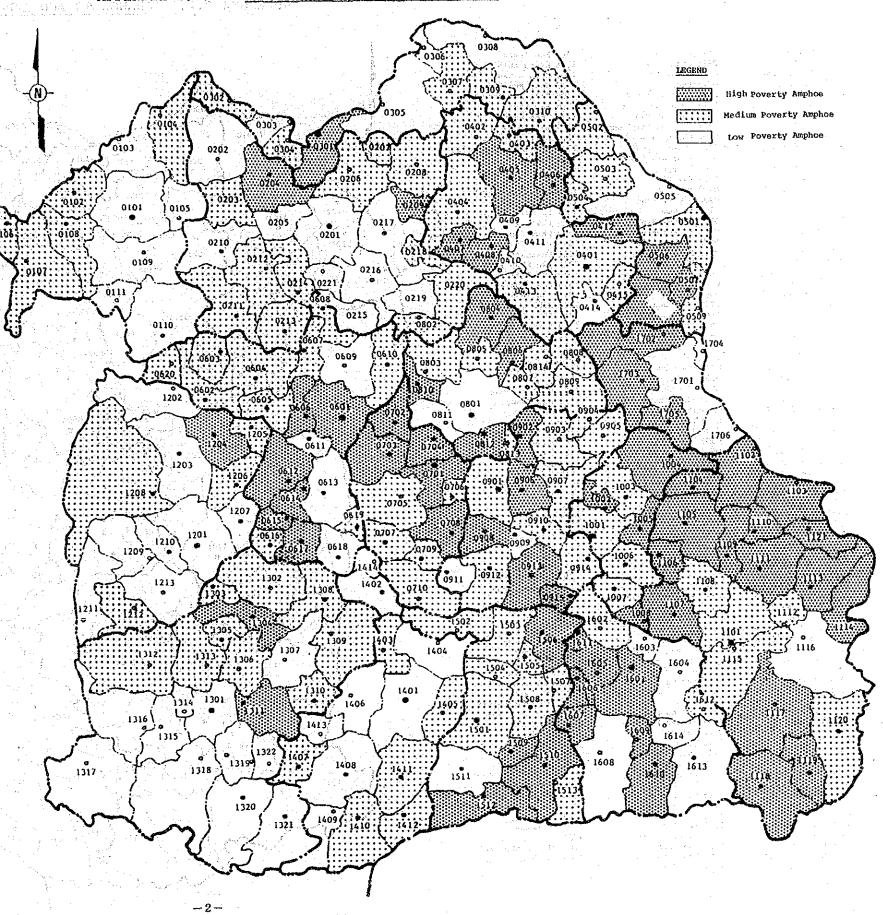
APPENDIX 2.2.1

APPENDIX 2.2.2 POVERTY AMPHOES IN THE REGION

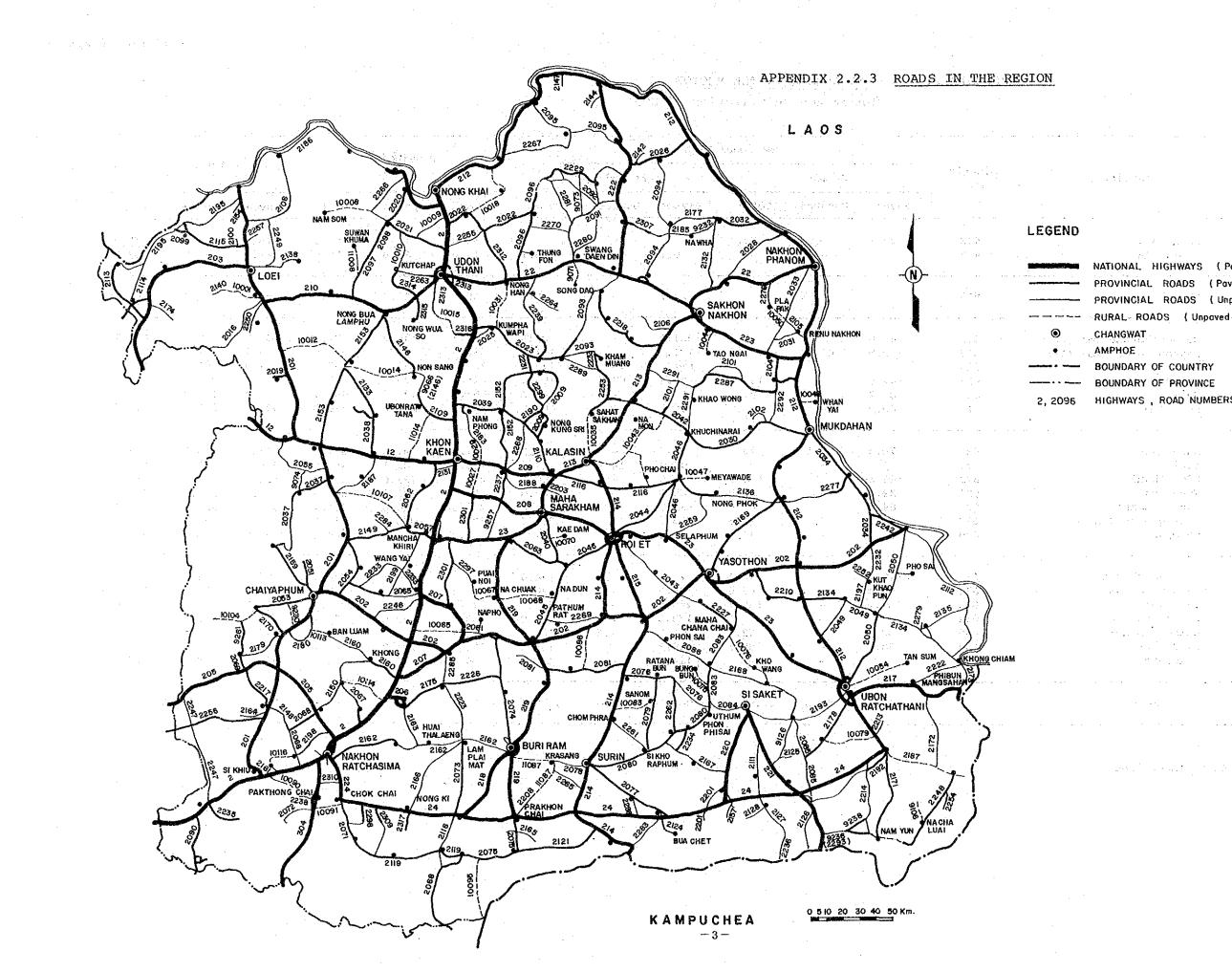
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APPENDIX 2.2.2



APPENDIX 2.2.3

1.1.1

NATIONAL HIGHWAYS (Poved) - PROVINCIAL ROADS (Poved) PROVINCIAL ROADS (Unpoved) RURAL ROADS (Unpoved) CHANGWAT • AMPHOE ----- BOUNDARY OF COUNTRY BOUNDARY OF PROVINCE . 2, 2096 HIGHWAYS , ROAD NUMBERS

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APPENDIX 2.2.4 ROAD LENGTH IN THE REGION

(Under the Jurisdiction of DOH)

			· .	National Highways						Provincia	1			
Division	District	District Code	Primary		Secondary			Roads				Total.		
		4 1	Paved	Unpaved	Total	Paved	Unpavēd	Total	Paveđ	Unpaved	Total	Paved	Unpaved	Tota.
LOP BURI	Sara Buri Lam Na Rai	432 435	22.7		22.7 -	- 46.1		- 46.1	52.9 17.0	- 33.9	52.9 50.9	75.6 63.1		75.6 97.(
PHITSANULOK	Phetchabun	515	-			20.7		20.7	65.7	80.7	146.4	86.4	80.7	167.]
NAKHON RATCHAS IMA	Nakhon Ratchasima (I) Nakhon Ratchasima (II) Chaiyaphum	611 612 613	85.0 135.0 -	45.0 -	85.0 180.0 -	201.8 111.1 198.2		201.8 111.1 198.2	245.4 290.3 208.8	136.5 66.5 56.5	381.9 356.8 265.3	532.2 536.4 407.0	136.5 111.5 56.5	668.7 647.9 463.5
	Ban Phai Surin Buri Ram	614 615 617	144.4 87.2 60.0		144.4 87.2 60.0	96.4 167.6 169.8	69.8 - -	166.2 167.6 169.8	245.9 265.9 265.4	229.9 198.0 182.6	475.8 463.9 448.0	486.7 520.7 495.2	299.7 198.0 182.6	786.4 718.7 677.8
KHON KAEN	Khon Kaen Loei	621 622	70.5	7.5	78.0	63.9 198.9		63.9 217.0	231.5 145.5	91.0 303.1	322.5 448.6	365.9 344.4	98.5 321.2	464.4 665.6
	Udon Thani Nong Khai Sakhon Nakhon Sawang Daen Din	623 624 625 628	146.1 39.5 84.6 68.5		146.1 39.5 84.6 71.3	90.6 180.0 138.6 203.7		90.6 180.0 138.6 203.7	287.7 84:2 200.5 124.1	232.6 123.1 220.6 338.1	520.3 207.3 421.1 462.2	524.4 303.7 423.7 396.3	232.6 123.1 220.6 340.9	757.0 426.8 644.3 737.2
	Chumpae	629	98.3	-	98.3	81.2		81.2	160.4	-	160.4	339.9	0	339.9
JBON RATCHATHANI	Ubon Ratchathani Maha Sarakham Yasothon	631 632 633	142.7 67.6 156.7		142.7 67.6 156.7	121.7 199.6 248.8	5.2	126.9 199.6 248.8	229.5 250.4 175.4	341.2 128.7 96.7	570.7 379.1 272.1	493.9 517.6 580.9	346.4 128.7 96.7	840.3 646.3 677.6
	Amnat Charoen Nakhon Phanom Si Sa Ket	634 635 638	- 53.7 88.1		53.7 88,1	173.5 164.5 155.3	1.4 1.5 -	174.9 166.0 155.3	32.3 53.2 183.3	439.6 126.0 201.9	471.9 179.2 385.2	205.8 271.4 426.7	441.0 127.5 201.9	646.8 398.9 628.6
· · · · · · · · · · · · · · · · · · ·	Mukdahan Total	639	- 1,527.9	55.3	-	114.8		114.8 3,176.0	349.4	64.9	414.3	464.2 8,637.0	64.9 3,728.8	529.1

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Note: As of November 1984

APPENDIX 2.2.4

APPENDIX 2.4.1 FARM AND NON-FARM POPULATION

网络小麦油小鼠科 的复数形式无限 建物 的复数的 人名法德 建铁石 法的过去式

		1981		· · ·	1982		1983				
en an an an an an HTEM an	Total	Farm*	% Farm	Total	Farm*	% Farm	Total	Farm*	% Farm		
Whole Country	47,875	32,500	67.9	48,847	33,085	67.7	49,515	33,681	68.0		
Northeastern Region (Total)	16,393	13,680	83.5	16,720	13,885	83.0	17,219	14,093	81.8		
			н 			·					
Related Changwat	789	667	84.5	n an	. 191	ng de la Pro-	C. S. C.		1000 - 1000 1000 - 1000		
. Udon Thani	1,475	1,156	78.3	1,523	1,165	76,1	1,564	1,175	75.1		
. Sakhon Nakhon	789	667	84.5	813	674	82.9	821	682	83.0		
		· · · · · ·			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			s go to	1. ¹		
. Khon Kaen	1,385	1,106	79.9	1,421	1,110	78.1	1,463	1,115	76.2		
. Roi Et	1,075	964	89.7	1,100	972	88.3	1,118	979	87.6		
				. 1.24 . 1.24	5.e.,				:		
. Yasothon	464	401	86.4	472	403	85.4	475	405	85.3		
. Ubon Ratchathani	1,590	1,373	86.4	1,648	1,402	85.1	1,684	1,431	85.0		
				er Transj		. • · · .	est. A	5 (A			
. Chaiyaphum	871	751	86.2	891	768	86.1	903	784	86.9		
. Nakhon Ratchasima	1,950	1,500	76.9	1,993	1,514	75.9	2,055	1,527	74.3		
				- 4 _ 2		. *		14			
. Buri Ram	1,160	896	77.2	1,209	920	76.1	1,227	945	77.0		
. Surin	1,066	970	91.0	1,085	995	91.7	1,120	1,021	91.2		
. Si Sa Ket	1,103	1,019	92.4	1,130	1,036	91.7	1,151	1,054	91.6		
	·			<u></u>							

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Estimation based on 1979-81 data :

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Sources: Registration Division, Administration Department, Ministry of Interior

Office of Agricultural Economics, Ministry of Agriculture and Cooperatives

APPENDIX 2.4.1

(Unit : thousand)

Growth-Rate	(1981-83)
Total	Form*
1.8	1.8
2.5	1.5
	an waarda a
3.0	0.8
2.0	1.1
	eres i de to
2.8	0.4
2.0	0.8
	anali in a
1.2	0.5 . 1.5
2.9	2.1
	 Alternation
1.8	2.2
2.7	0.9
	an ta sa
2.8	2.7
2.5	2.6
2.2	1.7

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APPENDIX 2.4.2 TREND OF LAND USE CONDITION (1978-1981)

		2013 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -				и н 1 н т			· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	(Unit : t	housand	rai)
	F	arm Hold	ing		Paddy L	and		Upland		free	Crops, and Flo	Vegetable wer	Idle,	Grass, and Oth	
	1978	1979	1980/1981	1978	1979	1980/1981	1978	1979	1980/1981	1978	1979	1980/1981	1978	1979	1980/19
	· · · · ·								· ·			and the same			
Whole Country	116,441	117,603	121,294	73,270	72,857	73,523	23,759	25,257	27,385	10,773	11,358	11,712	8,639	8,131	8,67
	•									;		·	e e e e e e e e e e e e e e e e e e e		
Northeastern Region (Total)	49,148.	49.,564	51,708	35,402	35,540	36,183	9,257	9,766	10,736	542	532	623	3,948	3,726	4,10
												n An that an the	· · ·		
Related Changwat		1.1		999 (A.) N	1999) 1997	· · · ·		·. ·						200	3
Udon Thani	4,406	4,513	4,718	3,050	3,165	3,183	785	909	1,156	35	51	51	536	388	•
. Sakhon Nakhon	2,346	2,429	2,557	1,853	1,872	1,895	161	196	238	34	31	44	298	330	3
		÷	i se se to se						•				·		
. Khon Kaen	4,061	4,110	4,160	2,830	2,890	2,815	1,043	1,041	1,053	32	29		156	150	2
. Roi Et	3,126	3,108	3,190	2,713	2,770		182	174	187	25	22	25	206	142	1
· · ·							12. Sec. 19. 2. S					· · · · · · · ·	•		
Yasothon	1,554	1,556	1,598	1,253	1,222	1,170	177	204	261	10	19	31	114	121	1
. Ubon Ratchathani	5,088	4,988	5,182	4,169	3,856	3,978	369	363	484	68	52		482	717	6
							•		a a '						
. Chaiyaphum	2,955	2,835	2,868	1,791	1,699	1,619	708	. 830	883	39	39	40	417	267	31
. Nakhon Ratchasima	6,637	6,764	7,141	3,441	3,448	3,666	2,601	2,675	2,719	79	95	. 99	516	546	6
			21			111	· . · ·	5.							
Buri Ram	3,418	3,514	3,680	2,807	2,934	3,089	417	394	386	27	25	30	167	161	1.
Surin	3,208	3,163	3,190	2,908	2,874	2,837	174	172	190	29	28	39	97	89	1:
. Si Sa Ket	3,062	3,107	3,230	2,612	~ 2,638	2,685	295	336	400	32	35	50	123	98	:
									ng lingth.	t ng transfer a T	e i set	a da ¹ 800 a la			_

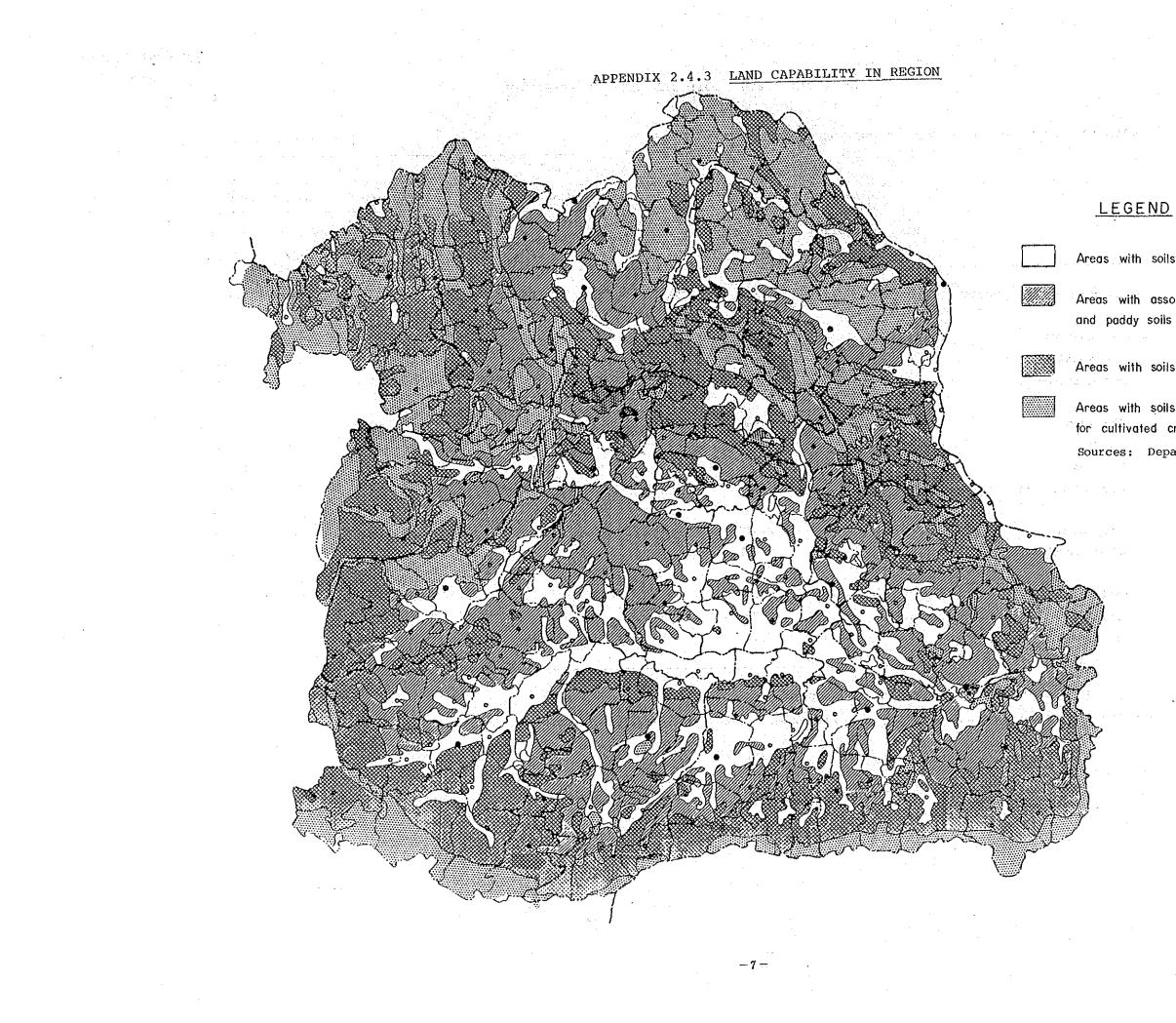
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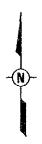
Scurces: Office of Agricultural Economics, Ministry of Agriculture and Cooperatives

 $\{x_{i,j}\}_{i=1}^{n} \in \{x_i\}$

÷.

APPENDIX 2.4.2





Areas with soils suited for paddy

Areas with associations of upland

Areas with soils suited for upland crops

Areas with soils not generally suited for cultivated crops

Sources: Department of Land Development, MAC

APPENDIX 2.4.4 SOIL SALINITY DISTRIBUTION

SOIL SALINITY	AFFECTED	AREA BY	CHANGWAT	

(Unit

	ta da sera da s Regional da sera							Ratio	0 (%)
	Cu	ltivated A	rea	Salinity	Affected	Salinit	y/Rice	Sa	
	Rice	Upland	Total	Over $8M^{1/2}$	1 - 8M	Total (4)	Over 8M	1 - 8M (4)/(1)	Over
	(1)		(2)	(3)		(4)	(3)/(1)	(3)/(1)	(317
Northeastern Region (Total)	35,886	10,434	46,325	5,283	30,482	35,765	14.7	84.9	נו
Related Changwat									
. Udon Thani	3,184	965	4,149	860	1,825	2,685	27.0	84.3	20
. Sakhon Nakhon	1,927	234	2,161	223	2,150	2,373	11.6	123.1	10
. Khon Kaen	2,894	1,072	3,966	92	1,641	1,733	3.2	59.9	2
. Roi Et	2,785	197	3,196	670	2,930	3,600	24.1	129.3	21
. Yasothon	1,249	328	1,577	82	1,934	2,016	6.6	161.4	. <u>f</u>
• Ubon Ratchathani	3,825	411	4,236	85	3,139	3,224	2.2	84.3	2
. Chaiyaphum	1,668	852	2,520	403	879	1,282	24.2	76.9	16
. Charyaphum . Nakhon Ratchasima	3,552	2,829	6,381	1,041	5,083	6,124	29.3	172.4	16
				A -7-6	2 000	4 370	16.2	340 7	14
. Buri Ram	2,925	418	3,343	476	3,902	4,378	16.3	149.7	
. Surin	2,700	200	2,900	265	698	963	9.8	35.7	· · ·
. Si Sa Ket	2,875	380	3,255	101	261	362	3.5	12.6	2
	and the second								

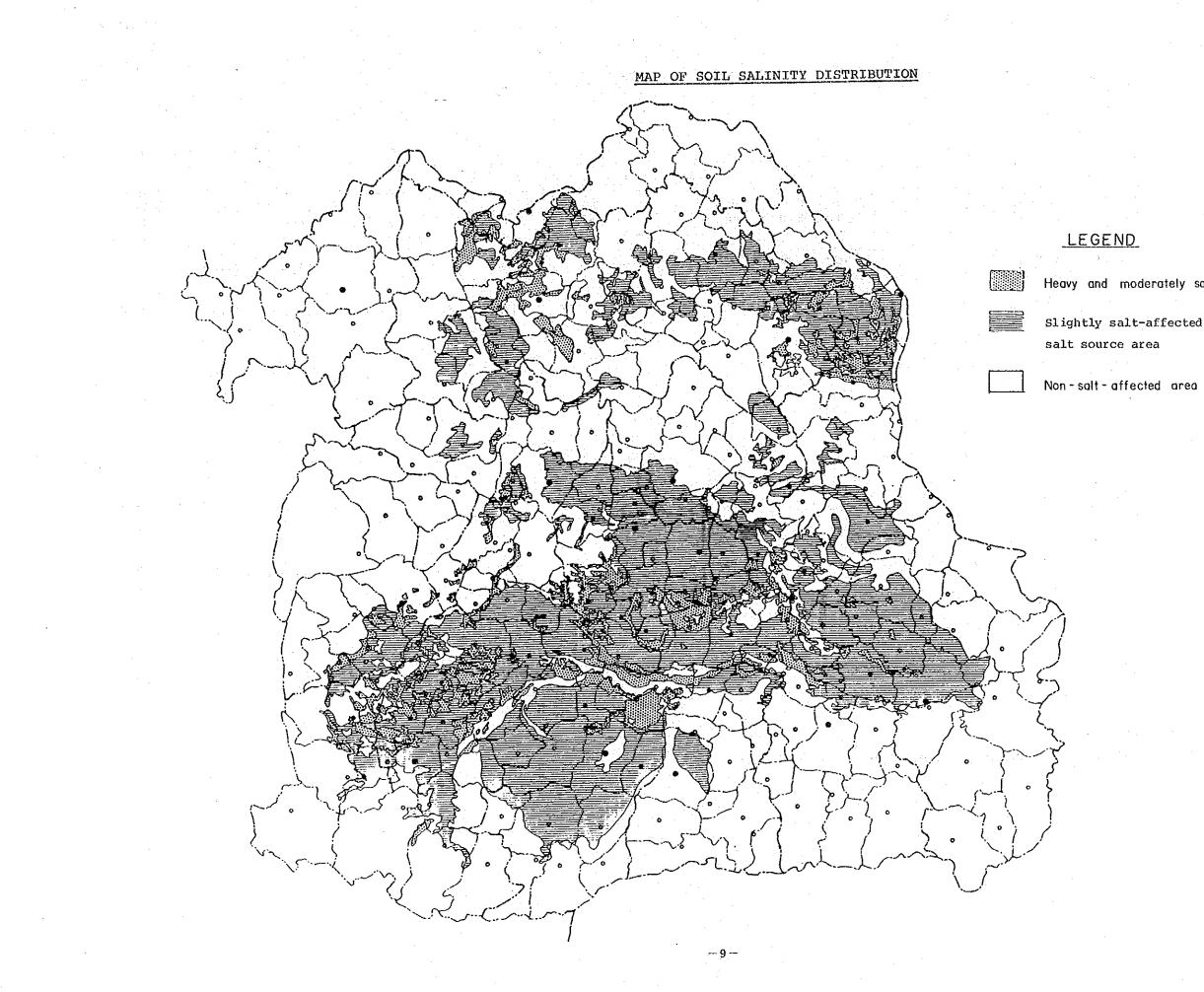
1/ : mmho/cm (1 mmho/cm = 0.64 g/& = 640 ppm)

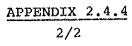
Sources : "Salinity Affected Area" by Land Development Bureau, MAC, 1977

-8-

APPENDIX 2.4.4 1/2

t : thousa	and rai)
(%)	
Salinit	y/Total
Over 8M	1 - 8M
(3)/(2)	(4)/(2)
11.4	77.2
20.7	64.7
10.3	109.8
2.3	43.7
21.0	112.6
5.2	127.8
2.0	76.1
- N. 	
16.0	50.9
16.3	96.0
14.2	131.0
9.1	33.2
3.1	11.1







Heavy and moderately salt-affected area

Slightly salt-affected area and potential

APPENDIX 2.4.5 PLANTED AREA OF CROPS (1983/84)

100

4 													(Un	it : thousa	and rai)
		Rice					U	pland Crops	3						Ratio of
	Total Rice	Glutinous Rice (%)	Maize	Sorghum	Mung beans	Soy beans	Ground nuts	Cassava	Sugar cane	Kenaf	Cotton	Others $\frac{1}{2}$	Upland Total	Total	Upland (%)
					. <u> </u>			· · · · · · · · · · · · · · · · · · ·			••••••••••••••••••••••••••••••••••••••				
Whole Country	62,033	(38)	10,552	1,657	3,022	1,008	783	8,780	3,607	1,343	638	953	32,343	94,376	34.3
	and the								사람이 가지 않는 이 아이들은 가지 문					- A	
Northeastern Region (Total) $\frac{1}{2}$	30,342	(62)	2,831	62	152	80	170	5,104	507	1,331	147	41	10,425	47,838	21.8
		3.1.2.1				i de la contra de la Contra de la contra d									
Related Changwat	n na an	ana an		х. Х.											
• Udon Thani	2,805	(84)	134		10	2	5	303	197	109	3 -	22	785	3,590	21.9
· Sakhon Nakhon	1,026	(84)	·	دی چرد روحت ر ب		•••	19	115	3	22	3	15	177	1,203	14.7
			, -		·								•		
• Khon Kaen	2,299	<u>(83)</u>	52	- 200 a - - 2 -2	53	7	6	427	137	120	-	1	803	3,151	25.5
• Roi Et	2,604	(55)	-	-	-	-	-	253	-	30	-	1	284	2,590	11.0
			•								en de la composition de la composition Composition de la composition de la comp				
• Yasothon	1,008	(54)	-	_	- A- 	-	3	38.	6	83	_		130	1,138	11.4
• Ubon Ratchathani	3,397	(73)	12	-		en e	3	72	-	135	5	1	229	3,626	6.3
														·	
• Chaiyaphum	1,618	(47)	223	31	38		8	368	36	320	4	7	1,035	2,653	39.0
• Nakhon Ratchasima	2,370	(14)	1,385	31	21	14	12	1,983	8	100	21	31	3,606	5,976	60.3
		(14)		n an ing ar mara ang ara ar mara ara ara					e i se transverse Se estadore en estadore Se estadore estadore						
Buri Ram	2,593	(1)	10		1	-	29	331	26	63	Serie <u>-</u> e la	6	466	3,059	15.2
• Surin	3,114	(33)	۱ <u>۰</u>		1		5	36		83		6	131	3,245	4.0
• Si Sa Ket	1,803		171		1		17	.33	-	88			310	2,113	14.7
													510	~	

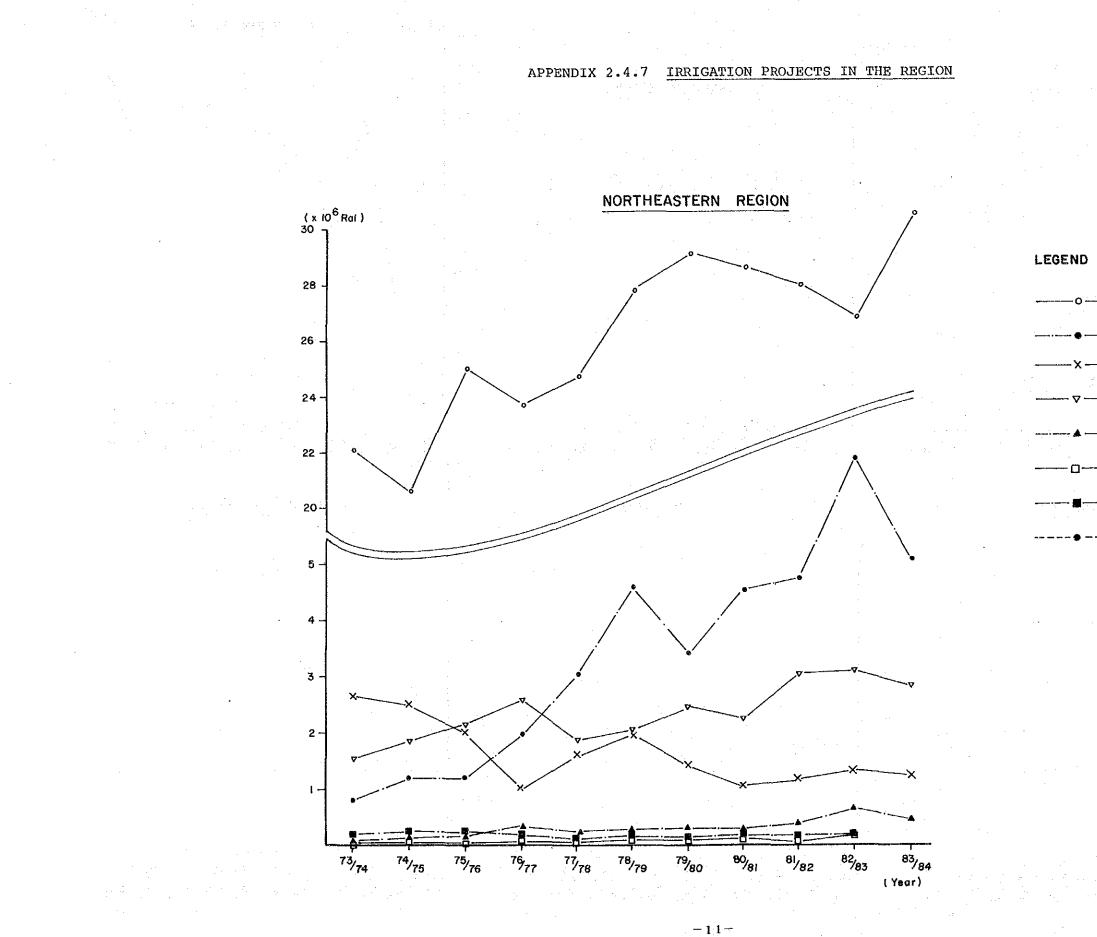
-10-

1/ Estimated Note:

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Agricultural Statistics, Ministry of Agriculture and Cooperatives Sources:

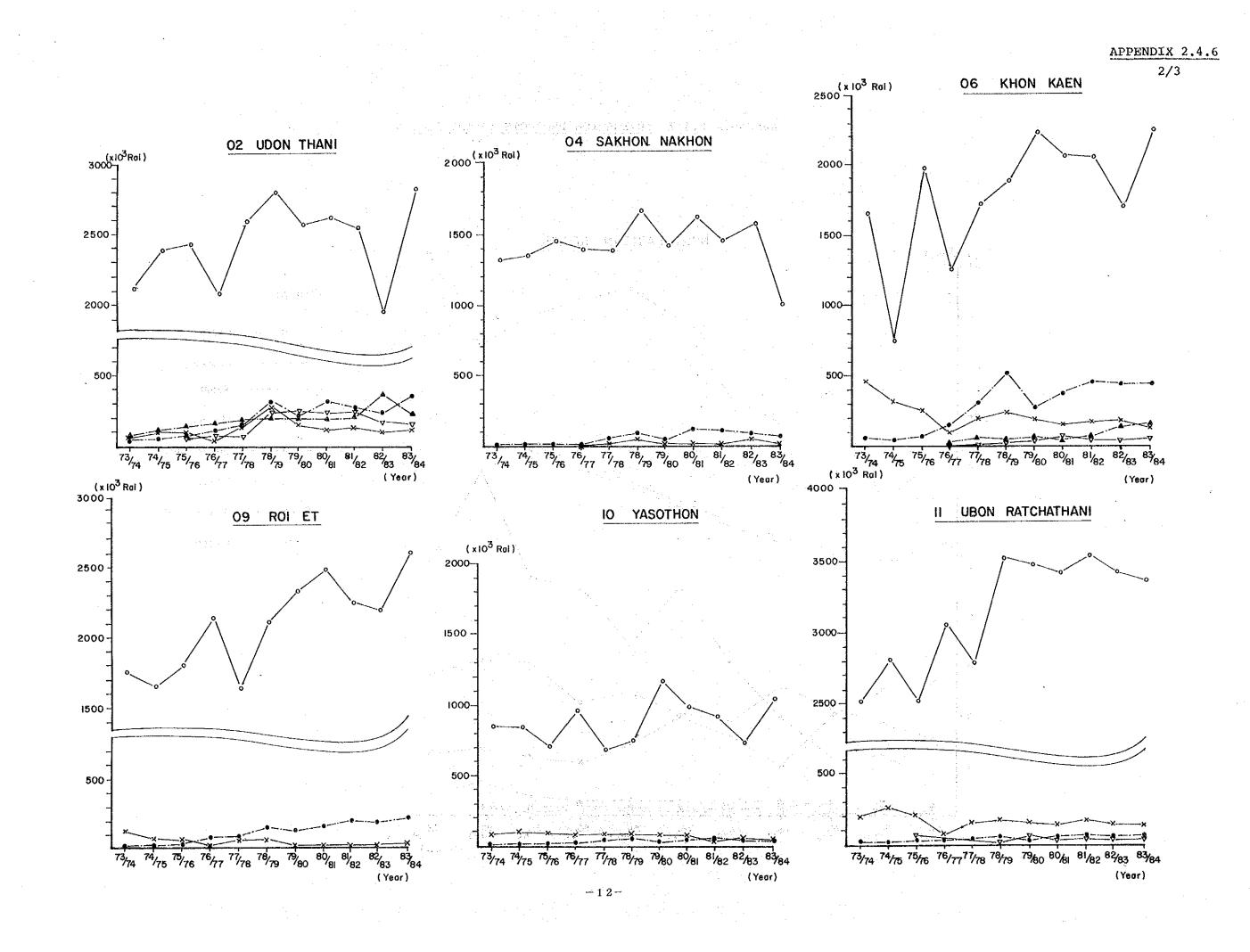
APPENDIX 2.4.5

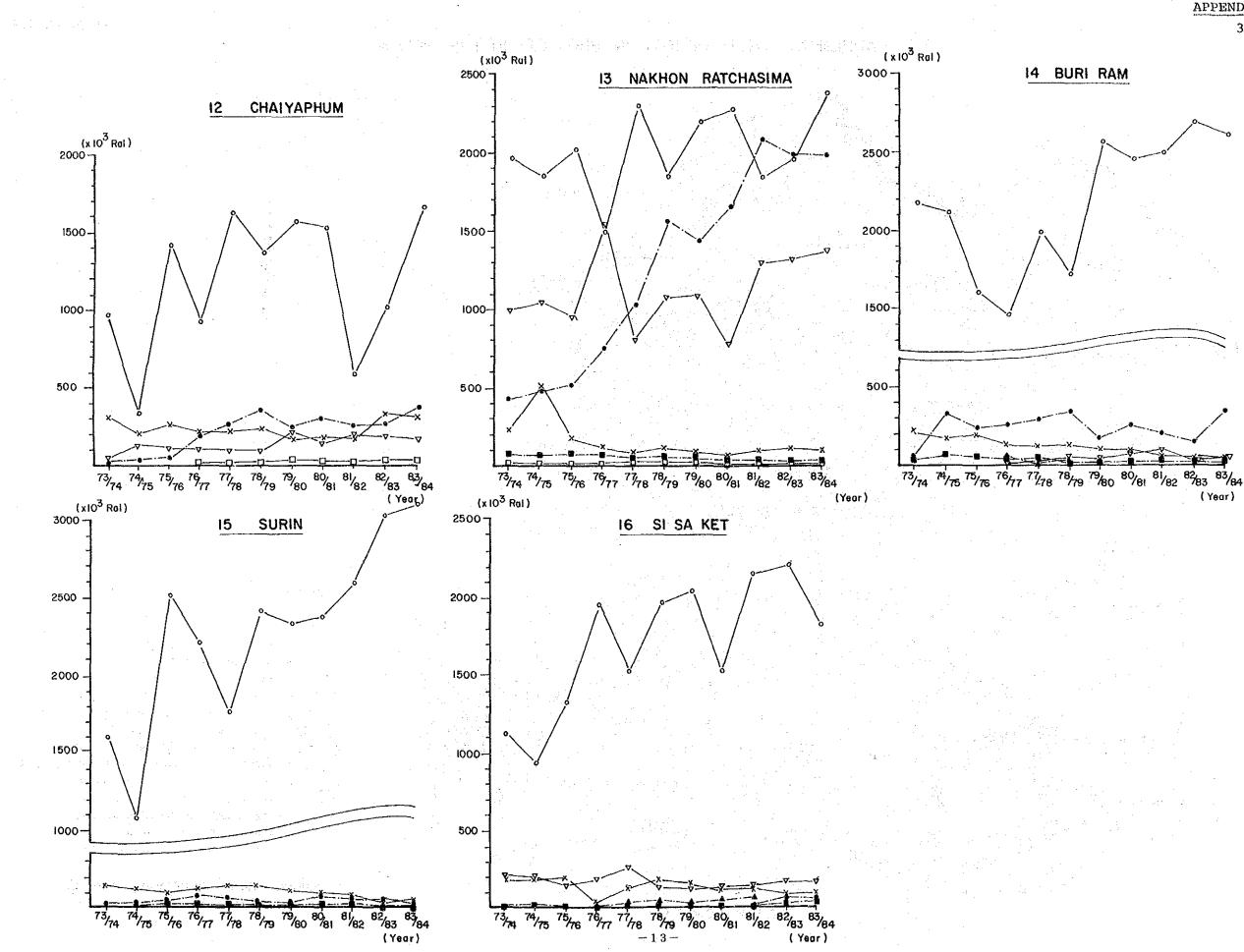


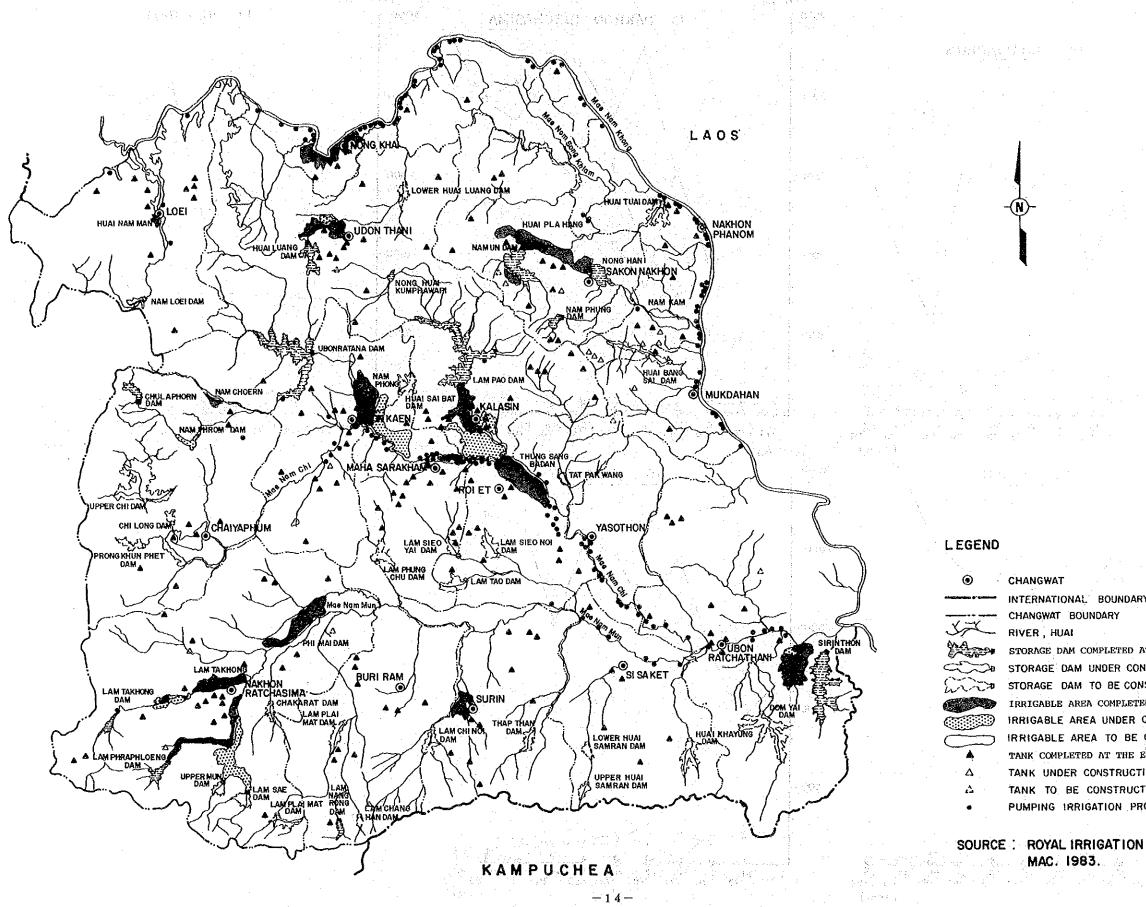
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APPENDIX 2.4.6 1/3

-	Paddy	
-	Cassava	
-	Kenaf	
	Malze	
	Sugar cane	
-	Beans	
	Ground nuts	
-	Cotton	







APPENDIX 2.4.7 IRRIGATION PROJECTS IN THE REGION

CHANGWAT INTERNATIONAL BOUNDARY - CHANGWAT BOUNDARY ST RIVER, HUAI PUMPING IRRIGATION PROJECT (NEA)

-(N)-

SOURCE : ROYAL IRRIGATION DEPARTMENT Real and the state of MAC, 1983. The state of

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APPENDIX 2.4.7

STORAGE DAM COMPLETED AT THE END OF 1982 STORAGE DAM UNDER CONSTRUCTION IN 1983 STORAGE DAM TO BE CONSTRUCTED IRRIGABLE AREA COMPLETED AT THE END OF 1983 IRRIGABLE AREA UNDER CONSTRUCTION IN 1983 IRRIGABLE AREA TO BE CONSTRUCTED TANK COMPLETED AT THE END OF 1982 TANK UNDER CONSTRUCTION IN 1983 TANK TO BE CONSTRUCTED

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APPENDIX 2.4.8 PLANTED AREA AND PRODUCTION OF MAJOR CROPS IN REGION

	197	(1) Average of 25/76 - 197		197	(2) Average of 78/79 - 198		4 N.	(3) Average of 81/82 - 198		- 2 gatan (11) - 7 - 4 a	Annual Gro	wth Rate		Index of Rec National = 10	gion Average
	Planted Area (thousand rai)	Produc- tion (thousand tons)	Average Yield (kg/rai)	Planted Area (thousand rai)	Produc- tion (thousand tons)	Average Yield (kg/rai)	Planted Area (thousand rai)	Produc- tion (thousand tons)	Average Yield (kg/rai)	Planted (2)/(1) %	Area (3)/(1)	Produ (2)/(1)	ction (3)/(1) %	1975/76 - 77/78 Average	1981/82 - 83/84 Average
·····												· · · · · · · · · · · · · · · · · · ·			
Rice	24,491	4,510	184	28,503	5,599	196	28,392	5,948	209	5.2	2.5	7,5	4.7	68	71
Maize	2,170	614	283	2,251	534	237	3,002	892	297	1.2	5.5	-4.5	6.4	85	92
Mungbeans	37	3.7	100	79	8.7	110	124	11.3	91	28.8	22.3	33.0	20.5	110	97
Soybeans	31	· 4 · ·	129	35	5.3	151	58	9.2	159	4.1	11.0	9.8	14.9	71	98
Groundnuts	176	31	176	139	23	165	173	29.6	171	-7.6	-0.3	-9.5	-0.8	88	90
Cassava	1,905	4,657	2,445	4,172	8,887	2,130	4,794	10,442	2,178	29.9	16.6	24.0	14.4	103	96
Sugarcane	253	1,391	5,489	294	1,682	5,721	514	3,358	6,537	5.1	12.5	6.5	15,8	66	93
Kenaf	1,534	243	158	1,473	253	172	1,285	209	163	-1.3	-2.9	1.4	-2.5	87	97
Cotton	95	17.7	186	170	35.9	211	170	33.42	196	21.4	10.2	26.6	11.2	106	109
Sorghum	15	2.5	170	22	4.1	186	56	9.7	173	14.4	25.0	17.9	25.4	100	102

-15-

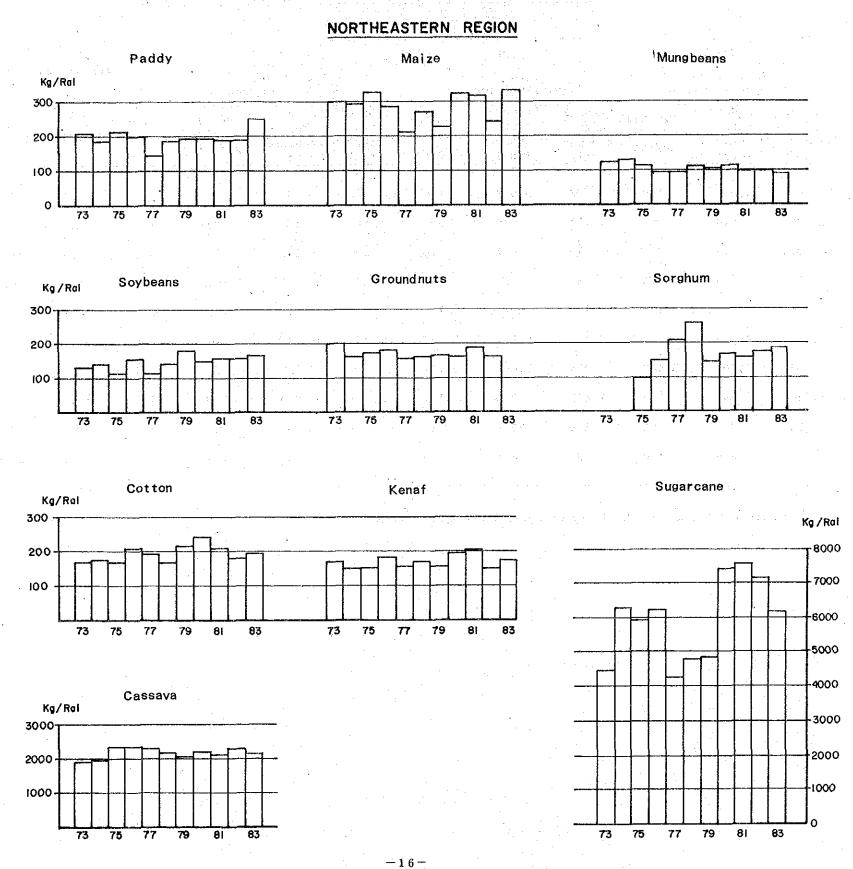
Sources: Office of Agricultural Economics, Ministry of Agriculture and Cooperatives

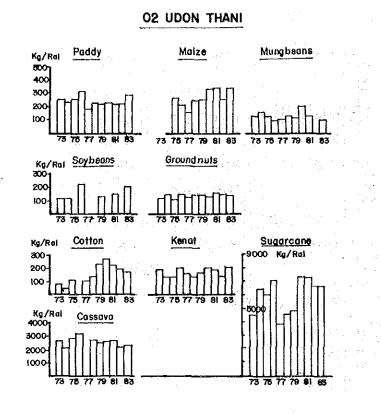
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APPENDIX 2.4.8

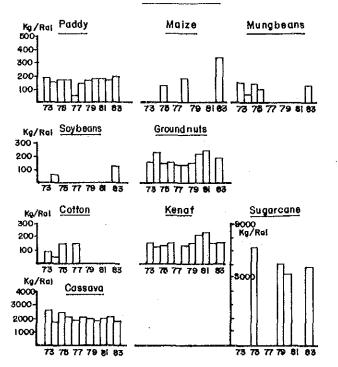
APPENDIX 2.4.9 TREND OF AVERAGE YIELD

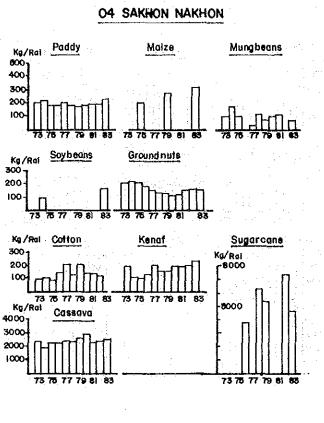
(1973 / 74 - 1983 / 84)

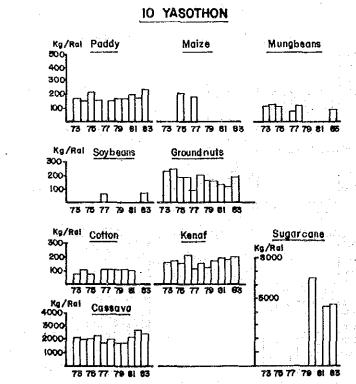


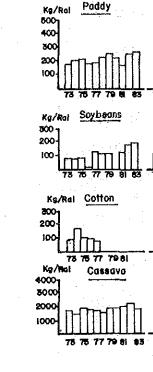


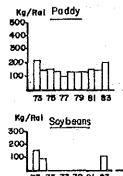
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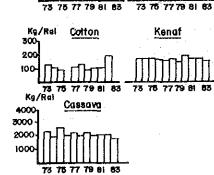




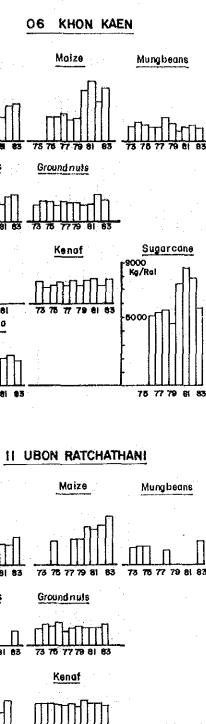


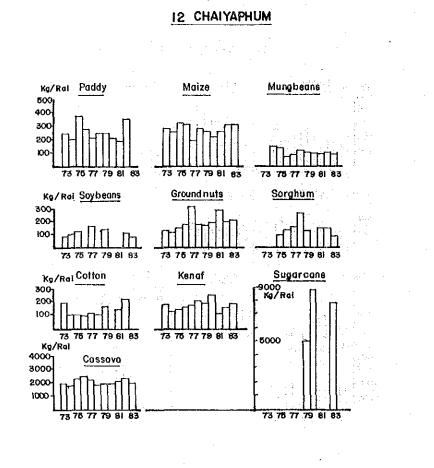




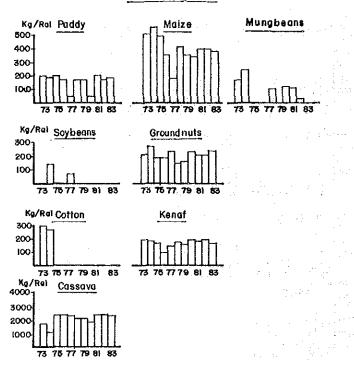


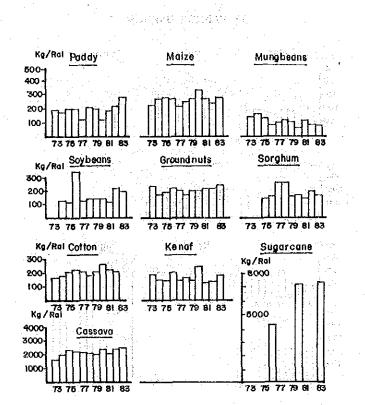
APPENDIX 2.4.9 2/3



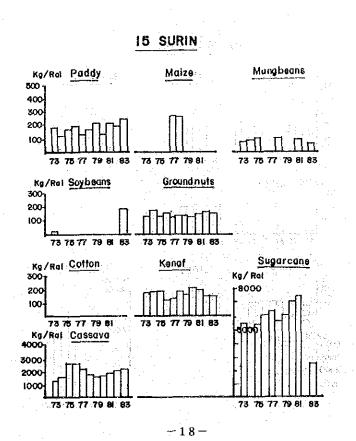


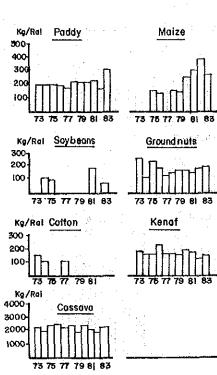






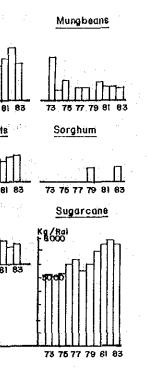
13 NAKHON RATCHASIMA











APPENDIX 2.4.10 AGRO-INDUSTRY (LOCATION, NUMBER AND TOTAL PRODUCT)

19. jan

							• .			•					ana a Na Ara	NA ARTI
			RICE M	ILL 1/				Ç	ASSAVA	<u>-</u>	<u></u>		KEI	iaf		
•	CHANGWAT		BIG		DIUM	PE	LLET	C	HIP	FJ	LOUR	BA	LING	TEX	TILE	BR
		NC	• T.P.	NO.	T.P.	NO.	т.р.	NO.	T.P.	NO.	T.P.	NO.	T.P.	NO.	Т.Р.	NO.
02	UDON THANI	11	390.5	15	303.2	33	601.8	160	248.2	1	18.2	11	43.6	1	N.A.	2
04	Sakhon Nakhon	3	131.4	6	73.6	3	17.9	60	50.2	-	·	1	3.5	-		-
06	KHON KAEN	12	487.6	18	368.5	64	780.3	207	663.4	1	10.9	45	120.0	2	N.A.	 1
09	ROI ET	3	102.2	8	149.5	8	169.0	83	70.0	-		5	7.5	-	••••	į –
10	YASOTHON	1	32.8	4	58.3	4	12.0	8	20.0			. 3	2.4	━.	: 	-
11	UBON RATCHATHANI	7	278.9	13	217.0	39	38.0	6	9.2	-	-	24	17.1	2	N.A.	• •
12	СНАТУАРНИМ	1	36.5	7	138.3	14	55,4	26	35.8	-	_	11	45.7	- 	-	
13	NAKHON RATCHASIMA	12	459.9	21	317.3	119	4,846.6	517	3,735.4	10	178.2	21	37.8	5	N.A.	· _
14	BURI RAM	5	189.8	31	514.9	19	100.0	93	82,9	-	- 4.	2	1.3	<u> </u>	-	1
15	SURIN	8	299.3	27	427.0	12	204.3	14	17.1			7	2.7	2	N.A.	-
16	SI SA KET	1	29.2	11	175.1	4	7.6	19	18.3	1		16	150.0	-	· . : .	

1/ : Big (80 tons/day), Medium (30-80 tons/day) N.A. : Date not available Note: T.P. : Total Product (thousand tons/year) No. : Number of Factories Number of Factories on each Changwat 1978-1983, Industrial Economic Division, Ministry of Industry Source:

APPENDIX 2.4.10

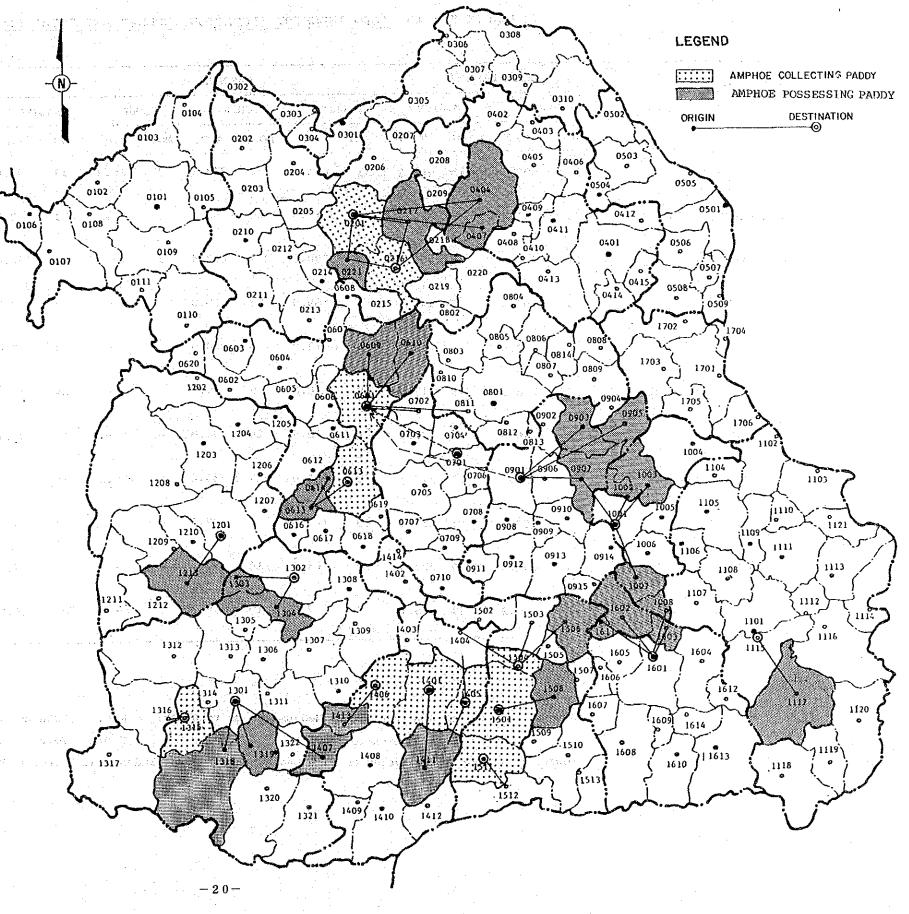
· · ·		(1983)
SU	GAR	
ROWN	REF	INERY
T.P.	NO.	T.P.
133.9	2	65.4
	n n New Jacob La Honore La Honore	-
150.0	1	75.0
-	-	-
_		-
-	1	29.9
- *. * .		-
-	-	
40.3	2	160.0
-		· ·_
_	-	-
· · ·		·

APPENDIX 2.4.11 COMMODITY FLOW OF MAIN CROPS

0101 M. Loei 0102 Tha Li 0103 Chiang Khan 0104 Pak Chom 0105 Na Duang 0106 Na Baeo 0107 Dan Ssi 0108 Phu Rua 0109 Wang Saphung 0110 Phu Kradung 0111 Phu Luang 0201 M. Udon Thant 0202 Nam Som 0203 Suwannakhuha 0204 Ban Phu 0205 Kut Chap 0206 Phen 0207 Sang Khom 0208 Ban Dung 0209 Thung Fon 0210 Na Klang 0211 Si Bun Ruang 0212 Nong Bua Lam Phu 0213 Non Sang 0214 Nong Wua So 0215 Non Sa~At 0216 Kumphawapi 0217 Nong Han 0218 Chaiwan 0219 Si That 0220 Wang Sam Mo 0221 Nong Saeng 0301 H. Nong Khai 0302 Sangkhom 0303 Si Chiang Mai 0304 Tha Bo 0305 Phon Phisai 0306 Pak Kad 0307 So Phisai 0308 Bung Kan 0309 Phon Charoen 0310 Seka 0401 M. Sakhon Nakhon 0402 Ban Muang 0403 Kham Ta Kla 0404 Sawang Daen Din 0405 Wanon Niwat 0406 Akat Amnuai 0407 Song Dao 0408 Waritchaphum 0409 Phang Khon 0410 Nikhom Nam Un 0411 Phanna Nikhom 0412 Kusuman 0413 Kut Bak 0414 Tao Koi 0415 Kok Sri Supan 0501 M. Nakhon Phanom 0502 Ban Phaeng 0503 Si Songkhram 0504 Na Wa 0505 Tha Uthen 0506 Pla Pak 0507 Renu Nakhon 0508 Na Kae 0509 That Phanom 0601 N. Khon Kaen 0602 Chumphae 0603 S1 Chomphu 0604 Phu Wiang 0605 Nong Rua 0606 Ban Fang 0607 Ubolratana 0608 Kaosuankwang 0609 Nam Phong 0610 Kranuan 0611 Phra Yun 0612 Mancha Khiri 0613 Ban Phai

0614 Chonnabot 1205 Ban Thaen 0615 Waeng Yai 0616 Waeng Noi 0617 Phon 0618 Nong Song Hon 0619 Phouy Not 0620 Phu Pha Man 0701 N. Maha Satakham 0702 Chiang Yun 0703 Kosum Phisai 0704 Kantharawichai 0705 Borabu 0706 Kae Dam 0707 Na Chuak 0708 Wapi Pathum 0709 Na Dum 0710 Phayakkhaphum Pisai 0801 M. Kalasin 0802 Tha Khantho 0803 Nong Kung Si 0804 Khom Muang 0805 Sahatsakhan 0806 Somdet 0807 Na Mon 0808 Khao Wong 0809 Kuchinarai 0810 Huai Mek 0811 Yang Talat 0812 Kamalasai 0813 Rong Kham 0814 Huay Pung 0901 M. Roi Et 0902 Pho Chai 0903 Phon Thong 0904 Muayawadee 0905 Nong Phok 0906 Thawatchaburi 0907 Selaphum 0908 Chaturapak Pimun 0909 Muang Suang 0910 At Samat 0911 Pathum Rat 0912 Kaset Wisai 0913 Suwannaphum 0914 Phanom Phrai 0915 Phon Sai 1001 N. Yasothon 1002 Sai Mun 1003 Kut Chum 1004 Loeng Nok Tha 1005 Pa Tiu 1006 Kham Khuan Kaeo 1007 Maha Chana Chai 1008 Kho Wang 1101 M. Ubon Ratchathani 1102 Chanuman 1103 Khemaraj 1104 Senang Khanikhom 1105 Amnat Charoen 1106 Hua Thaphan 1107 Khuang Nai 1108 Muang Samsip 1109 Phana 1110 Kut Kaopun 1111 Trakan Phutphon 1112 Taisum 1113 Si Muang Hai 1114 Khong Chiam 1115 Warin Chamrap 1116 Pibun Mungsahan 1117 Det Udom 1118 Nam Yun 1119 Na Chaiuai 1120 Buntharik 1121 Pho Sai 1201 M. Chaiyaphum 1202 Khon San 1203 Kaset Sombur 1204 Phu Khieo

1206 Kaeng Khlo 1207 Khon Sawan 1208 Nong Bua Daeng 1209 Nong Bua Rahueo 1210 Ban Khwao 1211 Thep Satit 1212 Bannet Narong 1213 Chatturat 1301 M. Nakhon Ratchasima 1302 Bua Yai 1303 Ban Luam 1304 Khong 1305 Kham Sakae Saeng 1306 Nong Sung 1307 Phimai 1308 Prathal 1309 Chum Phuang 1310 Huai Thalaeng 1311 Chakkaraj 1312 Dan Khun Thot 1313 Non Thai 1314 Kham Thalae So 1315 Sung Noen 1316 Sikhiu 1317 Pak Chong 1318 Pak Thong Chai 1319 Chok Chai 1320 Khon Buri 1321 Soeng Sang 1322 Nong Bunmak 1401 H. Buri Ram 1402 Phutthaisong 1403 Khu Muang 1404 Satuk 1405 Krasang 1406 Lam Plai Mat 1407 Nong Ki 1408 Nang Rong 1409 Pa khom 1410 Lahan Sai 1411 Prakhon Chai 1412 Ban Kruat 1413 Nong Hong 1414 Na Pho 1501 M. Surin 1502 Chumphon Buri 1503 Tha Tum 1504 Chom Phra 1505 Sanom 1506 Rattanaburi 1507 Samrong Thap 1508 Sikhoraphum 1509 Lamduan 1510 Sanekha 1511 Prasat 1512 Kap Choeng 1513 Bua Chet 1601 H. Si Sa Ket 1602 Rasi Salai 1603 Yang Chum Noi 1604 Kanthararom 1605 Uthumpon Phisai 1606 Huai Thap Than 1607 Prang Ku 1608 Khukhan 1609 Phrai Bung 1610 Khun Han 1611 Bung Boon 1612 Non Koon 1613 Kanthararak 1614 Sri Pattana 1701 Mukdahan 1702 Dong Luang 1703 Khamcha-I 1704 Wan Yai 1705 Nikhom Kham Soi 1706 Don Tan



APPENDIX 2.4.11 1/4

0101 H. Loei 0102 Tha Li 0103 Chiang Khan 0104 Pak Chom 0105 Na Duang 0106 Na Haeo 0107 Dan Sai 0108 Phu Rua 0109 Wang Saphung 0110 Phu Kradung 0111 Phu Luang 0201 H. Udon Thani 0202 Nam Som 0203 Suwannakhuha 0204 Ban Phu 0205 Kut Chap 0206 Phen 0207 Sang Khom 0208 Ban Dung 0209 Thung Fon 0210 Na Klang 0211 Si Bun Ruang 0212 Nong Bua Lam Phu 0213 Non Sang 0214 Nong Wua So 0215 Non Sa-At 0216 Kumphawapi 0217 Nong Han 0218 Chaiwan 0219 Si That 0220 Wang Sam Mo 0221 Nong Saeng 0301 M. Nong Khai 0302 Sangkhom 0303 Si Chiang Mai 0304 Tha Bo 0305 Phon Phisai 0306 Pak Kad 0307 So Phisai 0308 Bung Kan 0309 Phon Chargen 0310 Seka 0401 M. Sakhon Nakhon 0402 Ban Muang 0403 Kham Ta Kla 0404 Sawang Daen Din 0405 Wanon Niwat 0406 Akat Amnual 0407 Song Dao 0408 Waritchaphum 0409 Phang Khon 0410 Nikhom Nam Un 0411 Phanna Nikhom 0412 Kusuman 0413 Kut Bak 0414 Tao Koi 0415 Kok Sr1 Supan 0501 M. Nakhon Phanom 0502 Ban Phaeng 0503 Si Songkhram 0504 Na Wa 0505 Tha Uthen 0506 Pla Pak 0507 Renu Nakhon 0508 Na Kae 0509 That Phanom 0601 M. Khon Kaen 0602 Chumphae 0603 Si Chomphu 0604 Phu Wiang 0605 Nong Rua 0606 Ban Fang 0607 Ubolratana 0608 Kaosuankwang 0609 Nam Phong 0610 Kranuan 0611 Phra Yun 0612 Mancha Khiri 0613 Ban Phai

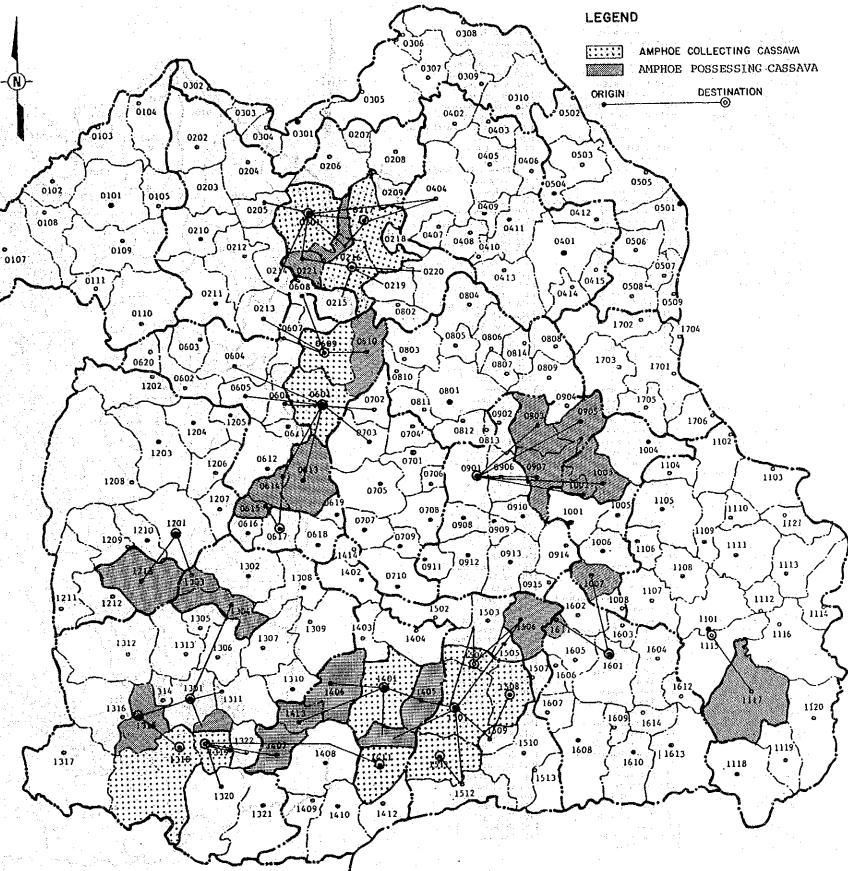
0614 Chonnabot 0615 Waeng Yai 0616 Waeng No1 0617 Phon 0618 Nong Song Hon 0619 Phouy No1 0620 Phu Pha Man 0701 M. Maha Satakham 0702 Chiang Yun 0703 Kosum Phisai 0704 Kantharawichai 0705 Borabu 0706 Kae Dam 0707 Na Chuak 0708 Wapi Pathum 0709 Na Dum 0710 Phayakkhaphum Pisai 0801 M. Kalasin 0802 Tha Khantho 0803 Nong Kung Si 0804 Khom Muang 0805 Sahatsakhan 0806 Sonde C 0807 Na Mon 0808 Khao Wong 0809 Kuchinarai 0810 Hual Mek 0811 Yang Talat 0812 Kamalasai 0813 Rong Kham 0814 Huay Pung 0901 M. Roi Et 0902 Pho Chai 0903 Phon Thong 0904 Muavawadee 0905 Nong Phok 0906 Thawatchaburi 0907 Selaphum 0908 Chaturapak Pimun 0909 Huane Suane 0910 At Samat 0911 Pathum Rat 0912 Kaset Wisai 0913 Suyannaphum 0914 Phanom Phrai 0915 Phon Sai 1001 N. Yasothon 1002 Sai Mun 1003 Kut Chum 1004 Loeng Nok Tha 1005 Pa Tiu 1006 Kham Khuan Kaeo 1007 Maha Chana Chai 1008 Kho Wang 1101 M. Ubon Ratchathani 1102 Chanuman 1103 Khemaraj 1104 Senang Khanikhom 1105 Amnat Chargen 1106 Hua Thaphan 1107 Khuang Nai 1108 Huang Samsip 1109 Phana 1110 Kut Kaopun 1111 Trakan Phutphon 1112 Taisum 1113 Si Huang Mai 1114 Khong Chiam 1115 Warin Chamrap 1116 Pibun Mungsahan 1117 Det Udom 1118 Nam Yun 1119 Na Chaiuai 1120 Buntharik 1121 Pho Sai 1201 M. Chaivaphum 1202 Khon San 1203 Kaset Sombum 1204 Phu Khieo

1205 Ban Thaen 1206 Kaeng Khlo 1207 Khon Sawan 1208 Nong Bua Daeng 1209 Nong Bua Rahueo 1210 Ban Khwao 1211 Thep Satit 1212 Bannet Narong 1213 Chatturat 1301 M. Nakhon Ratchasima 1302 Bus Yal 1303 Ban Luam 1304 Khong 1305 Kham Sakae Saeng 1306 Nong Sung 1307 Phimai 1308 Prathai 1309 Chum Phuang 1310 Huai Thalseng 1311 Chakkaraj 1312 Dan Khun Thot 1313 Non Thai 1314 Kham Thalae So 1315 Sung Noen 1316 Sikhin 1317 Pak Chong 1318 Pak Thong Chai 1319 Chok Chai 1320 Khon Buri 1321 Soeng Sang 1322 Nong Bunnak 1401 M. Buri Ram 1402 Phutthaisong 1403 Khu Muang 1404 Satuk 1405 Krasang 1406 Lam Plai Mat 1407 Nong Ki 1408 Nang Rong 1409 Pa khom 1410 Lahan Sai 1411 Prakhon Chai 1412 Ban Kruat 1413 Nong Hong 1414 Na Pho 1501 M. Surin 1502 Chumphon Buri 1503 Tha Tum 1504 Chom Phra 1505 Sanom 1506 Rattanaburi 1507 Samrong Thap 1508 Sikhoraphum 1509 Lamduan 1510 Sangkha 1511 Prasat 1512 Kap Choeng 1513 Bua Chet 1601 M. Si Sa Ket 1602 Rasi Salai 1603 Yang Chum Noi 1604 Kanthararow 1605 Uthumpon Phisad 1606 Huai Thap Than 1607 Prang Ku 1608 Khukhan 1609 Phrai Bung 1610 Khun Han 1611 Bung Boon 1612 Non Koon 1613 Kantbararak 1614 Sri Pattana 1701 Mukdahan 1702 Dong Luang 1703 Khamcha-I 1704 Wan Yai 1705 Nikhom Kham Soi 1706 Don Tan

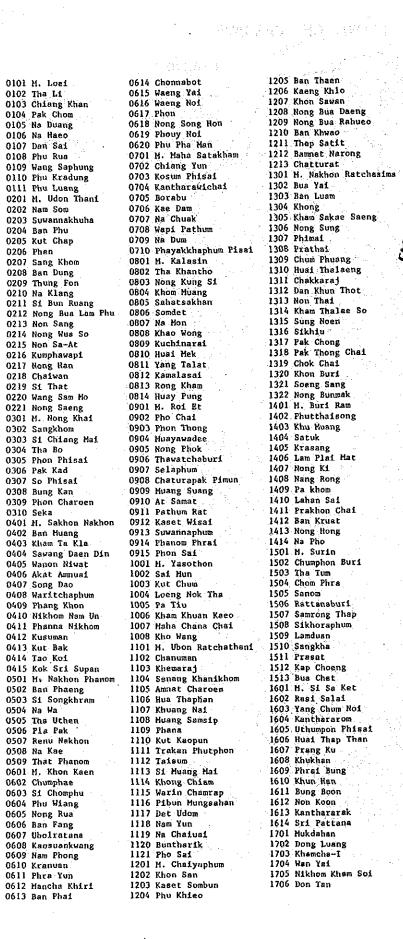
医腐蚀的 化铁酸盐 医丁乙酰胺 网络

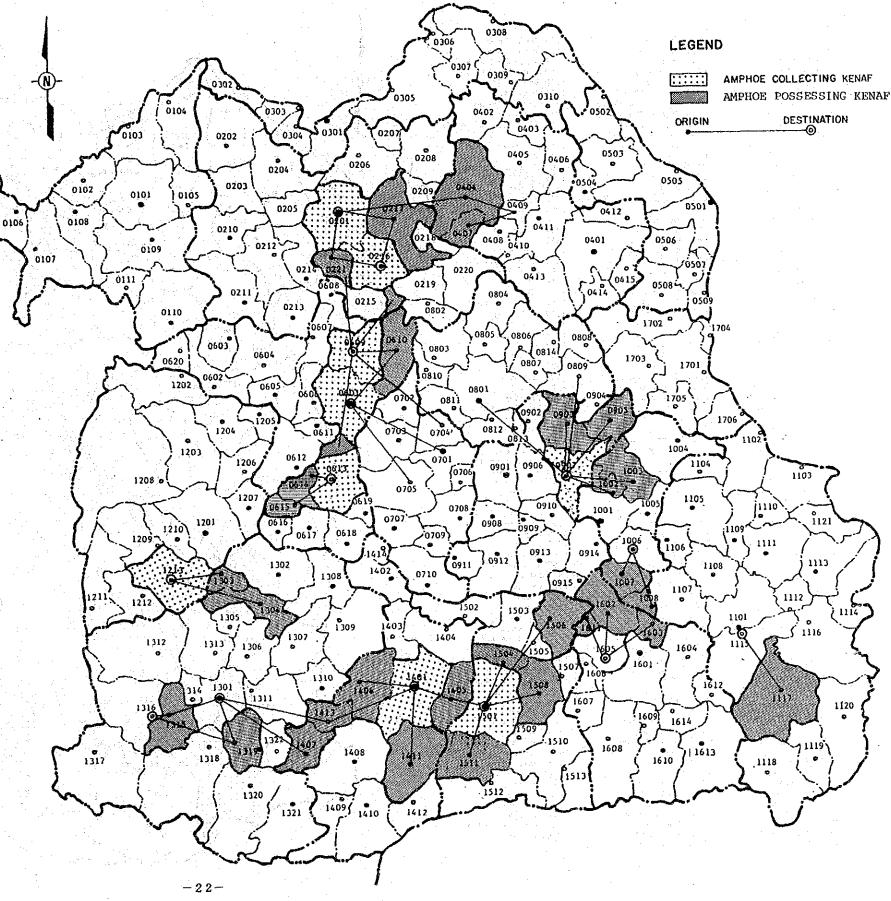
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COMMODITY FLOW OF KENAF

APPENDIX 2.4.11 3/4

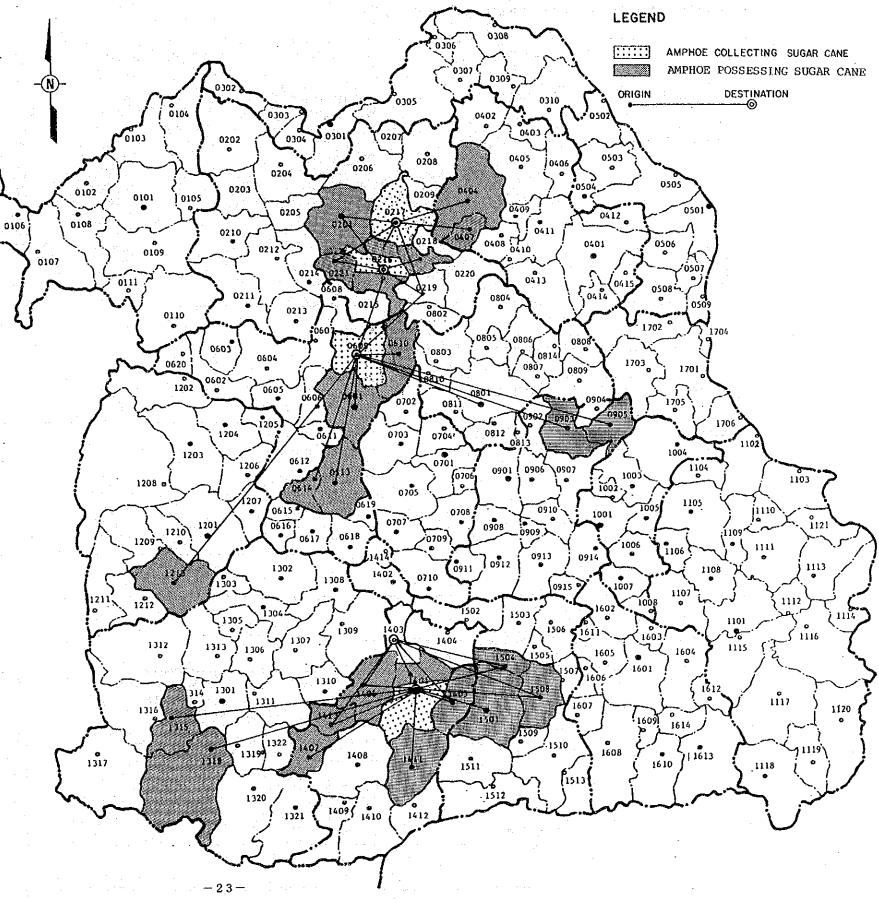
FLOW OF SUGAR CANE COMMODITY

0101 H. Loei 0102 Tha Li 0103 Chiang Khan 0104 Pak Chom 0105 Na Duang 0106 Na llaeo 0107 Dan Sai 0108 Phu Rua 0109 Wang Saphung 0110 Phu Kradung 0111 Phu Luang 0201 H. Udon Thani 0202 Nam Som 0203 Suwannakhuha 0204 Ban Phu 0205 Kut Chap 0206 Phen 0207 Sang Khom 0208 Ban Dung 0209 Thung Fon 0210 Na Klang 0211 Si Bun Ruang 0212 Nong Bua Lam Phu 0213 Non Sang 0214 Nong Wus So 0215 Non Sa-At 0216 Kumphawapi 0217 Nong Han 0218 Chaiwan 0219 Si That 0220 Wang Sam Mo 0221 Nong Saeng 0301 H. Nong Khai 0302 Sangkhom 0303 Si Chiang Mai 0304 Tha Bo 0305 Phon Phisai 0306 Pek Kad 0307 So Phisai 0308 Bung Kan 0309 Phon Chargen 0310 Seka 0401 M. Sakhon Nakhon 0402 Ban Muang 0403 Kham Ta Kla 0404 Sawang Daen Din 0405 Wanon Niwat 0406 Akat Ammuai 0407 Song Dao 0408 Warltchaphum 0409 Phang Khon 0410 Nikhom Nam Un 0411 Phanna Nikhom 0412 Kusuman 0413 Kut Bak 0414 Tao Koi 0415 Kok Sri Supan 0501 M. Nakhon Phanom 0502 Ban Phaeng 0503 Si Songkhram 0504 Na Wa 0505 The Uthen 0506 Pla Pak 0507 Renu Nakhon 0508 Na Kae 0509 That Phanom 0601 M. Khon Kaen 0602 Chumphae 0603 Si Chomphu 0604 Phu Wiang 0605 Nong Rua 0606 Ban Fang 0607 Ubolratana 0608 Kaosuankwang 0609 Nam Phong 0610 Kranuan 0611 Phra Yun 0612 Mancha Khiri 0613 Ban Phai

0614 Chonnabot 0615 Waeng Yai 0616 Waeng Noi 0617 Phon 0618 Nong Song Hon 0619 Phouy Noi 0620 Phu Pha Man 0701 H. Maha Satakham 0702 Chiang Yun 0703 Kosum Phisai 0704 Kantharawichai 0705 Borabu 0706 Kae Dam 0707 Na Chuak 0708 Wapi Pathum 0709 Na Dum 0710 Phayakkhaphum Pisai 0801 M. Kalasin 0802 Tha Khantho 0803 Nong Kung Si 0804 Khom Muang 0805 Sahatsakhan 0806 Sondet 0807 Na Mon 0808 Khao Wong 0809 Kuchinarai 0810 Huai Mek 0811 Yang Talat 0812 Kamalasai 0813 Rong Kham **O814 Huay Pung** 0901 M. Roi Et 0902 Pho Chai 0903 Phon Thong 0904 Musvawadee 0905 Nong Phok 0906 Thawatchaburi 0907 Selaphum 0908 Chaturapak Pimun 0909 Muane Suane 0910 At Samat 0911 Pathum Rat 0912 Kaset Wisai 0913 Suwannaphum 0914 Phanom Phrai 0915 Phon Sai 1001 M. Yasothon 1002 Sai Mun 1003 Kut Chum 1004 Loeng Nok Tha 1005 Pa Tiu 1006 Kham Khuan Kaeo 1007 Maha Chana Chai 1008 Kho Wang 1101 M. Ubon Ratchathani 1102 Chanuman 1103 Khemaraj 1104 Senang Khanikhom 1105 Amnat Charoen 1106 Hua Thaphan 1107 Khuang Nai 1108 Muang Samsip 1109 Phana 1110 Kut Kaopun 1111 Trakan Phutphon 1112 Taisum 1113 Si Muang Mai 1114 Khong Chiam 1115 Warin Chamrap 1116 Pibun Hungsahan 1117 Det Udom 1118 Nam Yun 1119 Na Chaiuai 1120 Buntharik 1121 Pho Sai 1201 M. Chalyaphum 1202 Khon San 1203 Kaset Sombun 1204 Phy Khieo

1206 Kaeng Khio 1207 Khon Sawan 1208 Nong Bua Daeng 1209 Nong Bus Rahueo 1210 Ban Khwao 1211 Thep Satit 1212 Bannet Narong 1213 Chatturat 1301 M. Nakhon Ratchasima 1302 Bua Yai 1303 Ban Luam 1304 Khong 1305 Kham Sakae Saeng 1306 Nong Sung 1307 Phimai 1308 Prathal 1309 Chum Phuang 1310 Huai Thalaeng 1311 Chakkaraj 1312 Dan Khun Thot 1313 Non Thai 1314 Kham Thalae So 1315 Sung Noen 1316 Sikhiu 1317 Pak Chong 1318 Pak Thong Chai 1319 Chok Chai 1320 Khon Buri 1321 Soeng Sang 1322 Nong Bunmak 1401 M. Buri Ram 1402 Phutthaisong 1403 Khu Muang 1404 Satuk 1405. Krasang 1406 Lam Plai Mat 1407 Nong Ki 1408 Nang Rong 1409 Pa khom 1410 Lahan Sai 1411 Prakhon Chai 1412 Ban Kruat 1413 Nong Hong 1414 Na Pho 1501 H. Surin 1502 Chumphon Buri 1503 Tha Tum 1504 Chom Phra 1505 Sanom 1506 Rattanaburi 1507 Samrong Thap 1508 Sikhoraphum 1509 Lamduan 1510 Sangkha 1511 Prasat 1512 Kap Choeng 1513 Bua Chet 1601 M. Si Sa Ket 1602 Resi Salai 1603 Yang Chum Noi 1604 Kanthararom 1605 Uthumpon Phisai 1606 Huai Thap Than 1607 Prang Ku 1608 Khukhan 1609 Phrai Bung 1610 Khun Han 1611 Bung Boon 1612 Non Koon 1613 Kanthararak 1614 Sri Pattana 1701 Mukdahan 1702 Dong Luang 1703 Khamcha-T 1704 Wan Yai 1705 Nikhom Kham Sol 1706 Don Tan

1205 Ban Thaca



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APPENDIX 3.1.1 POPULATION IN INFLUENCE AREAS

POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-1

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CHANGWAT	AMPHOE	TAMBON	POPULATION IN 1983	7.	POPULATION IN INFLUENCE AREA 1983 1988 1994 2002
2 CHAIYAPHUM 1	S CHATTÙRAT	ob ta nden op kahad	8563 4681	10 30	856 865 873 881 1404 1418 1431 1445
3 NAKHON RATCHASIMA O)3 BAN LUAM)4 KHONG	01 BAN LUAM 02 WANG PHO 03 KHOK KRA BUANG 04 CHO RAKA 01 MUANG KHONG 06 NONG MANAO 07 NONG BUA 08 NONG TENG	6417 3657 5640 4652 18446 6141 5012 5061	100 100 70 40 20 80 60 70	6417 6481 6540 6603 3657 3694 3727 3763 3948 3988 4024 4062 1861 1879 1896 1915 3689 3726 3760 3796 4913 4962 5007 5055 3007 3037 3065 3094 3543 3578 3611 3645
TOTAL					33295 33630 33933 34260 (0.20) (0.15) (0.12)

i de la compañía de l

CHANGWAT	AMPHOE	TAMBUN	FOFULATION	7.	POPULATION IN 1983 1988	INFLUENCE AREA
			IN 1983		1783 1788	1774 20
6 KHON KAEN		06 PHQENG YAI	7328	30	2198 2348	2510 21
	14 CHONNABOT	O1 CHONNABOT	7982	50	3991 4048	4134 42
		02 KUT PIA KHOM	10261	40	4104 4184	4251 4:
		03 WANG SAENG	6947	10	695 708	720
		04 HUAI KAE	5683	100	5683 5793	5886 5
		05 BAN TAEN	9201	30	2760 2814	2859 29
· · · · ·	15 WAENG YAI	O1 KHON CHIM	4304	75	3228 3228	3228 3:
		04 WAENG YAI	4395	100	4395 4395	4395 4
TOTAL					27055 27537	27983 28
						221 1 221
					(0.35) (0.3	≤ 11 $\langle 0.221$
	ی ہے ہے ہے یک شعر ہے جاتے ہو جو کا کا بعد ہے کا کا بعد کا بع	***			(0.35) (0.	2// (0.22/ 2002000000000000000000000000000000
ر به ها و ها به این این دو وی بی ای در به ای	ر بنه موجود بین بین می بین می ورو ها چه این این بین می می این این این این ا				(0.35) (0. 	
OPULATION WITHIN ARE	EA OF INFLUENCE : RO	UTE IM-5			(0.35) (0. 	
OPULATION WITHIN ARE	EA OF INFLUENCE : RO	UTE IM-5				
OPULATION WITHIN ARE CHANGWAT	EA OF INFLUENCE : ROI AMPHOE	UTE IM-5 TAMBON	FOPULATION IN 1983	 	(0.35) (0. POPULATION IN 1983 1988	INFLUENCE AREA
CHANGWAT	AMPHOE	TAMBCIN	IN 1983	•	POPULATION IN 1983 1988	INFLUENCE AREA 1774 20
CHANGWAT	AMPHOE 01 MUANG KHON KAEN	TAMBON 03 KHOK SI	IN 1983 12444		POPULATION IN 1983 1988 8089 9063	INFLUENCE AREA 1774 20 10166 11
CHANGWAT	AMPHOE	TAMBON OS KHOK SI O1 NAM PHONG	IN 1983 12444 13912	•	POPULATION IN 1983 1988 8089 9043 9738 10253	INFLUENCE AREA 1994 20 10166 11 10801 11
	AMPHOE 01 MUANG KHON KAEN	TAMBON 03 KHOK SI	IN 1983 12444	 65 70	POPULATION IN 1983 1988 8089 9063	INFLUENCE AREA 1994 20 10166 119 10801 110 6912 7:
CHANGWAT	AMPHOE 01 MUANG KHON KAEN	TAMBON OS KHOK SI O1 NAM PHONG O2 WANG CHAI	IN 1983 12444 13912 8903	45 70 70	POPULATION IN 1983 1988 8089 9063 9738 10253 6232 6562 2037 2145 5104 5373	INFLUENCE AREA 1294 20 10166 11 10801 11 6912 7 2259 20 5661 60
CHANGWAT	AMPHOE 01 MUANG KHON KAEN	TAMBON OS KHOK SI O1 NAM PHONG O2 WANG CHAI O4 BUA YAI	IN 1983 12444 13912 8903 6790	45 70 70 30	POPULATION IN 1983 1988 8089 9063 9738 10253 6232 6562 2037 2145 5104 5373 1222 1286	INFLUENCE AREA 1294 20 10166 119 10801 114 6912 73 2259 24 5661 60 1355 14
CHANGWAT	AMPHOE 01 MUANG KHON KAEN 09 NAM PHONG	TAMBON OS KHOK SI O1 NAM PHONG O2 WANG CHAI O4 BUA YAI O7 BAN KHAM O9 SAI MUN 10 THA KRASERM	IN 1983 12444 13912 8903 6790 8506 6108 7073	65 70 70 30 60 20 100	POPULATION IN 1983 1988 8089 9063 9738 10253 6232 6562 2037 2145 5104 5373 1222 1286 7073 7447	INFLUENCE AREA 1294 2 10166 11 10801 11 6912 7 2259 2 5661 6 1355 1 7845 8
CHANGWAT	AMPHOE 01 MUANG KHON KAEN	TAMBON OS KHOK SI OI NAM PHONG O2 WANG CHAI O4 BUA YAI O7 BAN KHAM O9 SAI MUN	IN 1983 12444 13912 8903 6790 8506 6108	65 70 70 30 60 20	POPULATION IN 1983 1988 8089 9063 9738 10253 6232 6562 2037 2145 5104 5373 1222 1286	INFLUENCE AREA 1294 2 10166 11 10801 11 6912 7 2259 2 5661 6 1355 1 7845 8
CHANGWAT	AMPHOE 01 MUANG KHON KAEN 09 NAM PHONG	TAMBON OS KHOK SI O1 NAM PHONG O2 WANG CHAI O4 BUA YAI O7 BAN KHAM O9 SAI MUN 10 THA KRASERM	IN 1983 12444 13912 8903 6790 8506 6108 7073	65 70 70 30 60 20 100	POPULATION IN 1983 1988 8089 9063 9738 10253 6232 6562 2037 2145 5104 5373 1222 1286 7073 7447	INFLUENCE AREA 1294 20 10166 115 10801 114 6912 70 2259 24 5661 60 1355 14 7845 80

APPENDIX 3.1.1

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POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-7

CHANGWAT	AMPHOE	TAMBON	POPULATION IN 1983	Υ.	POP 1983	ULATION IN 1988	INFLUENCE 1994	AREA 2002
02 UDON THANI	01 MUANG UDON THANI 21 NONG SAENG	05 BAN TAD 15 NONG HAI 11 NADI 16 BAN CHAN 01 NONG SAENG 02 SAENG SWANG	23879 7303 9616 20128 8313 13638	60 55 50 10 45 15	14327 4017 4808 2013 3741 2046	14862 4166 4987 2088 4316 2360	15425 4324 5176 2167 4982 2724	16092 4511 5400 2261 5839 3193
TOTAL					30951 (1.	32780 15) (1.0	34800 00) (0.8	37296 37)

POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-8

CHANGWAT		TAMBON	FOPULATION	7	POPU	LATION IN	INFLUENCE	
01111101111	, in a 17000		IN 1983		1983	1988	1994	2002
D2 UDON THANI	16 KUMPHAWAPI	01 THUM TAI 03 WIANG KHAM 07 HUAY KOENG	18233 6139 16540	40 10 80	7293 614 13232	8350 703 15150	9571 806 17364	11140 938 20211
TOTAL		<u></u>			21139	24203 4) (2.	27741 30) (1.1	3228: 92)

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POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-2

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	· · · · · · · · · · · · · · · · · · ·							
CHANGWAT	AMPHOE	TAMBON	POPULATION IN 1983	7.	POPI 1983	ILATION IN 1988	INFLUENCE 1994	AREA 2002
02 UDON THANI	16 KUMPHAWAPI	O3 WIANG KHAM	6139	.5	307	351	403	469
02 ODON TABAT		04 CHAE LAE	9682	40	3873	4434	5082	5915
		05 UM JAN	6014	20	1203	1377	1578	1837
	17 NONG HAN	01 NONG HAN	19687	40	7875	8224	8600	9054
	TA MORAC LINIA	02 NONG MEK	11954	20	2391	2497	2611	2745
		03 KHOK SAI	6811		4087	4268	4463	4698
		04 BAN CHIT	7232	5	362	378	395	416
		05 PHANG NGU	10218	90	9196	9604	10043	10573
TOTAL					29293	31134	33176	35712
TOTAL					(1.	23) (1.0	06) (O.S	92)
						==================	3232322533	

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•	1		•			-	
POPULATION	WITHIN	AREA	OF 'INFLUENCE	2	ROUTE	IM-12	

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LATION WITHI	IN AREA	OF INFLUENCE :	ROUTE IM	-12		· · ·				
HANGWAT		AMPHOE		TAMBON	POPULATION	 %	======================================	LATION IN	INFLUENCE A	:====== \REA
			· · ·		IN 1983		1983	1988	1994	2002
SAKHON NAKHON	1 0	4 SAWANG DAEN	DIN 01	SAWANG DAEN DIN	16973	30	5092	5092	5092	5092
					5923	5	296	296	296	290
			- S - F - C		6213	10	621	621	621	621
N		4	17	BAN TAI	6553	10	655	655	655	655
	0	7 SONG DAO	01	SONG DAD	5588	90 :	5029	5242	5413	5613
· .	in the second		03	WATTANA	4242	40	1697	1769	1826	1894
and the second		and the second	<u></u>	PHATUM WAPI	4323	40	1729	1803	1861	1930
	HANGWAT	HANGWAT AKHON NAKHON O	HANGWAT AMFHOE	HANGWAT AMPHOE AKHON NAKHON 04 SAWANG DAEN DIN 01 06 11 17 07 SONG DAO 01	AKHON NAKHON 04 SAWANG DAEN DIN 01 SAWANG DAEN DIN 06 NONG LUANG 11 SAT MUN 17 BAN TAI	HANGWAT AMPHOE TAMBON POPULATION IN 1983 AKHON NAKHON O4 SAWANG DAEN DIN O1 SAWANG DAEN DIN 14973 O6 NONG LUANG 5923 11 SAT MUN 6213 17 BAN TAI 6553 07 SONG DAO 01 SONG DAO 5588	HANGWAT AMPHOE TAMBON POPULATION % IN 1983 AKHON NAKHON 04 SAWANG DAEN DIN 01 SAWANG DAEN DIN 16973 30 06 NONG LUANG 5923 5 11 SAT MUN 6213 10 17 BAN TAI 6553 10 07 SONG DAO 01 SONG DAO 5588 90	LHTION WITHIN HALA OF INFLOENCE F NOTICE IN 12 HANGWAT AMPHOE TAMBON POPULATION % POPU IN 1983 1983 1983 1983 1983 AKHON NAKHON 04 SAWANG DAEN DIN 01 SAWANG DAEN DIN 01 SAWANG DAEN DIN 16973 30 5092 O6 NONG LUANG 5923 5 276 11 SAI MUN 6213 10 621 17 BAN TAI 6553 10 655 07 SONG DAO 01 SONG BAO 5588 90 5029	HANGWAT AMPHOE TAMBON POPULATION % POPULATION IN IN 1983 1988 AKHON NAKHON 04 SAWANG DAEN DIN 01 SAWANG DAEN DIN 14973 30 5092 5092 06 NONG LUANG 5923 5 296 296 11 SAI MUN 6213 10 621 621 17 BAN TAI 6553 10 655 655 07 SONG DAO 01 SONG DAO 5588 90 5029 5242	HANGWAT AMPHOE TAMBON POPULATION % POPULATION IN INFLUENCE A IN 1983 1983 1988 1994 AKHON NAKHON 04 SAWANG DAEN DIN 01 SAWANG DAEN BIN 16973 30 5092 5092 5092 06 NONG LUANG 5923 5 296 296 296 11 SAI MUN 6213 10 621 621 621 17 BAN TAI 6553 10 655 655 655 07 SONG DAO 01 SONG DAO 5588 90 5029 5242 5413

POPULATION	WITHIN	AREA	OF INFLU	JENCE :	ROUTE	IM-19	

POPULATION WITHIN ARE	A DE INFLUENCE :	ROUTE IM-19				· · · ·		
			an a					
CHANGWAT	AMPHOE	TAMBON	POPULATION IN 1783	χ.	POPU 1983	JLATION IN 1988	INFLUENCE 1994	AREA 200
09 ROI ET	03 PHONG THONG 05 NONG PHOK	11 PHROM SAWAN 04 KHOK PHO	4782 4361	80 10			4307 510	46 5
		06 NONG KHUN YAI 07 ROB MUANG	10230 6287	5	6138 314	6629 339	7182	78 4
· · · · · ·	07 SELAPHUM	01 KLANG 03 MUANG PHRAI 05 NA MUANG	15372 11012 8251	20 30 10	3074 3304 825	3230 3471 867	3399 3652 912	36
· •		06 WANG LUANG 09 PHO THONG	7169 13671	60 80	4301 10937	4519 11490	4755 12091	50 128
and a second second Second second	and a start of the second s	10 PHN NGEN 13 LAO NOI	11064 4476	70 90	7745 4028	8136 4232	8562 4454	90 47
10 YASOTHON	02 SAI MUN 03 KUT CHUM	04 NA WIENG 07 PHON NGAM	3712 7828	50 20	1856 1566	1912 1666	1970 1777	20 19
TOTAL					48350 (1.0		53941 23) (0.0	575 81)
ر برد ها بی برد ها به مربع به به به به به به به به مربع مربع مر	*****		بر مر مر مر مر مر مر می می می می او مر مر می می در مربع	2 422 86223	**********			
POPULATION WITHIN AREA) OF INFLUENCE :	ROUTE IM-24	a (ak antara ang bagan) ang ang ang ang ang ang ang ang ang ang	.* · · ·				
CHANGWAT	AMPHOE	TAMBON	FOPULATION IN 1983	*************************************	POPL 1983	LATION IN 1988	INFLUENCE 1994	AREA
11 UBON RATCHATHANI	17 DET UDOM	02 NA SUANG 03 NA YIA	11843 13459	 30 50	3553 6730 555	4097 7760		
		05 NA RUANG	5545	10	555	639	738	8.
TOTAL		·			10837	12497 9) (2.4	14415	168)0)

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APPENDIX 3.1.1 3/6

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POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-25

CHANGWAT	ÁMPHOE	TAMBUN	POPULATION IN 1983	POPULATION IN 1983 1988	N INFLUENCE AREA 1994 2002
10 YASOTHON	O7 MAHA CHANA O8 KHQ WANG	CHAI 01 FA YAD 04 PHU HEE 10 SONG YANG 01 FA HUAN 02 KUD NAM SAI 03 NAM OM 04 KHQ WANG	8351 50 4040 60 4000 100 5060 10 8339 70 4924 100 6612 95	4176 4354 2424 2528 4000 4171 506 530 5837 6112 4924 5155 6281 6577	4546 4777 2639 2775 4355 4576 556 587 6409 6770 5406 5711 6897 7285
16 SI SA KET	02 RASI SALAI 03 YANG CHUM		8805 10 4693 10	881 938 469 518	1001 1080 573 644
TOTAL	<u></u>			29498 30882 (0.92) (0.	32383 34203 79) (0.69)

POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-26

		·						=========
CHANGWAT	AMPHOE	TAMBON	FOPULATION IN 1983	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	POPI 1983	JLATION IN 1988	INFLUENCE 1994	AREA 2002
15 SURIN	06 RATTANABURI	02 THAT 11 BIRD	9815 6932	70 70	6871 4852	7294 5152	7763 5483	8345 5894
16 SI SA KET	OS UTHUMPON PHISAI 11 BUNG BOON	06 KHAM 07 NONG HAI 09 TA KORN 19 DOD 20 NONG MA 21 SUEW 02 POA	8378 7690 8646 5123 3886 6968 4382	60 20 10 100 100 100 50	5027 1538 865 5123 3886 6968 2191	5168 1581 889 5267 3995 7164 2430	5311 1625 913 5413 4106 7362 2704	5470 1674 941 5577 4231 7586 3050
TOTAL	<u></u>				37320	38942 35) (0.1	40680 73) (0.0	42774 63) =======

POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-27

CHANGWAT	 	AMPHOE			TAMBON	FOPULATION	1	FOPL	LATION IN	INFLUENCE	
Chiniconitz						IN 1983		1983	1988	1994	2003
5 SURIN	 	MUANG SURIN		08	 TA KUK	12448	20	2490	2634	2792	298
LU JUNIN	01	nome contra	•		BUNG	5061	5	253	268	284	304
	ÓА	CHOM PHRA			CHOM PHRA	10052	30	3016	3182	3364	3586
	V-7					7357	100	7357	7762	8207	8754
					BAN PHUE	4895	60	2937	3099	3276	3495
	08	SIKHORAPHUM		05		12826	90	11543	12485	13546	14880
		DIMIONITION			NONG BUA	10670	40	4268	4616	5008	550:
					NONG KWAW	8791	30	2637	2852	3095	3400
					KWAW YAI	5792	50	2896	3132	3398	3734
TOTAL	 				وہہ جنو میں سے سے سے مند وہے ہیں ہیں سے میں سے بنے سے		**	37397	40030	42971	46648
TOTAL								(1.3	37) (1.)	19) (1.0	03)

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p (OPULATION WITH	IN AREA	DE TNELLEN	CE : ROUT	eregenterizen beiten begenetre. E IM-29:10:20:00:5		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		-	an an the same	
									an a		
				un ba an An An An An An An An							
	CHANGWAT		AMPHOE		TAMBON	POPULATION	· · · · (' /		1988 19	1994	AREA 20
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	، دی اور					1/0 1700		1200 			
1	4 BURI RAM	0	5 KRASANG	111	01 KRASANG	12288	30	3688 S	4027	4413	49
主人な	sheet a	$(x,y) \in \mathbb{C}^{n+1}(Y)$		e No	03 SONG CHAN	7898	5	395	4:31	473	5
		an an an sea		1.3445	04 SUNG NOEN	7619	90	6857	7490	8209	21
· · · ·					08 BAN PRUE	6272	90	5645	6166	6757	750
· · ·			1 PRAKHON		01 PRAKHON CHAI		20	3346	3560	3797	409
					02 SALAENG TONE	16038 11679	10 20 ¹	1604 2336	1706 2485	1820 2651	े 190 285
-			· · · · · · · · · · · · · · · · · · ·	14 - 14 	03 BAN SAI 04 CHAN DUM	10689	20	2338 9620	2400 10235	10918	1170
	n an agus an		a terratione		09 KHOK KAMIN	5696	95	5411	5757	6141/1	
					12 PA CHAN	6650	30	1995	2123	2264	244
· _	urre i i horregen	n na lath luis	e so a a possione	eta di terreta terreta di terreta	13 SAODAO			5927		6727	
			·.		14 PHAI SAN	10235	5	512	544	581	61
	5 SURIN	0	1 MUANG SUI	RIN	13 SAWAI	13125		3938			471
	•		1 PRASART		05 TUNG MON	0	0	Ŏ	0	Q	
	TOTÁL	and an and the second sec					•••• ••• ••• ••• ••• ••• ••• ••• ••• •	51271	54997	59167	643
•••••								(1.41)	(1.2		
	122222222222222222						19 19 99 99 99 99 99 99 99 99				
		t di Ang					+			1	
Fi	OPULATION WITH	IN AREA	OF INFLUEN	CE : ROUTI	E IM-31	and and a second se Second second s		· · · · ·			
						and the second	20124	n schatzens es	۰. ۱		
.===	CHANGWAT	a 12 10 10 10 10 10 10 10 10 10 10 10 10 10	AMPHOE	==========		POPULATION	======================================	POPULA	TION IN	INFLUENCE	AREA
				1		IN 1983		1983	1988	1994	200
	4 BURI RAM		6 LAM PLAI		06 NONG KRATING	<u>5</u> 842	25	1411	1799	2253	284
 						6891	1 A A		8349	10458	1320
· · ·	• ••• •••• •••		7 NONG KI	· · · · · · · · · · · · · · · · · · ·		20796		2080	2103	2121	21
	والمتحر والجر	· · ·	1. The second		02 YEI PRASAT	9910	80	7928	8019	8086	81:
· · ·						2710		a contraction of the second		5007	50:
		• • • • • •			03 MUANG PHAI	9818	50	4909	4965		
• •		1	3 K.A.NONG	HONG	O3 MUANG PHAI 101 THAI SAMAKEE	9818 12005	50 70	4909 8404	9264	10244	
· · · ·		1:	3 K.A.NONG	HONG	03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN	9818 12005 12098	50 70 85	4909 8404 10283	9264 11336	10244 12535	1400
		1:			O3 MUANG PHAI 101 THAI SAMAKEE	9818 12005 12098 14601	50 70 85 70	4909 8404 10283	9264 11336 11267	10244 12535 12459	1149 1406 1397
	TOTAL				03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN 03 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781	9264 11336 11267 	10244 12535 12459 63164	1404 1393
	TOTAL	<u>.</u>		• • • • • • • • • •	03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN 03 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
	TOTAL	<u>.</u>		• • • • • • • • • •	03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN 03 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1395 7087 5)
	TOTAL			• • • • • • • • • •	03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN 03 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
	TOTAL				O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
	TOTAL				03 MUANG PHAI 01 THAI SAMAKEE 02 HUAY HIN 03 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
	TOTAL				O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	140/ 1397 7087 5)
	TOTAL				O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	140/ 1397 7087 5)
	TOTAL				O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
					O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601 	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	1404 1397 7087 5)
					O3 MUANG PHAI O1 THAI SAMAKEE O2 HUAY HIN O3 SRA KEAW	9818 12005 12098 14601 	50 70 85 70	4909 8404 10283 10221 51781 (1.98)	9264 11336 11267 57101 (1.7	10244 12535 12459 63164 70) (1.4	140 139 708 5)

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APPENDIX 3.1.1

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LUÉN	CE AREA
1994	2002
4413	4902
473	525
8209	9119
6757	7506
3797	4093
1820	1962
2651	2857
0918	11767
6141	6612
2264	2440
6727	~ 7250
581	626
4416	4726
Q	0
9167	64391

POPULATION WITHIN AREA OF INFLUENCE : ROUTE IM-33

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CHANGWA	r	AMPHOE	TAMBON		ATION 1 1983	%	POPULATION IN 1983 1988	I INFLUENCE AREA 1994 200
13 NAKHON	RATCHASIMA	15 SUNG NOEN 18 PAK THONG CHAI 19 CHOK CHAI	01 SUNG NOEN 07 MA KLUA MAI 08 MA KLUA KAO 10 NONG TAKAI 01 MUANG PAK 02 TA KHU 03 KHOK THAI 01 KRATOK 02 PLAB PLA	A	8404 4670 7675 4160 18475 10080 3961 12789 7409	10 40 30 70 30 50 50 10 40	840 868 1868 1930 2303 2379 2912 3008 5543 6005 5040 5461 1981 2146 1279 1468 4445 5104	897 93 1994 200 2458 255 3108 322 4528 718 5936 653 2333 256 1687 196 5864 684
TOTAL							26210 28369 (1.60) (1.	30805 3387 38) (1.20)
	• . • •						an an tha An tha an tha	
		anta Anta						
		• • • • • • • •						
				:				
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	e Na secondario de la composición de la c	en Transformer Na 1999 - Santa Santa Santa		:		:		and the second
		an ang pilang sa			•		an an an an Arthur An Anna an Anna Anna Anna Anna Anna Ann	
				•		:		• • •

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APPENDIX	3	. 1	1.
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						<u></u>		IN the second	·	Alter Charles		<u>, Kanan kanan</u> Alamatan kanan	
	(n) (a) an an a	n provi National Monte Provincia and Provincia	n an	(A)	(B) <u>1</u> /		n in the second s	a and a state of the second		ار این المیوند بیدان از محمد وال	(A)	(B) <u>1</u> /	
eren 1 - 20 2 - 20 2 - 20 2 - 2 5 - 2 	Changwat		Amphoe	Total Area (km ²)	Salinity Affected Area (km ²)	B/A (%)		Changwat		Amphoe	Total Area (km ²)	Salinity Affected Area (km ²)	B/A (%
02	UDON THANI	01	M. Udon Thani	1,081	240.9	22,3		NAKHON RATCHASIMA	. 03	Ban Luam	233	25.0	10.7
· · · · ·	and the second sec	16	Kumphawapi	1,308	367.4	28.1			04	Khong	914	274.4	30.0
en e		17	Nong Han	1,538	152.2	9.9	· • • • • • • • • • • • • • • • • • • •	fan 1950 û 18 An an an Anna Anna Anna Anna Anna	15	Sung Noen	1,187	·	· _
	etares L'Asta - Le Alexandres		Nong Saeng	651	. -	-				Pak Thong Chai	2,460	127.3	5.2
	an ann an thattair an th				and about to		e as all in tarres carefred	a estructure de merce. A	19	Chok Chai	1,004	··· · · · · · · · · · ·	. –
04	SAKHON NAKHON			1,372	-								
		. 07	Song Dao	356	-	-	14	BURI RAM	OF		·roo	F 0	0.1
06				1 110	26 5		•			Krasang	599	5.2	0.1
06	KHON KAEN		M. Khon Kaen	1,112	26.5	2.4				Lam Plai Mat	805		-
		09	Nam Phong	824		-	-		07		385	-	-
		10	Kranuan	436		-				Prakhon Chai	1,631	-	-
		13	Ban Phai	810	-				13	Nong Hong	343	. —	-
		14 15	Chonnabot	291	6.9	2.4		GUDTN	01	M. Charles	1 070		
		10	Waeng Yai	226	-	-	15	SURIN		M. Surin	1,278	-	-
09	ROI ET	03	Phon Thong	780	17.7	2.3				Chom Phra Rattanaburi	429 491	28,5	- 5.8
05		05	Nong Phok	450	±/./	_				Sikhoraphum	562	20, 5	J.0 _
		07	Selaphum	430 741	31.5	4.3		. •		Prasat	909		
10	YASOTHON		Sai Mun	940	25.0	4.6	16	SI SA KET	02	Rasi Salai	714	149.9	21.0
			Kut Chum	264	-	~			03		660	[*]	-
		07	Maha Chana Chai	455	10.2	2.2			05	Uthumphon Phisai	612	-	-
		08	Kho Wang	150	20.0	13.3			11	Bung Boon	50	-	-
11	UBON RATCHATHANI	17	Det Udom	1,853	. -	_	· · · · · · · · · · · · · · · · · · ·	<u></u>					
					:		·	<u>Note: 1/</u> : Mo	re th	an 8 mmho/cm (1 m	mho/cm =	0.64 g/l =	640 ppm)

APPENDIX 3.1:2

(1983)

	· · · · · · · · · · · · · · · · · · ·				
Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total
IM - 1					
Chaiyaphùm	Chatturat	Ta Noen	2.94	4.50	7.44
		Kahad	1.88	0.19	2.07
		(Total)	4.82	4.69	9.51
Nakhon	Ban Luam	Ban Luan	13.00	0.37	13.37
Ratchasima		Wang Pho	7,13	4.32	11.45
		Khok Kra Buang	35.00	25.33	60.33
		Cho Raba	4.31	4.13	8.44
		(Total)	59.44	34.12	93.56
	Khong	Muang Khong	7.56	0.63	8.19
		Nong Manao	19.50	7.88	27.38
		Nong Bua	11.69	5.32	17.01
		Nong Teng	8.19	2.38	10.57
		(Total)	46.94	16.21	63.15
		(TOTAL IM - 1)	111.20	55.02	166.22

1 .

Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total
IM - 4 Khon Kaen	Ban Phai	Phoey Yai	6.94		6.94
	Chonnabot	Chonnabot	10.50	0.40	10.90
· · · ·	·	Kut Pia Khem	20,19	0.44	20.63
		Wang Saeng	5.31	-	5.31
	· · ·	Kuay Kae	21.63	-	21.63
•	19. j 11	Bon Taen	14.13	-	14.13
	an sana Birana ang sana	(Total)	71.76	0.84	72.60
	Waeng Yai	Non Chim	50.00	-	50.00
		Waeng Yai		***	9.00
		(Total)	59.00		59.00
÷.,				. *	

(TOTAL IM - 4) 137.70

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APPENDIX 3.1.3

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(Unit : thousand rai)

37.70 0.84 138.54

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APPENDIX 3.1.3 CULTIVATED AREA BY TAMBON, AMPHOE AND ROUTE

(1983) (2983)

- 32 -

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Route No. Changwat	Amphoe	ideran Serange ∰	Tambon	Paddy Field	Upland Field	Total
IM - 5	M. Khon Ka	aen	Khok Si	30.50		30.50
Khon Kaen	Nam Phong		Nam Phong	7.12	1.31	8.43
	19		Wang Chai	6.19	1.06	7.25
1997 - 1977 1977 - 1977	100 C	vi da	Bua Yai	8.00		8.00
			Bua Kham	11.81	_	11.81
<i>,</i>		. .	Sai Mun	6.50		6.50
· · · ·			Tha Kraserm	26.38	. –	26.38
·· · ·	···· ·	e e Set est	(Total)	66.00	2.37	68.37
	Kranuan		Ban Non	5.63	ant in the state	5.63
 		ta da cara da c Cara da cara da	(TOTAL IM-5)	102.13	2.37	104.50
IM - 7		- 1	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -			
Udon	M. Udon		Ban Tad	8,37	20.88	29.25
Thani	Thani		Hong Hai	5.88	11.50	17.38
			Ban Chan	1,25	-	1.25
			Nadi	4.75	- .	4.75
			(Total)	20.25	32.38	52.63
	· *	- * *	al gotte and a			
	Nong Saeng	J	Nong Saeng	23.62	21.93	45.55
			Soeng Swang	6.19	4.76	10.95
			(Total)	29.81	26,69	56.50
			(TOTAL IM - 7)	50.06	59.07	109.13

:	· · ·				
Route No. Changwat	Amproe	Tambon	Paddy Field	Upland Field	Total
· .					
IM - 8					:
Udon	Kumphawapi	Thum Tai	11.00	aga sta <u>i</u> s	11.00
Thani		Wrang Kham	2.96	-	2.96
		Huay Koeng	18.05	8.24	26,29
		(TOTAL IM - 8)	32.01	8.24	40.25
IM - 9					
Udon	Kumphawapi		0.69	-	0.69
Thani		Chae Lae	10.00	7.25	17.25
		Um Jan	3.00	-	3.00
8 J. (14		(Total)	13.69	7.25	20.94
	status - 19				
	Nong Kan			4.70	22.95
		Nong Mek	3.31	2.76	6.07
		71 -1 Ord	11.31	6.68	17,99
		Ban Chit	0.81	-	0.81
	perior Ar	Phang Ngu	37.94	1.25	39.19
	n Maria Maria ang Ka	(Total)	71.62	15.39	87.01
·····		(TOTAL IM - 9)	85.31	22.64	107.95

APPENDIX 3.1.3 2/6

(Unit : thousand rai)

(1983)

Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total	:	Route No. Changwat	Amphoe	Tambon
	<u> </u>								
IM - 12			· ·				IM - 19		
Sakhon Nakhon	Sawang Daen Din	Sawang Daen Din	14.18	3.87	18.05		Roi Et	Phon Thong	Phrom Sawan
		Nong Luang	1,19	0.25	1.44		1.	Nong Phok	Khok Pho
	. · · · · ·	Sai Mun	6.94	0.56	7.50			e e e e e e e e e e e e e e e e e e e	Nong Khun Yai Rob Muang
		Ban Tai	0.94	4.75	5,69		· .		KOD Muang
		(Total)	23.25	9.43	32,68				(Total)
			- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10					$= \frac{1}{2} \left(-\frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) \right) + \frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) \left(\frac{1}{2} - \frac{1}$	
	Song Dao	Song Dao	14.94	12.06	27.00			Selaphum	Klang
		Wattana	5.62	7.31	12.93				Muang Phrai
	1. de 1.	Phatum Wapi	4.25	8.44	12,69		··· · ·		Na Muang
	.'	(Total)	24.81	27.81	52.62				Wang Luang Pho Thong
	· .	<u>.</u>						•	Phu Ngen
		(TOTAL IM-12)	48.06	37.24	85.30				Lao Noi
									(Total)

----(Total) (TOTAL IM - 19)

Sai Mun

Kut Chum

Yasothon

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APPENDIX 3.1.3 3/6

Paddy Field	Upland Field	Total
		· ·
16.75	4.19	20.94
-	0.75	0.75
5.63	21.31	26.94
	0.86	0.86
5.63	22.92	28.55
. *.		e prae
3.00	-	3.00
10.56	1.62	12.18
7.56	-	7.56
9.31	1.81	11.12
29.31	18.56	47.87
11.63	15.19	26.82
7,56	5.30	12.86
78,93	42.48	121.41
4.19	5.06	9,25
3,44	6,43	9.87
7.63	11.49	19.12
108.94	81.08	190.02

Na Wieng

Phon Ngam

(Unit : thousand rai)

APPENDIX 3.1.3 CULTIVATED AREA BY TAMBON, AMPHOE AND ROUTE

(1983) 1810

Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total
IM - 24		· .		•	n state
Ubon	Det Udom	Na Suang	15.19	1.69	16.88
Ratchathan	i	Na Yia	34.31	2.94	37.25
		Na Ruang	3,94]+x×4	3.94
		(TOTAL IM-24)	53.44	4.63	58,07
IM - 25				· · ·	
Yasothon	Maha Chana	Fa Yad	10.38	2,44	12.82
$(x_{i}^{1}) \in \mathcal{F}_{i}$		Phu Hee	14.31	0.60	14.91
•	1. 1. 1. 1.	Song Yang	8.44	1.82	10.26
		(Total)	33.13	4.86	37.99
	Kho Wang	Fa Huan	1.37	-	1.37
		Kud Nam Sai	13.69	- -	13.69
	· · · ·	Nam Om	23.13	2.25	25.38
• . •	and and a second se	Kho Wang	19.50	2.81	22.31
	an a	(Total)	57,69	5.06	62.75
Si Sa Ket	Rasi Salai	Phai	4.00		4.00
• • •	Yang Chum Noi	Non Koon	1.93		1.93
	· · · · · · · · · · · · · · · ·	(Total)	5,93	-	5.93
	·	• • • • •	· · · · · · · ·		

Route No. Changwat	Amphoe	uzuent Namita	Tambon	Paddy Field	Upland Field	Total
IM - 26	·· <u>···································</u>	*	<u> </u>		<u> </u>	2
Surin	Rattana	Buri	That	18.88	· · · · · · · · · · · · -	18,88
			Bird	10,94	-	10.94
			(Total)	29,82		29.82
Si Sa Ket	Uthumpho Phisaì	'n	Khan Nong Hai	12.06 3.62	. 	12.06
			Ta Karn	7.44	· . -	7.44
29. Ju		÷.	Dod state and state	19.19	. .	19,19
· .	1		Nong Ma	12.94	-	12.94
		· · · ·	Suew	18.00	2.25	20.25
· .			(Total)	75.25	2.25	77.50
	1. E 1	• • • •				
	K.A. Bur	ng 👘	Pon	6.44	1.48	7,92
	Boon		 			
			(TOTAL IM-26)	111.51	3.73	115,24

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APPENDIX 3.1.3

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(Unit : thousand rai)

and set of the

(1983)

Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total	· · · ·	Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total
IM - 27		<u> </u>		· • · · · · · · · · · · · · · · · · · ·			IM - 29					· · · · · · ·
Surin	M. Surin	Ta Kuk	10.38	-	10.38		Buri Ram	Krasang	Krasang	10.85	. –	10.85
		Bung	2.56	. .	2.56	•		· . · · ·	Song Chan	1.26	-	1.26
		(Total)	12.94		12.94				Sung Noen	25.67	-	25.67
									Ban Prue	21.90		21.90
	Chom Phra	Chom Phra	12.38	-	12.38				(Total)	59.68		59.68
		Bu Krang	20.25	-	20.25				· · · · · ·			
		Ban Phue	14.31	0.25	14,56			Prakhon Chai	Prakhon Chai	6.98	-	6.98
		(Total)	46.94	0.25	47.19	·	•		Salaeng Tone	3.49	-	3.49
		• • • • • • • • • • • • • • • • • • •							Ban Sai	6.98	-	6.98
	Sikhoraphum	Tae	34,88	-	34.88				Chan Dum	26.16	-	26.16
	-	Nong Bua	9.62	0.75	10.37				Khok Kamin	24.50	-	24.50
		Nong Kwaw	7.19	-	7.19			•	Pa Chan	11.44	-	11.44
		Kwaw Yai	11.00		11.00				Sa Dao	26.15	-	26.15
						<u> </u>			Phai Son	2.62	**	2.62
		(Total)	62.69	0.75	63.44		м. 1911 г. с.	n Attack and a star	(Total)	108.32	-	108.32
	·	(TOTAL IM-27)	122.57	1.00	123.57		- ·	• • •	· ·· · ·			
							Surin	M. Surin	Sawai	7.36		7.36
						· · ·		Prasart	Tung Mon	4.65	-	4.65
									(TOTAL IM-29)	180,01		180.01

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APPENDIX 3.1.3 5/6

(Unit : thousand rai)

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(1983)

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Route No. Changwat	Amphoe	Tambon	Paddy Field	Upland Field	Total
	:		·····		
IM - 31				•	
Buri Ram	Lam Plai Mat	Nong Krating	4.25	1.25	5.50
	4. 	Phathai Rin	32.75	2.25	35.00
10 (19 C) 10 C)	· · · · ·		27.00		40 50
		(Total)	37.00	3,50	40.50
· · ·	Nong Ki	Nong Ki	6.94	-	6.94
		Yei Prasat	39.18	4.50	43.68
		Muang Phai	14.19	10.38	24.57
12 - 14 1	$(x,y) \in \mathcal{A}_{p_{1}}$	(Total)	60.31	14.88	75.19
	··· ,	(10:01)	50.51	11100	
	K.A. Nong	Thai Samakee	45.75	2.62	48.37
	Hong	Huay Hin	49.94	7.50	57.44
* · · ·		Sra Keaw	37.12	_	37.12
	1 A - A	· · · · · · · · · · · · · · · · · · ·			
•		(Total)	132.81	10,12	142.93
- .		(TOTAL IM-31)	230.12	28.50	258.62

Route No. Changwat	Amphone	Tambon	Paddy Field
IM - 33			· · · ·
	a		1.66
Nakhon Ratchasima	Sung Noen	Sung Noen	
		Ma Klua Mai	0.98
		Ma Klua Kau	17.54
		Nong Takai	4.27
$[eff] = e^{-i\phi}$		(Total)	24.46
		$a_{i}^{*}(z) \neq z$	
an An an an	Pak Thong Chai	Muang Pak	3.23
	n na sa	Khok Thai	4.27
		Taku	1.04
: ; · ·		(Total)	8.54
:	Chok Chai	Kratok	0.53
		Plab Pla	. 4.34
가 가 가 가 가 가 가 가 가 가 가 가 가 다 가 가 다 가 가 다 가 가 다 가 가 가 가 다 가 가 다 가 가 다 가 가 다 다 가 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 다 이 이 이 이		(Total)	4.87

(TOTAL IM-33) 37.87

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APPENDIX 3.1.3 6/6

	housand rai)
Upland Field	
3.99	5.65
12.75	13.73
2,21	19.75
20.64	24.91
39,60	64.06
5.51	8.74
2.99	7,26
16.98	18.02
25.48	34.02
_	0.53
4.39	8.73
4.39	9.26
69.47	107.34

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APPENDIX 3.1.4 PLANTED AREA BY ROUTE

(1983)

			1740	· ·					· · ·	(Uni	t : thous
=====				1 CE 40 CE 40 CE 40 CE 40 CE 40	, , , , , , , , , , , , , , , , , , , 	UPL.AN	D CROPS			10222 <u>2</u>	<u> </u>
ROUTE NO.	PADDY	MAIZE	SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE		CASTOR BEANS	TOTAL
IM-1	92.74	2.06	0.77	0.27	0.05	13.29	9.92	. —	5,33	10.67	42.36
IM-4	85,37	0.39	 .		, T estua	0.39		<u> </u>		-	0.78
IM-5	74.04					••••	—	1.85		- 	1.85
1M-7	39.90	0.01		0.05	0.16	11.34	2.91	15.65		-	30.12
IM-8	25.64	-	-	-		0.02	0.26	7.23			7.51
IM-9	58.35		ter and the second s	0.18	0.07	5.07	3.59	7.33	-	. 	16.26
IM-12	47.10	2.73		0.48	<u></u> 	20.50	3.07	5.99	. 		32.77
IM-19	91.07	0.64	_	o . 94	1.27	45.70	22.48				71.03
IM-24	52.91	0.18	-	0,47	-	0.16	1.59		•••• ,		2.40
IM-25	92.02	. –		. 13 13		-	8.52	-	-	_ .	8.52
IM-26	107.83	_		a			2.61	-	-	<u>.</u>	2.61
IM-27	115.22	0.07		0.30	.	-	0.02			. 	0.39
IM-29	156.43		. –	<u> </u>	-	. -	-	-	. .	; 	·
IM-31	226.21	2.07	-	2.18	0.12	7.12	1,48	0.07	2	_ .	13.11
IM-33	27.19	9.28	0.22	0.67	1.04	26.18	0.13	· - · · · ·	0.51	0.76	38, 82

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APPENDIX 3.1.4

sand rai)

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TOTAL

waaree a

135.10 86.15 75.89 70.02 33.15 74.61 79.87 162.10 55.31 100.54 110.44 115.61 156.43 239.32

66.02

APPENDIX 3.1.5 AVERAGE CROP YIELD BY ROUTE

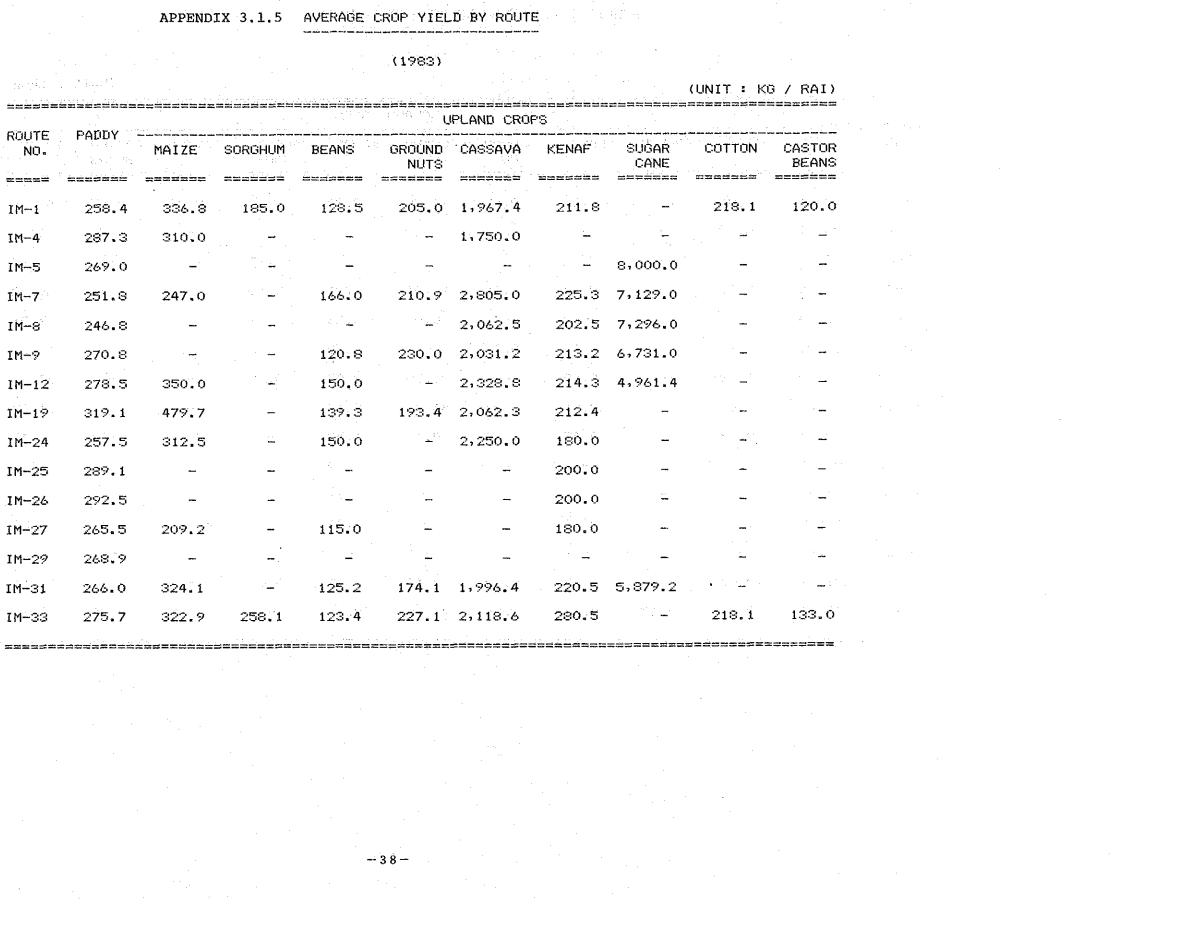
(1983)

(UNIT : KG / RAI)

an thur the		والمراجع والمراجع المراجع								(UNIT : KU	; / KAI)
a se				· · · ·		1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	IPLAND CRO	PS			
	ROUTE NO.	ΡΑΦΟΥ -	MAIZE	SORGHUM	BEANS	GROUND NUTS	CASSAVA	KENAF	SUGAR CANE	COTTON	CASTOR BEANS
	*****	aangan:		======		===					
	IM-1	258.4	336.8	185.0	128.5	205.0	1,967.4	211.8	• •••	218.1	120.0
$F_{\rm eff} = 10^{-1} {\rm eff}$	IM-4	287.3	310.0		. –		1.750.0	<u></u>		نىن ت	· _ ·
	IM-5	269.0	_		-	-			8,000.0	—	
.:	IM-7	251.8	247.0	_	166.0	210.9	2,805.0	225.3	7,129.0	_	·
	IM-8	246.8		· _ ·	a di <u>a</u> n di		2,062.5	202.5	7,296.0	· -	
1	IM-9	270.8	-		120.8	230.0	2,031.2	213.2	6,731.0	· _	·
	IM-12	278.5	350.0	÷	150.0	2007 - 1000 1000 - 1000 1000 - 1000	2,328.8	214.3	4,961.4	· · · · _ ·	·
1 . Al	IM-19	319.1	479.7	-	139.3	193.4	2,062.3	212.4	-	- -	
1997 - 1997 1	IM-24	257.5	312.5	· · ·	150.0	·	2,250.0	180.0		<u> </u>	
	IM-25	289.1	-		-	-	-	200.0	-	· _	· _ ·
1. E.	IM-26	292.5	. –	-	<u> </u>		-	200.0	<u></u>		. '
	IM-27	265.5	209.2	-	115.0		-	180.0	 .	 -	· <u> </u>
	IM-29	268.9		•	· <u> </u>	-	-		· _	<u>ـــ</u>	يت `
н 1910 - Мариян 1910 - Мариян	IM-31	266.0	324.1	· · · · · ·	125.2	174.1	1,996.4	220.5	5,879.2	• • •	·
	IM-33	275.7	322.9	258.1	123.4	227.1	2,118.6	280.5	427 - 9 - 22 10 - 10	218.1	133.0
											· · · · · ·

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APPENDIX 3.1.5



APPENDIX 3.1.6 CROP PRODUCTION AMOUNT BY ROUTE

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الاس مانه محد حد من هذه بعد بعد بن اند مانا من هذه عند عد بعد بعد بند بني وجرجها عند عد اند ابت ابت ابت وي عد عد

en de la sectadore estador de la construcción de la construcción de la construcción de la construcción de la c

		•							n an	to search an Ara - Araban an Araban - Araban	· .	(UN)	ίT
					3384863¥5		UPLAN	D CROPS					1
	ROUTE NO.	PADDY	MAIZE	SORGHUM	BEANS	GROUND	CASSAVA	KENAF	SUGAR	COTTON	CASTOR	TOTAL	
and the second sec					=======	NUTS		=======	CANE		BEANS		;
	IM-1	23,964	694	142	. 35	10	26,147	2,101	1999 - 1997 -	1,162	1,280	31,572	
	IM-4	24,527	121		· `		683		n de la companya de l Esta de la companya de		· _	803	
	IM-5	19,917		. • . • . • . • . •	-	. –			14,800			14,800	
	IM-7	10,047		-	8	34	31,809	656	111,569		• -	144,076	:
• •	IM-8	6,328	a 1	·· · · <u>-</u>	· _ ·	- 1. 2010 - <u></u>	41	53	52,750	· ····	-	52,844	
	IM-9	15,801			22	21	10,298	765	49,338	· · -		60,444	
and a start of	IM-12	13,117	956		72		47,740	658	29,719		-	79,145	
· · · · ·	IM-19	29,060	307		131	246	94,247	4,775	· · · · · · · · · · · · · · · · · · ·			99,705	:
	IM-24	13,624	56		70	- -	360	286				773	
÷.,	IM-25	26,603	n an Taonaiste an <u>Ta</u> rta	-	•	. .		1,704			1 ()	1,704	• •
	IM-26	31,540	- ¹ _	-	·	аналан алар 1997 — Алар Алар Алар 1997 — Алар Алар Алар Алар Алар Алар Алар Алар	1	522		_	-	522	
	IM-27	30,591	15	-	35			4	-	•••		53	• :
	IM-29	42,064	· . ·-		-		.aa≓a	-		-		1 ₁	
	IM-31	60,172	671		273	21	14,354	326	412		··	16,057	
	IM-33	7,497	2,997	57	83	241	55,471	36	-	111	102	59,098	

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APPENDIX 3.1.6

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IT : TON)
TOTAL
55,536
25,330
34,717
154,123
59,172
76,245
92,262
128,766
14,397
28,307
32,062
30,644
42,064
76,229
66,595
88223838

⁽¹⁹⁸³⁾

APPENDIX 3.2.1 COMPARISON OF TRAFFIC FORECAST METHODOLOGY

JICA Method

		Traffic Movement	and the state of the	Future Traff	ic	
Base Year Traffic	Vehicle Type	in Base Year	Growth Rate	Future Movem	ent	ADT
 Established based on synthetic analysis of traffic counts by the study team and DOH. Adjusted by seasonal factors. In case of new constru- ction routes, present traffic volume was estimated by the model developed from O/D survey data. 	1. Passenger 1. Type Occupancy 1 P/C 3.0 persons P/P 3.8 L/B 14.5 M/B 20.6 H/B 38.7 2. Freight Type Average Load 1 P/T 0.6 tons 4/T 0.74 6/T 2.17 10/T 8.61 1/: Occupancy rates and average loads were estimated based on the roadside inter- view survey conducted by the study team.	Passenger 1. Movement in terms of a) persons was calculated by multiplying the number of passenger vehicles by occupancy rate by vehicle type and then b) summing up. Freight Movement in terms of tons was calculated by multiplying the number of freight vehicles by average load by vehicle 2. type and then summing up. a) b)	Passenger Estimated based on the growth rates of: . Population . Per capita income . Transportation price Elasticity Income and transportation price elasticities were applied for the estimation. Income elasticity was obtained from the home interview survey. Freight Established based on the following movement: Non-agricultural freight Estimated by the correlation model between passenger move- ment and freight based on road- side interview results. Agricultural freight Estimated based on the future crop production obtained from the agricultural development study.	 the passenge b) Induced traffic Multiplying traffic" by traffic" rate assumed as 1 DOH data. c) Developed traffic developed traff	ic passenger base year by r growth rate. fic 2. "normal the "induced io which was 5% based on 3. raffic "normal and fic" by atio which ed based on area in "with case. uural used on the which was the model.	Passenger Estimated applying the average occupancy and traffic composition to passenger movement. Freight Estimated applying the average load and traffic composition to freight movement. Motorcycle Estimated by the model established based on an analysis of the relationship be- tween motorcycle volume and ADT.

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APPENDIX 3.2.1 1/6

Study of Rural Roads May 1981

Base Year Traffic

- Estimated based on:
- . Transportation movement
- . Occupancy rate by vehicle
- type for passengers
- . Average load

	Vehic	le Type		
1.	Passenger			
a)		Occupancy	Share	
•	Heavy bus	34	58	-1
•	Light bus	9	95 %	
-	Motor cycle	1.5		
•	Pickup	5	70 %	
•	Car	4.5	L _{30 %}	1
b)	Motorcycle,	pickup a	nd	
	car passenge	ers were e	stimated	

- using a linear model.
- 2. Freight

	Т	able 4-B		1.		
Сгор	P	ickup	Trucks			
Crop	%	Ay. load	92	Av. load		
Rice	20	1.5	20	-		
Rubber	50	1.5	- 1	·		
Cassara	- 1	I – I	100	9		
Sugarcane	-	-	100	14		
Tobacco	20	1.5	80	6		
All others	80	1.5	20	5		

Trar	sportation	· · · · ·	ni e la jita.		
Move	ment in Base Y	lear		Growth	Rate
ji e s	1	.:	. *		
. Ge	eneration of Pa	assenger	ega de la	·	
Mo	ovement	•	1		. : .
) CJ	assification c	f		• •	
pa	ssengers				
•	Bus				
•	Motorcycle, pi	lekup			
	and car				
) Tr	ips (T) was es	timated			
ba	sed on:	•			

- . Expenditure for transportation (E)
- . Average trip length (L)
- . Average cost per km (C)
- . T=E / (CxL).

.....

1.

a)

b)

- . Divided by 365 and
- multiplied by 3/8
- 2. Freight movement
- a) Basis is agricultural production by kind.
- b) Added to back hauls and 10% of non-agricultural supplies.
- c) Divided by 365 and multiplied by 3/8.
- * "Socio-economic Survey 1975-76"

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- production growth rated wat. 2. Estimated by applying fu tion, income production 3. In case of
 - development
 - applied for
- - of population
 - and crop pro

APPENDIX 3.2.1 2/6

	Future Traffic		
	Future Movement	• .	ADT
1.	Estimated future popula-	1.	ADTs were estimated
	tion, income and crop production by applying growth rated by Chang-		using same method as base year. Generated and deve-
	wat. Estimated by models		loped traffic were calculated by sub-
÷.	applying future popula- tion, income and crop		tracting normal from total.
3.	production by Changwat. In case of "with project", development model was		
	applied for estimation of population, income and crop production.		

and the second second

Road Feasibility Study Project October 1982

والمتحدث والمراجع والمحاج والم	Transportation Move-	e de la construcción de la construc	Future Traffic	
Base Year Traffic Vehicle Type	ment in Base Year	Growth Rate	Future Movement	
1. Weekly ADTs were assumed 10 Types:	Traffic movements 1	. Passenger car, light		1. Nor
by applying adjustment . Motorcycles	were explained in	truck and light bus		cal
factor to 3-day counts Passenger cars and	terms of number of	Growth rate = P + eU	and a second	the
2. Annual ADTs were calcu-	vehicles.	P: Population growth	and the second second	
lated combining weekly . Light trucks		rate	and the second	2. Ger
ADTs and agricultural . Medium trucks		U: Per capita GPP growth rate	an an an Arrange ann an Arrange ann An Arrange ann an Arr	riı
traffic, . Heavy trucks . Light buses	a standard a Standard a standard a st	e: 1.33 which is income elasticity outside Bangkok based on		COI
. Medium buses		data for 1975-1979		· . F
. Agricultural light	•	ta ang ang ang ang ang ang ang ang ang an	ter en ante de la presenta de la composición de la composición de la composición de la composición de la compos	, I
trucks		. Medium bus	and a second state of the	a
. Agricultural mediu	in a state of the	Growth rate = P+eU		. м
trucks	alter and	P,U: As above		h
. Agricultural heavy	•			3. Dev
war da her trucks		e : 1.0 national value		was
	3			4. Div
		Derived based on the		est
	en e	trend of motorcycle registrations and motorcycle traffic.		O/D
	4	. Medium and Heavy Trucks		
	en esta de la casa de l Casa de la casa de la c Casa de la casa de la c	Growth rate = GPP Growth Rate.	·	

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APPENDIX 3.2.1

3/6

ADT ormal traffic was alculated by applying he growth rates to AADTS. Generated traffic rates considering change of road surface condition were established: Passenger car 50% Light trucks and all buses 20% Motorcycles, medium and heavy trucks 0% evelopment traffic as limited. iverted traffic was stimated based on /D survey data.

en e			Transpor	tation Move-			Future Traffic
ase Year Traffic		Vehicle Type	ment in	Base Year	· · · · · · · · · · · · · · · · · · ·	Growth Rate	Future Movement
. AADT were calculated	1.	Passenger			1.	Passenger	
based on:		. Motorcycles		·	a)	Affecting factors	
. Results of traffic		. Passenger cars &				. Population	
survey		taxis				. Per capita income	· ·
. Seasonal adjustment		. Light buses	•			. Transportation price	
factors by subregion		. Heavy buses		• •	b)	Elasticity	
which were established for passenger and freight vehicles	2.	. Light trucks Freight . Medium trucks				. Income elasticity of demand for transportation services (based on "Socio- economic Survey 1975-1976")	
(based on DOH data).		. Heavy trucks				$ep = 15.02 \times Y^{-0.295}$	
	3.	Occupancy rate for				$ev = 113.2 \times Y^{-0.443}$	
		all vehicle types were estimated and				Where, ep: Income elasticity of public transpor- tation	
		also average load and empty car rates				ev: Income elasticity of vehicle ownership	
		for vehicles which				Y : Income	
		were used for freight			c)	Modification of elasticities was	
		transportation.				assumed based on:	
				· . · ·		. Between light bus and heavy bus	
						. Between automobile and motorcycle	
					d)	Price elasticities were established	
						by purpose of trip;	
						. Work/business = -0.15	
			1. A A			. Other trip $= -0.40$	
				an da an	2.	Freight	
		:	· .		a)	Growth rate of GPP was applied	
		· · · · :			b)	Future traffic mix of medium and	
						heavy trucks was modified, using	
						average load and empty rate by	
						type of vehicle.	

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APPENDIX 3.2.1 4/6

	ADT
1.	ADTs were estimated by multi-
	plying "base year traffic"
	by growth rates and modified
	by traffic mix.
2.	Generated traffic was
	estimated by applying price
	elasticities of -0.15 and
	-0.40 for work/business and
	social/recreational trips,
	respectively.
3.	Developed traffic was not
	included.
4.	Forecast for new construc-
	tion:
	. Estimate income level
	. Estimate expenditure for
	transportation based on
	income level applying
	equation below:
	Adjustment factor =
	94.15 x $y^{-0.46}$
	Y : Per capita income

Highway Sector Project, February 1983

		Transportation Move-	and the second second second second second	Future Traffic
Base Year Traffic	Vehicle Type	ment in Base Year	Growth Rate at the second	Future Movement
	a (an ar a the second			· · · · · · · · · · · · · · · · · · ·
1. Established based on the	1. For traffic counts:	1.	For cars, medium/heavy trucks,	· 1
traffic counts.	. Same as PRI study	a da anti-arrente da anti-arrente da anti-arrente da anti- arrente da anti-arrente da anti-arrente da anti-arrente da anti-arrente da anti-arrente da anti-arrente da anti-	light and heavy buses:	
2. Applied adjustment	2. For forecasting:	a).	Equation	$(\mathbf{x}_{1},\mathbf{x}_{2}^{T})=\mathbf{z}_{1}^{T}+\mathbf{z}_{2}^{T}+\mathbf{z}_$
factors of: the second second	. Medium and heavy			
. Weekly factors	trucks were combined	a ser la dout production de la ser	0.5 $\left[(1+\frac{P}{100}) \times (1+\frac{G}{100})^{a} + \right]$	
. Seasonal factors	into one category.		$(1+\frac{p}{100}) \times (1+\frac{g}{100})^{a}$	$\mathcal{T}_{X_{i}} = \{x_{i}, x_{i}, x_{i}, x_{i}, \dots, x_{i}\}$
3. Diversion traffic		and the second secon		and the second second
was estimated based	•	 Alexandrian (1991) A state of the state of t	where,	
on O/D survey results			P: National population growth rate	
$\{ i_{k} \}_{k \in [k, k]} \in \{ i_{k} \} $			G: Real GDP per capita growth	
Marka Marka San San San San San San San San San Sa			rate	
		e and set a set of the	p: Provincial population	
in product where we have a set			growth rate	and the second
			g: Real GPP per capita growth rate	and the state of the second
(1, y) = (1, y) + (and a second	a: Income elasticity	a tata ang ang ang ang ang ang ang ang ang an
and a second second state of the second	·	b)	Elasticity	
and the second second second			e de la companya de l	$(1,1,2,\ldots,2^{n-1},\ldots,2^{n-$
$\frac{1}{2} = \frac{1}{2} \left[\frac{1}{2} \left[$		and set of the set of	Vahicle Type Value of a 1990-99	
and the second		والمتعرفة والمتحد والمحجر والمحادث	Cars 1.3 1.7 2.0 Hedium/heavy trucks 1.2 1.2 1.2	
a secondaria de producto			Light buses 0.8 0.8 0.8 Heavy buses 0.5 0.5 0.5	
		1. ali e a cara cara e e e e e 2 ,	For light trucks: average of	
	· · · · ·		cars and medium/heavy trucks.	
		and a second		
		3.	For motorcycles: national	
			annual average growth rates of	
		Addition of the second states	9.0, 5.0 and 3.0%, respectively	
		an a	were used for the forecasting	
		Maria di sua	periods, adjusted only for the	
		n fan Stan yn ei staat in de staat de s	difference in population growth	
			rate between Changwat and the	
			Kingdom.	

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APPENDIX 3.2.1 5/6

. ADTs were estimated by multiplying "base year traffic" by growth rate by Changwat by vehicle type.		ADT
multiplying "base year traffic" by growth rate by Changwat by vehicle type.	<u></u>	<u></u>
traffic" by growth rate by Changwat by vehicle type.	L.	ADTs were estimated by
by Changwat by vehicle type.		multiplying "base year
type.		traffic" by growth rate
		by Changwat by vehicle
		type.
and an ann an Anna Anna Anna Anna Anna Anna		r e e
and a state of the second s Second second		

Second Provincial Road Project, April 1984

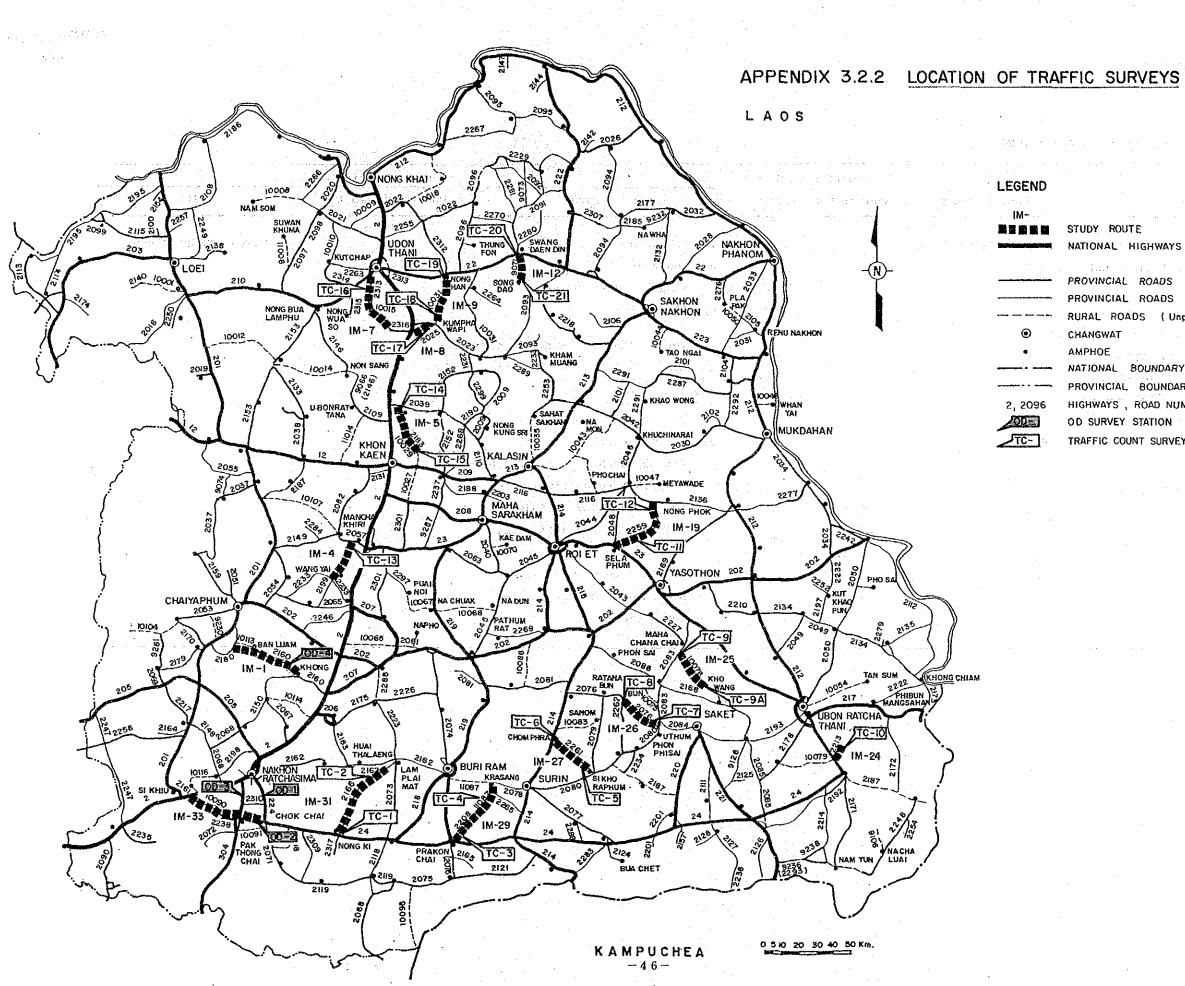
		Transportation Move-		Future Traffic	
Base Year Traffic	Vehicle Type	ment in Base Year	Growth Rate	Future Movement	
••••••••••••••••••••••••••••••••••••••	na se su se	······································		•••••••••••••••••••••••••••••••••••••••	
Base year ADT was developed	Same as "PRI" Study		1. For ADTs	S	Sa
in accordance with their count			a) Equation		
data:			Same as "HSP" Study		
Group A - Annual census data			b) Elasticity		
Group B - Combination of			Valua of a		
- census and supple-			Vahicle Type 1982-86 1985-91 1991-2000 Cars 1.5 1.7 1.9		
mentary count data			Light Trucks 1.8 1.5 1.2		
Group C - Combination of census			Heavy Trucks 0.8 0.8 0.5		
			Light Euses 1.0 0.6 0.5 Heavy Buses 0.8 0.5 0.5		
and short term traffic		an a	2. For Motorcycle		
counts taken during			and the set of the Tarlow Browners and the set		
the reconnaissance			Growth rates were 12.0, 7.0,		
and inventory surveys.			and 4.0%, respectively, for		
· · ·			the forecasting periods		
			adjusted by the difference		
	· ·		between the population		
			growth rate of Changwat/		
			Region and the Kingdom in		
			the period.		
			cur berion.		

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APPENDIX 3.2.1

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ADT Same as "HSP" Study



NATIONAL HIGHWAYS (Poved) 1.1.1 PROVINCIAL ROADS (Poved) PROVINCIAL ROADS (Unpoved) RURAL ROADS (Unpoved) NATIONAL BOUNDARY PROVINCIAL BOUNDARY 2, 2096 HIGHWAYS , ROAD NUMBERS OD SURVEY STATION

TRAFFIC COUNT SURVEY STATION

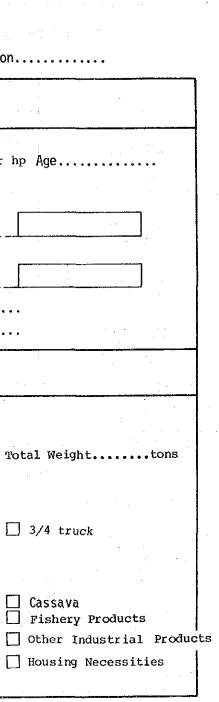
APPENDIX 3.2.3 O/D SURVEY FORMS

THE ROAD DEVELOPMENT STUDY IN NORTHEASTERN REGION (PHASE II)

Question General Questions Vehicle Type Spec. Vehicles Taxi Types 2. Fuel Type A. Diesel B. Regular C. Premium D. Gas 3. Origin of this trip (Village Tambon Amphoe Changwat) Public Vehicle Private Car, Jeep, Van 4. Destination of this trip (Village Tambon Amphoe Changwat) and All _____ **Private** FOL 5. Number of trips using this route per day/week/month..... Pickup or 6. Number of passengers including driver..... smaller Ouestions for Particular Vehicle Goods Pickup Truck or smaller Carrying Private/Passenger/Truck 7. Registration Type 4-wheel Truck 8. Empty Weight.....tons Legal Loading Capacity.....tons Legal Total Weight.....tons bigger than Pickup 9. Loaded Weight tons Vehicles 10. Loaded Volume •••••• m3 6-wheel Truck Trucks $\int 1/2$ truck Empty truck 1/4 truck other [] Full 1/4 over 1/2 over 11. Commodity Type 10-wheel Truck ч **Rice** Sugarcane [] Maize Cotton Trucks Beans Tobacco Livestock Agricultural Products Forestry Products 🖸 Mine [] Fuel or Gas Groceries FOL Trailer Truck Passengers **Others....**

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APPENDIX 3.2.3 1/2



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ROAD DEVELOPMENT STUDY IN THE NORTHEASTERN REGION (PHASE 11)

PASSENGER O/D SURVEY FORM

Passenger Details (Cont.) ORIGIN DESTINATION GENERAL DETAILS BUS TYPE No. (Tambon Amphoe Changwat) (Tambon Interview Location......Direction..... 5. Interview Date......Time..... Light Bus 6 (Pickup or smaller) Engine Capacity..... cc or hp 7. Vehicle Age.....years 8. Type of Fuel: Medium Bus 9. (4 Wheel larger than Pickup or 6 Wheel) 🗌 Regular Diesel 10. . . 11. Gas Super 12. Heavy Bus 13. An an arrest × . 14. Bus Details 15. Origin (Village, Tambon, Amphoe, Changwat) 16. Destination (Village, Tambon, Amphoe, Changwat) 17. Legal Passenger Capacity 18. Number of Passengers during the Interview (including Driver) ... 19. Passenger Details 20, DECOMPANY ON tyr. As fillera 21.

No.	ORIGIN	DESTINATION	
	(Tambon Amphoe Changwat)	(Tambon Amphoe Changwat)	
1.			
2.			
3.		· · · · · · · · · · · · · · · · · · ·	
4.			

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22. 23.

24.

25.

26.

APPENDIX 3.2.3 2/2

Amphoe Changwat)