APPENDIX B-7 PROJECT COST FLOW TABLES OF 7 KABUPATENS

KABUPATEN KEPULAUAN RIAU

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rpa.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	35.1	16.7	28.0	79.8	557.4	218.7	66.0	66.1		66.1	38.2	1,026.2
'82	35.1	16.7		51.8		218.7	66.0	66.1		66.1		402.6
'83	35.1	16.7		51.8		218.7	66.0	66.1		66.1		402.5
'84	12.5			12.5	- 230.5			99.2	25.8	125.0		-93.0
'85	12.5			12.5				99.2	25.8	125.0		137.5
'86	12.5			12.5				99.2	25.8	125.0		137.5
'87	12.5			12.5				99.2	25.8	125.0		137.5
'88	12.5			12.5				99.2	25.8	125.0		137.5
'89	12.5			12.5				99.2	25.8	125.0		137.5
'90	12.5			12.5				99.2	25.8	125.0		137.5
'91	12.5			12.5				99.2	25.8	125.0		137.5
'92	12.5			12.5				99.2	25.8	125.0		137.5
'93	12.5			12.5				99.2	25.8	125.0		137.5
'94-'96												
Total	230.3	50.1	28.0	308.4	326.9	656.0	198.0	1,190.3	258.0	1,448.3	38.2	2,975.8

Administration Cost = (Construction Cost + Bridging Cost + Maintenance Cost) X 10%

KABUPATEN LAHAT

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	18.3	15.9	23.7	57.9	531.6	141.4	1.0	41.0		41.0	36.4	809.3
'82	18.3			34.2		141.3	1.0	41.0		41.0		217.5
'83	18.3			34.2		141.3	1.0	41.0		41.0		217.5
'84	7.8			7.8	- 225.3			61.5	16.0	77.5		- 140.0
'85	7.8			7.8				61.5	16.0	77.5		85.3
'86	7.8			7.8				61.5	16.0	77.5		85.3
'87	7.8			7.8				61.5	16.0	77.5		85.3
'88	7.8			7.8				61.5	16.0	77.5		85.3
'89	7.8			7.8				61.5	16.0	77.5		85.3
'90	7.8			7.8				61.5	16.0	77.5		85.3
'91	7.8			7.8				61.5	16.0	77.5		85.3
'92	7.8			7.8				61.5	16.0	77.5		85.3
'93	7.8			7.8				61.5	16.0	77.5		85.3
'94-'96												
Total	132.9	47.7	23.7	156.6	306.3	424.0	3.0	738.0	160.0	898.0	36.4	1,872.0

KABUPATEN LAMPUNG SELATAN

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	9.3	13.5	22.7	45.5	451.0	45.7	11.4	36.2		36.2	30.9	620.7
'82	9.3	13.5		22.8		45.7	11.3	36.2		36.2		116.0
'83	9.3	13.5		22.8		45.7	11.3	36.2		36.2		116.0
'84	6.8			6.8	- 193.0			54.3	14.1	68.4		- 117.8
'85	6.8			6.8				54.3	14.1	68.4		75.2
'86	6.8			6.8				54.3	14.1	68.4		75.2
'87	6.8			6.8				54.3	14.1	68.4		75.2
'88	6.8			6.8				54.3	14.1	68.4		75.2
'89	6.8			6.8				54.3	14.1	68.4		75.2
'90	6.8			6.8				54.3	14.1	68.4		75.2
'91	6.8			6.8				54.3	14.1	68.4		75.2
'92	6.8			6.8				54.3	14.1	68.4		75.2
'93	6.8			6.8				54.3	14.1	68.4		75.2
'94-'96												
Total	95.9	40.5	22.7	159.1	258	137.1	34.0	651.6	141.0	792.6	30.9	1,411.7

KABUPATEN MANGGARAI

Year	Administration Cost & Consulting Cost			Total	Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign		Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	14.2	18.0	30.2	44.4	601.2	72.4	3.2	66.7		66.7	41.2	847.1
'82	14.2	18.0		14.2		72.4	3.2	66.7		66.7		174.5
'83	14.2	18.0		14.2		72.3	3.2	66.7		66.7		174.4
'84	14.2			14.2		72.3	3.2	66.7		66.7		156.4
'85	14.2			14.2	39.8	72.3	3.1	66.7		66.7		196.1
'86	14.2			14.2	346.0	72.3	3.1	66.7		66.7		502.3
'87	10.1			10.1	- 319.0			80.1	20.9	101.0		- 207.9
'88	10.1			10.1				80.1	20.9	101.0		111.1
'89	10.1			10.1				80.1	20.9	101.0		111.1
'90	10.1			10.1				80.1	20.9	101.0		111.1
'91	10.1			10.1				80.1	20.9	101.0		111.1
'92	10.1			10.1				80.1	20.9	101.0		111.1
'93	10.1			10.1				80.1	20.9	101.0		111.1
'94-'96	30.3			30.3				240.3	62.7	303.0		333.3
Total	186.2	54.0	30.2	270.4	668.0	434.0	19.0	1,201.2	209.0	1,401.0	41.2	2,842.8

KABUPATEN BOLAANG MANGONDOW

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	22.5	18.5	31.0	72.0	616.5	113.4	16.2	95.3		95.3	42.2	995.6
'82	22.5	18.5		41.0		113.4	16.2	95.3		95.3		265.9
'83	22.5	18.5		41.0		113.3	16.2	95.3		95.3		265.8
'84	22.5			22.5		113.3	16.2	95.3		95.3		247.3
'85	22.5			22.5	98.4	113.3	16.1	95.3		95.3		345.6
'86	22.5			22.5	297.3	113.3	16.1	95.3		95.3		544.5
'87	14.4			14.4	- 308.7			114.4	29.8	144.2		- 150.1
'88	14.4			14.4				114.4	29.8	144.2		158.6
'89	14.4			14.4				114.4	29.8	144.2		158.6
'90	14.4			14.4				114.4	29.8	144.2		158.6
'91	14.4			14.4				114.4	29.8	144.2		158.6
'92	14.4			14.4				114.4	29.8	144.2		158.6
'93	14.4			14.4				114.4	29.8	144.2		158.6
'94-'96	43.2			43.2				343.2	89.4	432.6		475.8
Total	279.0	55.5	31.0	365.5	703.5	680.0	97.0	1,715.8	298.0	2,013.8	42.2	3,902.0

KABUPATEN BONE

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	20.5	14.9	25.0	60.6	496.9	148.4	8.7	49.4		49.4	34.0	795.8
'82	20.5	14.9		35.4		148.3	8.7	47.4		47.4		239.8
'83	20.5	14.9		35.4		148.3	8.6	47.4		47.4		239.7
'84	9.0			9.0	- 207.0			71.2	18.6	89.8		- 108.2
'85	9.0			9.0				71.2	18.6	89.8		98.8
'86	9.0			9.0				71.2	18.6	89.8		98.8
'87	9.0			9.0				71.2	18.6	89.8		98.8
'88	9.0			9.0				71.2	18.6	89.8		98.8
'89	9.0			9.0				71.2	18.6	89.8		98.8
'90	9.0			9.0				71.2	18.6	89.8		98.8
'91	9.0			9.0				71.2	18.6	89.8		98.8
'92	9.0			9.0				71.2	18.6	89.8		98.8
'93	9.0			9.0				71.2	18.6	89.8		98.8
'94-'96												
Total	151.5	44.7	25.0	221.2	289.9	445.0	26.0	854.2	186.0	1,042.2	34.0	2,056.3

KABUPATEN BUTON

Year	Administration Cost & Consulting Cost				Equipment Cost	Construction Cost	Bridging Cost	Maintenance Cost			Contingency	Total Cost million Rps.
	Local		Foreign	Total	Foreign			Local	Foreign	Total	Foreign	
	Adm.	Cons.	Cons.									
'81	24.8	17.0	28.5	60.3	567.6	151.4	14.9	81.4		81.4	38.9	924.5
'82	24.8	17.0		41.8		151.4	14.9	81.4		81.4		289.5
'83	24.3	17.0		41.8		151.3	14.8	81.4		81.4		289.3
'84	24.8			24.8		151.3	14.8	81.4		81.4		272.3
'85	24.3			24.8	94.8	151.3	14.8	81.4		81.4		367.1
'86	24.8			24.8	307.1	151.3	14.8	81.4		81.4		579.4
'87	12.3			12.3	- 305.0			97.7	25.5	123.2		- 169.5
'88	12.3			12.3				97.7	25.5	123.2		135.5
'89	12.3			12.3				97.7	25.5	123.2		135.5
'90	12.3			12.3				97.7	25.5	123.2		135.5
'91	12.3			12.3				97.7	25.5	123.2		135.5
'92	12.3			12.3				97.7		123.2		135.5
'93	12.3			12.3				97.7	25.5	123.2		135.5
'94-'96	36.9			36.9				93.1	76.5	369.6		406.5
Total	271.8	51.0	28.5	351.3	664.5	908.0	89.0	1,465.4	255.0	1,720.4	38.9	3,772.1

Administration Cost = (Construction Cost + Bridging Cost + Maintenance Cost) x 10%

APPENDIX B-8 ECONOMIC ANALYSIS OF 7 KABUPATENS

KABUPATEN : KEPULAUN RIAU

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total			
1981	- 1,026.2	16.7	- 1,009.5	-	-	-
1982	- 402.6	51.0	- 351.6	-	-	-
1983	- 402.6	87.2	- 315.4	-	-	-
1984	93.0	109.5	202.5	-	-	-
1985	- 137.5	112.2	- 25.3	-	-	-
1986	- 137.5	115.1	- 22.4	-	-	-
1987	- 137.5	118.1	- 12.4	-	-	-
1988	- 137.5	121.1	- 16.4	-	-	-
1989	- 137.5	124.6	- 12.9	-	-	-
1990	- 137.5	127.8	- 2.7	-	-	-
1991	- 137.5	129.3	- 8.2	-	-	-
1992	- 137.5	129.3	- 8.2	-	-	-
1993	- 137.5	138.7	- 1.2	-	-	-
Total	- 2,975.8	1,382.5	- 1,583.3	-	-	-

KABUPATEN : LAHAT

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total	20%	30%	40%
1981	- 809.3	25.0	- 784.3	- 784.3	- 784.3	- 784.3
1982	- 217.5	158.0	- 59.5	- 49.6	- 45.8	- 42.5
1983	- 217.5	392.0	174.5	121.2	103.3	89.0
1984	140.0	429.0	632.0	365.7	287.7	230.3
1985	- 85.3	460.0	374.7	180.7	131.2	97.5
1986	- 85.3	498.0	412.7	165.9	111.2	76.7
1987	- 85.3	541.0	455.7	152.6	94.4	60.5
1988	- 85.3	575.0	489.7	136.7	78.0	46.5
1989	- 85.3	629.0	543.7	126.4	66.7	36.8
1990	- 85.3	677.0	591.7	114.7	55.8	28.6
1991	- 85.3	723.0	637.7	103.0	46.3	22.0
1992	- 85.3	795.0	709.7	95.5	39.6	17.5
1993	- 85.3	844.0	758.7	85.1	32.6	13.4
Total	- 1,872.0	6,848.0	4,974.0	813.0	216.7	- 108.0

KABUPATEN : LAMPUNG SELATAN

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total	30%	50%	70%
1981	- 620.7	1	- 619.7	- 619.7	- 619.7	- 619.7
1982	- 116.0	146	30.0	23.1	20.0	17.6
1983	- 116.0	171	55.0	32.5	24.4	19.0
1984	117.8	1,036	1,153.8	525.2	341.9	234.8
1985	- 75.2	1,106	1,030.8	360.0	203.6	123.4
1986	- 75.2	1,281	1,205.8	324.8	158.8	84.9
1987	- 75.2	1,498	1,422.8	294.7	124.9	58.9
1988	- 75.2	1,577	1,501.8	239.3	87.9	36.6
1989	- 75.2	2,611	2,535.8	310.9	98.9	36.4
1990	- 75.2	2,919	2,843.8	268.2	74.0	24.0
1991	- 75.2	3,060	2,984.8	216.5	51.8	14.8
1992	- 75.2	3,375	3,299.8	184.1	38.1	9.6
1993	- 75.2	4,686	4,610.8	197.9	35.5	7.9
Total	- 1,411.7	23,467	22,052.3	2,358.4	640.1	48.2

KABUPATEN : MANGGARAI

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total	3%	5%	8%
1981	- 847.1	1.7	- 845.4	- 845.4	- 845.4	- 845.4
1982	- 174.5	32.2	- 142.3	- 138.2	- 135.5	- 131.8
1983	- 174.4	69.8	- 104.6	- 111.0	- 94.9	- 89.9
1984	- 156.4	102.4	- 54.0	- 49.4	- 46.6	- 42.9
1985	- 196.1	147.0	- 49.1	- 43.6	- 40.4	- 36.1
1986	- 502.3	182.3	- 320.0	- 276.0	- 250.7	- 217.8
1987	+ 207.9	220.8	428.7	359.0	319.9	270.2
1988	- 111.1	239.8	128.7	104.6	91.5	75.1
1989	- 111.1	258.4	147.3	116.3	99.7	79.6
1990	- 111.1	278.6	167.5	128.4	108.0	83.8
1991	- 111.1	296.9	185.8	138.2	114.1	86.1
1992	- 111.1	319.2	208.1	150.3	121.7	96.4
1993	- 111.1	344.6	233.5	163.8	130.0	92.7
1994 - 1996	- 333.3	1,208.2	874.9	578.4	441.9	297.9
Total	- 2,842.8	3,701.9	858.1	275.5	13.3	- 281.9

KABUPATEN : BOLAANG MONGONDOW

Million Rps.

Year	Cost, Benefit Flows			Discount Value		
	Cost	Benefit	Total			
1981	- 955.6	6.7	- 948.9	-	-	-
1982	- 265.9	41.1	- 224.8	-	-	-
1983	- 265.8	77.9	- 187.9	-	-	-
1984	- 247.3	116.4	- 130.9	-	-	-
1985	- 345.6	158.9	- 186.7	-	-	-
1986	- 544.5	204.7	- 339.8	-	-	-
1987	150.1	243.1	393.2	-	-	-
1988	- 158.6	256.7	98.1	-	-	-
1989	- 158.6	270.3	111.7	-	-	-
1990	- 158.6	288.9	130.3	-	-	-
1991	- 158.6	306.7	148.1	-	-	-
1992	- 158.6	322.1	163.5	-	-	-
1993	- 158.6	351.4	192.8	-	-	-
1994 - 1996	- 475.8	1,255.6	779.8	-	-	-
Total	- 3,902.0	3,900.5	- 1.5	-	-	-

KABUPATEN : BONE

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total	3%	5%	8%
1981	- 795.8	12.0	- 783.8	- 783.8	- 783.8	- 783.8
1982	- 239.8	51.0	- 188.8	- 183.3	- 179.8	- 174.8
1983	- 239.7	100.0	- 139.8	- 131.8	- 126.8	- 119.7
1984	108.2	130.0	238.2	218.0	205.8	189.1
1985	- 98.8	155.0	56.2	49.9	46.2	41.3
1986	- 98.8	195.0	96.2	83.0	75.4	65.5
1987	- 98.8	220.0	121.2	101.5	90.4	76.4
1988	- 98.8	273.0	174.2	141.6	123.8	101.6
1989	- 98.8	312.0	213.2	168.3	144.3	115.2
1990	- 98.8	342.0	243.2	186.4	156.8	121.7
1991	- 98.8	277.0	178.2	132.6	109.4	82.5
1992	- 98.8	299.0	200.2	144.6	117.1	92.7
1993	- 98.8	341.0	242.2	169.9	134.9	96.2
Total	- 2,056.3	2,709.0	650.7	296.9	113.7	- 96.3

KABUPATEN : BUTON

Million Rps.

Year	Cost, Benefit Flow			Discount Value		
	Cost	Benefit	Total	10%	15%	20%
1981	- 924.5	55.0	- 869.5	- 869.5	- 869.5	- 869.5
1982	- 289.5	93.6	- 195.9	- 178.1	- 170.3	- 163.2
1983	- 289.3	154.3	- 135.0	- 111.6	- 102.1	- 93.7
1984	- 272.3	234.5	- 37.8	- 28.4	- 24.9	- 21.9
1985	- 367.1	333.0	- 34.1	- 23.3	- 19.5	- 16.4
1986	- 579.4	438.2	- 141.2	- 87.9	- 70.2	- 56.7
1987	169.5	513.6	683.1	385.6	295.3	228.8
1988	- 135.5	556.7	421.2	216.1	158.3	117.5
1989	- 135.5	612.9	477.4	222.7	156.1	111.0
1990	- 135.5	668.0	532.5	225.8	151.4	103.2
1991	- 135.5	720.7	585.2	225.6	144.7	94.5
1992	- 135.5	717.5	582.0	204.0	125.1	78.3
1993	- 135.5	829.8	694.3	221.2	129.8	77.9
1994 - 1996	- 406.5	3,356.0	2,949.5	776.7	416.8	229.7
Total	- 3,772.1	9,283.8	5,613.7	1,179.1	321.0	- 180.5

APPENDIX B-9 EQUIPMENT OWNERSHIP COST FOR THE PROJECT PERIOD

EQUIPMENT OWNERSHIP COST FOR THE PROJECT PERIOD

x ¥ 1,000

Kabupaten	Period of Project	Sub Total of Equipment Initial Cost				Total of Equipment Initial Cost	Ownership Cost of 3rd and 6th Years Period	Ownership Cost of Full E.L.Y.
		Equip. of E.L.Y. 4	Equip. of E.L.Y. 5	Equip. of E.L.Y. 6	Equip. of E.L.Y. 8			
Kamper	3	29,750	88,900	37,000	15,000	170,650	162,055	281,396
Kepulauan Riau	3	29,850	94,100	37,000	14,000	174,950	166,402	287,839
Lahat	3	20,750	94,100	37,000	15,000	166,850	157,137	276,504
O.K.I.	6	38,950	157,700	48,200	15,000	259,850	417,103	424,750
O.K.U.	3	29,750	103,300	37,000	15,000	185,050	175,905	304,479
Liot	3	29,750	94,100	37,000	15,000	175,850	167,056	289,731
Lampung Utara	3	20,950	111,700	37,000	15,000	184,650	174,285	305,011
Lampung Selatan	3	20,750	68,800	37,000	15,000	141,550	132,804	235,948
Manggarai	6	12,500	108,600	39,600	28,000	188,700	304,397	318,672
Belu	6	20,750	96,400	37,000	14,000	168,150	271,015	278,152
Bolang Mongondow	6	30,900	93,300	41,300	28,600	193,500	309,879	324,227
Gorontalo	6	39,900	188,400	41,300	30,000	299,600	478,609	493,903
Takalar	3	20,750	58,100	37,000	15,000	130,850	122,513	218,796
Bone	3	29,750	74,200	37,000	15,000	155,950	147,917	257,832
Sidrap	3	20,750	69,600	37,000	15,000	142,350	133,573	237,229
Pinrang	3	20,750	62,700	37,000	15,000	135,450	126,937	226,168
Polmas	3	20,750	62,700	37,000	14,000	134,450	126,172	224,129
Enrekang	3	20,950	71,100	37,000	15,000	144,050	135,236	239,929
Jeneponto	3	29,750	90,300	37,000	15,000	172,050	163,402	253,640
Kendari	6	29,950	127,200	37,000	15,000	209,150	333,438	343,085
Buton	6	29,750	96,400	37,000	15,000	178,150	285,771	293,418
TOTAL	3 Years Period	345,000	1,143,700	518,000	208,000	2,214,700	2,091,387	
	6 Years Period	202,700	868,000	281,400	145,000	1,497,100	2,402,211	
GRAND TOTAL		547,700	2,011,700	799,400	353,000	3,711,800	4,493,598	6,114,838

* E.L.Y. : Economic Life Year

Formula of Calculation for Equipment Ownership Cost

E = (B - C) D + 0,2 C Rp/Year
E : Ownership Cost Rp/Year
B : Initial Purchased Cost Rp
C : Salvage Value (10% of B) Rp
D : Capital Recover Factor

$$D = \frac{i\,(1+i)^{\Lambda}}{(1+i)^{\Lambda} - 1}$$

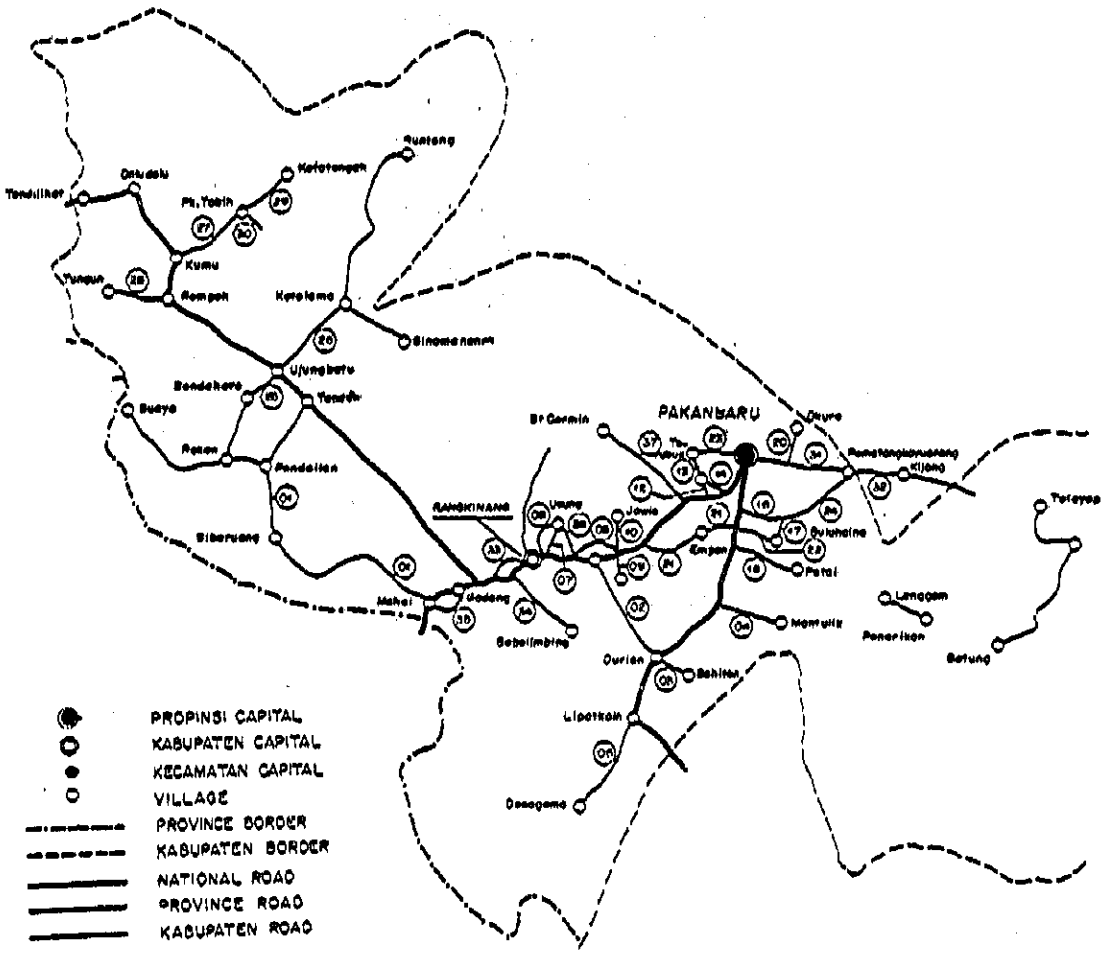
i = Interest Rate 20%/Year
Λ = Economic Life Year

i - Λ - D Table

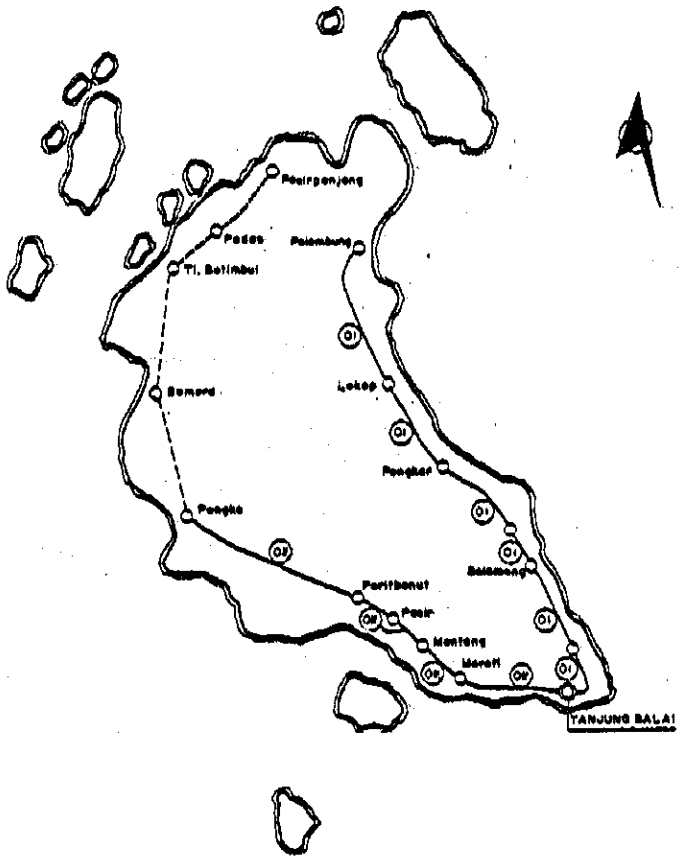
Life Year Λ	Interest Rate	D
4	20%/Year	0.386
5	"	0.334
6	"	0.301
8	"	0.261

APPENDIX C-1 LINK NUMBER MAPS OF ROADS

Province : Riau
Kabupaten : Kampar

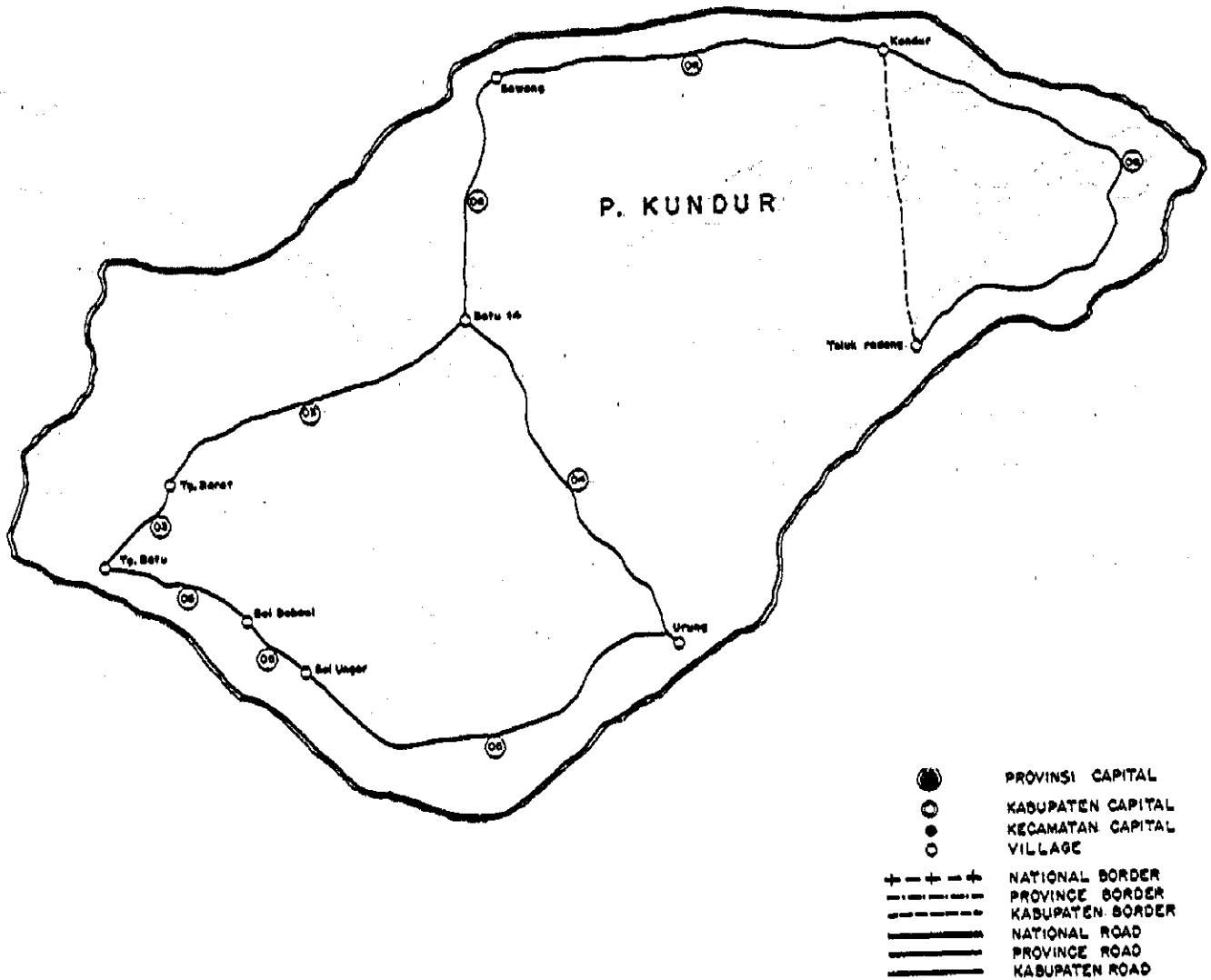


Province : Riau
Kabupaten : Riau Kepulauan
Kecamatan : Karimun

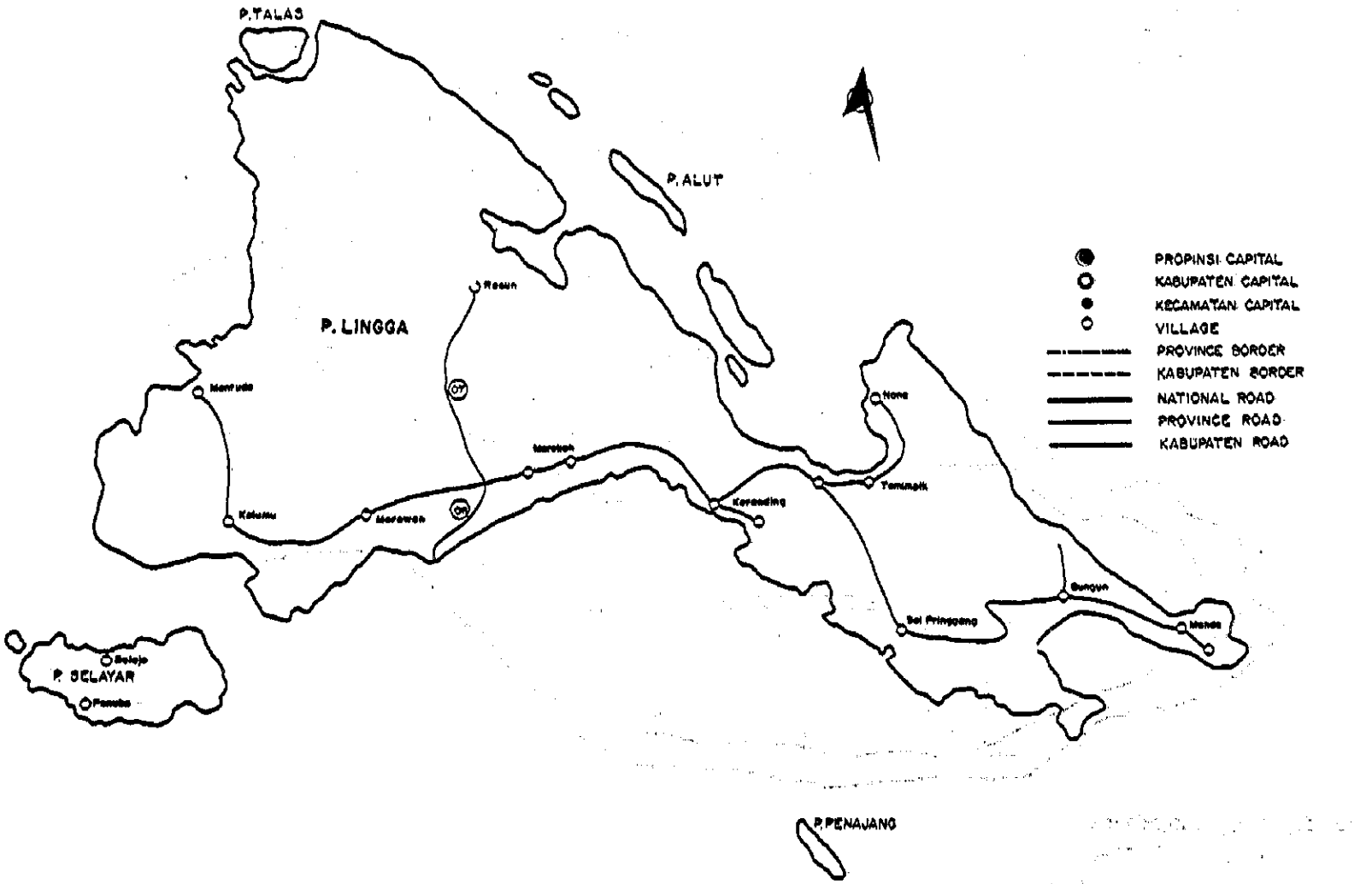


PROVINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
NATIONAL BORDER
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD

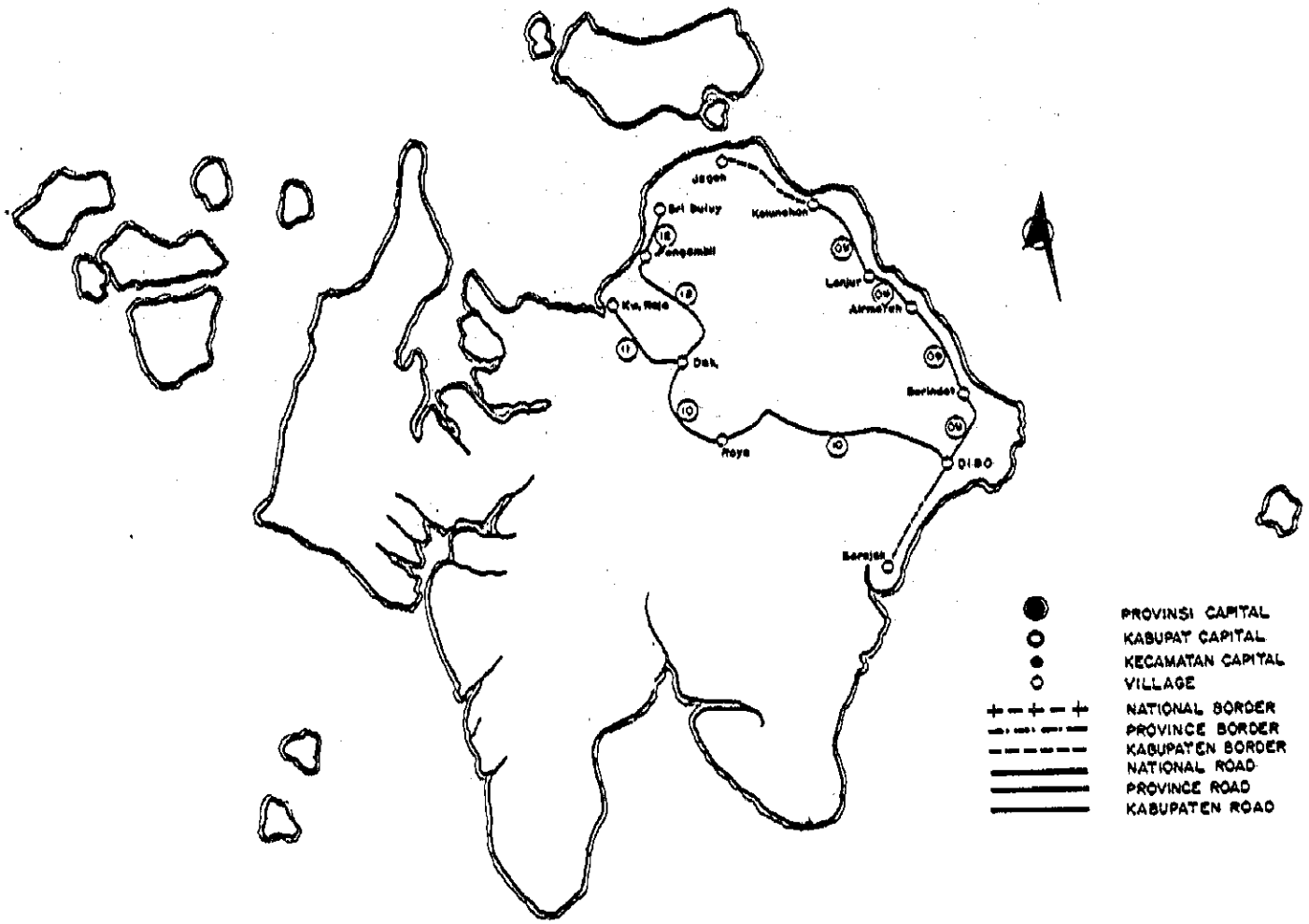
Province : Riau
Kabupaten : Riau Kepulauan



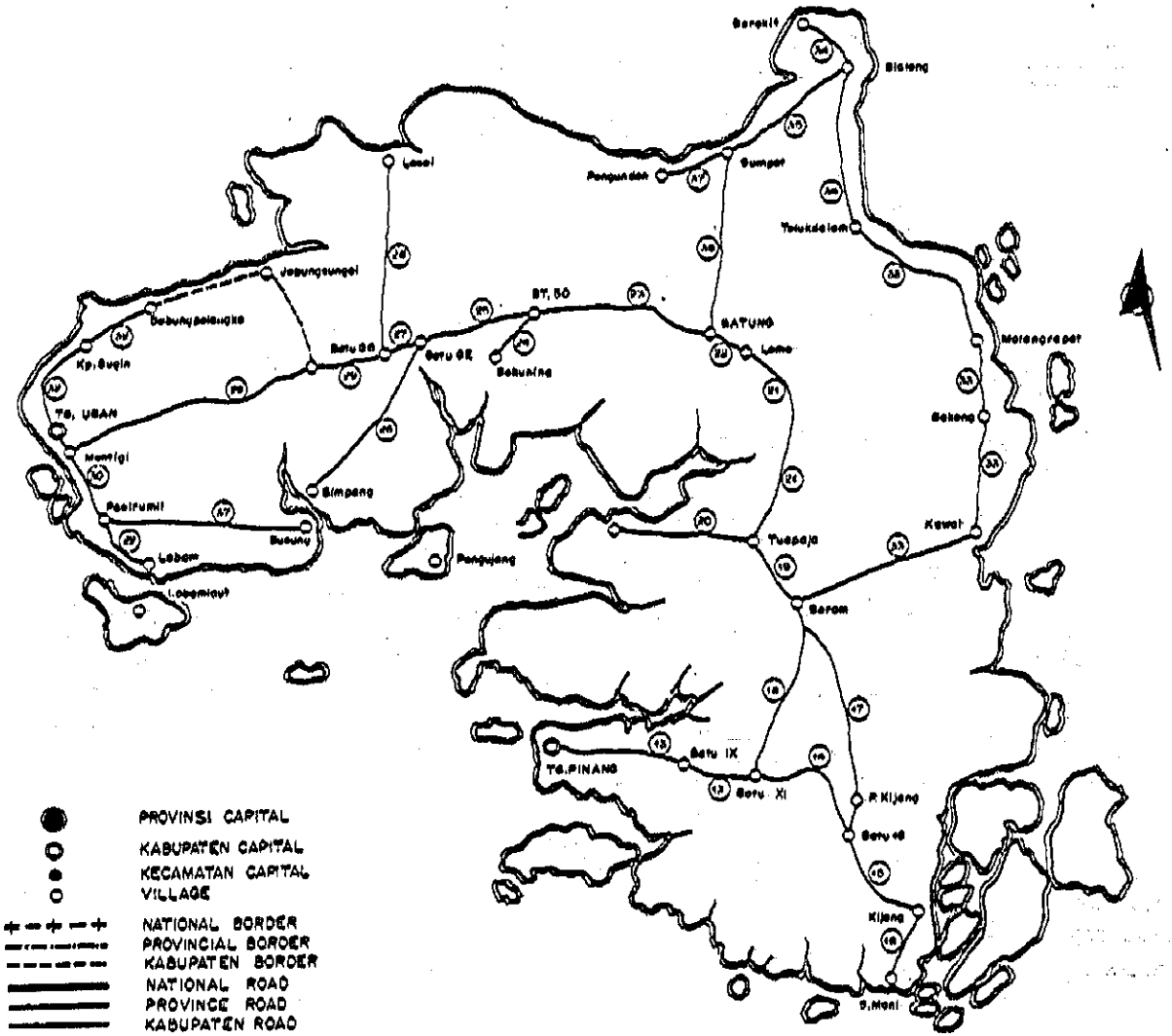
Province : Riau
Kabupaten : Kepulauan Riau



Province : Riau
Kabupaten : Riau Kepulauan
Kecamatan : Singkep

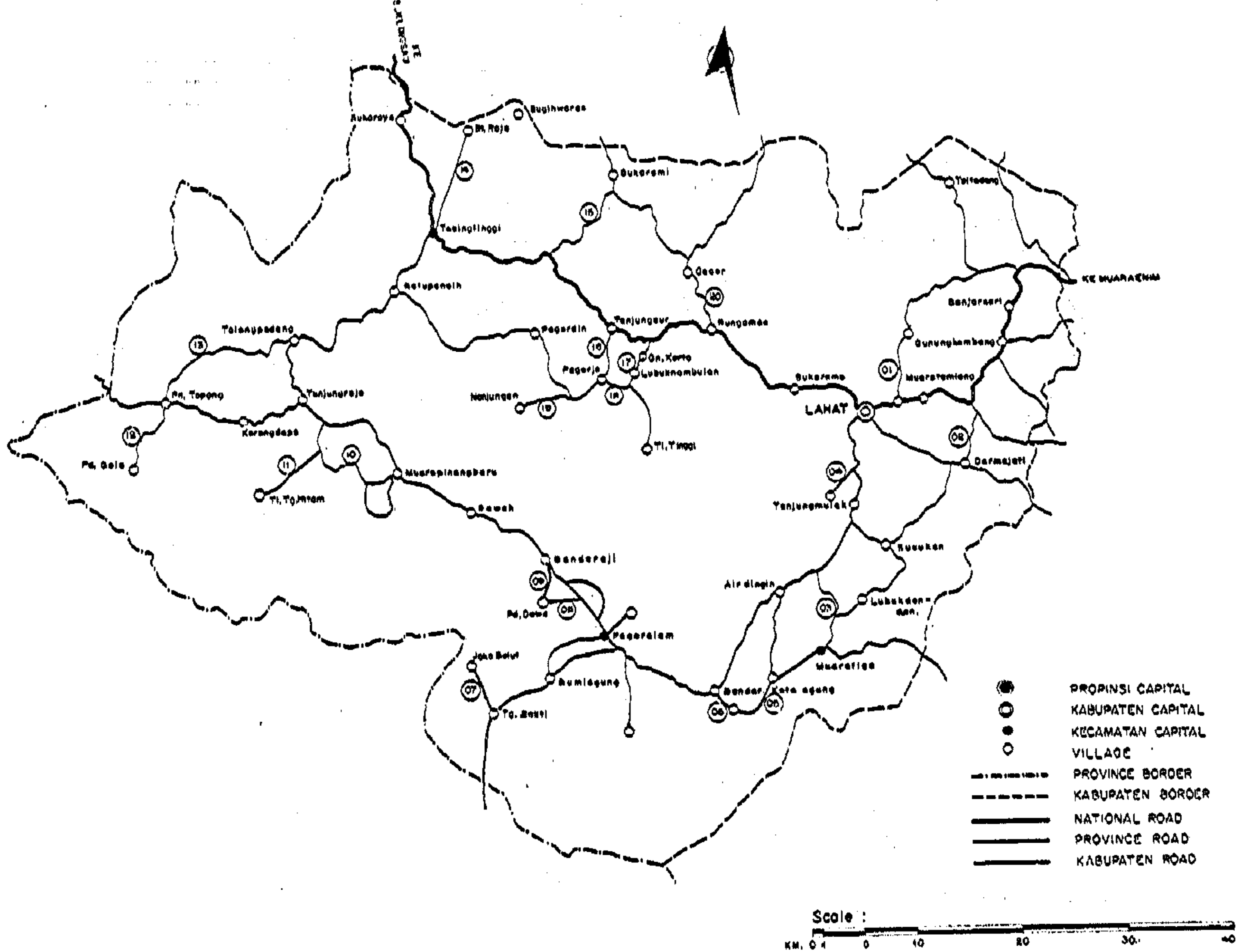


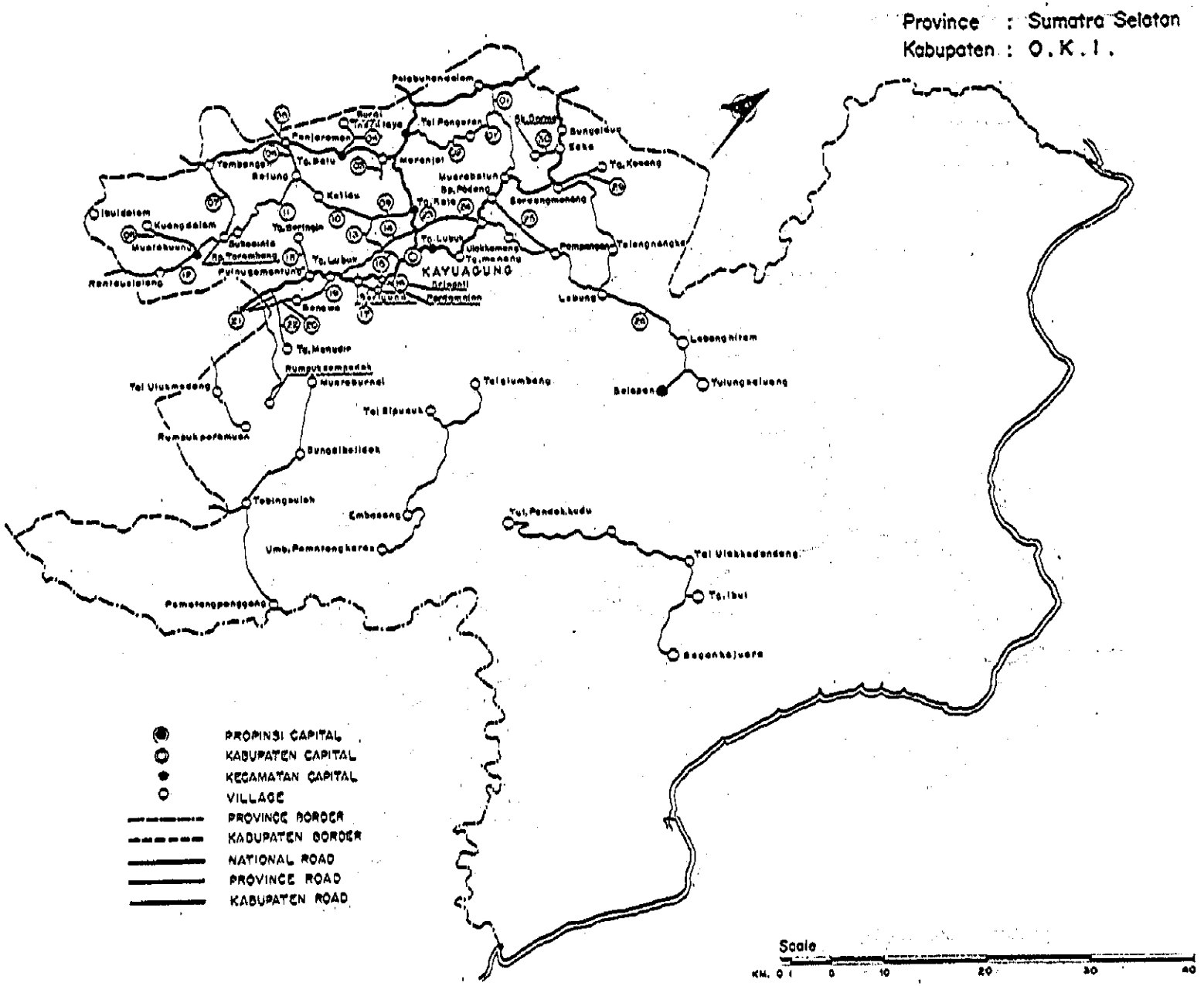
Province : Riau
Kabupaten : Riau Kepulauan
(P. Bintan Utara & Bintan Selatan)

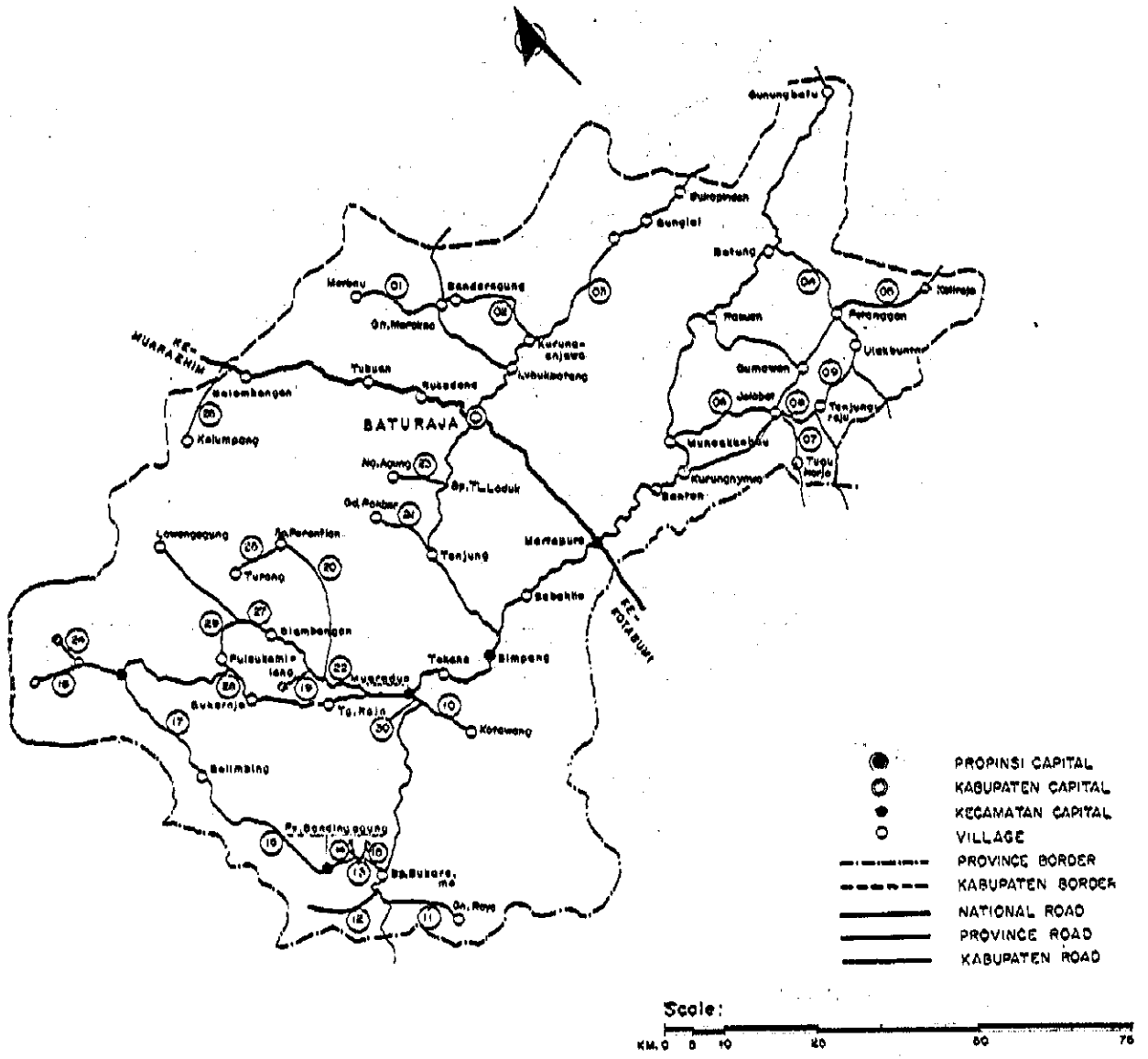


Province : Sumatera Selatan

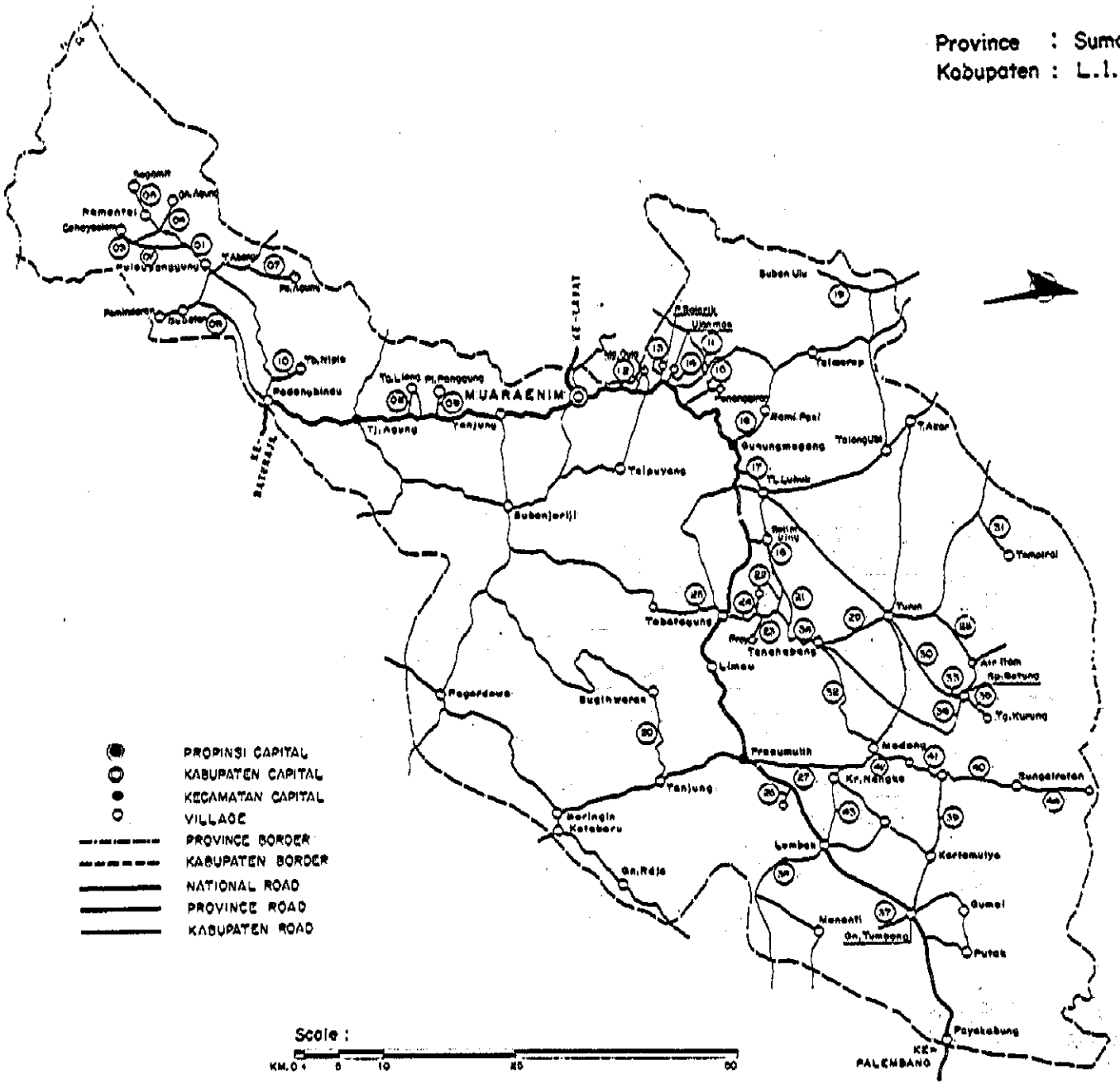
Kabupaten : Lahat


LAHAT
Sukarame
Bungamas
Tanjungaur
Pagardin
Pagarjo
Lubuknambulan
Tasingtinggi
Sukaremi
Muarapinangbaru
Pagaralam
Bumiagung
Tg. Sakti
Airdingin
Bandar
Kota agung
Muarafiga
Darmajati
Muarasemiang
Gunungkembang
Banjarsari
Tanjungamulak
KE MUARAENIM
PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD
Scale :
KM. 0
0
10
20
30
40

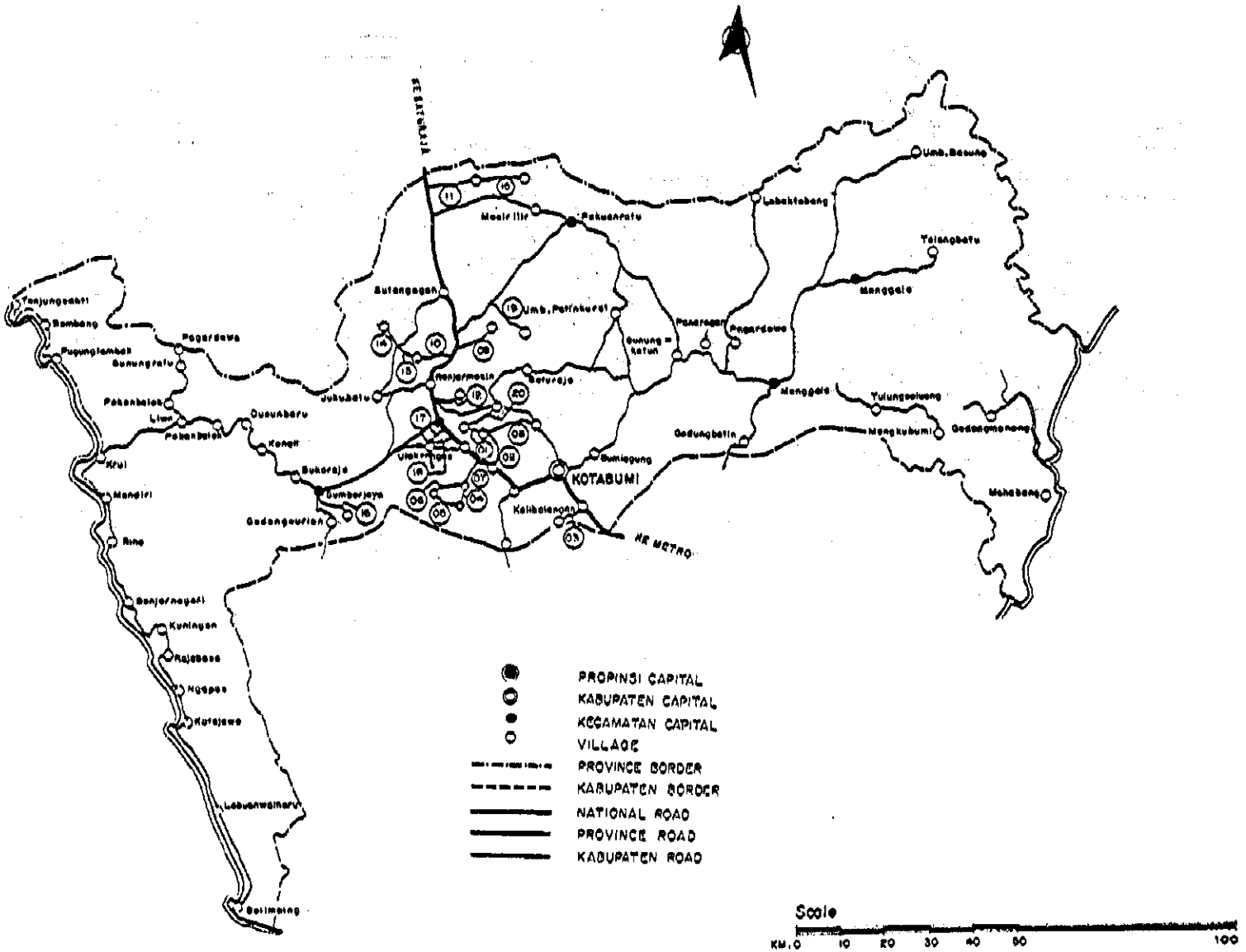

Province : Sumatra Selatan
Kabupaten : O.K.I.
KAYUAGUNG
PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD
Scale
KM. 0 1 0 10 20 30 40


Province : Sumatera Selatan
Kabupaten : O.K.U
BATURAJA
Martapura
Kayuagung
Kelumpang
Belimbing
Simpang
Tanjung
Kotaraya
Sebokito
Tekana
Kurungnyiur
Bantan
Tugu mulya
Tanjung raju
Jaluber
Sumawan
Pasuan
Batung
Sungiai
Gunung batu
Tulung selapan
Kurungan anjuro
Lubuk batang
Tubuan
Gelumbangan
Muara Rhim
Prop. Bengkulu
Prop. Lampung
PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD
Scale:
KM. 0 5 10 20 50 75

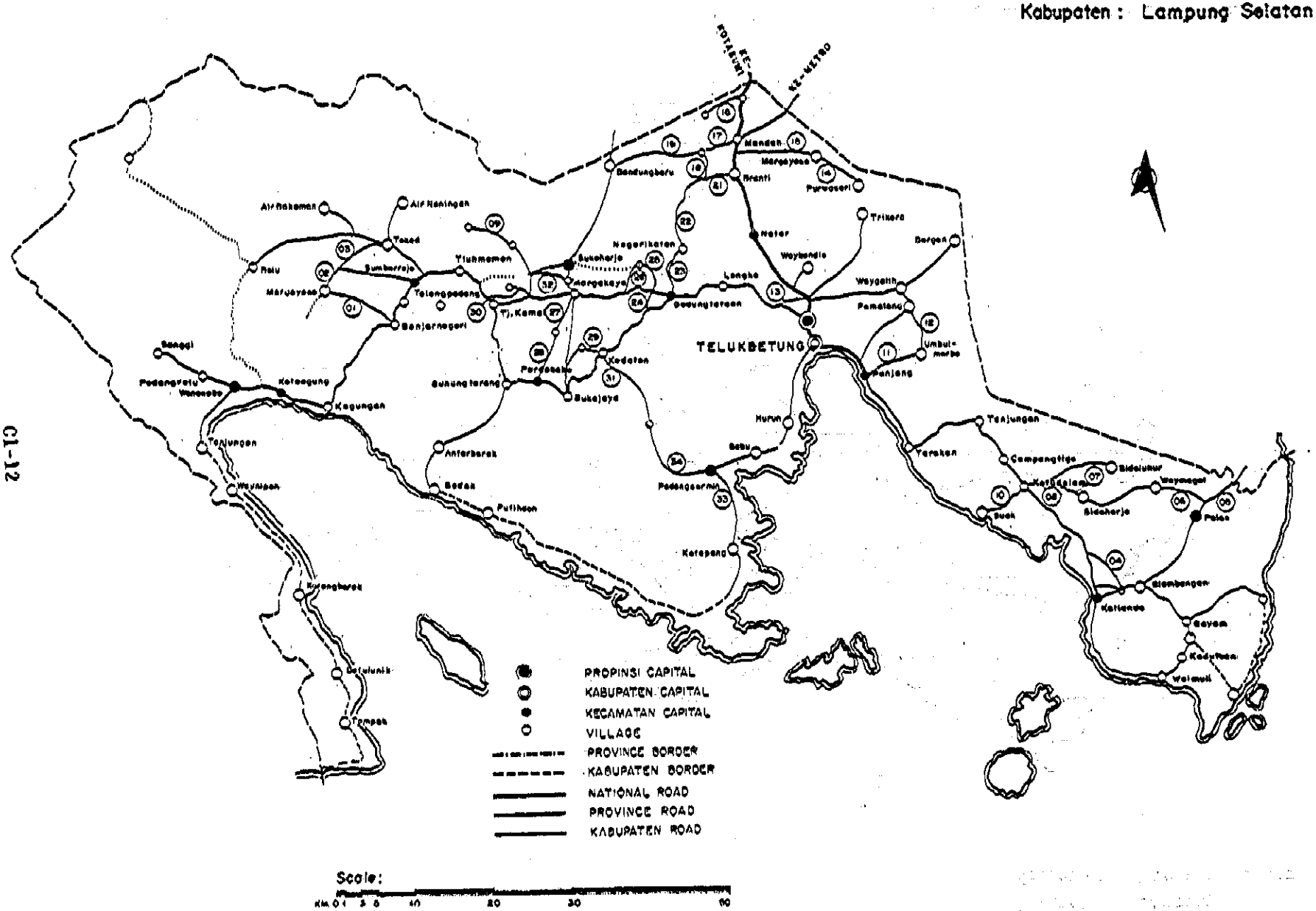
Province : Sumatera Selatan
Kabupaten : L.I.O.T



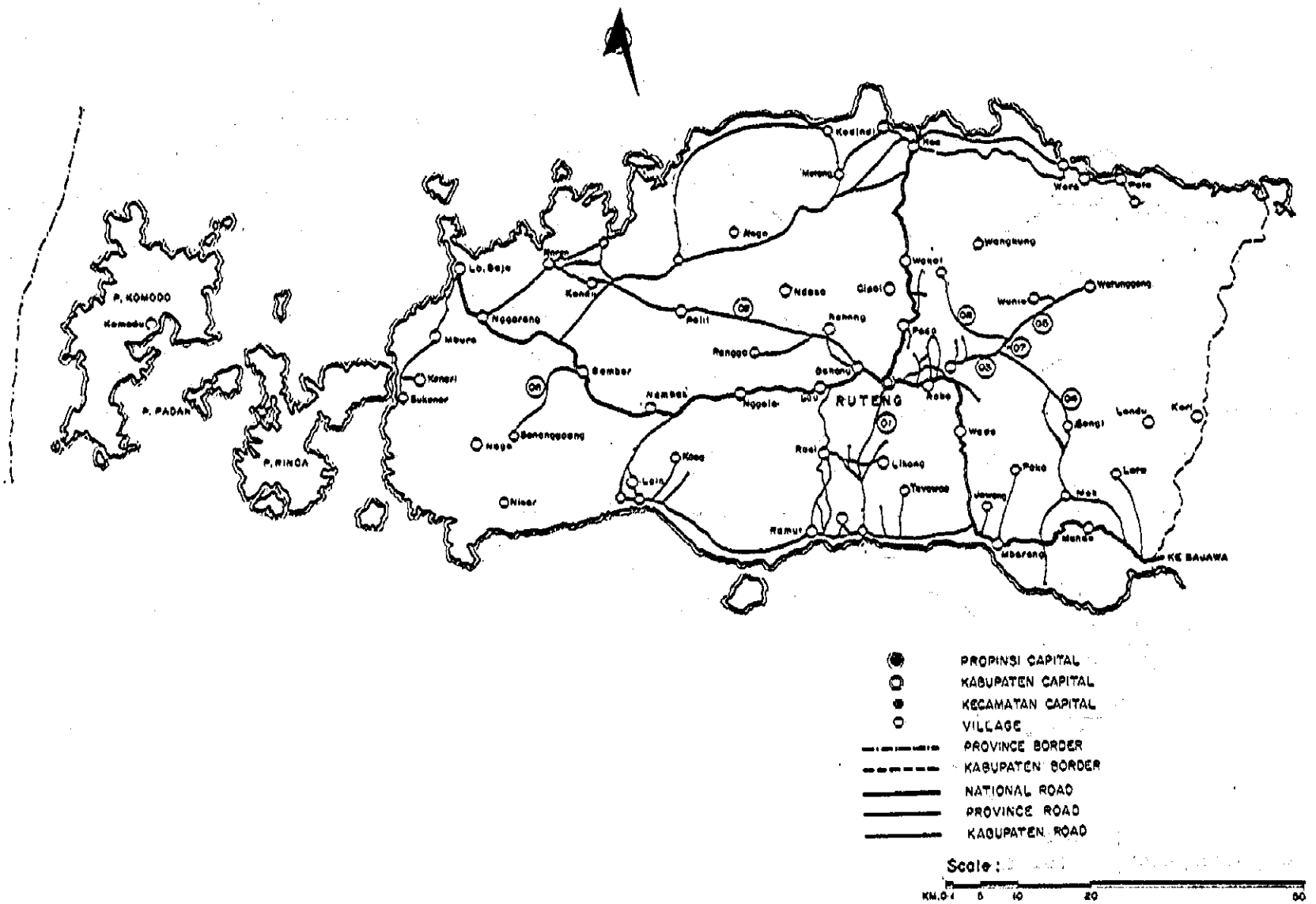
Province :. Lampung
Kabupaten :. Lampung Utara



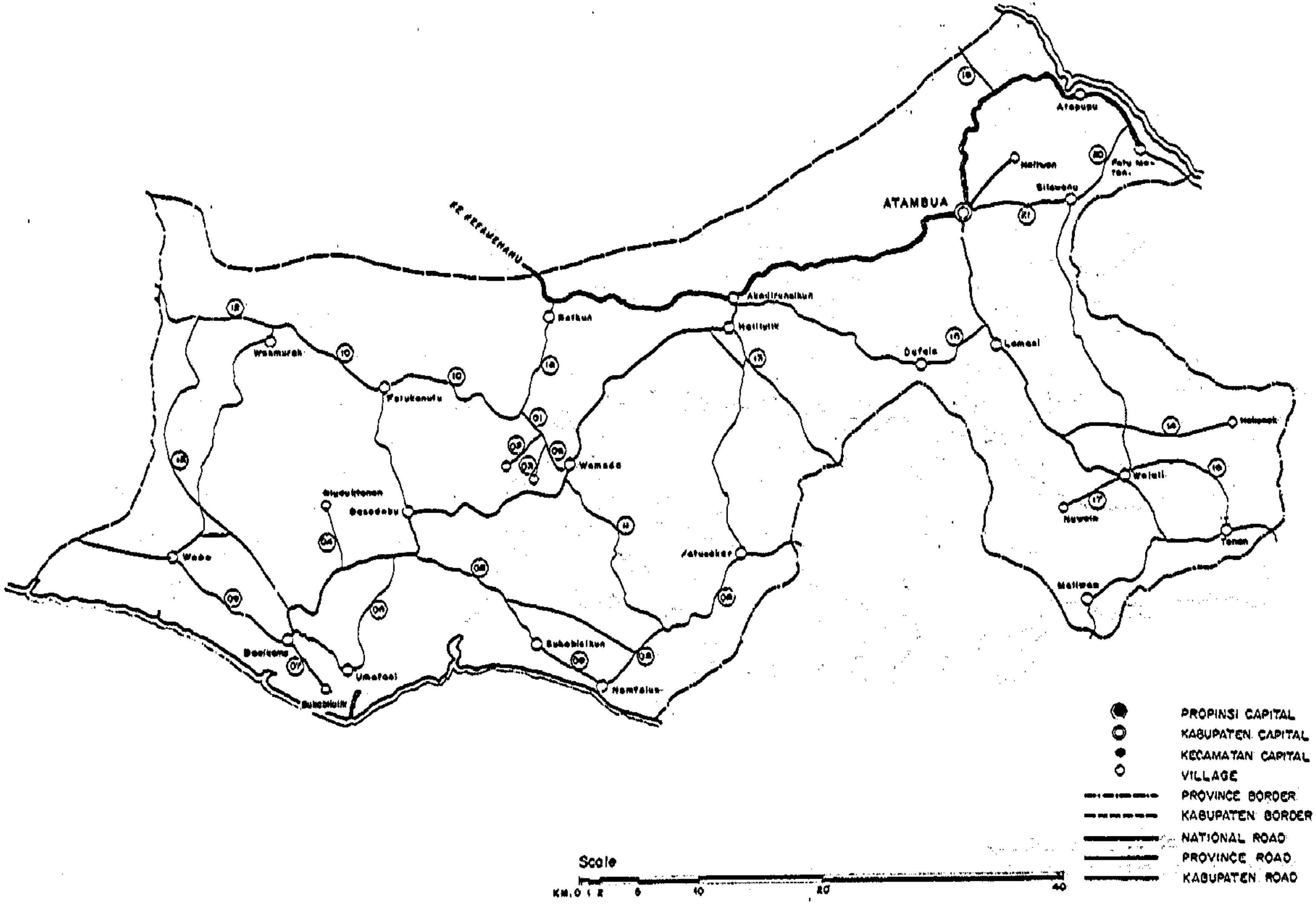
Province : Lampung
Kabupaten : Lampung Selatan



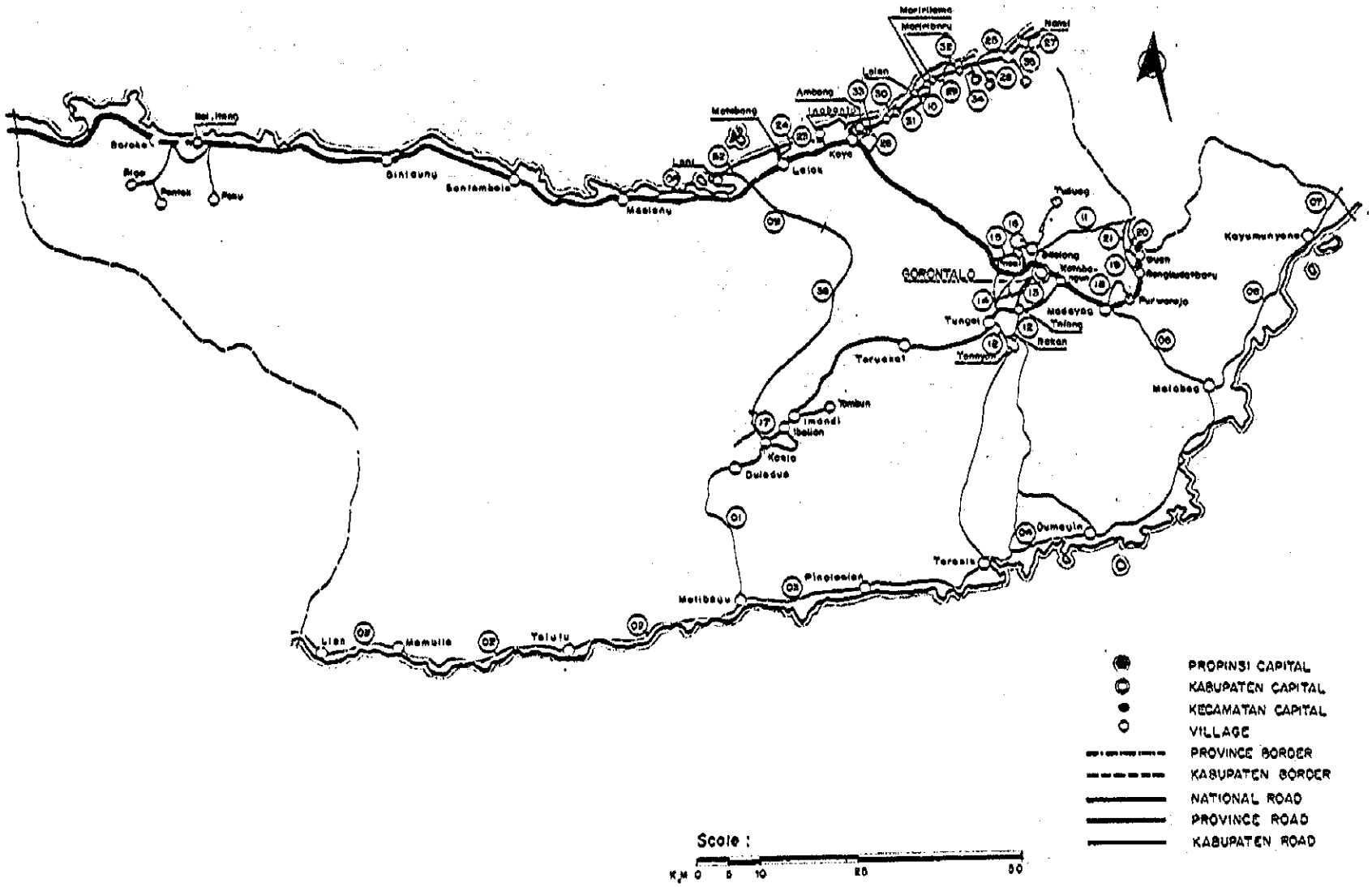
Province : Nusatenggara Timur
Kabupaten : Manggarai



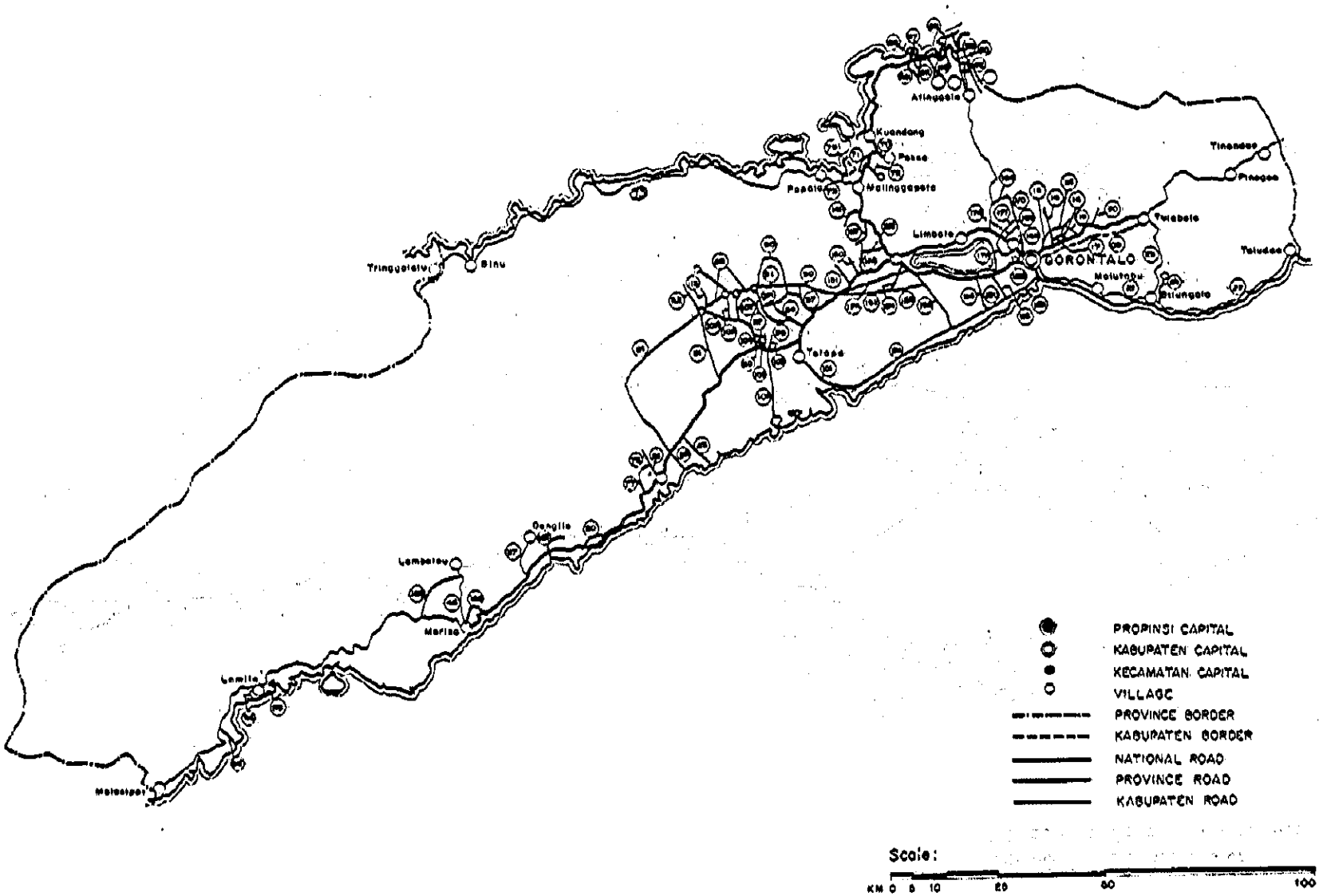
Province : Nusatenggara Timur
Kabupaten : Belu



Province : Sulawesi Utara
Kabupaten : Bolaangmongondow



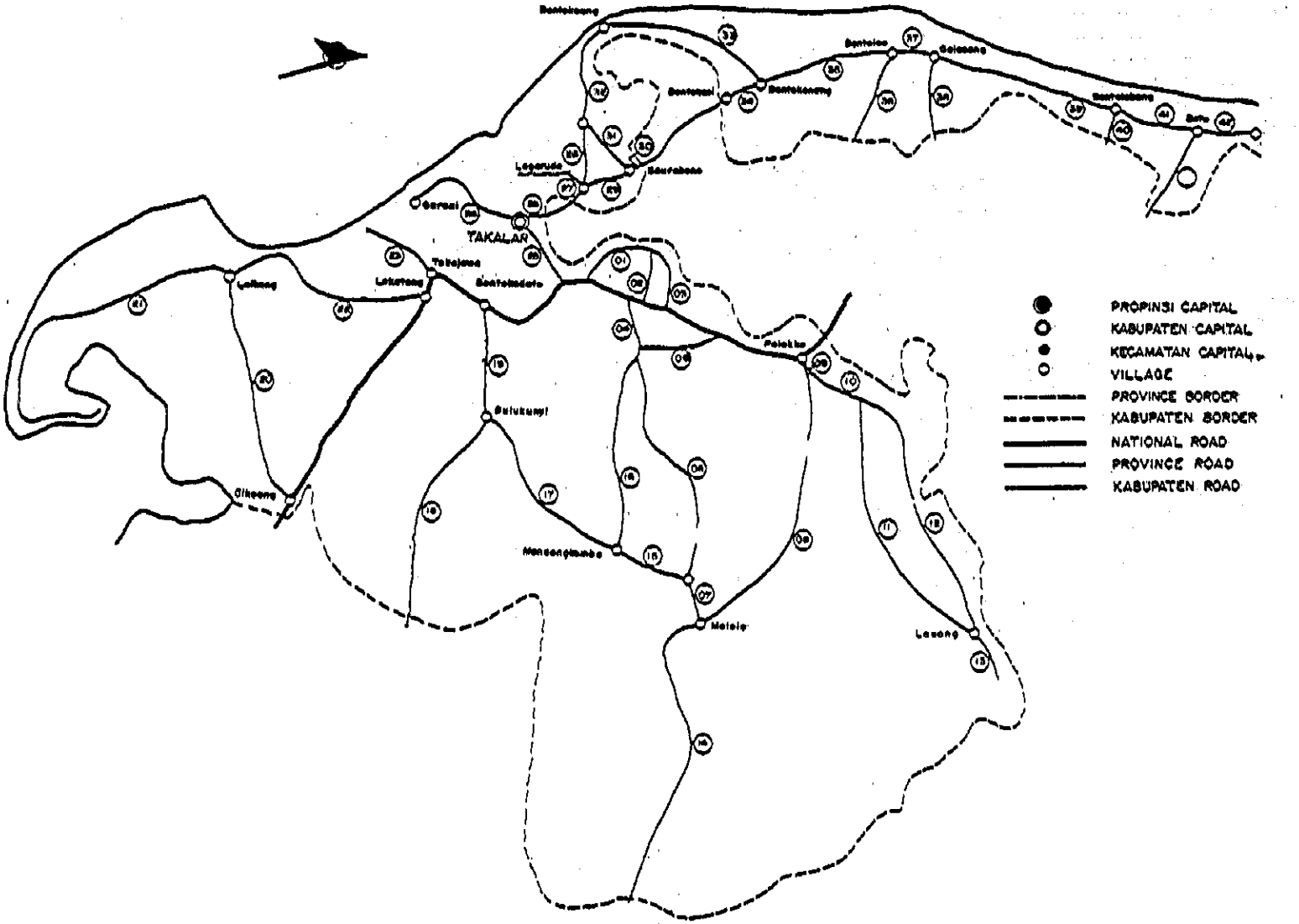
Province : Sulawesi Utara
Kabupaten : Gorontalo



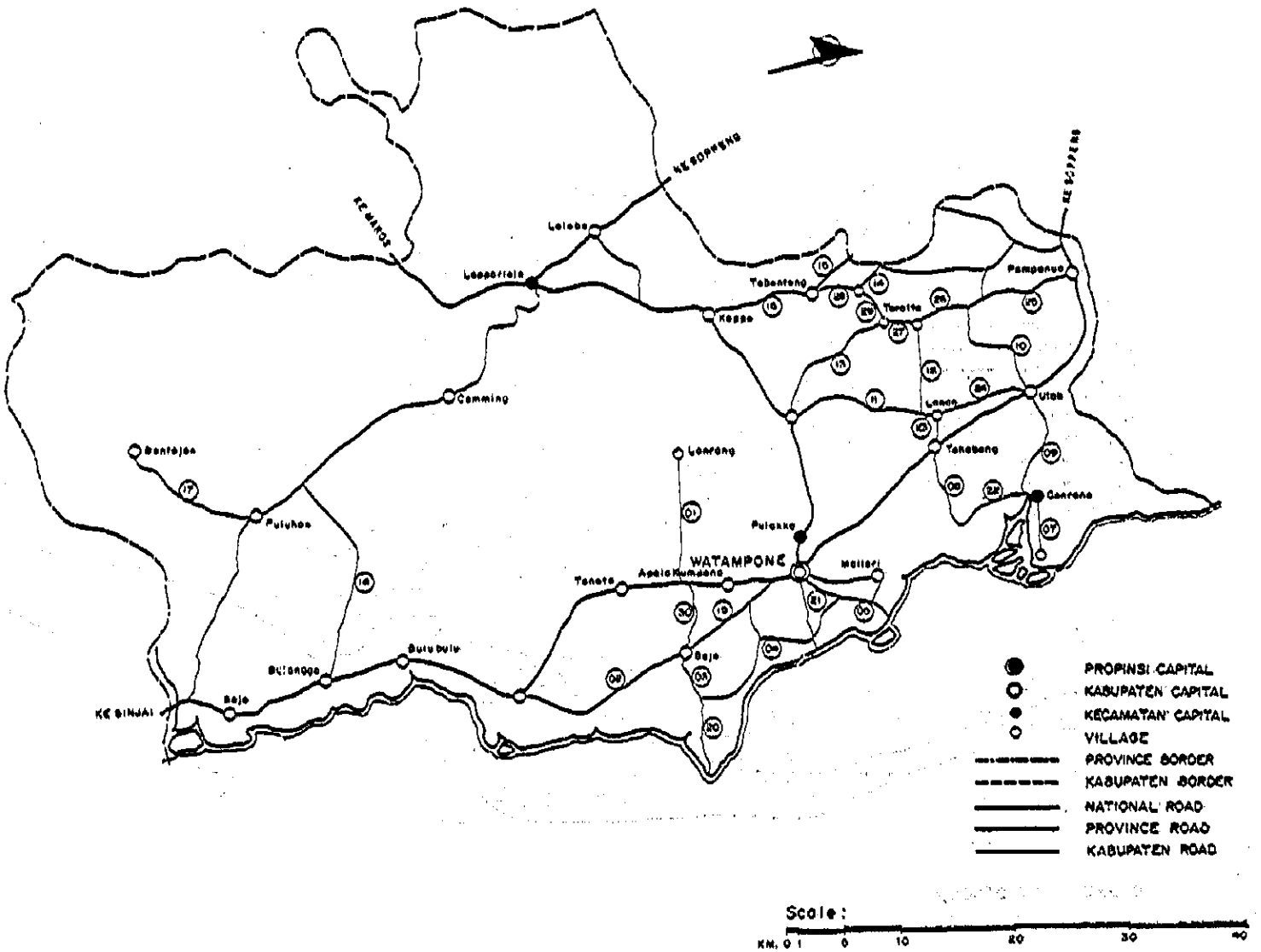
PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD

Scale:
KM 0 5 10 20 50 100

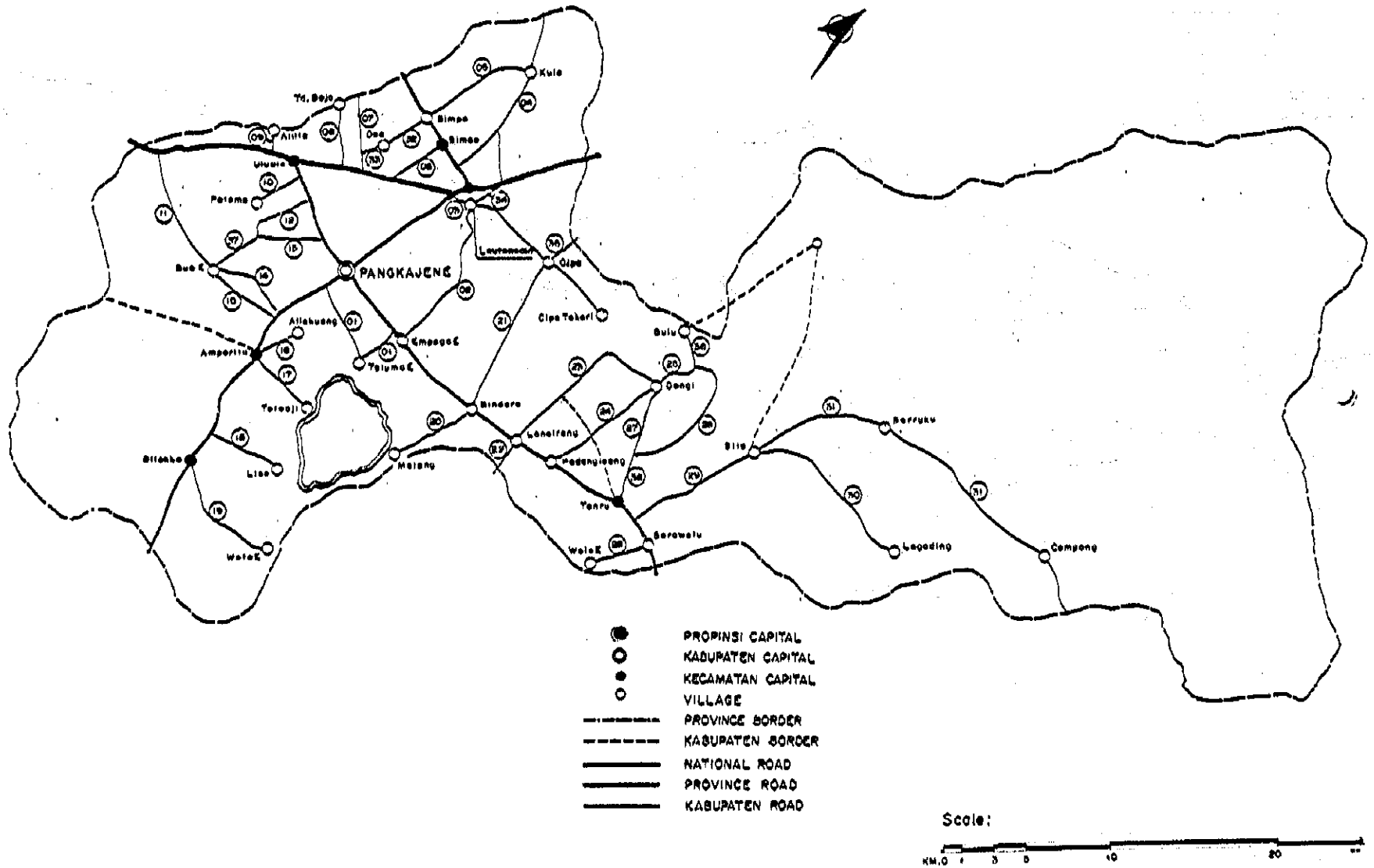
Province : Sulawesi Selatan
Kabupaten : Takalar



Province : Sulawesi Selatan
Kabupaten : Bone



Province : Sulawesi Selatan
Kabupaten : Sidrap

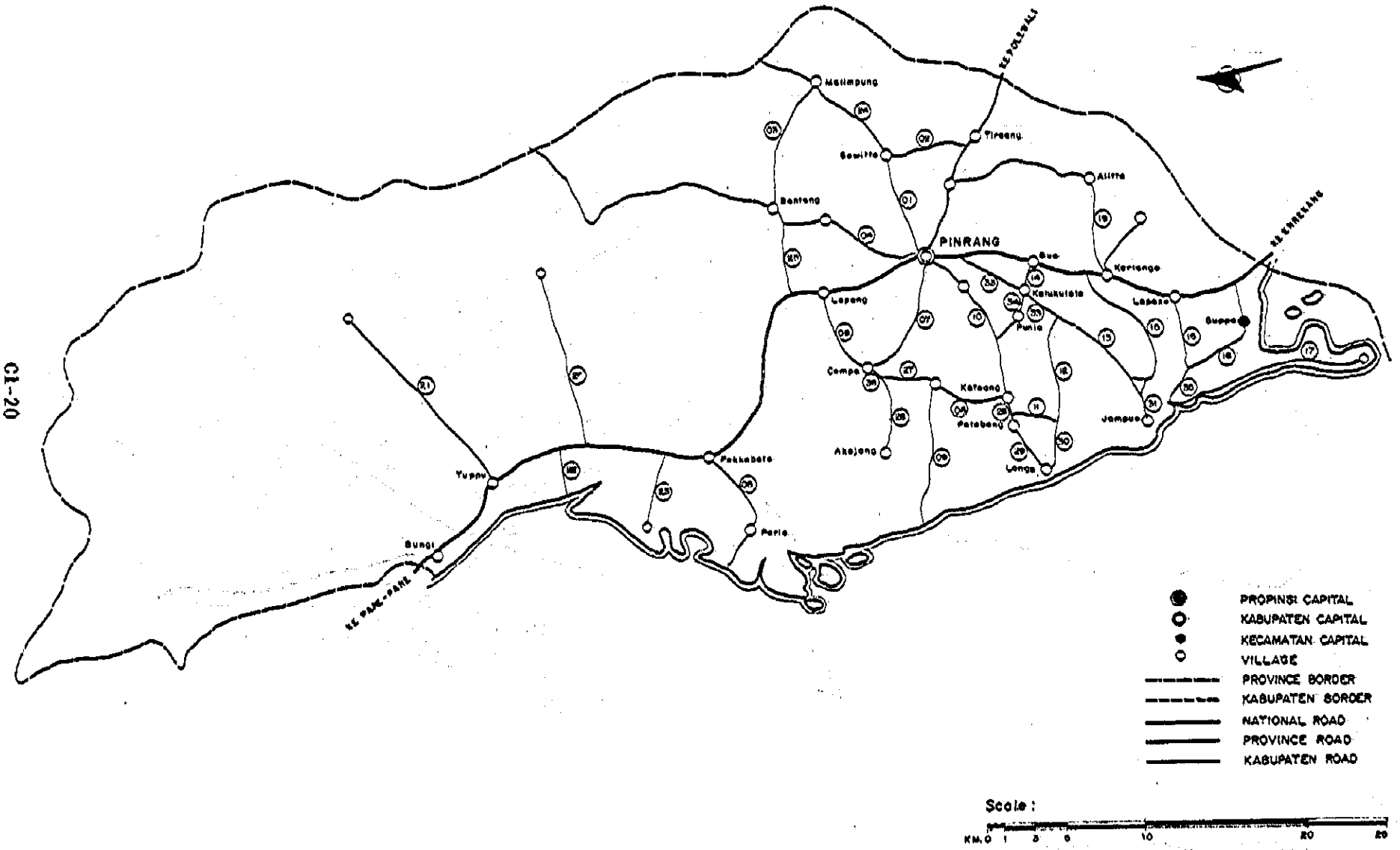


PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD

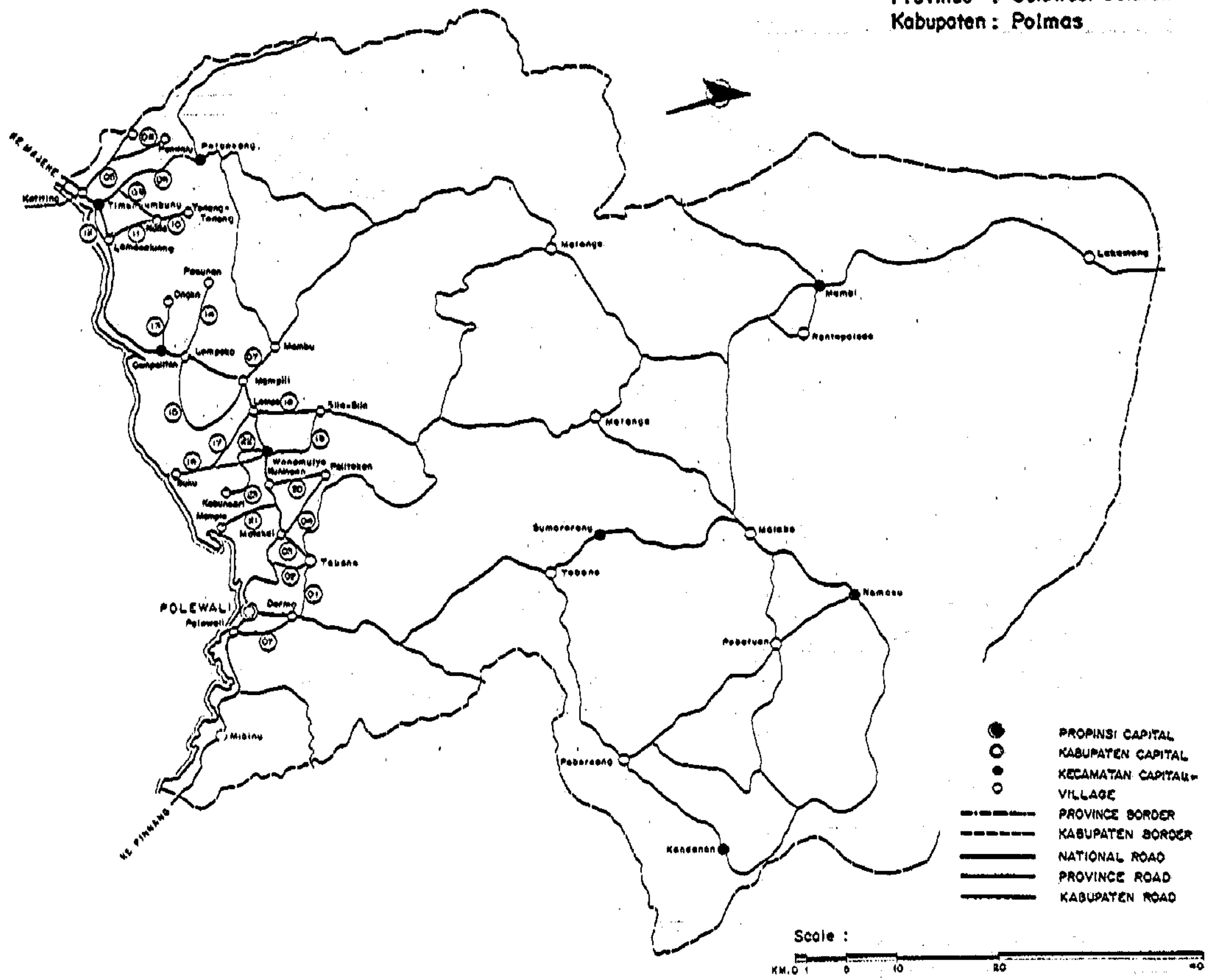
Scale:

KM. 0 1 3 5 10 20

Province : Sulawesi Selatan
Kabupaten : Pinrang



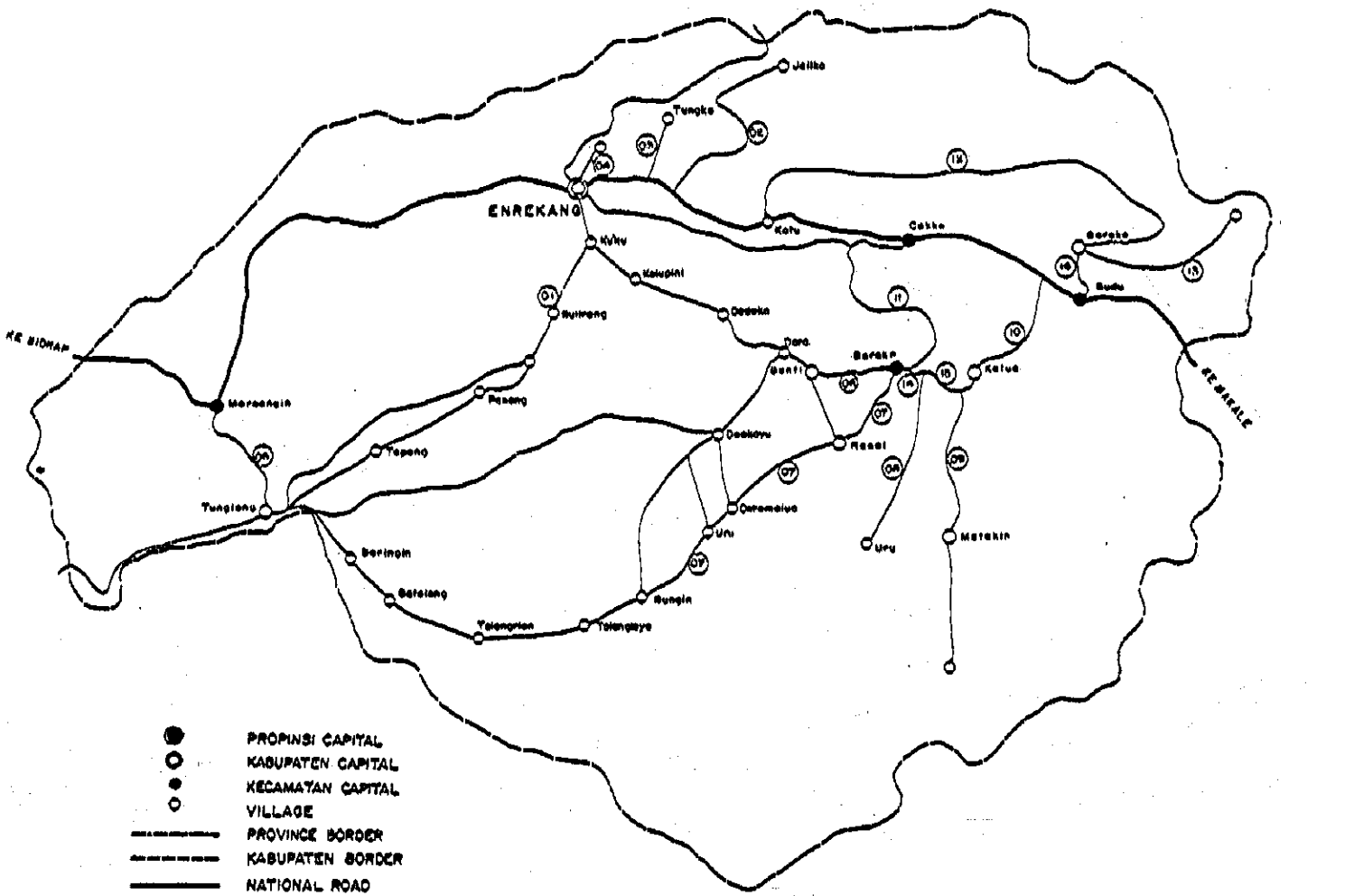
Province : Sulawesi Selatan
Kabupaten : Polmas



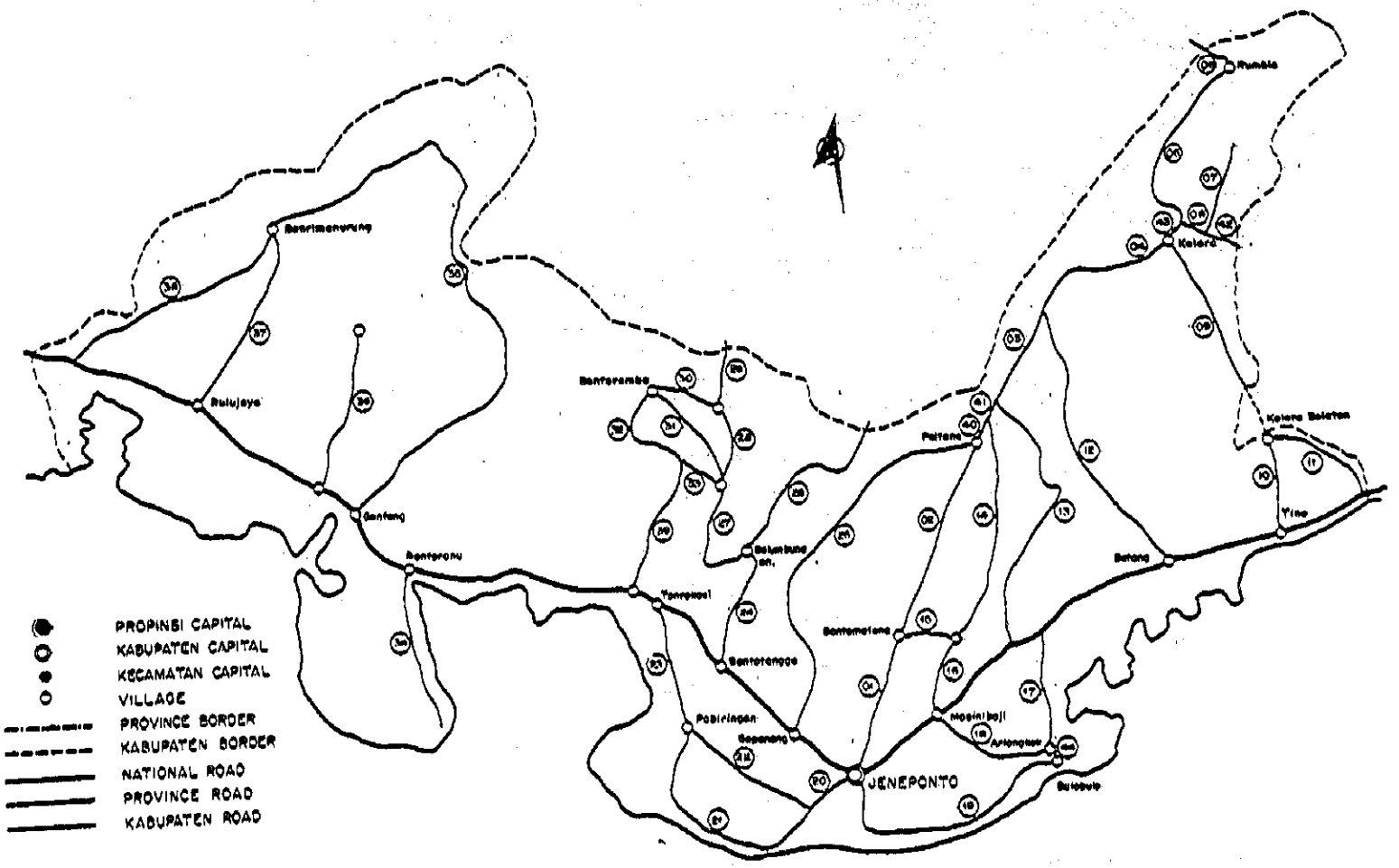
PROPINSI CAPITAL
KABUPATEN CAPITAL
KECAMATAN CAPITAL
VILLAGE
PROVINCE BORDER
KABUPATEN BORDER
NATIONAL ROAD
PROVINCE ROAD
KABUPATEN ROAD

Scale :
KM. 0 1 5 10 20 40

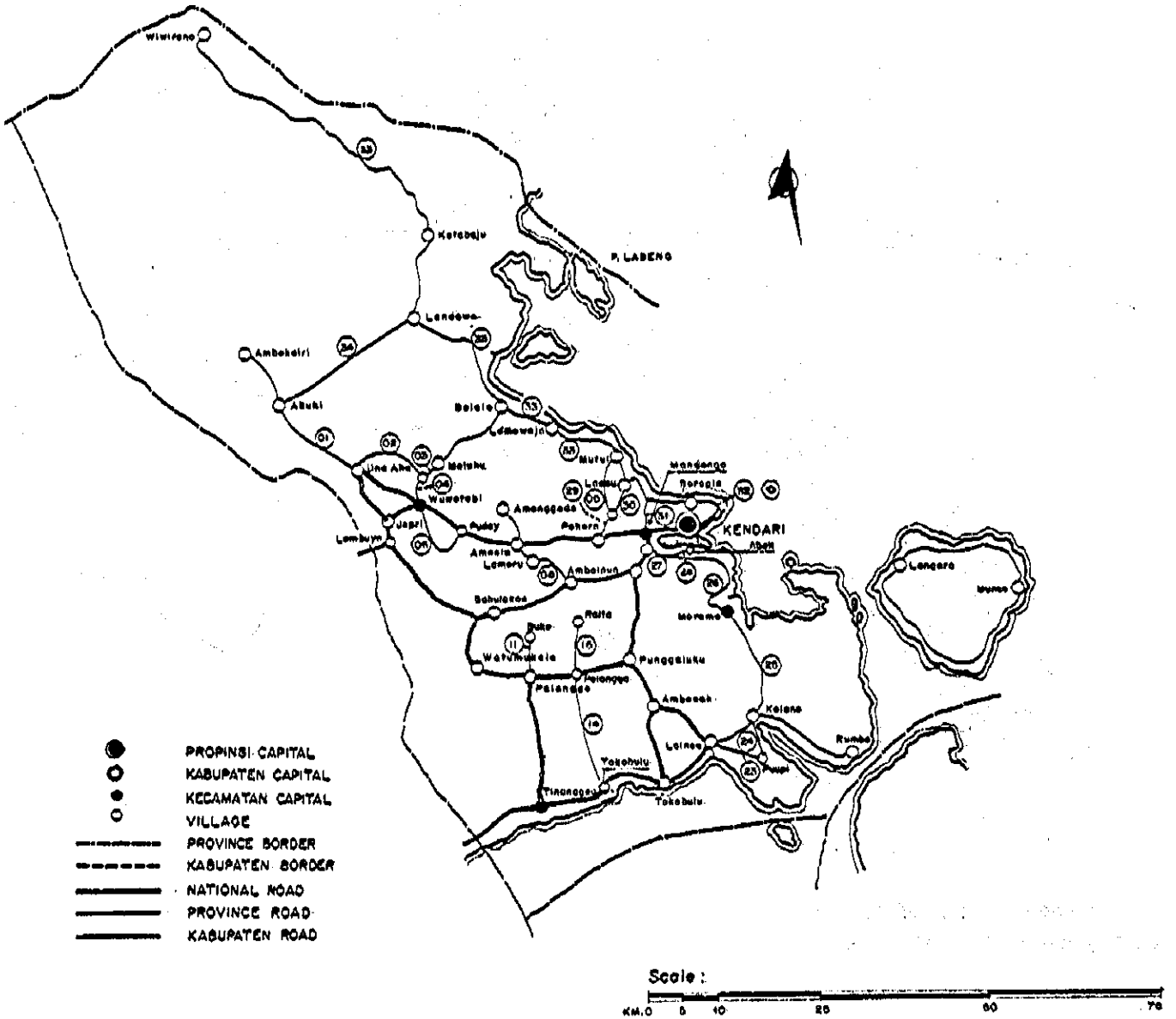
Province : Sulawesi Selatan
Kabupaten : Enrekang



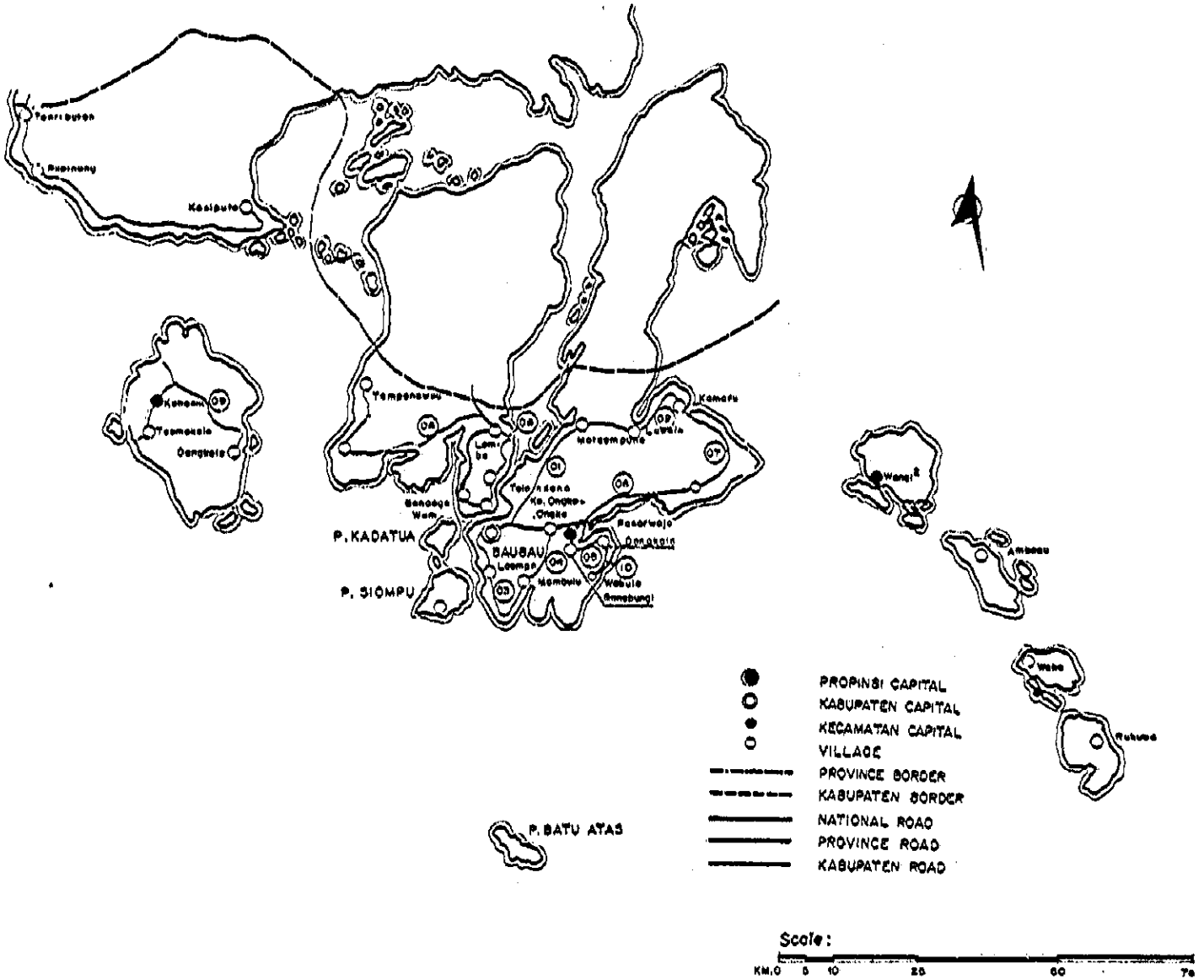
Province : Sulawesi Selatan
Kabupaten : Jeneponto



Province : Sulawesi Tenggara
Kabupaten : Kendari



Province : Sulawesi Tenggara
Kabupaten : Buton



APPENDIX C-2 BRIDGES

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
RIAU	Kapar	Good	1	10	1	6	-	-	19	227	5	36	26	279
		Damaged	-	-	1	7	-	-	96	963	8	108	105	1078
		Dangerous	-	-	-	-	-	-	48	620	7	98	55	718
		Collapsed	-	-	-	-	-	-	4	63	-	-	4	63
		No bridge	-	-	-	-	-	-	2	45	2	26	4	71
		T o t a l	1	10	2	13	-	-	169	1918	22	268	194	2209
	Kepulauan Riau	Good	3	35	11	85	-	-	62	880	3	16	79	1016
		Damaged	2	34	2	30	-	-	38	501	-	-	42	565
		Dangerous	-	-	-	-	-	-	10	236	3	13	13	249
		Collapsed	-	-	-	-	-	-	-		-	-	-	-
		No bridge	-	-	-	-	-	-	-		1	4	1	4
		T o t a l	5	69	13	115	-	-	110	1617	7	33	135	1834
SUMATERA SELATAN	Lahat	Good	10	163	33	362	-	-	2	14	15	74	60	613
		Damaged	-	-	-	-	-	-	-	-	2	8	2	8
		Dangerous	4	35	-	-	-	-	2	20	5	64	11	119
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	4	24	-	-	1	34	4	518	9	576
		T o t a l	14	198	37	386	-	-	5	68	26	664	82	1316
	O.K.I	Good	5	219	22	182	-	-	11	102	16	176	54	679
		Damaged	-	-	-	-	-	-	43	605	-	-	43	605
		Dangerous	-	-	-	-	-	-	38	396	-	-	38	396
		Collapsed	-	-	-	-	-	-	2	29	-	-	2	29
		No bridge	-	-	-	-	-	-	3	52	3	35	6	87
		T o t a l	5	219	22	182	-	-	97	1184	19	211	143	1796

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
SUMATERA SELATAN	O.K.U	Good	15	178	46	620	-	-	-	-	-	-	61	798
		Damaged	3	32	1	3	-	-	4	86	-	-	8	121
		Dangerous	1	55	1	36	-	-	2	65	-	-	4	156
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	-	-	-	-	-	-	2	64	2	64
		T o t a l	19	265	48	659	-	-	6	151	2	64	75	1139
	LIOT	Good	16	171	1	4	-	-	3	47	11	156	31	378
		Damaged	23	414	1	13	-	-	1	23	6	55	31	505
		Dangerous	2	22	-	-	-	-	-	-	-	-	2	22
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	-	-	-	-	-	-	4	32	4	32
		T o t a l	41	607	2	17	-	-	4	70	21	243	68	937
LAMPUNG	Lampung Utara	Good	-	-	6	119	-	-	1	6	9	63	16	188
		Damaged	3	55	-	-	-	-	3	61	1	5	7	121
		Dangerous	-	-	-	-	-	-	-	-	2	31	2	31
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	-	-	-	-	-	-	-	-	-	-
		T o t a l	3	55	6	119	-	-	4	67	12	99	25	340
	Lampung Selatan	Good	1	18	28	240	-	-	-	-	2	14	31	272
		Damaged	3	54	5	28	-	-	1	4	3	48	12	134
		Dangerous	-	-	-	-	-	-	-	-	1	4	1	4
		Collapsed	1	30	-	-	-	-	-	-	-	-	1	30
		No bridge	-	-	-	-	-	-	-	-	3	15	3	15
		T o t a l	5	102	33	268	-	-	1	4	9	81	48	455

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
NUSA TENGGARA TIMUR	Manggarai	Good	1	36	4	26	-	-	-	-	7	45	12	107
		Damaged	-	-	-	-	-	-	10	68	1	8	11	76
		Dangerous	-	-	-	-	-	-	-	-	-	-	-	-
		Collapsed	-	-	1	15	-	-	1	9	1	12	3	36
		No bridge	-	-	-	-	-	-	2	15	72	978	74	993
		T o t a l	1	36	5	41	-	-	13	92	81	1043	100	1212
	Belu	Good	1	24	-	-	-	-	1	5	-	-	2	29
		Damaged	-	-	-	-	-	-	6	38	-	-	6	38
		Dangerous	-	-	-	-	-	-	-	-	-	-	-	-
		Collapsed	-	-	-	-	-	-	1	5	-	-	1	5
		No bridge	-	-	-	-	-	-	-	-	14	691	14	691
		T o t a l	1	24	-	-	-	-	8	48	14	691	23	763
SULAWESI UTARA	Bolaang Mongondow	Good	1	25	20	91	-	-	1	9	1	3	23	128
		Damaged	2	52	3	20	-	-	29	233	2	18	36	323
		Dangerous	2	90	-	-	-	-	3	44	1	7	6	141
		Collapsed	-	-	1	3	-	-	1	12	1	14	3	29
		No bridge	-	-	-	-	-	-	-	-	91	2420	91	2420
		T o t a l	5	167	24	114	-	-	34	298	96	2462	159	3041
	Gorontalo	Good	6	56	9	57	-	-	37	480	-	-	52	593
		Damaged	4	33	-	-	-	-	21	215	-	-	25	248
		Dangerous	-	-	-	-	-	-	12	78	1	7	13	85
		Collapsed	-	-	-	-	-	-	1	5	45	1328	46	1333
		No bridge	-	-	-	-	-	-	7	54	-	-	7	54
		T o t a l	10	89	9	57	-	-	78	832	46	1335	143	2313

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
SULAWESI SELATAN	Takalar	Good	4	65	33	262	-	-	-	-	-	-	37	327
		Damaged	3	46	-	-	-	-	9	61	-	-	12	107
		Dangerous	-	-	-	-	-	-	3	13	-	-	3	13
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	-	-	-	-	-	-	-	-	-	-
		T o t a l	7	111	33	262	-	-	12	74	-	-	52	447
	Bone	Good	1	5	46	320	1	10	1	6	-	-	49	341
		Damaged	5	37	2	11	3	13	3	25	-	-	13	86
		Dangerous	-	-	-	-	-	-	8	31	-	-	8	31
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	-	-	1	4	-	-	5	380	6	384
		T o t a l	6	42	48	331	5	27	12	62	5	380	76	842
	Sidrap	Good	-	-	26	165	-	-	4	38	-	-	30	203
		Damaged	2	16	1	5	-	-	4	30	-	-	7	51
		Dangerous	-	-	-	-	-	-	9	58	-	-	9	58
		Collapsed	1	11	-	-	-	-	-	-	-	-	1	11
		No bridge	-	-	-	-	-	-	-	-	4	18	4	18
		T o t a l	3	27	27	170	-	-	17	126	4	18	51	341
	Pinrang	Good	4	34	23	282	-	-	2	17	1	6	30	339
		Damaged	-	-	-	-	1	4	6	30	-	-	72	34
		Dangerous	1	41	-	-	-	-	11	64	2	12	14	117
		Collapsed	-	-	-	-	-	-	1	6	-	-	1	6
		No bridge	-	-	-	-	-	-	-	-	-	-	-	-
		T o t a l	5	75	23	282	1	4	20	117	3	18	52	496

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
SULAWESI SELATAN	Polmas	Good	1	14	9	75	-	-	-	-	-	-	10	89
		Damaged	-	-	-	-	-	-	-	-	-	-	-	-
		Dangerous	2	13	-	-	-	-	-	-	-	-	2	13
		Collapsed	-	-	-	-	-	-	9	65	7	44	16	109
		No bridge	-	-	-	-	-	-	3	23	9	216	12	239
		T o t a l	3	27	9	75	-	-	12	88	16	260	40	450
	Enrekang	Good	1	60	11	61	-	-	1	3	6	201	19	325
		Damaged	2	7	-	-	-	-	1	10	1	5	4	22
		Dangerous	-	-	-	-	-	-	-	-	-	-	-	-
		Collapsed	-	-	-	-	-	-	-	-	-	-	-	-
		No bridge	-	-	1	10	-	-	-	-	17	247	18	257
		T o t a l	3	67	12	71	-	-	2	13	24	453	41	604
	Jeneponto	Good	2	21	10	142	1	6			1	4	14	173
		Damaged	9	65	2	13	-	-	14	105	8	44	33	227
		Dangerous	-	-	-	-	-	-	-	-	-	-	-	-
		Collapsed	-	-	1	7	-	-	-	-	-	-	1	7
		No bridge	-	-	2	11	-	-	6	28	15	167	23	206
		T o t a l	11	86	15	173	1	6	20	133	24	215	71	613
SULAWESI TENGGARA	Kendari	Good	3	15	28	203	2	10	72	490	9	60	114	778
		Damaged	3	29	4	23	-	-	167	1405	13	78	187	1535
		Dangerous	-	-	-	-	-	-	11	62	-	-	11	62
		Collapsed	-	-	-	-	-	-	1	15	-	-	1	15
		No bridge	-	-	-	-	-	-	1	3	23	206	24	209
		T o t a l	6	44	32	226	2	10	252	1975	45	344	337	2599

INVENTORY OF BRIDGES

Province	Kabupaten	Condition	Steel		Concrete		Stone		Timber		Others		Total	
			Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)	Number of bridge	Length of bridge(m)
SULAWESI TENGGARA	Buton	Good	5	63	16	145	-	-	1	25	4	24	26	257
		Damaged	3	130	1	7	-	-	32	220	-	-	36	357
		Dangerous	-	-	-	-	-	-	12	88	1	6	13	94
		Collapsed	-	-	-	-	-	-	-	-	1	7	1	7
		No bridge	-	-	-	-	-	-	-	-	-	-	-	-
		T o t a l	8	193	17	152	-	-	45	333	6	37	76	715
GRAND T O T A L		Good	81	1212	383	3447	4	26	218	2,349	90	878	776	7,912
		Damaged	67	1004	23	160	4	17	488	4,683	45	377	627	6,241
		Dangerous	12	256	1	36	-	-	169	1,775	23	242	205	2,309
		Collapsed	2	41	3	25	-	-	21	209	55	1,405	81	1,680
		No bridge	-	-	7	45	1	4	25	254	269	6,017	302	6,320
		T o t a l	162	2,513	417	3,713	9	47	921	9,270	482	8,919	1,991	24,462
				10.3%		15.2 %		0.1 %		37.9%		36.5 %		100.0%

APPENDIX C-3 UNIT PRICES OF LABOR AND MATERIALS

UNIT PRICE

	ITEM	UNIT	RIAU		SUMATRA SELATAN				LAMPUNG		N.T.T.		SULAWESI UTARA		SULAWESI SELATAN							SULAWESI TENGGARA	
			Kampar	Kep.Riau	Lahat	O.K.I.	O.K.U.	LIOT	Lampung Utara	Lampung Selatan	Manggarai	Belu	Bolaang Mongondow	Gorontalo	Pakalar	Bone	Sidrap	Pinrang	Polmas	Enrekang	Jeneponto	Kendari	Buton
1.	Operator	Rp/day	2,500	-	1,500	-	-	1,500	1,500/1,250	1,500	500	600	1,750	1,750	1,000	1,500	1,000	4,000	2,500	1,000	1,030	1,500	1,000
2.	Assitant operator	Rp/day	1,500	-	1,000	-	-	1,000	1,000/200	800	600	400	1,200	1,500	750	750	500	-	1,000	750	750	750	750
3.	Driver	Rp/day	2,000	-	1,000	-	-	1,500	1,250	1,500	1,200	600	1,750	1,500	1,000	1,000	1,000	1,500	1,500	1,000	1,000	1,500	1,000
4.	Forezan	Rp/day	2,500	-	1,250	-	-	1,250	1,000	1,750	600	450	1,500	1,250	700	750	1,000	700	700	1,250	1,040	750	750
5.	Stone mason	Rp/day	2,000	2,200	1,500	-	-	1,500	1,250	1,250	900	750	1,750	1,500	1,000	850	1,000	1,500	1,250	1,250	1,000	1,250	1,000
6.	Carpenter	Rp/day	2,000	2,250	1,500	-	-	1,500	1,250	1,250	900	750	1,750	1,500	1,500	850	1,000	1.500	1,250	750	1,500	1,250	1,000
7.	Common Labour	Rp/day	1,500	1,000	1,000	-	-	1,000	800	800	500	350	1,200	1,000	5,000	450	350	700	6,000	-	500	500	600
8.	Mechanic	Rp/day	2,500	2,800	2,500	-	-	-	1,250	2,000	1,200	750	1,500	1,500	-	1,500	1,000	-	2,500	1,250	1,000	2,000	1,250
9.	River stone	Rp/m3	4,000	-	5,000	-	-	5,000	5,500	4,000	1,500	1,500	3,500	3,500	3,500	2,500	3,500	3,500	2,000	2,000	3,000	3,000	-
10.	Boulder 10 - 15 cm	Rp/m3	5,000	6,500	5,500	-	-	10,000	6,750	5,000	2,000	2,500	4,000	3,500	3,000	2,500	3,500	3,500	2,500	2,000	4,000	2,500	1,750
11.	Crushed stone 5 - 7 cm	Rp/m3	6,000	-	6,000	-	-	12,500	7,500	7,500	2,250	4,000	4,000	4,000	3,000	2,000	4,000	4,000	3,000	3,000	5,000	8,500	2,500
12.	Crushed stone 3 - 5 cm	Rp/m3	6,000	8,000	6,500	-	-	15,000	8,250	8,000	2,500	4,500	6,000	400	4,000	2,500	6,400	6,000	-	6,000	6,500	10,000	2.500
13.	Crushed stone 1 - 2 cm	Rp/m3	7,000	9,000	7,500	-	-	1,500	9,000	9,500	3,000	4,000	7,500	400	4,000	2,000	5,000	5,000	-	6,000	7,000	11,000	3,000
14.	Filled gravel	Rp/m3	4,000	-	4,000	-	-	5,000	5,000	3,000	1,350	-	3,000	1,500	-	2,000	4,400	4,500	1,500	2,500	3,000	1,500	3,000
15.	Common gravel	Rp/m3	4,000	4,000	4,500	-	-	5,000	5,000	4,000	2,250	3,000	4,000	1,500	3,000	2,500	4,400	4,500	2,000	6,000	3,500	3,500	-
16.	Concrete gravel	Rp/m3	4,000	9,000	5,500	-	-	-	6,500	5,000	2,500	4,000	5,000	1,500	3,500	2,500	8,800	8,000	3,000	6,000	4,500	4,000	3,000
17.	Corn gravel	Rp/m3	4,000	-	6,000	-	-	5,000	6,500	10,000	3,000	-	6,500	1,500	-	3,000	-	-	-	-	5,000	4,500	-
18.	Filled sand	Rp/m3	2,500	-	4,000	-	-	3,000	3,750	3,000	900	1,250	3,000	750	1,000	1,250	1,500	1,500	1,000	2,000	2,000	2,250	2,000
19.	Sand for masonry	Rp/m3	4,000	3,300	5,000	-	-	3,500	4,000	5,000	2,000	2,500	3,500	1,000	2,000	1,350	2,500	2,500	1,250	3,500	2,500	2,500	2,000
20.	Concrete sand	Rp/m3	4,000	-	5,500	-	-	-	4,000	6,000	3,000	3,000	3,500	1,000	3,000	2,000	3,800	3,000	1,500	3,500	2,500	3,000	2,500
21.	Cement	Rp/kg	2,200	2,200	75	-	-	2,500	60	75	75	75	2,200	75	2,300	6,250	2,100	2,200	62.5	2,500	60	2,400	2,500
22.	Steel concrete	Rp/kg	350	400	400	-	-	500	500	625	500	350	500	350	350	600	750	-	600	500	350	350	500
23.	Asphalt	Rp/kg	400	200	135	-	-	120	125	125	150	200	150	175	140	150	-	-	45	250	260	35	132
24.	Diesel Oil	Rp/ltr	40	40	50	-	-	40	45	45	125	60	50	100	50	50	35	-	40	50	-	55	65
25.	Gasolice	Rp/ltr	100	100	100	-	-	100	100	100	200	110	100	100	100	100	100	-	125	100	100	100	110
26.	Oil	Rp/ltr	600	1,300	1,100	-	-	-	700	1,000	700	830	500	1,250	350	500	-	-	400	1,100	700	600	750
27.	Timber ϕ 15 - 10	Rp/m3	70,000	90,000	75,000	-	-	80,000	72,500	55,000	50,000	100,000	55,000	80,000	150,000	100,000	120,000	-	100,000	9,000	150,000	150,000	100,000
28.	Timber ϕ 10 - 25	Rp/m3	70,000	100,000	75,000	-	-	80,000	75,000	9,500	60,000	100,000	50,000	80,000	150,000	125,000	120,000	-	100,000	2,000	149,000	80,000	100,000

	ITEM	UNIT	RIAU		SUMATRA SELATAN				LAMPUNG		N.T.T.		SULAWESI UTARA		SULAWESI SELATAN							SULAWESI TENGGARA	
			Pekan	Kep.Riau	Lahat	O.K.I.	O.K.U.	LIOT	Lampung Utara	Lampung Selatan	Manggarai	Belu	Bolaang Mongondow	Gorontalo	Takalar	Bone	Sidrap	Pinrang	Polmas	Enrekang	Jeneponto	Kendari	Buton
29.	Timber ϕ 25	Rp/m	45,000	-	75,000	-	-	80,000	6,750	95,000	75,000	100,000	65,000	80,000	150,000	125,000	100,000	-	125,000	2,000	20,000	65,000	1,175
30.	Concrete culvert	Rp/each	10,000	11,000	50,000	-	-	300,000	4,000	-	80,000	50,000	75,000	25,000	15,000	11,500	-	-	125,000	-	7,000	70,000	-
31.	Paint	Rp/kg	2,000	1,000	1,500	-	-	1,500	1,400	1,300	2,500	3,000	1,500	1,900	1,500	1,500	1,600	-	1,500	-	1,600	1,500	1,750
32.	⊥L steel, L 50, 505	Rp/kg	500	-	22,500	-	-	-	500	575	3,000	8,000	8,500	1,000	185	800	3,500	-	-	-	7,000	-	7,500
33.	Profile steel I40	Rp/kg	1,500	-	-	-	-	-	550	-	2,500	600	600	1,500	185	900	-	-	-	-	-	-	-
34.	Earth excavation cost	Rp/m3	600	800	1,250	-	-	600	625	650	702.50	450	750	1,042	18,978	801.56	585	-	500	-	500	750	622.50
35.	Filled work & its material cost	Rp/m3	1,500	2,000	1,500	-	-	1,000	1,250	1,250	657.63	2,500	1,000	32	6,750	200.30	2,634	-	500	-	1,200	1,030.50	-
36.	Bed road compaction	Rp/m2	3,000	-	157	-	-	250	200	250	1,000	80	750	558	321,625	2,070	850	-	14	-	300	1,500	235.50
37.	Finished gravelling work	Rp/m3	5,500	-	6,400	-	-	60	5,250	250	900	-	6,000	359	250	2,819.22	-	-	1,000	-	750	2,000	732.50
38.	Finished sub-base work	Rp/m3	-	-	6,650	-	-	-	26,250	2,500	753.83	2,200	7,500	-	-	18,871.31	-	-	1,250	-	650	5,000	845.75
39.	Finished base work	Rp/m3	-	-	9,850	-	-	-	24,500	2,500	745.08	500	5,000	-	-	21,332.25	-	-	1,500	-	500	8,000	353.14
40.	Aspal coating work	Rp/m2	63,000	-	650	-	-	-	1,250	100	614.41	1,500	550	802.80	-	532	21,925	-	10	-	60	700	810.15
41.	Culvert work	Rp/m	7,000	-	6,500	-	-	75,000	125,000	-	60,000	100,000	100,000	10,000	-	11,500	150,000	-	2,500	-	1,750	-	976.350
42.	Side ditch work	Rp/m3	500	800	1,250	-	-	600	700	650	25,000	274	1,000	1,042	80,000	593.44	585	-	650	-	1,000	-	622.50
43.	Brige railing work	Rp/m3	-	-	3,000	-	-	-	138,000	-	20,000	-	70,000	49,875	100,000	175,713.75	-	-	3,000	-	-	-	-
44.	Brige floor work	Rp/m2	50,000	5,000	29,600	-	-	10,000	9,000	180,000	19,000	1,450	70,000	913	135,000	1,626.33	136,570	-	1,000	-	1,000	-	820
45.	Beam exchange work	Rp/m	4,000	15,000	343,000	-	-	-	75,250	-	-	-	5,000	2,000	-	43,269.44	21,600	-	5,000	-	500	-	-
46.	Lower structure work	Rp/m3	70,000	35,000	36,500	-	-	-	25,250	20,000	16,000	17,500	90,000	7,110	12,500	68,019.59	18,163	-	3,000	-	3,500	-	16,326
47.	Retained work	Rp/m3	500	30,000	1,750	-	-	-	38,400	20,000	500	275	25,000	755	10,000	422.66	-	-	2,000	-	2,000	-	1,190
48.	Temporary strengthening work	Rp/each	3,000	-	1,500,000	-	-	-	18,250	-	-	-	50,000	-	-	1,500	-	-	-	-	15,000	-	-
49.	Temporary brige (width-3m) bolting	Rp/m	60,000	30,000	85,000	-	-	-	12,500	-	400,000	405,000	51,500	3,000	10,000	500	5,000	-	35,000	-	25,000	-	350,000
50.	Nail	Rp/kg	600	550	400	-	-	500	650	550	500	850	600	750	500	600	1,100	-	-	-	600	600	700

APPENDIX D-1 PRIORITY SETTING OF ROAD LINKS

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : RIAU

KABUPATEN: KAMPAR

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1	87	15,240	16.52	2.11	34.31	366.9	0.094	2	11	6.5	6						5
2	32	19,520	21.1	1.62	34.18	113.9	0.300	3	4	3.5	3						3
3	6	1,780	1.9	2.45	4.65	30.93	0.150	10	7	8.5	9						9
4	15	4,800	5.2	2.49	12.94	89.27	0.144	6	8	7	8						8
5	30	5,400	5.8	1.62	9.39	30.77	0.305	8	3	5.5	5						6
18	15	5,010	5.4	1.79	9.66	54.17	0.178	7	6	6.5	6						7
21	15	10,200	11.1	2.07	22.97	20.04	1.146	4	1	2.5	1						1
25	7	1,260	1.3	1.46	1.83	14.35	0.127	11	9	10	11						11
26	22	3,080	3.3	1.46	4.31	43.83	0.102	9	10	9.5	10						10
27,29	32	15,820	17.1	2.33	39.84	160.28	0.229	1	5	3	2						2
28	14	9,520	10.3	1.38	14.21	23.43	0.606	5	2	3.5	3						3
35	3	0.270	0.3	2.25	0.67	15.24	0.039	12	12	12	12						12

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : RIAU

KABUPATEN : KEPULAUAN RIAU

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1.2	40	26,670	18.0	2.11	37.98	192.30	0.20	2	2	2	2						5
3.4 5.6	67	43,470	29.8	2.26	67.34	186.93	0.36	1	1	1	1						4
7.8	16	3,470	2.4	1.91	4.58	62.71	0.07	8	8	8	8						9
9.10 11.12	52	28,880	19.8	1.89	37.46	217.08	0.17	2	5	3.5	3						6
17	9	4,030	2.8	1.45	4.07	21.85	0.19	7	3	5	4					0	2
18.19.21 23.25.27 29.	73	18,790	12.9	1.74	22.48	243.17	0.09	4	7	5.5	6					0	1
20	10	1,960	1.3	1.36	1.77	15.76	0.12	10	6	8	8						9
22	3	140	0.1	2.27	0.23	16.57	0.01	15	15	15	15						15
24	5	300	0.2	1.80	0.36	16.54	0.02	14	14	14	14						14
26	7	840	0.6	2.01	1.21	29.25	0.04	13	11	12	13						13
28	5	900	0.6	2.32	1.39	27.71	0.05	12	10	11	11						11
30.31	14	1,260	0.9	2.22	2.00	69.23	0.03	9	12	10.5	10						3
32	13	1,170	0.8	1.82	1.46	45.78	0.03	11	12	11.5	12						12
33.34	46	9,020	6.2	1.54	9.52	140.64	0.07	5	8	6.5	7						8
36	10	3,430	3.5	2.05	7.19	39.42	0.18	6	4	5	4						7

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SUMATERA SELATAN

KABUPATEN: LAHAT

Link No.	Length	Population (Pi)	Total Development Potentiality Index	Road Level Improvement Index	Development Effect Index	Support Work Cost	Effect Cost Ratio Index	Priority				Engineering Remarks	Local & National Level Remarks				Proposed Priority
								From	From	Average of	Priority		Transmigration	Approach to Isolated Area	Damaged by Natural Disaster	Others	
(1)	(2)	(3)	(4)	(5)	(6)=(4)@(5)	(7)	(8)=(7)/(6)	(9)	(10)	(9)&(10) (11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	12	5,090	3.36	1.42	4.77	20.32	0.23	8	3	5.5	5						5
2	29	5,680	3.75	2.28	8.55	142.32	0.060	5	8	6.5	7						7
3	30	19,650	12.95	2.00	25.9	119.72	0.21	2	4	3	3						3
4-A	6																
4-CE	14	4,070	2.68	2.37	6.35	76.68	0.08	6	7	6.5	7						7
10-A	5																
10-CE	24	39,360	26.08	2.043	53.28	92.27	0.57	1	1	1	1						1
11	12	17,040	11.23	1.59	17.83	50.12	0.35	3	2	2.5	2						2
12	10	3,700	2.44	2.19	5.35	36.3	0.14	7	5	6	6						6
13	21	9,720	6.40	1.44	9.21	93.26	0.098	4	6	5	4						4
15	7	770	0.50	2.15	1.07	30.55	0.035	11	10	10.5	10						9
17	8	540	0.35	2.14	0.74	37.12	0.020	12	13	12.5	13						13
18	4	430	0.28	1.81	0.50	12.79	0.039	13	11	12	12						11
19	11	880	0.58	2.03	1.17	41.28	0.029	10	12	11	11						9
20	16	1,300	0.86	1.60	1.37	35.53	0.038	9	9	9	9						12

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SUMATERA SELATAN

KABUPATEN : O.K.I

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	17	16,400	9.6	1.70	16.66	43.73	0.38	5	1	3	3						3
7	17	8,500	5.1	2.24	11.42	77.41	0.15	7	7	7	7						7
11.12	39	19,500	11.7	2.06	24.07	153.07	0.16	4	5	4.5	5						5
13.14.15	23	24,800	14.9	2.52	37.55	126.02	0.30	2	2	2	1						2
18.19.20 21.22	28	20,000	12.0	2.27	27.24	132.34	0.21	3	4	3.5	4						4
23.24	17	12,000	7.2	1.80	12.96	81.05	0.16	6	5	5.5	6	improved					6
25.26	72	64,900	39.0	2.15	83.85	320.75	0.26	1	3	2	1			0			1

TABLE

PROVINCE : SUMATERA SELATAN

PRIORITY SETTING OF ROAD LINKS

KABUPATEN: O.K.U

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	8	1,920	1.64	3.14	5.15	53.77	0.095	10	10	10	10						10
2	13	4,056	3.46	1.63	5.64	24.91	0.23	9	7	8	8						8
3	30	12,240	10.46	1.87	19.54	81.00	0.24	6	6	6	6						6
4-A	10																
4-CK	11	9,790	8.37	2.62	21.92	67.34	0.32	4	5	4.5	5						5
5	18	21,060	18.00	3.13	56.34	120.00	0.48	2	2	2	2						2
6	22	27,940	23.89	2.71	64.74	138.59	0.43	1	2	1.5	1						1
7	14	16,380	14.00	3.14	43.96	94.08	0.43	3	2	2.5	3						3
8	8	9,360	8.00	2.61	20.88	40.32	0.52	5	1	3	4						4
16-A	10																
16-CK	12	3,880	3.32	1.89	6.27	52.54	0.12	8	9	8.5	9						9
20	28	10,300	8.81	1.68	14.80	101.28	0.15	7	8	7.5	7						7

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SUMATERA SELATAN

KABUPATEN: L.I.O.T

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Emigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	18	8,310	9.03	1.76	15.90	52.83	0.30	4	9	6.5	6						6
2	10	4,620	5.02	1.20	6.01	24.06	0.25	9	11	10	10						10
6	24	8,520	9.26	1.41	13.08	37.62	0.35	5	5	5	5						5
7	3	920	1.00	1.49	1.46	6.70	0.22	17	12	14.5	15						15
11,15, 16,17	15	1,320	1.44	1.85	2.65	59.65	0.04	15	17	16	17						17
18	10	17,770	1.93	2.00	3.87	44.44	0.09	12	16	14	13						13
20	17	12,490	13.58	2.00	27.19	78.81	0.34	2	6	4	4						4
21	14	39,770	4.32	1.46	6.32	58.42	0.11	8	15	11.5	12						12
24	4	1,370	1.49	1.85	2.76	16.53	0.17	14	14	14	13						13
25	4	1,370	1.49	1.52	2.26	10.72	0.21	16	13	14.5	15						15
29	12	43,870	4.77	1.33	6.38	18.62	0.34	7	7	7	7						7
31	5	2,280	2.48	1.32	3.29	5.56	0.59	13	2	7.5	8						8
34	4	3,920	4.26	1.94	8.273	13.65	0.61	6	1	3.5	3						3
36	7	3,190	3.48	1.44	5.01	16.33	0.31	11	8	9.5	9						9
37	6	2,980	3.24	1.70	5.50	19.37	0.28	10	10	10	10						10
38	19	14,160	15.39	1.74	26.78	70.08	0.38	3	3	3	2						2
39	22	16,400	17.82	2.06	36.70	99.71	0.37	1	4	2.5	1						1

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : LAMPUNG

KABUPATEN : LAMPUNG UTARA

Link No. (1)	Length (2)	Population (P1) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
2	9	5,400	9.8	1.61	11.37	6.96	1.63	5	4	4.5	4						4
3	10	10,300	18.8	1.37	25.71	7.01	3.66	2	1	1.5	1						1
8	22	17,200	31.4	1.08	33.97	10.28	3.30	1	2	1.5	1						1
14	4	1,300	2.4	1.44	3.46	7.19	0.48	7	7	7	7						7
15	22	13,100	23.9	1.08	25.69	11.30	2.27	3	3	3	3						3
19	4	2,000	3.7	2.08	7.69	13.44	0.57	6	6	6	6						6
20	11	5,600	10.2	1.70	17.34	24.05	0.72	4	5	4.5	4						4

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : LAMPUNG

KABUPATEN: LAMPUNG SELATAN

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)*(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority (12)	Engineering Remarks (13)	Local & National Level Remarks: Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1.2.3	22	26,250	10.3	1.60	16.48	62.21	0.26	3	8	5.5	5						5
6	7	4,080	1.6	1.38	2.21	20.29	0.11	11	11	11	11						11
7.8.10	19	19,810	7.8	1.52	11.84	62.88	0.19	7	9	8	9						9
9	3	6,560	2.6	1.71	4.45	23.45	0.19	10	9	9.5	10						10
12	8	21,790	9.7	1.62	15.72	32.26	0.49	5	4	4.5	4						4
13	7	11,900	4.7	1.37	6.45	15.19	0.42	8	6	7	7						7
25.26	10	45,420	17.8	1.85	32.98	42.69	0.77	1	2	1.5	1						1
29	6	9,230	3.6	1.31	4.71	11.01	0.43	9	5	7	7						7
30.32	13	39,330	15.4	1.67	25.77	38.58	0.67	2	3	2.5	2						2
31	7	25,120	9.9	1.61	15.90	16.15	0.98	4	1	2.5	2						2
33.34	12	18,490	7.3	1.68	12.24	41.22	0.30	6	7	6.5	6						6

TABLE

PROVINCE : NUSA TENGGARA TIMUR

PRIORITY SETTING OF ROAD LINKS

KABUPATEN : MANGGARAI

Link No. (1)	Length (2)	Population (P1) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1-A	4																
1.CE	53	25,920	10.38	1.27	13.44	64.03	0.21	4	2	3	3						3
2	130	89,700	36.62	1.71	62.48	350.43	0.18	1	3	2	2						2
3	24	67,680	27.63	1.44	39.73	19.79	2.00	2	1	1.5	1						1
4	53	33,070	13.50	1.21	16.34	92.02	0.18	3	4	3.5	4						4
5	26	12,090	4.94	1.79	8.83	69.30	0.13	6	5	5.5	5						5
6	27	4,860	1.98	1.45	2.86	63.00	0.045	7	7	7	7						7
8	25	11,000	4.49	2.07	9.29	93.54	0.099	5	6	5.5	5						5

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : NUSA TENGGARA TIMUR

KABUPATEN: BELU

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Immigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	3	620	0.33	3.14	1.04	33.60	0.03	18	17	17.5	18						18
2.3	13	2,030	1.10	2.05	2.25	45.22	0.05	13	16	14.5	15						15
4	4	3,060	1.65	1.35	2.23	14.14	0.15	15	5	10	11						11
5	11	10,390	5.60	2.31	12.94	52.29	0.25	4	2	3	3						3
6	10	1,240	0.67	3.14	2.10	67.20	0.031	16	17	16.5	17						17
7	5	2,410	1.30	1.72	2.23	33.60	0.07	14	14	14	14						14
9	39	31,330	16.90	2.49	42.04	191.98	0.21	2	3	2.5	2						2
10	13	11,360	6.13	2.85	17.46	83.13	0.21	3	4	3.5	4						4
11	21	7,260	3.91	1.49	5.82	45.84	0.13	6	9	7.5	5						5
12	50	80,350	43.34	3.02	130.89	329.36	0.40	1	1	1	1						1
13	6	3,28	1.77	3.14	5.56	40.32	0.14	7	8	7.5	5						5
14	21	9,360	5.05	2.28	11.51	114.36	0.10	5	12	8.5	8						8
15	6	3,050	1.64	1.37	2.25	15.42	0.15	12	6	9	9						9
16	12	6,79	3.66	1.44	5.27	46.26	0.11	8	10	9	9						9
17	4	1,410	0.76	1.9	1.44	17.00	0.08	17	13	15	16						16
18	10	2,760	1.49	3.14	4.68	67.20	0.07	10	15	12.5	13						13
19	6	2,870	1.55	3.14	4.87	40.32	0.12	9	7	8	7						7
20	6	2,670	1.44	3.14	4.52	40.32	0.11	11	10	10.5	12						12
21	10	140	0.07	1.72	0.12	51.40	0.002	19	19	19	19						19

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SULAWESI UTARA

KABUPATEN: BOLAANG MONGONDOW

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1-A	4																
1-GK	18	5,130	6.78	1.92	13.02	127.32	0.01	5	14	9.5	11			0			2
2	78	7,870	10.39	2.93	30.44	494.38	0.06	2	11	6.5	5						6
3	18	1,310	1.73	1.56	2.66	124.35	0.02	13	13	13	14						14
4	93	14,930	19.71	1.58	31.14	228.69	0.14	1	8	4.5	3						4
5-A	3																
5-GK	32	12,280	16.21	1.17	18.96	37.34	0.51	4	3	3.5	1			0			1
6	27	4,980	6.58	1.260	8.29	15.42	0.54	8	1	4.5	3						4
9	9	1.650	2.18	1.17	2.55	15.42	0.17	14	6	10	12						12
11-A	5																
11-GK	14	3,120	4.12	1.97	8.12	52.55	0.15	10	7	8.5	10						11
12-A	6																
12-GK	24	4,620	6.09	1.53	9.31	69.97	0.13	7	9	8	9						10
15	5	4,530	5.99	1.92	11.50	22.58	0.51	6	2	4	2						3
17-A	7																
17-GK	11	3,820	5.05	1.62	8.18	40.93	0.20	9	5	7	7						8
18-A	3																
18,19, 20,21	19	1,340	2.03	2.24	4.54	101.22	0.05	12	12	12	13						13
22,23, 24	20	3.100	4.09	1.14	4.66	22.57	0.21	11	4	7.5	8						9
36	36	5,630	7.46	3.41	25.43	241.92	0.11	3	10	6.5	5						6

TABLE

PROVINCE : SULAWESI UTARA

PRIORITY SETTING OF ROAD LINKS

KABUPATEN: GORONTALO

Link No. (1)	Length (2)	Population (P1) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
21,22	75	23,500	16.19	1.36	22.01	321.23	0.06	2	16	9	7			0			4
73	72	20,800	14.33	2.98	42.70	459.19	0.09	1	12	6.5	4			0			3
81	34	6,200	4.27	2.93	12.51	212.60	0.06	6	15	10.5	12		0				1
88	21	6,500	4.47	2.67	11.93	348.02	0.03	7	17	12	14						14
84,87, 95	15	17,300	11.92	1.72	20.44	41.84	0.48	3	1	2	1						2
101	35	6,300	4.34	1.200	5.20	51.91	0.10	15	11	13	16						16
103	20	5,100	3.51	1.43	5.08	57.89	0.08	16	13	14.5	17						17
114	10	5,400	3.72	2.02	7.31	41.66	0.18	11	7	9	17						9
128, 152	9	5,500	3.79	1.90	7.21	31.53	0.22	12	5	8.5	5						7
132	14	6,000	4.13	2.59	10.69	73.55	0.14	9	9	9	7						9
134	30	5,700	3.92	2.18	8.55	110.55	0.07	10	14	12	14						14
135, 136	11	6,900	4.75	1.19	5.66	17.99	0.31	14	4	9	7						9
168,169 170	6	6,500	4.47	1.20	5.38	12.34	0.43	15	2	8.5	5						7
184	9	4,700	3.23	1.86	6.01	35.56	0.16	13	8	10.5	12						13
187	12	5,000	3.44	3.14	10.80	80.64	0.13	8	10	9	7						9
188	10	6,700	4.61	3.14	14.47	67.20	0.21	5	6	5.5	3						6
189	7	7,000	4.82	3.14	15.13	47.04	0.32	4	3	3.5	2						5

Note 1. Link No.81 is important for trans-imigration project, and was given special priority

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SULAWESI SELATAN

KABUPATEN: TAKALAR

Link No. (1)	Length (2)	Population (P1) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
3	6	5,440	4.54	1.180	5.35	7.26	0.73	11	9	10	11						11
5	4	2,420	2.01	1.24	2.49	6.49	0.38	14	14	14	15						15
6	8	12,080	10.09	1.52	15.36	19.79	0.77	7	8	7.5	7						7
8	10	5,000	4.17	1.45	6.05	23.78	0.25	10	15	12.5	13						13
11	8	3,000	2.50	1.60	4.00	10.09	0.39	12	13	12.5	13						13
12	9	3,360	2.82	1.35	3.79	3.84	0.98	13	4	8.5	9						9
13	3	7,500	6.26	1.56	9.79	11.99	0.81	9	7	8	8						8
14	8	25,000	20.89	1.52	31.66	24.26	1.30	2	3	2.5	2						2
17	9	19,030	15.89	1.60	25.47	42.26	0.60	3	11	7	5						5
18	7	14,798	12.36	1.30	16.06	17.38	0.92	6	6	6	4						4
20	8	17,020	14.22	1.65	23.50	37.44	0.63	4	10	7	5						5
21	14	21,280	17.78	2.55	45.34	33.00	1.38	1	2	1.5	1						1
22	8	12,160	10.16	1.48	15.08	26.43	0.57	8	12	10	11						11
23	3	2,740	2.28	1.08	2.47	2.53	0.98	15	4	9.5	10						10
33	6	18,100	15.12	1.18	17.86	4.10	4.3	5	1	3	3						3

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SULAWESI SELATAN

KABUPATEN: BONE

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potencialiity Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1	18	12,030	4.44	1.90	8.44	90.45	0.09	10	13	11.5	12						12
4	12	9,140	3.37	1.33	4.49	35.90	0.12	13	12	12.5	13						13
5	7	5,230	1.93	1.44	2.77	38.55	0.07	15	15	15	15						15
6	16	26,030	9.61	1.70	16.42	42.22	0.38	5	4	4.5	4						4
7	4	8,070	2.98	3.17	9.44	26.4	0.36	9	5	7	7						7
9	12	4,850	1.79	2.31	4.14	48.01	0.08	14	14	14	14						14
12	12	24,290	8.96	2.11	18.94	43.47	0.44	2	2	2	1						1
15	8	23,710	8.75	1.73	15.14	27.67	0.54	6	1	3.5	3						3
16	15	29,640	10.94	1.36	14.97	55.89	0.26	7	8	7.5	8						8
17	12	9,930	3.66	2.755	10.08	74.82	0.13	8	11	9.5	9						9
18	22	27,020	9.97	1.86	18.57	83.15	0.22	3	9	6	6						6
20	7	7,250	2.67	3.14	8.38	47.04	0.17	11	10	10.5	11						11
24	14	26,810	9.8	1.78	17.44	55.52	0.31	4	6	5	5						5
25.26. 27.29	27	59,710	22.04	1.29	28.43	66.26	0.42	1	3	2	1						1
30	7	1,050	3.9	1.25	4.89	17.99	0.27	12	7	9.5	9						9

TABLE

PROVINCE : SULAWESI SELATAN

PRIORITY SETTING OF ROAD LINKS

KABUPATEN : SIDRAP

Link No. (1)	Length (2)	Population (P4) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1	9	10,900	10.34	1.14	11.87	7.63	1.55	5	1	3	1						3
2	12	18,160	17.23	1.69	29.11	43.69	0.67	2	5	3.5	2						4
4	10	1,630	1.55	1.92	2.98	47.80	0.06	12	16	14	15						15
5	13	2,730	2.59	1.79	4.64	54.84	0.08	10	15	12.5	11						12
7	4	1,760	1.67	1.30	2.17	12.49	0.17	15	11	13	12						13
11	22	24,600	23.34	1.97	46.09	78.15	0.58	1	6	3.5	2						4
12	6	1,780	1.69	1.45	2.46	15.56	0.15	14	13	13.5	14						14
17	3	4,540	4.31	1.35	5.81	4.60	1.26	8	2	5	5						7
19	10	8,440	8.01	1.25	10.01	26.19	0.38	7	8	7.5	8						10
20	7	10,590	10.05	1.29	12.96	18.65	0.69	4	4	4	4						6
21	8	12,110	11.49	1.53	17.68	31.91	0.55	3	7	5	5						7
27	4	5,020	4.76	1.13	5.39	5.39	0.99	9	3	6	7						9
29	9	1,800	1.71	1.67	2.87	18.48	0.15	13	13	13	12	Inpres		0		Social Stability	2
30	6	1,170	1.11	1.40	1.55	8.62	0.17	17	11	14	15						15
31	20	7,250	6.88	1.46	10.09	34.53	0.29	6	10	8	9			0		Social Stability	1
32	8	1,050	0.99	1.91	1.89	38.92	0.04	16	17	16.5	17						17
34	5	280	0.26	2.22	0.57	27.27	0.02	18	18	18	18						18
37	4	2,080	1.98	1.59	3.15	10.46	0.30	11	9	10	10						11

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SULAWESI SELATAN

KABUPATEN: PINRANG

Link No. (1)	Length (2)	Population (P1) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Trans-Imigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	19	2,2190	19.5	1.32	25.89	34.78	0.74	1	3	2	1						1
2	8	16,350	14.4	1.12	16.2	10.13	1.59	3	1	2	1						1
3	10	6,020	5.3	2.16	11.44	41.66	0.27	6	11	8.5	8						8
6	13	8,540	7.5	1.72	12.93	64.68	0.19	5	13	9	9						9
9	9	8,270	7.3	2.18	15.91	17.86	0.89	4	2	3	3						3
11	5	2,550	2.2	1.46	3.22	23.64	0.13	13	15	14	15						15
12	7	6,660	5.8	1.41	6.61	13.30	0.49	8	5	6.5	5						5
14	5	1,690	1.4	1.13	1.38	6.61	0.23	14	12	13	12						12
15	13	7,970	7.03	1.53	10.79	29.93	0.36	7	9	8	7						7
16	6	3,300	2.9	1.40	4.06	9.33	0.43	11	7	9	9						9
18	10	6,420	5.6	1.15	6.44	14.31	0.44	9	6	7.5	6						6
19	13	13,220	11.6	1.45	16.87	23.50	0.71	2	4	3	3						3
22	4	850	0.7	1.44	1.01	8.64	0.11	15	17	16	16						16
23	5	910	0.8	1.23	0.99	8.00	0.12	16	16	16	16						16
26	5	2,210	1.9	1.83	3.48	20.28	0.17	12	14	13	12						12
27	4	2,980	2.65	1.67	4.35	10.62	0.40	10	8	9	9						9
34	4	1,080	0.9	1.08	0.97	3.34	0.29	17	10	13.5	14						14

TABLE

PRIORITY SETTING OF ROAD LINKS

PROVINCE : SULAWESI SELATAN

KABUPATEN: POLMAS

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1	7	6,140	9.28	1.58	14.69	23.84	0.61	2	3	2.5	2						2
3	3	570	0.86	1.83	1.58	13.95	0.11	17	17	17	17						17
6-A	1																
6-GE	10	3,740	8.68	1.16	10.06	17.47	0.58	6	4	5	5						5
7	5	3,330	5.04	1.36	6.86	13.14	0.52	10	6	8	9						9
8	6	3,010	4.55	1.89	8.62	22.26	0.39	8	7	7.5	7						7
9	4	1,720	2.60	1.57	4.08	12.31	0.33	11	9	10	10						10
11	4	6,320	9.55	1.31	12.53	8.58	1.46	5	1	3	3						3
13	3	850	1.29	1.45	1.88	9.07	0.21	15	12	13.5	13						13
15	13	6,200	9.37	1.56	14.66	47.06	0.31	3	10	6.5	6						6
16	13	4,720	7.14	1.32	9.42	25.91	0.36	7	8	7.5	7						7
17	6	1,340	2.04	1.59	3.24	16.93	0.19	12	13	12.5	12						12
18	6	1,550	2.35	1.29	3.03	18.18	0.17	14	15	14.5	16						16
19-A	1																
19-GE	9	2,720	4.12	1.71	7.05	41.96	0.17	9	14	11.5	11						11
20	3	770	1.18	1.42	1.67	6.93	0.24	16	11	13.5	13						13
21	13	13,690	20.69	1.36	28.18	31.76	0.89	1	2	1.5	1						1
22	5	1,290	1.96	1.57	3.06	18.37	0.17	13	15	14	15						15
23	7	6,140	9.28	1.57	14.32	25.71	0.57	4	5	4.5	4						4

TABLE

PROVINCE : SULAWESI SELATAN

PRIORITY SETTING OF ROAD LINKS

KABUPATEN : ENREKANG

Link No. (1)	Length (2)	Population (Pt) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (6) (9)	Priority From (8) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
1	10	4,580	9.39	1.47	13.80	34.83	0.39	5	3	4	5						5
5	10	2,720	5.59	1.92	10.73	35.81	0.29	6	6	6	6						6
7	33	10,270	21.07	3.08	64.89	213.27	0.30	1	5	3	2						2
8	10	1,240	2.55	3.13	7.98	64.88	0.12	7	8	7.5	7						7
9	5	620	1.27	3.14	3.98	33.60	0.11	9	9	9	9						9
10,14, 15	13	4,770	9.78	2.16	21.12	54.86	0.38	3	4	3.5	4						4
12	38	20,820	42.69	1.46	62.32	57.04	1.09	2	1	1.5	1						1
13	7	2,950	6.06	3.14	19.02	47.04	0.40	4	2	3	2						2
16	3	760	1.56	3.14	4.89	20.16	0.24	8	7	7.5	7						7

TABLE

PRIORITY RATING OF ROAD LINKS

PROVINCE : SULAWESI SELATAN

KABUPATEN: JENEPONTO

Link No. (1)	Length (2)	Population (Pt) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority From (A) (9)	Priority From (B) (10)	Priority Average of (9)&(10) (11)	Priority Priority (12)	Engineering Remarks (13)	Local & National Level Remarks: Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	Proposed Priority (18)
3-A	7																
3-GR	3	2,820	1.48	3.14	4.64	20.16	0.23	13	6	9.5	9						9
7,8	5	3,140	1.64	1.91	3.13	17.92	0.17	15	10	12.5	14						14
9,10,11	18	28,260	14.84	2.900	43.04	106.28	0.40	2	2	2	2						2
12	16	15,070	7.92	2.07	16.38	53.76	0.30	6	6	4.5	4						4
13	9	29,320	15.50	2.78	43.09	57.32	0.75	1	1	1	1						1
15,16	14	9,370	5.02	3.14	15.77	94.08	0.17	7	11	9	8						8
17,18,19,44	22	17,100	8.98	2.72	24.43	137.64	0.18	4	9	6.5	6						6
21,23	18	17,920	9.41	1.30	12.26	41.12	0.30	10	4	7	7						7
25	16	16,410	8.62	3.14	27.06	107.52	0.25	3	5	4	3						3
26	10	6,640	3.48	1.72	5.98	51.40	0.12	12	15	13.5	15						15
27,28,29,30,31,32	24	13,280	6.97	1.76	12.27	87.76	0.14	9	13	11	10						10
34A	1																
34	7	3,610	1.89	1.92	3.62	20.16	0.18	14	8	11	10						10
35	21	14,440	7.58	2.73	20.71	114.24	0.18	5	7	6	5						5
36	18	12,380	6.50	1.97	12.79	94.08	0.14	8	14	11	10						10
37	15	7,740	4.06	2.43	9.87	67.20	0.15	11	12	11.5	13						13

TABLE

PROVINCE : SULAWESI TENGGARA

PRIORITY SETTING OF ROAD LINKS

KABUPATEN: BUTON

Link No. (1)	Length (2)	Population (Pi) (3)	Total Development Potentiality Index (4)	Road Level Improvement Index (5)	Development Effect Index (6)=(4)@(5)	Support Work Cost (7)	Effect Cost Ratio Index (8)=(7)/(6)	Priority				Engineering Remarks (13)	Local & National Level Remarks				Proposed Priority (18)
								From (6) (9)	From (8) (10)	Average of (9)&(10) (11)	Priority (12)		Transmigration (14)	Approach to Isolated Area (15)	Damaged by Natural Disaster (16)	Others (17)	
1-A	10																
1-GE	38	63,070	19.08	1.80	34.24	113.51	0.30	4	1	2.5	1						1
2	43	59,340	17.95	2.45	43.96	207.60	0.21	2	3	2.5	1						1
3-A	10																
GE	38	60,610	18.34	2.14	39.19	202.06	0.19	3	4	3.5	4						4
4	22	42,020	12.71	2.14	27.17	124.25	0.21	5	2	3.5	4						4
5	6	1,780	0.54	2.69	1.45	30.84	0.05	9	9	9	9						9
6-A	12																
GE	16	7,930	2.40	3.14	7.54	107.52	0.07	8	6	7	6						6
7	56	21,630	6.54	3.14	20.54	376.32	0.05	6	8	7	6						6
8	70	56,490	17.09	3.14	53.66	470.40	0.11	1	5	3	3						3
9	43	16,790	5.08	3.14	15.95	288.96	0.06	7	7	7	6						6
10	5	770	0.23	3.14	0.72	33.60	0.02	10	10	10	10						10

APPENDIX D-2 PRIORITY OF ROAD LINKS

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the Major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Riau	Kampar	21.	18		1. Excution Scheze is to be studied
		27.29	4		
		2	3		
		28			
		1	26		
		5	25		
			35		
		modified alternative			
		A 21	18		
		2	4		
		5	3	35 (3)	
		F 27.29	-	26 (22)	
		28	-	25 (7)	
		1			
	Kepulauan Riau	13,19,21.23	3. 4. 5. 6	36	
		25.27.29	1. 2	33.34	
		17	9.10.11.12	7. 8	
		30.31		20	
				28	
				32	
				26	
				24	
				22	

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Sumatera Selatan	Lahat	10 GE	13	20	1. Link No. 13512 maybe improved continuously and Link No.162 Priority modified.
		11	1	15	
		3	12	19	
			2	18	
			4 GE	17	
		modified alternative			
		10	13	20	
		11	12	15	
		3	1	19	
			2	18	
			4	17	
	O.K.I	25.26	18.19.20.21.22	11.12	1.Link No.25526 to be improved in around three years with one fleet of equipment allocated.
		13.14.15		23.24	2. In improving the Inventory survey, many new links are supposedly needed to be improved, in relation with transmigration Scheme.
		1		7	
	O.K.U	6	8	2	
		5	4 GE	16 GE	
		7	3	1	
			20		
	L.I.O.T.	39	1	21	1. In modification, Link 6,1,2 and 7 are proposed to be improved as one package to decrease the transportation cost.
		38	29	18	
		34	31	24	
		20	36	7	
		6	37	25	
			2	11.15.16.17 (15)	
		modified alternative			
		39	2	21	
		38	7	18	
		34	29	24	
		20	31	25	
		6	36	11.15.16.17	
		1	37		

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Lampung	Lampung Utara	3 8 15 modified alternative 3 2 8	2 20 15 20	19 14 19 14	1. Before of work of Link No.3, Link No.2 is to be improved to access to the national road. 2. It is supposed many Kabupaten Roads have not surveyed for this inventory.
	Lampung Selatan	25,26 30 31,32 12 modified alternative 25,26 30,32 31 29	1, 2, 3 33,34 29 13 12 13 1, 2, 3 33.34	7. 8.10 9 6 7. 8.10 6 9	1. Link No.29 is to be improved with work of Link No.31, Link No.13 with Link No.12, and Link No.9 with Link No. 7,8,10, to rationalize the execution scheme.
Nusa Tenggara Timur	Manggarai	3 2	1 GE 4	5 8 6	
	Belu	12 9 5 10	11 13 19 14 15 16 11	20 18 7 2. 3 17 6 1 21	1. In executing the support work agricultural develop project is to be studied.

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Sulawesi Utara	Bolaang Mongondow	5 GE			1. To access to the iso - late area along Link No.263, Link No.1 is needed to improve beforehand
		1 GE	2		
		15		11 GE	
		4	36		
		6	17 GE	9	
			22.23.24	18.19.20	
			12 GE	3	
		modified alternative			
		5		12 GE	
		15	22.23.24		
		6		11 GE	
		4		18.19.20.21	
		1		36	
		2	17 GE	9	
				3	
	Gorontalo	81	189 (5)	184 (9)	
		84.87.95	188 (10)	88 (21)	
		73	128.152 (9)		
			168.169.170 (6)		
			154 (10)	134 (30)	
		21.22	132 (14)	101 (35)	
				103 (20)	
			135.136 (11)		
			187 (12)		
		modified alternative			
		A 81	21.22	128.152	
		84.87.95	114	168.169.170	
				132	
				187	
		B		153.135	
		73	188.189		
				184	
				88	
				134	
				101	
				103	

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Sulavesi Selatan	Takalar	21	6	8	1. To improve Link No.21, Link No.20 should be improved beforehand to access to the provincial road, also Link No.6 before Link No.14.
		14	13	11	
		33	12	5	
		18	23		
		17	3		
		20	22		
		modified alternative			2. To rationalize the execution, Link No.3 is to be improved before the work of Link No.23, also Link No.5 before Link No.8.
		20	18	5	
		21	17	8	
		6	13	11	
		14	12		
		33	3		
			23		
			22		
	Bone	12	18		
		25.26.27.29	7	20	
			16	1	
		15	17	4	
		6	30	9	
		24		5	
	Sidrap	31	20	37	
		29	21	5	
		1	17	7	
		2	27	12	
		11	19	30	
	Pinrang	1	12	14	
		2	18	26	
		9	15	34	
		19	3	11	
			6	22	
			16	23	
			27		

PRIORITY OF ROAD LINKS FOR SUPPORT WORK

Province	Kabupaten	Link Number of the major Support Work			Remarks
		First Priority Links	Second Priority Links	Third Priority Links	
Sulawesi Selatan	Polmas	21 1 11 23 6 GE	15 8 16 7 9	19 GE 17 13 20 22 18 3	1. Link No.23 maybe improved after Link No.21 to decrease the equipment transport.
	Enrekang	12 (38) 7 (33) 13 (7)	10.14.15 (13) 1 (10) 5 (10)	8 (10) 16 (3) 9 (5)	1. Link no.7 should be surveyed more detailly.
	Jeneponto	33 9.10.11 25 12 35	17.18.19.44 21.23 15.16 5 GE	27.28.29 30.31.32 34 36 7. 8 26	1. Link No.9.10.11 is scheduled in Inpres. 2. Link No.35 is scheduled in Inpres.
Sulawesi Tenggara	Kendari	31 GE 32 33	1 3 34 15	8 25 2 5 24 26 23 14 11 6 29 30	1. Link No.33 should be studied in two links, divided be Belalo.
	Buton	1 GE 2	8 3 GE 4	6 GE 7 9 5 10	1. In execution of Link No. 859, the economical execution program with the equipment is to be scrutized.

APPENDIX E QUANTITIES OF SUPPORT WORK BASED ON INVENTORY SURVEY

APENDIX E

QUANTITIES OF SUPPORT WORK BASED ON THE INVENTORY SURVEY

Note 1) Design category; refer to Design-Procedure
Note 2) L = Total length of Kabupaten Roads surveyed
Note 3) A = Total area of Kabupaten Roads carriageway surveyed

Province	Kabupaten	Design Category	Length (m)	Area (m^2)	Leveling		Bulldozer Work (Excavation, level)	Fill Improvement subgrade)		Partial Use of Aggregate		Aggregate (S6C, Crushed Stone)		Shouldering		Length of Ditch (m)
					Grader A_L (m^2)	Bulldozer A_E (m^2)	V_A (m^3)	Volume V_E (m^3)	Haul, Distance L_E (Km)	Volume V_g (m^3)	Haul, Distance L_g (Km)	Volume V (m^3)	Haul, distance L_A (Km)	Volume of soil V_s (m^3)	Haul, Distance L_s (Km)	
RIAU	Kampar	(3)	1,600	6,400	-	-	-	-	-	-	-	112	5	-	-	
		(5)	5,980	24,650	24,650	-	-	-	-	-	-	1,299	5	-	-	
		(6)	2,292	7,375	-	7,375	-	-	-	-	-	777	5	137	5	
		(7)	108,731	321,258	321,258	-	-	-	-	3,373	5	33,828	5	6,059	5	
		(8)	92,653	289,908	-	-	28,991	-	-	5,793	5	30,527	5	5,152	5	
		(9)	2,125	6,375	-	-	-	-	-	-	-	1,007	5	118	5	
		(10)	125	375	375	-	-	42	5	-	-	39	5	7	5	
		Total	213,506	656,341	346,283	7,375	28,991	42	5	9,171		67,573		11,473		426,000
	Kepulauan Riau	(5)	28,205	118,569	118,569	-	-	-	-	-	-	6,237	5	-	-	
		(6)	28,638	106,850	-	106,850	-	-	-	-	-	11,251	5	1,592	5	
		(7)	75,619	269,036	269,036	-	-	-	-	2,825	5	28,329	5	4,204	5	
		(8)	71,269	289,189	-	-	24,971	-	-	4,995	5	26,295	5	3,963	5	
		(10)	20,763	78,248	78,248	-	-	1,693	5	-	-	8,240	5	1,156	5	
		(11)	16,728	61,101	61,101	-	-	1,577	5	-	-	6,434	5	930	5	
		Total	241,222	922,993	526,954	106,850	24,971	2,270		7,819		86,785		11,843		492,000
	Lahat	(3)	3,900	13,300	-	-	-	-	-	-	-	233	10	-	-	
		(4)	4,850	15,100	7,550	-	-	-	-	-	-	397	10	-	-	
		(5)	2,767	11,300	11,300	-	-	-	-	-	-	594	10	-	-	
		(6)	2,250	7,500	-	7,500	-	-	-	-	-	190	10	236	5	
		(7)	31,731	127,430	127,430	-	-	-	-	1,338	10	13,418	10	2,219	5	
		(8)	30,476	120,067	-	-	12,007	-	-	2,401	10	12,643	10	2,428	5	
		(9)	40,850	157,990	-	-	-	-	-	-	-	25,917	10	2,088	5	
		(10)	22,533	67,600	67,600	-	-	7,510	5	-	-	7,818	10	2,320	5	
		Total	139,297	520,287	213,880	7,500	12,007	7,510		3,739		60,140		9,291		278,000
SUMATERA SELATAN	O.K.I	(5)	29	200	200	-	-	-	-	-	-	11		-	-	
		(6)	4,723	24,334	-	24,334	-	-	-	-	-	2,562	50%	376	50% 5 Km	
		(7)	77,226	444,001	444,001	-	-	-	-	4,662	50% 10 Km	46,753	10 Km	5,054		
		(8)	104,712	542,276	-	-	54,276	-	-	10,855	50% 30 Km	57,353	50%	5,843		
		(10)	100	700	-	-	-	78	5	-		74	30 Km	11	50% 15 Km	
		Total	186,788	1,001,511	444,201	24,334	54,276	78		15,517		106,553		11,234		323,000
	O.K.U	(4)	4,667	18,000	9,000	-	-	-	-	-	-	473	10	-	-	
		(6)	12,000	36,000	-	36,000	-	-	-	-	-	3,791	10	2,002	5	
		(7)	22,117	70,350	70,350	-	-	-	-	739	10	7,408	10	3,911	5	
		(8)	86,592	375,525	-	-	37,558	-	-	7,512	10	39,519	10	3,328	5	
		(9)	9,600	28,800	-	-	-	-	-	-	-	4,548	10	1,601	5	
		Total	134,976	528,225	79,350	36,000	37,558			8,251		55,769		11,842		269,000

Pro-vince	Kabupaten	Design Category	Length (m)	Area (m^2)	Leveling		Bulldozer Work (Excavation level)	Fill(Improvement of subgrade)		Partial Use of Aggregate		Aggregate (SSG crushed stone)		Shouldering		Length of Ditch (m)
					Grader A_L (m^2)	Bulldozer A_E (m^2)	V_A (m^3)	Volume V_f (m^3)	Haul Distance L_f (Km)	Volume V_g (m^3)	Haul Distance L_g (Km)	Volume V (m^3)	Haul Distance L_A (Km)	Volume of soil V_s (m^3)	Haul Distance L_s (Km)	
Sumatera Selatan (Continue)	Llot	(3)	4,975	16,200	-	-	-	-	-	-	-	284	10	-	-	
		(4)	6,394	25,075	12,538	-	-	-	-	-	-	659	10	-	-	
		(5)	3,617	13,300	13,300	-	-	-	-	-	-	700	10	-	-	
		(6)	9,396	32,950		32,950	-	-	-	-	-	3,470	10	884	5	
		(7)	49,424	166,000	166,000	-	-	-	-	1,743	10	17,480	10	5,198	5	
		(8)	39,181	134,625	-	-	13,463	-	-	2,693	10	14,176	10	3,913	5	
		(9)	12,175	39,200	-	-	-	-	-	-	-	6,190	10	1,349	5	
		(10)	3,321	11,250	11,250	-	-	1,250	10	-	-	1,185	10	264	5	
		(11)	2,267	6,900	1,533	-	-	1,533	10	-	-	727	10	129	5	
		Total	130,750	465,500	204,621	32,950	13,463	2,783		4,436		44,871		11,737		261,000
Lampung	Lampung Utara	(6)	200,000	600,000	-	600,000	-	-	-	-	-	63,180	20	11,120	5	
		(7)	11,517	38,600	38,600	-	-	-	-	-	-	4,071	20	1,525	5	
		(8)	5,879	20,575	20,575	-	2,028	-	-	406	20	2,135	20	807	5	
		(9)	5,132	16,365	-	-	-	-	-	-	-	2,584	20	753	5	
		Total	222,528	675,540	59,235	600,600	2,028			406		71,970		14,205		445,000
	Lampung Selatan	(5)	2,884	8,650	8,650	-	-	-	-	-	-	455	10	-	-	
		(6)	6,450	19,350	-	19,350	-	-	-	-	-	2,038	10	1,059	5	
		(7)	34,843	104,525	104,525	-	-	-	-	1,093	5	11,006	10	5,678	5	
		(9)	19,905	59,725	-	-	-	-	-	-	-	9,431	10	3,235	5	
		(10)	83	250	250	-	-	28	5	-	-	26	10	14	5	
		(11)	613	1,850	1,850	-	-	433	5	-		195	10	103	5	
		Total	64,778	194,350	115,275	19,350		433		1,093		23,151		10,090		329,000
Nusa Tenggara Timur	Manggarai	(3)	5,027	24,600	-	-	-	-	-	-	-	431	10	-	-	
		(6)	9,045	38,355	-	38,355	-	-	-	-	-	4,039	10	503	5	
		(7)	36,093	137,379	137,379	-	-	-	-	1,440	10	14,445	10	2,050	5	
		(8)	41,723	152,684	-	-	15,248	-	-	3,050	10	16,057	10	2,320	5	
		(9)	27,232	108,000	-	-	-	-	-	-	-	17,053	10	1,514	5	
		(10)	4,093	17,328	17,328	-	-	1,925	5	-	-	1,825	10	253	5	
		(11)	6,651	23,836	23,836	-	-	5,295	5	-	-	2,510	10	392	5	
		Total	129,865	501,782	178,343	38,355	15,248	7,221		4,490		56,360		7,032		259,000

APPENDIX E

	Kabupaten	Design Category	Length (m)	Area (m2)	Leveling: Grader AL(m2)	Leveling: Bulldozer AE(m2)	Bulldozer Work(Excave m³ Level) VA(m3)	Fill(Improvement of subgrade): Volume VE(m3)	Fill(Improvement of subgrade): Haul. Distance LE(km)	Partial use of aggregate: Volume Vg (m3)	Partial use of aggregate: Haul.Distance Lg (km)	Aggregate(S&C Crushed Stone): Volume V (m3)	Aggregate(S&C Crushed Stone): Haul.Distance LA(km)	Shouldering: Volume of soil Vs(m3)	Shouldering: Haul.Distance Ls(km)	Length of Ditch (m)
Main Trunk Line (continued)	Belu	(5)	4,666	21,000	21,000	-	-	-	-	-	-	1,105	10	-	-	
		(6)	7,664	29,486	-	29,486	-	-	-	-	-	3,105	10	426	5	
		(7)	42,591	154,789	154,789	-	-	-	-	1,625	10	16,299	10	3,146	5	
		(8)	75,833	297,267	-	-	29,727	-	-	5,945	10	31,302	10	4,216	5	
		(10)	19,789	66,811	66,811	-	-	7,423	5	-	-	7,035	10	1,656	5	
		(11)	67,867	252,663	252,663	-	-	56,142	5	-	-	26,605	10	4,552	5	
		Total	218,410	822,016	495,263	29,486	29,727	63,565		7,570		85,451		13,996		436,000
Selawesi Utara	Bolaang Mongondow	(3)	2,381	9,675	-	-	-	-	-	-	-	169	5	-	-	
		(4)	600	1,800	900	-	-	-	-	-	-	47	5	-	-	
		(5)	23,321	82,850	82,850	-	-	-	-	-	-	4,358	5	-	-	
		(6)	24,747	83,095	-	83,095	-	-	-	-	-	8,750	5	1,794	5	
		(7)	58,922	185,971	185,971	-	-	-	-	1,953	5	19,583	5	3,991	5	
		(8)	105,211	321,572	-	-	32,157	-	-	6,431	5	33,862	5	5,935	5	
		(9)	5,344	22,925	-	-	-	-	-	-	-	3,620	5	620	5	
		(10)	1,507	5,825	5,825	-	-	647	5	-	-	613	5	108	5	
		(11)	38,406	115,848	115,848	-	-	25,741	5	-	-	12,199	5	2,263	5	
		Total	260,639	829,561	391,394	83,095	32,157	26,388		8,384		83,201		14,711		521,000
	Gorontalo	(5)	67,606	250,444	250,444	-	-	-	-	-	-	13,173	5	-	-	
		(6)	62,395	199,248	-	199,248	-	-	-	-	-	20,981	5	3,480	5	
		(7)	176,976	834,209	834,209	-	-	-	-	8,759	5	87,842	5	17,522	5	
		(8)	372,248	1,344,634	-	-	134,463	-	-	26,893	5	141,390	5	22,778	5	
		(9)	6,897	32,650	-	-	-	-	-	-	-	5,155	5	1,136	5	
		(10)	3,483	10,450	10,450	-	-	1,161	5	-	-	1,100	5	410	5	
		(11)	7,250	23,350	23,350	-	-	5,188	5	-	-	2,439	5	1,154	5	
		Total	697,075	2,694,985	1,118,453	199,248	134,463	6,349		35,652		272,300		46,480		1,394,000

APPENDIX E

Sulawesi Selatan

Kabupaten	Design Category	Length (m)	Area (m2)	Leveling		Bulldoker work (Excavate, Level)	Fill (Improvement of subgrade)		Partial Use of Aggregate		Aggregate (S&G, Crushed Stone)		Shoudering		Length of Ditch (m)
				Grader AL(m2)	Bulldoker AE(m2)	VA(m3)	Volume VE(m3)	Haul. Distance LE(km)	Volume Vg(m3)	Haul. Distance Lg(km)	Volume V(m3)	Haul. Distance LA(km)	Volume of soil Vs(m3)	Haul. Distance Ls(km)	
Takalar	(4)	250	1,000	500	-	-	-	-	-	-	26	10	-	-	
	(5)	5,161	22,600	22,600	-	-	-	-	-	-	1,189	10	-	-	
	(6)	500	2,500	-	2,500	-	-	-	-	-	263	10	28	5	
	(7)	52,590	197,271	197,271	-	-	-	-	2,071	5	20,773	10	3,777	5	
	(8)	4,484	17,766	-	-	1,777	-	-	355	5	1,870	10	263	5	
	(9)	6,000	24,000	-	-	-	-	-	-	-	3,790	10	667	5	
	Total	68,985	265,137	220,371	2,500	1,777	-		2,426		27,911		4,735		139,000
Bone	(4)	7,624	30,500	15,250	-	-	-	-	-	-	802	5	-	-	
	(5)	7,618	30,475	30,475	-	-	-	-	-	-	1,603	5	-	-	
	(6)	2,209	10,666	-	10,666	-	-	-	-	-	1,123	5	165	5	
	(7)	77,956	314,475	314,475	-	-	-	-	3,302	5	33,114	5	12,163	5	
	(8)	29,633	123,917	-	-	12,392	-	-	2,478	5	13,048	5	3,307	5	
	(9)	16,866	74,100	-	-	-	-	-	-	-	11,700	5	1,827	5	
	(10)	8,334	41,666	41,666	-	-	4,629	-	-	-	4,387	5	463	5	
	(11)	13,000	65,000	65,000	-	-	14,443	-	-	-	6,845	5	1,112	5	
	Total	163,240	690,799	466,866	10,666	12,392	19,072		5,780		72,622		19,037		326,000
Sidrap	(3)	11,319	48,800	-	-	-	-	-	-	-	854	10	-	-	
	(4)	3,069	12,750	6,375	-	-	-	-	-	-	335	10	-	-	
	(5)	32,436	125,300	125,300	-	-	-	-	-	-	6,391	10	-	-	
	(6)	37,569	126,396	-	126,396	-	-	-	-	-	13,309	10	2,331	5	
	(7)	8,501	34,050	34,050	-	-	-	-	358	10	3,585	10	945	5	
	(8)	13,212	50,138	-	-	5,014	-	-	1,003	10	5,280	10	1,149	5	
	(9)	3,746	15,150	-	-	-	-	-	-	-	2,392	10	417	5	
	(10)	16,485	53,581	53,581	-	-	3,953	5	-	-	5,642	10	1,069	5	
	(11)	12,443	39,813	39,813	-	-	8,846	5	-	-	4,192	10	817	5	
	Total	138,780	505,978	239,119	126,396	5,014	14,799		1,361		42,180		6,948		277,000

APPENDIX E

Sulawesi Selatan (Celtes2)

Kabupaten	Design Category	Length (m)	Area (m2)	Leveling: Grader AL(m2)	Leveling: Bulldozer AB(m2)	Bulldozer Work (Excavation, Level) VA(m3)	Fill (improvement of subgrade): Volume VF(m3)	Fill (improvement of subgrade): Haul. Distance LF(km)	Partial use of aggregate: Volume Vx(m3)	Partial use of aggregate: Haul. Distance Lx(km)	Aggregate (SAG, Crushed Stone): Volume V(m3)	Aggregate (SAG, Crushed Stone): Haul. Distance LA(km)	Shouldering: Volume of Soil Vs(m3)	Shouldering: Haul. Distance Ls(km)	Length of Ditch (m)
Pinrang	(3)	713	2,906	-	-	-	-	-	-	-	51	10	-	-	
	(4)	6,412	25,868	12,934	-	-	-	-	-	-	680	10	-	-	
	(5)	1,480	9,645	9,645	-	-	-	-	-	-	507	10	-	-	
	(6)	27,412	123,908	-	123,908	-	-	-	-	-	13,048	10	2,402	5	
	(7)	12,453	55,014	55,014	-	-	-	-	378	10	5,793	10	1,282	5	
	(8)	13,992	74,392	-	-	7,459	-	-	1,492	10	7,855	10	876	5	
	(9)	12,859	52,075	-	-	-	-	-	-	-	8,223	10	1,243	5	
	(10)	708	3,542	3,542	-	-	394	5	-	-	373	10	39	-	
	Total	76,029	347,550	81,135	123,908	7,459	394		2,070		36,530		5,842		152,000
Polmas	(3)	7,217	28,425	-	-	-	-	-	-	-	497	10	-	-	
	(5)	15,552	81,425	81,425	-	-	-	-	-	-	4,283	10	-	-	
	(6)	9,536	37,352	-	37,352	-	-	-	-	-	3,934	10	719	5	
	(7)	23,614	102,421	102,421	-	-	-	-	1,075	10	10,785	10	1,980	5	
	(8)	4,081	19,580	-	-	1,958	-	-	392	10	2,062	10	227	5	
	(9)	3,389	12,925	-	-	-	-	-	-	-	2,041	10	359	5	
	(10)	12,262	48,808	48,808	-	-	5,423	5	-	-	5,139	10	946	5	
	(11)	5,389	20,925	20,925	-	-	4,649	5	-	-	2,203	10	403	5	
	Total	81,040	352,061	253,579	37,352	1,958	10,072		1,467		30,964		4,634		162,000
Enrekang	(4)	3,700	14,800	7,400	-	-	-	-	-	-	389	10	-	-	
	(5)	16,688	58,554	58,554	-	-	-	-	-	-	3,080	10	-	-	
	(6)	1,200	4,800	-	4,800	-	-	-	-	-	505	10	87	5	
	(7)	9,854	32,317	32,317	-	-	-	-	339	5	3,423	10	561	5	
	(8)	42,464	149,869	-	-	14,987	-	-	2,997	5	15,781	10	2,424	5	
	(9)	5,125	20,500	-	-	-	-	-	-	-	3,237	10	476	5	
	Total	79,031	280,840	98,271	4,800	14,987			3,336		26,415		3,548		158,000

	Kabupaten	Design Category	Length (m)	Area (m2)	Leveling: Grader AL(m2)	Leveling: Bulldozer AB(m2)	Bulldozer Work(Excav. Level) VA(m3)	Fill(Improvement of subgrade): Volume VK(m3)	Fill(Improvement of subgrade): Haul.Distance LK(km)	Partial Use of Aggregate: Volume Vp(m3)	Partial Use of Aggregate: Haul.Distance Lp(km)	Aggregate(SAC Crushed Stone): Volume V(m3)	Aggregate(SAC Crushed Stone): Haul.Distance LA(km)	Shouldering: Volume of Vm(m3)	Shouldering: Haul.Distance Lm(km)	Length of Ditch(m)
Sulawesi Selatan (Continue)	Jeneponto	(7)	30,000	137,000	137,000	-	-	-	-	1,439	5	14,426	10	2,613	5	
		(8)	143,238	692,096	-	-	69,210	-	-	13,842	5	72,878	10	11,467	5	
		Total	173,238	829,096	137,000		69,210			15,281		87,304		14,080		346,000
Sulawesi Tenggara	Kendari	(3)	1,843	6,450	-	-	-	-	-	-	-	113	10	-	-	
		(4)	1,929	6,750	3,375	-	-	-	-	-	-	177	10	-	-	
		(5)	18,965	81,550	81,550	-	-	-	-	-	-	4,289	10	-	-	
		(6)	17,346	74,673	-	74,673	-	-	-	-	-	7,863	10	980	5	
		(7)	63,293	264,148	264,148	-	-	-	-	2,774	5	27,815	10	6,912	5	
		(8)	141,880	623,566	-	-	62,557	-	-	12,511	5	65,872	10	8,988	5	
		(9)	12,357	43,250	-	-	-	-	-	-	-	6,829	10	1,430	5	
		(11)	103,000	449,000	449,000	-	-	99,768	5	-	-	47,280	10	5,727	5	
		Total	360,613	1,551,387	798,073	74,673	62,557	99,768		15,285		160,238		24,057		721,000
	Buton	(5)	961	3,365	3,365	-	-	-	-	-	-	177	5	-	-	
		(6)	1,115	3,900	-	3,900	-	-	-	-	-	411	5	62	5	
		(7)	42,712	149,335	149,335	-	-	-	-	1,368	5	15,727	5	2,375	5	
		(8)	52,878	185,080	-	-	18,508	-	-	3,702	5	19,489	5	2,940	5	
		(9)	12,591	44,065	-	-	-	-	-	-	-	6,958	5	700	5	
		(11)	202,186	707,650	707,650	-	-	157,240	5	-	-	74,516	5	11,242	5	
		Total	312,443	1,093,415	860,350	3,900	18,508	157,240		5,270		117,278		17,319		624,000
Grand Total			4,093,233	15,719,854	6,903,415	1,544,604	510,437	437,912		158,709		1,615,572		279,134		8,178,000

APPENDIX P-1 BASIC CAPACITIES OF EQUIPMENT

BASIC CAPACITY OF EQUIPMENT

Type of Equipment	Work Item			(1) Hourly Capacity	(2) Yearly Performance (1) X7 hoursX200 days	Yearly Performance (1)x7hx150days	(1)x7hx170days	(1)x7hx190days	(1)x7hx210days	(1)x7hx220days
Bulldozer 21° class	Quarry site	Soil		46.4 m3/h	65,000 m3/year	47,670	54,026	60,382	66,738	69,916
		Gravel and Crushe stone		49.3 m3/h	69,000 m3/year	51,765	58,667	65,569	72,471	75,922
	Earthwork 0.2 m thick			775 m2/h	1,085,000 m2/year	813,750	922,250	1,030,750	1,139,250	1,193,500
Wheel Loader 1 m3 class	Without dozer-work	Soil		19.6 m3/h	27,000 m3/year	19,425	22,015	24,605	27,195	28,490
		Gravel and crushed stone		24.4 m3/h	20,160 m3/year	15,120	17,136	19,152	21,168	22,176
	With dozer-work	Soil		27.9 m3/h	39,000 m3/year	29,295	33,201	37,107	41,013	42,966
		Gravel and crushed stone		32.8 m3/h	30,240 m3/year	22,680	25,704	28,728	31,752	33,264
	Soil	Main support work	Hauling Distance 6 km	1.83 m3/h	2,560 m3/year	1,922	2,178	2,434	2,690	2,818
			10	1.50	1,410 m3/year	1,050	1,190	1,330	1,470	1,540
			15	0.88		729	821	914	1,014	1,063
			20	0.63	740 m3/year	557	631	705	779	816
		On improved roads	Hauling Distance 6 km	2.92 m3/h	4,080 m3/year	3,066	3,475	3,884	4,292	4,497
			10	2.38	2,390 m3/year	1,764	1,999	2,234	2,470	2,587
			15	1.59		1,239	1,404	1,569	1,735	1,817
			20	0.87	1,060 m3/year	956	1,083	1,210	1,338	1,401
	Gravel without dozer-work	Main support work	Hauling Distance 6 km	1.84 m3/h	2,840 m3/year	1,932	2,190	2,447	2,705	2,834
			10	1.50	1,470 m3/year	1,071	1,214	1,357	1,499	1,571
			15	0.92		744	843	944	1,044	1,093
			20	0.64	780 m3/year	567	643	719	794	832
			25	0.54		462	524	585	647	678
			30	0.47	630 m3/year	390	440	492	544	570
			35	0.41		336	381	426	470	493
			40	0.38	500 m3/year	306	346	386	426	446
			45	0.36		294	333	372	412	431
			50	0.33		263	298	333	368	385
						231	262	293	323	339
		On improved roads	Hauling Distance 6 km	2.02 m3/h	4,060 m3/year	3,014	3,415	3,817	4,219	4,420
			10	1.60	2,490 m3/year	2,373	2,688	3,004	3,319	3,477
			15	1.00		1,260	1,428	1,596	1,764	1,848
			20	0.68	1,300 m3/year	977	1,107	1,237	1,367	1,432
			25	0.50		744	904	1,011	1,117	1,170
			30	0.44	810 m3/year	672	762	851	941	986
			35	0.40		588	666	745	825	862
			40	0.35	700 m3/year	515	583	652	720	755
			45	0.44		462	524	585	647	678
			50	0.40		420	476	532	588	616

					1500 x 7h	1700 x 7h	1900 x 7h	2100 x 7h	2200 x 7h
Crushed Stone with doner-work at quarry	Main support work	Hauling Distance 5 km	1.26 m3/h	2,040 m3/year	2,048	2,321	2,594	2,867	3,003
		10	1.06	1,610 m3/year	1,103	1,250	1,397	1,544	1,617
		15	0.72		756	857	958	1,059	1,109
		20	0.56	780 m3/year	578	655	732	809	847
		25	0.44		449	508	568	627	657
		30	0.37	630 m3/year	389	440	492	544	570
		35	0.32		336	381	426	470	493
		40	0.28	500 m3/year	294	333	372	412	431
		45	0.25		263	298	333	368	385
		50	0.23		242	274	306	338	354
	on improved roads	Hauling Distance 5 km	3.33 m3/h	4,670 m3/year	3,287	3,725	4,163	4,601	4,820
		10	1.79	2,618 m3/year	1,869	2,118	2,367	2,617	2,741
		15	1.24		1,302	1,476	1,649	1,823	1,910
		20	0.96	1,400 m3/year	1,008	1,142	1,277	1,411	1,478
		25	0.78		819	928	1,037	1,147	1,201
		30	0.65	940 m3/year	683	774	865	956	1,001
		35	0.56		588	666	745	823	862
		40	0.50	700 m3/year	525	595	665	735	770
		45	0.44		462	524	585	647	678
		50	0.40		420	476	532	588	616

Type of Equipment	Work Item		(1) Hourly Capacity	(2) Yearly Performance (1)X7hourxX200 days	Yearly Performance (1)x7hx150days 1500 x 7h	(1)x7hx170days 1700 x 7h	(1)x7hx190days 1900 x 7h	(1)x7hx210days 2100 x 7h	(1)x7hx220days 2200 x 7h
Motor grader 3.1 m class	Levelling		600 m2/h	700,000 m2/year	525,000	595,000	665,000	735,000	770,000
	Ditching		600 m /h	700,000 m/year	525,000	595,000	665,000	735,000	770,000
	Earthwork: Soil	0.2 m thick	48.0 m3/h	67,200 m3/year	36,400	37,120	63,840	70,560	73,920
	Earthwork: Gravel	0.1 m thick	26.0 m3/h	36,400 m3/year	27,300	30,940	34,580	38,220	40,040
	Maintenance	(thick) m soil	9.8 m3/h	13,400 m3/year	10,080	11,424	12,768	14,112	14,784
	Ditto	gravel	10.4 m3/h	14,500 m3/year	10,920	12,376	13,832	15,288	16,016
	In site mixing 0.1 m	Soil	13 m3/h	18,200 m3/year	12,600	14,280	15,960	17,640	18,480
		Gravel and crushed stone	13 m3/h	18,200 m3/year	13,650	15,470	17,290	19,110	20,020
Macadam Roller, 8 - 10t class	Soil (0.2 m thick)		75 m3/h	106,000 m3/year	78,750	89,250	99,750	110,250	115,500
	Gravel or crushed stone (0.1 m thick)		37.5 m3/h	52,600 m3/year	39,375	44,625	49,875	55,125	57,750
	Maintenance (0.04 m thick)		15 m3/h	21,000 m3/year	15,750	17,850	19,950	22,050	23,100
Tire Roller 8.6 -15t class	Soil (0.2 m thick)		86 m3/h	120,400 m3/year	90,300	102,340	114,380	126,420	132,440
	Gravel or crushed stone (0.1 m thick)		43 m3/h	60,200 m3/year	45,150	51,170	57,190	63,210	66,220
	Maintenance		17 m3/h	23,800 m3/year	17,850	20,230	22,610	24,990	26,180

1. *Bulldozer 11^{t} class*

$$Q = \frac{60 \times q \times 1/f \times E}{Cm}$$ *(m3/h, excavated volume at quarry site)*

$$A = \frac{1{,}000 \times b \times V \times E}{N}$$ *(m2/h, for earth work of partially deteriorated section of gravel roads).*

Where :

q = capacity of bulldozer blade (m3)	*1.89*
f = swell factor of material	*1.25 for soil*
	1.15 for gravel and crushed stone
E = working efficiency of equipment	*0.5*
Cm = cycle time = 0.037 l + 0.25	*(min)*
Cm = 1.0 (min) for l = 20 m	
b = effective width of blade (m)	*3.1*
V = working speed (km)	*2.0*
N = number of pass	*4*

Then :

Hourly capacity of bulldozer 11^{t} class

	S o i l	*Gravel and crushed stone*
at quarry site	*45.4 m3/h*	*49.3 m3/h*
earth work	*775 m2/h*	

2. *Wheel loader 1 m3 class*

$$Q = \frac{3{,}600 \times q \times K \times 1/f \times E}{Cm}$$ *(m3/h, excavated volume)*

Where :

q = Capacity of bucket 1.0 m3	
K = loading factor of bucket	*0.7 for soil* *0.5 for gravel or crushed stone*
f = swell factor of material	*1.25 for soil* *1.15 for gravel or crushed stone*
E = working efficiency of equipment	*0.6*
Cm= cycle time = ml + t1 + t2 (sec)	
l = moving distance of equipment (m)	*8*
m = moving coefficient of equipment m/sec	*1.8*
t1= loading time (sec)	*35 (without dozer-work)* *13 (with dozer-work)*
t2= unloading time and others (sec)	*16*

Then :

Hourly capacity of wheel loader 1.0 m3 class (m3/h)

	Soil		Gravel or crushed stone
Without dozer-work	(Cm = 65.4)	18.5	14.4
With dozer-work	(Cm = 43.4)	27.9	21.6

3. *Dump truck 3-4 t class*

$$Q = \frac{60 \times q \times 1/f \times E}{Cm} \quad (m3/h, \text{ excavated volume})$$

Where :

q = capacity in volume on loose condition (m3)

3.5 t/1.5t/m3 = 2.3 for soil

3.5 t/1.6t/m3 = 2.2 for gravel and crushed stone

f = swell factor of material 1.25 for soil

1.15 for gravel and crushed stone

E = working efficiency of equipment 0.9

Cm = *cycle time* $= \frac{Cms \times n}{60 \times Es} + T1 + T2 + t1 + t2$ *(min).*

Cms= cycle time of wheel loader (sec.)

n = round number of cycles of loading to fill up the truck vessel, which is q of dump truck/(q of loader) X (k of loader)

Es = working efficiency of wheel loader 0.6

T1 = travel time at loaded condition (min.)

T2 = travel time at unloaded condition (min.)

t1 = unloading time + loss time (min.) 1.5

t2 = time required for positioning the truck at loading site + loss time (min.) 0.5

(Calculation)

$$\frac{Cms \times n}{60 \times Es}$$

Cms = 65.4 sec. (without dozer-work)
43.4 sec. (with dozer-work)

n = 2.3 m3/1 m3 X 0.7 = 4 (soil)

2.2 m3/1 m3 X 0.5 = 5 (gravel and crushed stone)

$\frac{65.4 \times 4}{60 \times 0.6} = 7$ (min.) (soil)

$\frac{65.4 \times 5}{60 \times 0.6} = 9$ (min.) (gravel)

$\frac{43.4 \times 5}{60 \times 0.6} = 6$ (min.) (crushed stone)

$T1 + T2 + t1 + t2$

Traveling speed of a dump truck V (km/h) is assumed as follows.

	Loaded condition V1	Unloaded condition V2
Earth road and poor gravel road support work	10	20
Maintenance	20	30

Note : T1 or T2 = $\frac{\text{hauling distance (km)}}{\text{V1 or V2 (km/h)}}$

Haul distance (km)	For Support work	On improved road
5	30' + 15' + 2' = 47'	15' + 10' + 2' = 27'
10	60' + 30' + 2' = 92'	30' + 20' + 2' = 52'
15	90' + 45' + 2' = 137'	45' + 30' + 2' = 77'
20	120' + 60' + 2' = 182'	60' + 40' + 2' = 102'
25	150' + 75' + 2' = 227'	75' + 50' + 2' = 127'
30	180' + 90' + 2' = 272'	90' + 60' + 2' = 152'
35	210' + 105' + 2' = 317'	105' + 70' + 2' = 177'
40	240' + 120' + 2' = 362'	120' + 80' + 2' = 202'
45	270' + 135' + 2' = 407'	135' + 90' + 2' = 227'
50	300' + 150' + 2' = 452'	150' + 100' + 2' = 252'
100	600' + 300' + 2' = 902'	300' + 200' + 2' = 502'

Then :

Hourly capacity of dump truck 3,5t class (m3/h)

Hauling distance (km)	Soil		Gravel without dozer-work		Crushed stone with dozer-work at quarry	
	for support work	on improved road	for support work	on improved road	for support work	on improved road
5	1.84	2.92	1.84	2.87	1.95	3.13
10	1.00	1.68	1.02	1.69	1.05	1.78
15	0.69	1.18	0.71	1.20	0.72	1.24
20	0.53	0.91	0.54	0.93	0.55	0.96
25	0.42	0.74	0.44	0.76	0.44	0.78
30	0.36	0.62	0.37	0.64	0.37	0.65
35	0.31	0.54	0.32	0.56	0.32	0.56
40	0.27	0.48	0.28	0.49	0.28	0.50
45	0.24	0.42	0.25	0.44	0.25	0.44
50	0.22	0.38	0.22	0.40	0.23	0.40
100	0.11	0.20	0.11	0.20	0.11	0.20

4. Motor grader 3.1 m class

4-1 spreading work

$$Q = \frac{b \times V \times H \times 1/f \times E}{N} \quad (m3/h, \text{ excavated volume})$$

Where :

b = width of road 3,4,5,6 m

V = average working speed 2,000 m/h

H = thickness of spreading material 0.2 m for soil

0.1 m for gravel and crushed stone

0.04m for maintenance

f = swell factor of material 1.25 for soil

1.15 for gravel and crushed stone

E = working efficiency 0.5

N = Number of pass

road width	normal spreading	mix material
3 m	10	20
4.5 m	15	30
6 m	20	40

Then :

Hourly capacity of motor grader 3.1 m class (m^3/h)

		Soil	Gravel & crushed stone
Spreading	Soil (0.2m)	48	-
	Gravel (0.1 m)	-	26
	Maintenance (0.04 m)	9.6	10.4
In site mixing (0.1 m)		12	13

4 - 2 Leveling

$$A = \frac{b \times V \times E}{N} \quad (m2/h)$$

Where :

b = width of road 3,4,5,6 m

V = average working speed 2,000 m/h

E = 0.5

N = 6 for 3 m width

9 for 4.5 m width

12 for 6 m width

(3 pass, effective width of blade = 1.9 m)

Then :

Hourly capacity of motor grader 3.1 m class (m2/h)

Width of road	3 m	4.5 m	6 m
Capacity	500	500	500

4 - 3 Ditching 500 m/h (2 pass)

5. Tire Roller 8.5 - 15^t class

$$Q = \frac{b \times V \times H \times 1/f \times E}{N} \quad (m3/h, \text{ excavated volume})$$

Where :

b = width of road 3, 4, 5, 6 m

V = average working speed 2,300 m/h

H = thickness of spread material 0.2 m for soil

0.1 for gravel and crushed stone

0.04m for maintenance

E = working efficiency 0.5

N = number of pass 8 for 3 m width

12 for 4.5m width

16 for 6.0m width

(effective compacting width = 1.7 m, 4 pass)

f = 1

Then :

Hourly capacity of Tire Roller 8.5 - 15^t class (m3/h)

	Soil			Gravel and crushed stone		
	3m width	4.5 m	6 m	3 m	4.5 m	6 m
Soil (0.2 m)	86	86	86	-	-	-
Gravel and crushed stone (0.1 m)	-	-	-	43	43	43
Maintenance (0.04 m)	17	17	17	17	17	17

6. Macadam Roller 8 - 10^t class

$$Q = \frac{b \times V \times H \times 1/f \times E}{N} \quad (m3/h, \text{ excavated volume})$$

Where :

b = width of road 3, 4.5 , 6 m

V = average working speed 2,000 m/h

H = thickness of spread material
- 0.2 m for soil
- 0.1 m for gravel and crushed stone
- 0.04 m for maintenance

E = working efficiency 0.5

N = number of pass
- 8 for 3 m width
- 12 for 4.5m width
- 16 for 6 m width

(effective compacting width = 1.7 m, 4 pass)

f = 1

Then : Hourly Capacity of Macadam Roller 8 - 10^t class

	Soil			Gravel and crushed stone		
	3m width	4.5 m	6 m	3 m	4.5 m	6 m
Soil (0.2)	75	75	75	-	-	-
Gravel and crushed stone(0.1 m)	-	-	-	37.5	37.5	37.5
Maintenance (0.04 m)	15	15	15	15	15	15

APPENDIX F-2 CALCULATION OF NUMBER OF EQUIPMENT

CALCULATION OF NUMBER OF EQUIPMENT

1. Kampar (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{346,283}{735,000} + \frac{42 + 11,473}{70,600} + \frac{9,171 + 67,579}{38,200} + \frac{426,000}{735,000} \right) \times 1/3 = 1.05 = 1$$

(2) Bulldozer

$$\left(\frac{7,375}{1,139,000} + \frac{28,991}{66,700} + \frac{9,171 + 67,579}{72,500} \right) \times 1/3 = 0.50 = 1$$

(3) Wheel loader

$$\left(\frac{9,171 + 67,579}{31,700} + \frac{42 + 11,473}{27,200} \right) \times 1/3 = 0,946 = 1$$

(4) Dump Truck

$$\left(\frac{9,171 + 67,579}{3,462} + \frac{42 + 11,473}{3,491} \right) \times 1/3 = 8.5 = 9$$

(5) Tire Roller

$$\frac{656,341 \times 3}{632,000} \times 1/3 = 1.03 = 1$$

2. Kepulauan Riau (3 years, mostly bauxite)

(1) Grader

$$\left(\frac{526,954}{735,000} + \frac{22,270 + 11,843}{70,600} + \frac{7,819 + 86,785}{38,200} + \frac{482,000}{735,000} \right) \times 1/3$$

$$= 1.45 = 2$$

(2) Bulldozer

$$\left(\frac{106,850}{1,139,000} + \frac{24,971}{66,700} + \frac{7,819 + 86,785}{72,500} \right) \times 1/3 = 0.59 = 1$$

(3) Wheel loader

$$\left(\frac{7,819 + 86,785}{31,700} + \frac{22,270 + 11,843}{27,200} \right) \times 1/3 = 1.41 = 2$$

(4) Dump Truck

$$\left(\frac{7,819 + 86,785}{3,462} + \frac{22,270 + 11,843}{3,491} \right) \times 1/3 = 12.4 = 13$$

(5) Tire Roller

$$\frac{922,993 \times 3}{632,000} \times 1/3 = 1.46 = 2$$

3. Lahat (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{213,880}{595,000} + \frac{7,510 + 9,291}{57,120} + \frac{3,739 + 60,140}{30,940} + \frac{278,000}{595,000} \right) \times 1/3 = 1.06 = 1$$

(2) Bulldozer

$$\left(\frac{7,500}{922,000} + \frac{12,007}{54,000} + \frac{3,739 + 60,140}{58,700} \right) \times 1/3 = 0.44 = 1$$

(3) Wheel loader

$$\left(\frac{7,510 + 9,291}{22,000} + \frac{3,739 + 60,140}{25,700} \right) \times 1/3 = 1.08 = 2$$

(4) Dump Truck

$$\left(\frac{7,510 + 9,291}{2,827} + \frac{3,739 + 60,140}{1,613} \right) \times 1/3 = 15.2 = 16$$

(5) Tire Roller

$$\frac{520,287 \times 3}{511,700} \times 1/3 = 1.02 = 1$$

4. O.K.I (6 years, mostly crushed stone)

(1) Grader

$$\left(\frac{444,201}{595,000} + \frac{78 + 11,234}{57,120} + \frac{15,517 + 106,553}{30,940} + \frac{373,000}{595,000} \right) \times 1/6 = 0.92 = 1$$

(2) Bulldozer

$$\left(\frac{24,334}{922,000} + \frac{54,276}{54,000} + \frac{15,517 + 106,553}{58,700} \right) \times 1/6 = 0.5 = 1$$

(3) Wheel loader

$$\left(\frac{78 + 11,234}{22,000} + \frac{15,517 + 106,553}{25,700} \right) \times 1/6 = 0.87 = 1$$

(4) Dump Truck

$$\left(\frac{78 + 11,234}{2,827} \times \frac{1}{2} + \frac{78 + 11,234}{1,113} \times \frac{1}{2} + \frac{15,517 + 106,553}{1,684} \times \frac{1}{2} + \frac{15,517 + 106,553}{607} \times \frac{1}{2} \right)$$

$$\times 1/6 = 23.98 = 24$$

(5) Tire Roller

$$\frac{1,011,511 \times 3}{511,700} \times 1/6 = 0.99 = 1$$

5. O.K.U (3 years, mostly crushed stone)

(1) Grader

$$\left(\frac{79,350}{595,000} + \frac{16,842}{57,000} + \frac{8,251 + 55,769}{30,900} + \frac{269,000}{595,000} \right) \times 1/3 = 0.99 = 1$$

(2) Bulldozer

$$\left(\frac{36,000}{922,000} + \frac{37,558}{54,000} + \frac{8,251 + 55,769}{58,700} \right) \times 1/3 = 0.61 = 1$$

(3) Wheel loader

$$\left(\frac{16,842}{22,000} + \frac{8,251 + 55,769}{25,700} \right) \times 1/3 = 1.09 = 1$$

(4) Dump Truck

$$\left(\frac{16,842}{2,827} + \frac{8,251}{1,684} + \frac{55,769}{1,167} \right) \times 1/3 = 19.6 = 20$$

(5) Tire Roller

$$\frac{528,725 \times 3}{511,700} \times 1/3 = 1.03 = 1$$

6. Liot (3 years, mostly crushed stone)

(1) Grader

$$\left(\frac{204,621}{595,000} + \frac{2,783 + 11,737}{57,100} + \frac{4,436 + 44,871}{30,900} + \frac{261,000}{595,000} \right) \times 1/3 = 0.88 = 1$$

(2) Bulldozer

$$\left(\frac{32,950}{922,000} + \frac{13,463}{54,000} + \frac{4,436 + 44,871}{58,700} \right) \times 1/3 = 0.38 = 1$$

(3) Wheel loader

$$\left(\frac{2,783 + 11,737}{22,000} + \frac{4,436 + 44,871}{25,700} \right) \times 1/3 = 0.86 = 1$$

(4) Dump Truck

$$\left(\frac{2,783 + 11,737}{2,178} + \frac{4,436 + 44,871}{857} \right) \times 1/3 = 16.0$$

(5) Tire Roller

$$\frac{445,500 \times 3}{511,700} \times 1/3 = 0.87 = 1$$

7. Lampung Utara (3 years, mostly crushed stone)

(1) Grader

$$\left(\frac{59,235}{770,000} + \frac{406 + 71,970}{40,000} + \frac{14,205}{73,900} + \frac{445,000}{770,000} \right) \times 1/3 = 0.89 = 1$$

(2) Bulldozer

$$\left(\frac{600,000}{1,193,500} + \frac{2,028}{69,900} + \frac{406 + 71,970}{75,900} \right) \times 1/3 = 0.49 = 1$$

(3) Wheel loader

$$\left(\frac{406 + 71,970}{33,300} + \frac{14,205}{28,500} \right) \times 1/3 = 0.89 = 1$$

(4) Dump Truck (Improved Condition)

$$\left(\frac{406 + 71,970}{1,478} + \frac{14,205}{4,497} \right) \times 1/3 = 17.3 = 18$$

(5) Tire Roller

$$\frac{675,540 \times 3}{662,200} \times 1/3 = 1.02 = 1$$

8. Lampung Selatan (3 years, sand & gravel 50 %, crushed stone 50 %)

(1) Grader

$$\left(\frac{115,275}{770,000} + \frac{439 + 10,090}{73,900} + \frac{1,098 + 23,151}{40,000} + \frac{129,000}{770,000} \right) \times 1/3 = 0.36 = 1$$

(2) Bulldozer

$$\left(\frac{19,350}{1,193,500} + \frac{1,098 + 23,151}{75,900} \right) \times 1/3 = 0.11 = 1$$

(3) Wheel loader

$$\left(\frac{439 + 10,090}{28,500} + \frac{1,098 + 23,151}{33,300} \right) \times 1/3 = 0.37 = 1$$

(4) Dump Truck

$$\left(\frac{439 + 10,090}{3,658} + \frac{1,098 + 23,151}{2,087} \times \frac{1}{2} + \frac{1,098 + 23,151}{2,179} \times \frac{1}{2} \right) \times 1/3$$

$$= 4,75 = 5$$

(5) Tire Roller

$$\frac{194,350 \times 3}{662,200} \times 1/3 = 0.29 = 1$$

9. Manggarai (6 years, mostly crushed stone)

(1) Grader

$$\left(\frac{178,343}{525,000} + \frac{7,221 + 7,032}{50,400} + \frac{4,490 + 56,360}{27,300} + \frac{259,000}{525,000} \right) \times 1/6 = 0.56 = 1$$

(2) Bulldozer

$$\left(\frac{38,355}{813,750} + \frac{15,248}{47,700} + \frac{4,490 + 56,360}{51,800} \right) \times 1/6 = 0.26 = 1$$

(3) Wheel Loader

$$\left(\frac{7,221 + 7,032}{19,400} + \frac{4,490 + 56,360}{22,700} \right) \times 1/6 = 0.6 = 1$$

(4) Dump Truck

$$\left(\frac{7,221 + 7,032}{2,494} + \frac{4,490 + 56,360}{1,486} \right) \times 1/6 = 7.8 = 8$$

(5) Tire Roller

$$\frac{501,782 \times 3}{451,500} \times 1/6 = 0.6 = 1$$

10. Belu (6 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{495,263}{525,000} + \frac{63,565 + 13,996}{50,400} + \frac{7,570 + 85,451}{27,300} + \frac{436,000}{525,000} \right) \times 1/6 = 1.1 = 1$$

(2) Bulldozer

$$\left(\frac{29,486}{813,800} + \frac{29,727}{47,700} + \frac{7,570 + 85,451}{51,800} \right) \times 1/6 = 0.4 = 1$$

(3) Wheel loader

$$\left(\frac{63,565 + 13,996}{19,400} + \frac{7,570 + 85,451}{22,700} \right) \times 1/6 = 1.4 = 2$$

(4) Dump Truck

$$\left(\frac{63,565 + 13,996}{2,494} + \frac{7,570 + 85,451}{1,423} \right) \times 1/6 = 16.1 = 17$$

(5) Tire Roller

$$\frac{822,016 \times 3}{451,500} \times 1/6 = 0.91 = 1$$

11. Bolaang Mongondow (6 years, mostly crushed stone)

(1) Grader

$$\left(\frac{391,394}{665,000} + \frac{26,388 + 14,711}{63,800} + \frac{8,384 + 83,201}{34,600} + \frac{521,000}{665,000} \right) \times 1/6 = 0.78 = 1$$

(2) Bulldozer

$$\left(\frac{83,095}{1,030,000} + \frac{32,157}{60,400} + \frac{8,384 + 83,201}{65,500} \right) \times 1/6 = 0.34 = 1$$

(3) Wheel loader

$$\left(\frac{26,388 + 14,711}{24,600} + \frac{8,384 + 83,201}{28,700} \right) \times 1/6 = 0.81 = 1$$

(4) Dump Truck

$$\left(\frac{26,388 + 14,711}{3,159} + \frac{8,384 + 83,201}{3,379} \right) \times 1/6 = 6.68 = 7$$

(5) Tire roller

$$\frac{829,561 \times 3}{572,000} \times 1/6 = 0.73 = 1$$

12. Gorontalo (6 years, mostly crushed stone)

(1) Grader

$$\left(\frac{1,11 + 53}{665,000} + \frac{6,349 + 46,480}{63,800} + \frac{35,652 + 272,300}{34,600} + \frac{1,394,000}{665,000} \right) \times 1/6$$

$$= 2.25 = 3$$

(2) Bulldozer

$$\left(\frac{199,248}{1,030,000} + \frac{134,463}{60,400} + \frac{35,652 + 272,300}{65,500} \right) \times 1/6 = 1,187 = 2$$

(3) Wheel loader

$$\left(\frac{6,349 + 46,480}{24,600} + \frac{35,652 + 272,300}{28,700} \right) \times 1/6 = 2.15 = 2$$

(4) Dump Truck

$$\left(\frac{6,349 + 46,480}{3,159} + \frac{35,652 + 272,300}{3,379} \right) \times 1/6 = 17.97 = 18$$

(5) Tire Roller

$$\frac{2,694,985 \times 3}{572,000} \times 1/6 = 2.36 = 3$$

13. Takalar (3 years, sand and gravel 50: crushed stone 50)

(1) Groder

$$\left(\frac{220,371}{665,000} + \frac{2,426 + 27,911}{34,600} + \frac{4,735}{63,800} + \frac{139,000}{665,000} \right) \times 1/3 = 0.5 = 1$$

(2) Bulldozer

$$\left(\frac{2,500}{1,030,000} + \frac{1,777}{60,400} + \frac{2,426 + 27,911}{65,600} \right) \times 1/3 = 0.16 = 1$$

(3) Wheel loader

$$\left(\frac{2,426 + 27,911}{28,800} + \frac{4,735}{24,600} \right) \times 1/3 = 0.41 = 1$$

(4) Dump Truck

$$\left(\frac{2,426 + 27,911}{1,803} \times \frac{1}{2} + \frac{2,426 + 27,911}{1,882} \times \frac{1}{2} + \frac{4,735}{3,159} \right) \times 1/3 = 5.99 = 6$$

(5) Tire Roller

$$\frac{265,137 \times 3}{572,000} \times 1/3 = 0.46 = 1$$

14. Bone (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{466,866}{665,000} + \frac{19,072 + 19,037}{63,840} + \frac{5,780 + 72,622}{34,580} + \frac{326,000}{665,000} \right) \times 1/3$$

$$= 1.35 = 2$$

(2) Bulldozer

$$\left(\frac{10,666}{1,030,000} + \frac{12,392}{60,400} + \frac{5,780 + 72,622}{65,500} \right) \times 1/3 = 0.47 = 1$$

(3) Wheel loader

$$\left(\frac{19,072 + 19,037}{24,600} + \frac{5,780 + 72,622}{28,700} \right) \times 1/3 = 1.43 = 2$$

(4) Dump Truck

$$\left(\frac{19,072 + 19,037}{3,159} + \frac{5,780 + 72,622}{3,132} \right) \times 1/3 = 12.37 = 13$$

(5) Tire Roller

$$\frac{690,799 \times 3}{572,000} \times 1/3 = 1.21 = 2$$

15. Sidrap (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{259,119}{665,000} + \frac{14,799 + 6,948}{63,800} + \frac{1,361 + 42,180}{34,600} + \frac{277,000}{665,000} \right) \times 1/3 = 0.80 =$$

(2) Bulldozer

$$\left(\frac{126,396}{1,030,000} + \frac{5,014}{60,400} + \frac{1,361 + 42,180}{65,500} \right) \times 1/3 = 0.29 = 1$$

(3) Wheel Loader

$$\left(\frac{14,799 + 6,948}{24,600} + \frac{1,361 + 42,180}{28,700} \right) \times 1/3 = 0.80 = 1$$

(4) Dump truck

$$\left(\frac{14,799 + 6,948}{3,159} + \frac{1,361 + 42,180}{1,803} \right) \times 1/3 = 10.4 = 11$$

(5) Tire Roller

$$\frac{505,978 \times 3}{572,000} \times 1/3 = 0.88 = 1$$

16. Pinrang (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{81,135}{665,000} + \frac{394 + 5,842}{63,800} + \frac{2,070 + 36,530}{34,600} + \frac{152,000}{665,000} \right) \times 1/3 = 0.5 = 1$$

(2) Bulldozer

$$\left(\frac{123,908}{1,030,000} + \frac{7,459}{60,400} + \frac{2,070 + 36,530}{65,500} \right) \times 1/3 = 0.3 = 1$$

(3) Wheel loader

$$\left(\frac{394 + 5,842}{24,600} + \frac{2,070 + 36,530}{28,700} \right) \times 1/3 = 0.5 = 1$$

(4) Dump Truck

$$\left(\frac{394 + 5,942}{3,159} + \frac{2,070 + 36,530}{1,803} \right) \times 1/3 = 7.8 = 8$$

(5) Tire Roller

$$\frac{347,550 \times 3}{572,000} \times 1/3 = 0.6 = 1$$

17. Polmas (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{253,579}{665,000} + \frac{10,072 + 4,634}{63,800} + \frac{1,467 + 30,964}{34,600} + \frac{162,000}{665,000} \right) \times 1/3 = 0.6 = 1$$

(2) Bulldozer

$$\left(\frac{37,552}{1,030,000} + \frac{1,958}{60,400} + \frac{1,467 + 30,964}{65,500} \right) \times 1/3 = 0.2 = 1$$

(3) Wheel loader

$$\left(\frac{10,072 + 4,634}{24,600} + \frac{1,467 + 30,964}{28,700} \right) \times 1/3 = 0.6 = 1$$

(4) Dump Truck

$$\left(\frac{10,072 + 4,634}{3,159} + \frac{1,467 + 30,964}{1,803} \right) \times 1/3 = 7.55 = 8$$

(5) Tire Roller

$$\frac{352,061 \times 3}{572,000} \times 1/3 = 0.6 = 1$$

18. Enrekang (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{98,271}{665,000} + \frac{3,336 + 26,415}{34,600} + \frac{3,548}{63,800} + \frac{158,000}{665,000} \right) \times 1/3 = 0.44 = 1$$

(2) Bulldozer

$$\left(\frac{4,800}{1,030,000} + \frac{14,987}{60,400} + \frac{3,336 + 26,415}{65,500} \right) \times 1/3 = 0.24 = 1$$

(3) Wheel loader

$$\left(\frac{3,336 + 26,415}{28,700} + \frac{3,548}{24,600} \right) \times 1/3 = 0.39 = 1$$

(4) Dump Truck

$$\left(\frac{3,336 + 26,415}{1,803} + \frac{3,548}{3,159} \right) \times 1/3 = 5.9 = 6$$

(5) Tire Roller

$$\frac{280,840 \times 3}{572,000} \times 1/3 = 0.49 = 1$$

19. Jeneponto (3 years, mostly sand and gravel)

(1) Grader

$$\left(\frac{137,000}{665,000} + \frac{15,281 + 87,304}{34,600} + \frac{14,080}{63,800} + \frac{346,000}{665,000} \right) \times 1/3 = 1.30 = 2$$

(2) Bulldozer

$$\left(\frac{69,210}{60,400} + \frac{15,281 + 87,304}{65,500} \right) \times 1/3 = 0.92 = 1$$

(3) Wheel loader

$$\left(\frac{15,281 + 87,304}{28,700} + \frac{14,080}{24,600} \right) \times 1/3 = 1.39 = 2$$

(4) Dump Truck

$$\left(\frac{15,281}{3,132} + \frac{87,304}{1,803} + \frac{14,080}{3,159} \right) \times 1/3 = 19.3 = 20$$

(5) Tire Roller

$$\frac{829,096 \times 3}{572,000} \times 1/3 = 1.45 = 2$$

20. Kendari (6 years, mostly crushed stone)

(1). Grader

$$\left(\frac{789,073}{735,000} + \frac{99,768 + 24,057}{70,500} + \frac{15,285 + 160,238}{38,200} + \frac{721,000}{735,000} \right) \times 1/6$$

$$= 1.41 = 2$$

(2) Bulldozer

$$\left(\frac{74,673}{1,139,000} + \frac{62,557}{66,700} + \frac{15,285 + 160,238}{72,500} \right) \times 1/6 = 0.56 = 1$$

(3) Wheel loader

$$\left(\frac{99,768 + 24,057}{27,200} + \frac{15,285 + 160,238}{31,700} \right) \times 1/6 = 1.68 = 2$$

(4) Dump Truck

$$\left(\frac{99,768 + 24,057}{3,491} + \frac{15,285}{3,734} + \frac{160,238}{2,081} \right) \times 1/6 = 19.43 = 20$$

(5) Tire Roller

$$\frac{1,551,387 \times 3}{632,000} \times 1/6 = 1.22 = 2$$

21. Buton (6 years, mostly crushed stone)

(1) Grader

$$\left(\frac{860,350}{735,000} + \frac{157,240 + 17,319}{70,500} + \frac{5,270 + 117,278}{38,200} + \frac{624,000}{735,000} \right) \times 1/6$$

$$= 1.29 = 2$$

(2) Bulldozer

$$\left(\frac{3,900}{1,139,000} + \frac{18,508}{66,700} + \frac{5,270 + 117,278}{72,500} \right) \times 1/6 = 0.33 = 1$$

(3) Wheel loader

$$\left(\frac{157,240 + 17,319}{27,200} + \frac{5,270 + 117,278}{31,700} \right) \times 1/6 = 1.72 = 2$$

(4) Dump Truck

$$\left(\frac{157,240 + 17,319}{3,491} + \frac{5,270 + 117,278}{3,734} \right) \times 1/6 = 13.8 = 14$$

(5) Tire Roller

$$\frac{1,093,415 \times 3}{632,000} \times 1/6 = 0.87 = 1$$

APPENDIX F-3 COST OF EQUIPMENT AND SPARE PARTS

COST ESTIMATE OF EQUIPMENT

Equipment	Number	Estimated CIF Unit Price		Cost	
		¥ 1000	Rp 1000	¥ 1000	Rp 1000
Buildozer 11t	42	13,000	32,500	546,000	1,365,000
Motor Grader 3,1 m	54	9,000	22,500	486,000	1,215,000
Tire Roller 8,5 - 15t	43	8,300	20,750	356,900	892,250
Wheel Loader 1 m^3	43	9,500	23,750	408,500	1,021,250
Dump Truck 3,5t	370	2,300	5,750	851,000	2,127,500
Water Tank Truck 3,5001	21	3,800	9,500	79,800	199,500
Fuel Tank Truck	25	4,000	10,000	100,000	250,000
Portable Concrete Mixer 0,3 m^3	21	2,000	5,000	42,000	105,000
Portable Crusher (jaw) 10-20t/h	7	14,000	35,000	98,000	245,000
Portable Crusher (jaw) 20-30t/h	17	15,000	37,500	255,000	637,500
Portable Compressor 250 cfm 7.m^3/min	24	2,600	6,500	62,400	156,000
Leg Drill	17	350	875	5,950	14,875
Hand Hammer	55	250	625	13,750	34,375
Hydraulic Excavator	6	13,000	32,500	78,000	195,000
Mobile Work Shop	21	12,000	30,000	252,000	630,000
Service Car (Jeep)	45	1,700	4,250	76,500	191,250
SUB - TOTAL				3,711,800	9,279,500
SPARE PARTS				668,200	1,670,500
T O T A L				4,380,000	10,950,000

APPENDIX G-1 OWNERSHIP AND OPERATING COST OF EQUIPMENT

CALCULATION OF OWNERSHIP AND OPERATING COST

I. Equipment Cost (TC) = Owner's Cost (E) + Operating Cost (T)
Indirect Cost (I)

II. Ownership Cost (E)

$$E = \frac{(B-C)\ D + 0.2\ C}{W}$$

E : Owner's Cost Rp./hr

B : Initial Purchased Cost Rp.

C : Salvage Value (10% of B) Rp.

D : Capital Recovery Factor

W : Hour Used per Year

$$D = \frac{i\ (1 + i)^A}{(1 + i)A - 1}$$

i : Interest Rate 20 % / year

A : Economic Life Year (4 - 12 years)

Table A , i - D

Life Years (A)	Interest Rate				
	10 %	12 %	15 %	20 %	25 %
1	1,100	1,120	1,150	1,200	1,250
2	0,576	0,592	0,615	0,655	0,694
3	0.402	0,416	0,438	0,475	0,512
4	0,315	0,329	0,350	0,386	0,423
5	0,264	0,277	0,298	0,334	0,372
6	0,230	0,243	0,264	0,301	0,339
7	0,205	0,219	0,240	0,277	0,316
8	0,187	0,201	0,223	0,261	0,300
9	0,173	0,188	0,210	0,248	0,289
10	0,163	0,177	0,199	0,239	0,280
11	0,154	0,168	0,191	0,231	0,273
12	0,147	0,161	0,184	0,225	0,268
13	0,141	0,156	0,179	0,221	0,265
14	0,136	0,151	0,175	0,217	0,262
15	0,131	0,147	0,171	0,214	0,259

III. Operating Cost (T)

$T = F + G + H + J + K$

T : Operating Cost Rp.

F : Spare Part and Tire Cost

$= (12,5\% \text{ (a) } 17,5\%) \times \frac{B}{W}$ Rp.

G : Work Shop Cost

$= (6,25\% \text{ (a) } 8,75\%) \times \frac{B}{W}$ or $= \frac{F}{2}$ Rp.

H : Fuel and Lubricating Oil Cost

$= \frac{12 \text{ (a) } 15}{100} \times HP \times FP + \frac{2,5 \text{ (a) } 3}{100} \times HP \times OP$

HP : Engine Rated Horse Power

FP : Fuel Price (Rp./l)

OP : Oil Price (Rp./l)

J : Operator or Driver Cost (Rp./hr)

K : Assistanct Operatorof Driver Cost(Rp./hr)

IV. Indirect Cost

$I = 25\% \ (E + T)$

I : Indirect Cost = Pool Cost + Office Cost + Risk + Profit Rp.

E : Owner's Cost Rp.

T : Operating Cost Rp.

ESTIMATED HOURLY OWNING AND OPERATION COST OF CONSTRUCTION EQUIPMENT

Equipment	P.S.	Estimated CIF Unit Price		Economical life of Equipment	Hours used per year	Ownership cost per Hour used	Fuel+lub.oil+ grease per hour	Spare Parts + ctrs per hour	Work shop per hour	Operator & driver per hour	In direct Cost per hour	Total operation cost per hour
		1000 x ¥	Rp. 1000	Hour/years	Hour	Rp	Rp.	Rp.	Rp.	Rp.	Rp.	Rp.
1	2	3	4	5	6	7	8	9	10	11	12	13
Bulldozer 11t	100	13,000	32,500	7,000/5	1,400	7,442	1,850	2,902	1,451	500	3,536	17,681
Motor Grader 3,1m	110	9,000	22,500	5,600/4	1,400	5,905	2,035	2,009	1,005	500	2,864	14,318
Tire Roller 8,5 - 15t	95	8,300	20,750	7,000/5	1,400	4,752	1,758	1,853	927	500	2,448	12,238
Wheel Loader 1m3	100	9,500	23,750	8,400/6	1,400	4,935	1,850	2,121	1,061	500	2,617	13,084
Dump Truck 3,5t	100	2,300	5,750	7,000/5	1,400	1,317	* 1,110	513	257	500	924	4,621
Water Tank Truck 3,5001	100	3,800	9,500	7,000/5	1,400	2,176	* 1,110	848	424	500	1,265	6,323
Fuel Tank Truck	100	4,000	10,000	7,000/5	1,400	2,290	* 1,110	893	447	500	1,310	6,550
Portable Concrete Mixer 0,3m3	15	2,000	5,000	5,600/4	1,400	1,190	278	446	223	500	690	3,449
Portable Crusher (jaw) 10-20t/h	40	14,000	35,000	9,600/8	1,200	7,435	740	3,646	1,823	500	3,536	17,860
Portable Crusher (jaw) 20-30t/h	50	15,000	37,500	9,600/8	1,200	7,965	925	3,906	1,953	500	3,812	19,061
Portable Compressor 250 cfm 7.m3/min	75	2,600	6,500	7,200/6	1,200	1,576	1,388	677	339	250	1,058	5,288
Leg Drill	-	350	875	2,400/4	1,000	321	-	109	55	350	209	1,044
Hand Hammer	-	250	625	2,400/4	1,000	230		78	39	350	174	871
Hydraulic Excavator	90	13,000	32,500	7,000/5	1,400	7,443	1,665	2,902	1,451	500	3,490	17,451
Mobile Work Shop	100	12,000	30,000	6,000/6	1,000	8,727	1,110	3,750	1,875	500	3,991	19,953
Service Car (jeep)	135	1,700	4,250	6,000/6	1,000	1,236	** 1,480	531	266	500	1,003	5,016

* Calculated as PS = 60 ** Calculated as PS = 80

APPENDIX G-2 CALCULATION OF UNIT COSTS OF SUPPORT WORKS

CALCULATION OF UNIT COSTS OF SUPPORT WORKS

1. Construction Cost of Design Category (3)
excluding material cost per 1,000 m^2

(surface type 3, Macadam, cobble, Telford, lightly corrugated)

(1) Volume of aggregate for 1/3 length
$V = 0{,}0175 \times 1{,}000 = 17.5\ m^3$

Actual volume including 5% loss at guarry site is
$17.5 \times 1.05 = 18.38\ m^3$

(2) Spreading of aggrefate with grader
$\frac{17.5}{13 m^3/h} = 1.35$ hours

1.35 hours X (local) 6,404 = Rp 8,650
(foreign) 7,914 = Rp 10,680

(3) Compaction of aggregate with tire roller
$\frac{17.5}{21.5 m^3/h} = 0.81$ hours

0.81 hours X (local) 5,633 = Rp 4,560
(foreign) 6,605 = Rp 5,350

(4) Grader work for remaining part 2/3
$\frac{1{,}000 \times 2/3}{500} = 1.33$ hours

1.33 hours X (local) 6,404 = Rp 8,520
(foreign) 7,914 = Rp 10,530

(5) Fuel Tank Truck
1.0 hour X (local) 3,367 = Rp 3,367
(foreign) 3,183 = Rp 3,183

(6) Foremen 2 X $\frac{1.35 + \frac{1}{2} \times 0.81 + 1.33}{7}$ X 1,500 = Rp 1,320

(7) Labor $12 \times \frac{1.35 + \frac{1}{2} \times 0.81 + 1.33}{7} \times 1,000 = Rp\ 5,290$

Total cost excluding material cost per 1,000 m^2

Local; 8,650 + 4,560 + 8,520 + 3,367 + 1,320 + 5,290 = Rp 31,707

Foreign; 10,680 + 5,350 + 10,530 + 3,183 = Rp 29,743

Grand Total Rp 61,450

2. Construction Cost of Design Category (4)
excuding material cost per 1,000 m^2

(surface type 2, Gravel, lightly corrugated)

(1) Volume of aggregate for ½ length
$V = 0,0262 \times 1,000 = 26.3\ m^3$

Actual volume including 5% loss at guarry site is
$26.3 \times 1.05 = 27.62\ m^3$

(2) Leveling with grader (½ X 1000) + maintenance with grader (½ X 1000)
$\frac{1,000}{500 m^3/h} = 2$ hours

2 hours X (local) 6,404 = Rp 12,810
(foreign) 7,914 = Rp 15,830

(3) Spreading of aggregate with grader
$\frac{26.3}{13\ m^3/h} = 2.02$ hours

2.02 hours X (local) 6,404 = Rp 12,940
(foreign) 7,914 = Rp 15,990

(4) Compaction of aggregate with tire roller
$\frac{26.3}{21.5\ m^3/h} = 1.22$ hours

1.22 hours X (local) 5,633 = Rp 6,870
(foreign) 6,605 = Rp 8,060

(5) Fuel Tank Truck

1.5 hours X (local) 3,367 = Rp 5,051

(foreign) 3,183 = Rp 4,775

(6) Foremen $2 \times \frac{2 + 2.02 + \frac{1}{2} \times 1.22}{7} \times 1{,}500$ = Rp 1,980

(7) Labor $12 \times \frac{2 + 2.02 + \frac{1}{2} \times 1.22}{7} \times 1{,}000$ = Rp 7,940

Total cost excluding material cost per 1,000 m^2

Local; 12,810 + 12,940 + 6,870 + 5,050 + 1,980 + 7,940 = Rp 47,590

Foreign; 15,830 + 15,990 + 8,060 + 4,775 = Rp 44,655

Grand Total Rp 92,245

3. Construction Cost of Design Category (5)
excluding material cost per 1,000 m^2

(surface type 1, earth, lightly corrugated)

(1) Volume of aggregate for whole length

V = 0,0526 X 1,000 = 52.6 m^3

Actual volume including 5% loss at quarry site is

52.6 X 1.05 = 55.2 m^3

(2) Leveling with grader

$\frac{1{,}000}{500}$ = 2 hours

2 hours X (local) 6,404 = Rp 12,810

(foreign) 7,914 = Rp 15,830

(3) Spreading of aggregate with grader

$\frac{52.6}{13}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,940

(foreign) 7,914 = Rp 32,050

(4) Compaction of aggregate with tire roller

$\frac{52.6}{21.5}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foreign) 6,605 = Rp 16,180

(5) Fuel Tank Truck

2.0 hours X (local) 3,367 = Rp 6,734
(foreign) 3,183 = Rp 6,366

(6) Foremen $2 \times \frac{2 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1,500$ = Rp 3,120

(7) Labor $12 \times \frac{2 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1,000$ = Rp 12,470

Total cost excluding material cost per 1,000 m^3

Local; 12,810 + 25,940 + 13,800 + 6,734 + 3,120 + 12,470 = Rp 74,874

Foreign; 15,830 + 32,050 + 16,180 + 6,366 = Rp 70,426

Grand Total Rp 145,300

4. Construction Cost of Design Category (6)
excluding material cost and shouldering per 1,000 m^2

(surface type 1, 2 and 3, heavily corrugated)

(1) V = 0,1053 X 1,000 = 105.3 m^3
105.3 X 1.05 = 110.6 at guarry site

(2) Excavation and leveling with bulldozer

$\frac{1,000}{775}$ = 1.29 hours

1.29 hours X (local) 7,347 = Rp 9,480
(foreign) 10,334 = Rp 13,330

(3) Spreading of aggregate with grader

$\frac{105.3}{26}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,940
(foreign) 7,914 = Rp 32,050

(4) Compaction of aggregate with tire roller

$\frac{105.3}{43}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foreign) 6,605 = Rp 16,180

(5) Fuel Tank Truck

2.0 hours X (local) 3,367 = Rp 6,734
(foreign) 3,183 = Rp 6,366

(6) Foremen $2 \times \frac{1.29 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1{,}500$ = Rp 2,640

(7) Labor $12 \times \frac{1.29 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1{,}000$ = Rp 10,570

Total cost excluding material cost and shouldering per 1,000 m^2

Local; 9,480 + 25,940 + 13,800 + 6,734 + 2,640 + 10,570 = Rp 69,164

Foreign; 13,330 + 32,050 + 16,180 + 6,366 = Rp 67,926

Grand Total Rp 137,090

5. Construction Cost of Design Category (7)
Excluding material cost and shouldering per 1,000 m^2

(surface type 1, 2 and 3, light damage with potholes)

(1) Vg = 0,0105 X 1,000 = 10,5 m^3
10.5 X 1.05 = 11.1 m^3 at quarry sites

(2) V = 0,1053 X 1,000 = 105.3 m^3
105.3 X 1.05 = 110.6 m^3 at quarry sites

(3) Leveling with grader

$\frac{1,000}{500}$ = 2 hours

2 hours X (local) 6,404 = Rp 12,810
(foreign) 7,914 = Rp 15,830

(4) Spreading aggregate partially with grader

$\frac{10.5}{13}$ = 0,81 hours

0.81 hours X (local) 6,404 = Rp 5,190
(foreign) 7,914 = Rp 6,410

(5) Compaction of partially used aggregate with tire roller

$\frac{10.5}{21.5}$ = 0.49 hours

0.49 hours X (local) 5,633 = Rp 2,760
(foreign) 6,605 = Rp 3,260

(6) Spreading aggregate with grader

$\frac{105.3}{26}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,940
(foreign) 7,914 = Rp 32,050

(7) Compaction of aggregate with tire roller

$\frac{105.3}{43}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foreign) 6,605 = Rp 16,180

(8) Fuel Tank Truck

2.5 hours X (local) 3,367 = Rp 8,418
(foreign) 3,183 = Rp 7,958

(9) Foremen $2 \times \frac{2 + 0.81 + \frac{1}{2} \times 0.49 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1,500$ = Rp 3,570

(10) Labor $12 \times \frac{2 + 0.81 + \frac{1}{2} \times 0.49 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1,000$ = Rp 14,280

Total cost excluding material cost and shouldering per 1,000 m^2

Local; 12,810 + 5,190 + 2,760 + 25,940 + 13,800 + 8,418 + 3,570 + 14,280 = Rp 86,768

Foreign; 15,830 + 6,410 + 3,260 + 32,050 + 16,180 + 7,958 = Rp 81,688

Grand Total Rp 168,456

6. Construction Cost of Design Category (8)
excluding material cost and shouldering per 1,000 m^2

(suface type 1 and 2, earth and gravel, heavy damage)

(1) $Vg = 0.02 \times 1,000 = 20\ m^3$
$20 \times 1.05 = 21\ m^3$ at guarry sites

(2) $V = 0,1053 \times 1,000 = 105.3\ m^3$
$105.3 \times 1.05 = 110.6\ m^3$ at guarry sites

(3) Excavation with bulldozer
$V_A \triangleq 0.10 \times 1,000 = 100\ m^3$
$\frac{100}{45.4} = 2.20$ hours

2.20 hours X (local) 7,347 = Rp 16,180
(foreign) 10,334 = Rp 22,730

(4) Mix at side by grader
$\frac{100 + 20}{13} = 9.23$ hours

9.23 hours X (local) 6,404 = Rp 59,110
(foreign) 7,914 = Rp 73,050

(5) Compaction with tire roller
$\frac{100 + 20}{43} = 2.79$ hours

2.79 hours X (local) 5,633 = Rp 15,720
(foreign) 6,605 = Rp 18,430

(6) Spreading aggregate with grader

$\frac{105.3}{26}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,940
(foreign) 7,914 = Rp 32,050

(7) Compaction of aggregate with tire roller

$\frac{105.3}{43}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foreign) 6,605 = Rp 16,180

(8) Fuel Tank Truck

4.0 hours X (local) 3,367 = Rp 13,468
(foreign) 3,183 = Rp 12,732

(9) Foremen $2 \times \frac{2.20 + 9.23 + \frac{1}{2} \times 2.79 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1{,}500$ = Rp 7,760

(10) Labor $12 \times \frac{2.20 + 9.23 + \frac{1}{2} \times 2.79 + 4.05 + \frac{1}{2} \times 2.45}{7} \times 1{,}000$ = Rp 31,030

Total cost excluding material cost and shouldering per 1,000 m^2

Local 16,180 + 59,110 + 15,720 + 25,940 + 13,800 + 13,468 + 7,760 + 31,030 = Rp 183,008

Foreign 22,730 + 73,050 + 18,430 + 32,050 + 16,180 + 12,732 = Rp 175,172

Grand Total Rp 358,180

7. Construction Cost of Design Category (9)
excluding material cost and shouldering per 1,000 m^2

(surface type 3, Macadam ,cobble and Telford, heavy damage)

(1) V = 0.1579 X 1,000 = 157.9 m^3
157.9 X 1.05 = 165.8 m^3 at quarry sites

(2) Spreading of aggregate with grader

$\frac{157.9}{39}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,940
(foreign) 7,914 = Rp 32,050

(3) Compaction of aggregate with tire roller

$\frac{157.9}{64.5}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foreign) 6,605 = Rp 16,180

(4) Fuel Tank Truck

2.0 hours X (local) 3,367 = Rp 6,734
(foreign) 3,183 = Rp 6,366

(5) Foremen $2 \times \frac{4.05 + \frac{1}{2} \times 2.45}{7} \times 1,500$ = Rp 2,260

(6) Labor $12 \times \frac{4.05 + \frac{1}{2} \times 2.45}{7} \times 1,000$ = Rp 9,050

Total cost excluding material cost and shouldering per 1,000 m^2

Local 25,940 + 13,800 + 6,734 + 2,260 + 9,050 = Rp 57,784

Foreign 32,050 + 16,180 + 6,366 = Rp 54,576

Grand Total Rp 112,380

8. Construction Cost of Design Category (10)
excluding material cost and shouldering per 1,000 m^2

(surface type 1, 2 and 3, bearing capacity is less)

(1) V_g = 0,1111 X 1,000 = 111.1 m^3
111.1 X 1.05 = 116.7 m^3 at borrow pits

(2) V = 0,1053 X 1,000 = 105.3 m^3
105.3 m^3 X 1.05 = 110.6 at quarry sites

(3) Leveling with grader

$\frac{1,000}{500}$ = 2 hours

2 hours X (local) 6,404 = Rp 12,810
(foreign) 7,914 = Rp 15,830

(4) Spreading soil with grader

$\frac{111,1}{24}$ = 4.63 hours

4.63 hours X (local) 6,404 = Rp 29,650
(foreign) 7,914 = Rp 36,640

(5) Compaction soil with tire roller

$\frac{111.1}{43}$ = 2.58 hours

2.58 hours X (local) 5,633 = Rp 14,530
(foreign) 6,605 = Rp 17,040

(6) Control of moisture with water tank

4.0 hours X (local) 3,299 = Rp 13,196
(foreign) 3,024 = Rp 12,096

(7) Spreading of aggregate with grader

$\frac{105.3}{26}$ = 4.05 hours

4.05 hours X (local) 6,404 = Rp 25,946
(foreign) 7,914 = Rp 32,050

(8) Compaction of aggregate with tire roller

$\frac{105.3}{43}$ = 2.45 hours

2.45 hours X (local) 5,633 = Rp 13,800
(foriegn) 6,605 = Rp 16,180

(9) Fuel Tank Truck

4.0 hours X (local) 3,367 = Rp 13,468
(foreign) 3,183 = Rp 12,732

(10) Foremen $2 \times \frac{2 + 4.63 + 1/2 \times 2.58 + 4.05 + 1/2 \times 2.45}{7} \times 1{,}500 = Rp\ 5{,}660$

(11) Labor $12 \times \frac{2 + 4.63 + 1/2 \times 2.58 + 4.05 + 1/2 \times 2.45}{7} \times 1{,}000 = Rp\ 22{,}630$

Total cost excluding material cost and shouldering per 1,000 m^2

Local 12,810 + 29,650 + 14,530 + 13,196 + 25,940 + 13,800 + 13,468 + 5,660 + 22,630 = Rp 151,684

Foreign 15,830 + 36,640 + 17,040 + 12,096 + 32,050 + 16,180 + 12,732 = Rp 142,568

Grand Total Rp 294,252

9. Construction Cost of Design Category (11)
excluding material cost and shouldering per 1,000 m^2

(surface type 1, 2 and 3 bearing capacity is insufficient)

same as Design Category (10) except volume of soil.

(1) $V_E = 0.2222 \times 1{,}000 = 222.2\ m^3$

$222.2 \times 1.05 = 233.3$

(2) $V = 105.3\ m^3$

$105.3 \times 1.05 = 116.7\ m^3$

(3) Leveling with grader

(Local) Rp 12,810

(Foreign) Rp 15,830

(4) Spreading soil with grader

$\frac{222.2}{48} = 4.63$ hours

(Local) Rp 23,650

(Foreign) Rp 36,640

(5) Compaction soil with tire roller

$\frac{222.2}{86}$ = 2.58 hours

(Local) Rp 14,530
(Foreign) Rp 17,040

(6) Control of moisture with water tank

4.0 hours X (local) 3,299 = Rp 13,196
(foreign) 3,024 = Rp 12,096

(7) Spreading aggregate with grader

(Local) Rp 25,940
(Foreign) Rp 32,050

(8) Compaction aggregate with tire roller

(Local) Rp 13,800
(Foreign) Rp 16,180
Rp 5,660

(9) Fuel Tank Truck

4.0 hours X (local) 3,367 = Rp 13,468
(foreign) 3,183 = Rp 12,732

(10) Foremen Rp 5,660

(11) Labor Rp 22,630

Total cost excluding material cost and shouldering per 1,000 m^2

Local Rp 151,684

Foreign Rp 142,568

Grand Total Rp 294,252

10. Construction cost of Fill (improvement of subgrade) per 1,000 m^2

(1) Vs = 0.2222 X 1,000 = 222.2 m^3
222.2 X 1.05 = 233.3 m^3 at borrow pit
233.3 X Rp 100/m^3 = Rp 23,330

(2) Loading cost of soil

wheel loader (including 5% loss)

$\frac{1 \times 1.05}{18.5\ m^3/h} = 0.0568$ hours/m^3

0.0568 X 233.3 X (local) 6,028 = Rp 79,880

(foreign) 7,056 = Rp 93,502

(3) Sreading with grader

222/24 = 9.26 hours

9.26 hours X (local) 6,404 = Rp 59,301

(foreign) 7,914 = Rp 73,284

(4) Compaction with tire roller

222.2/43 = 5.17 hours

5.17 hours X (local) 5,633 = Rp 29,123

(foreign) 6,605 = Rp 34,148

(5) Fuel Tank Truck

4.0 hours X (local) 3,367 = Rp 13,468

(foreign) 3,183 = Rp 12,732

(6) Foremen $2 \times \frac{9.26 + 1/2 \times 5.17}{7} \times 1{,}500$ = Rp 5,079

(7) Labor $12 \times \frac{9.26 + 1/2 \times 5.17}{7} \times 1{,}000$ = Rp 20,314

Total cost including material cost per 1,000 m^2

Local 23,330 + 79,880 + 59,301 + 29,123 + 13,468 + 5,079 + 20,314

= Rp 230,495 (Rp 1,037/m^3)

Foreign 93,502 + 73,284 + 34,148 + 12,732 = Rp 213,666 (Rp 962/m^3)

Grand Total Rp 444,161 (Rp 1,999/m^3)

11. Construction Cost of Shouldering per 1,000 m^2

(1) Vs = 0.0556 X 1,000 = 55.6 m^3

55.6 X 1.05 = 58.4 m^3 at borrow pit

58,4 X Rp 100/m^3 = Rp 5,840

(2) Loading cost of soil wheel loader (including 5% loss)

$\frac{1 \times 1.05}{18.5\ m^3/h}$ = 0.0568 hours/m^3

0.0568 X 58.4 X (local) 6,028 = Rp 19,996

(foreign) 7,056 = Rp 23,406

(3) Spreading with grader

$\frac{55.6}{24}$ = 2.32 hours

2.32 hours X (local) 6,404 = Rp 14,860

(foreign) 7,914 = Rp 18,360

(4) Compaction with tire roller

$\frac{55.6}{43}$ = 1.29 hours

1.29 hours X (local) 5,633 = Rp 7,270

(foreign) 6,605 = Rp 8,520

(5) Fuel Tank Truck

1.0 hours X (local) 3,367 = Rp 3,367

(foreign) 3,183 = Rp 3,183

(6) Foremen 1 X $\frac{2.32 + 1/2 \times 1.29}{7}$ = Rp 640

(7) Labor 6 X $\frac{2.32 + 1/2 \times 1.29}{7}$ = Rp 2,540

Total cost including material cost per 1,000 m^2

Local 5,840 + 19,996 + 14,860 + 7,270 + 3,367 + 640 + 2,540

= Rp 54,513 (Rp 980/m^3)

Foreign 23,406 + 18,360 + 8,520 + 3,183 = Rp 53,469 (Rp 962/m^3)

Grand Total Rp 107,982 (Rp 1,942/m^3)

12. Transportation cost of material per m^3 (cubic meter)

(1) Example

Soil - 5 Km Capacity = 1/2 (1.83 + 2.92) = 2.38 m^3/h

$$\frac{1}{2.83\ m^3/h} = 0.42 \text{ hours}$$

0.42 X (local) 2,791 = Rp 1172
(foreign) 1,830 = Rp 769

(per m^3)

Hauling Distance	Soil and Gravel			Crushed Stone		
	hours	cost	Rp	hours	cost	
5	$\frac{1}{2.36} = 0.424$	Local Foreign Total	1,183 776 1,959	$\frac{1}{2.59} = 0.394$	Local Foreign Total	1,100 721 1,821
10	$\frac{1}{1.36} = 0.735$	Local Foreign Total	2,051 1,345 3,396	$\frac{1}{1.42} = 0.704$	Local Foreign Total	1,965 1,288 3,253
15	$\frac{1}{0.96} = 1.042$	Local Foreign Total	2,908 1,907 4,815	$\frac{1}{0.98} = 1.020$	Local Foreign Total	2,847 1,867 4,714
20	$\frac{1}{0.74} = 1.351$	Local Foreign Total	3,771 2,472 5,243	$\frac{1}{0.76} = 1.316$	Local Foreign Total	3,673 2,408 6,081
25	$\frac{1}{0.60} = 1.667$	Local Foreign Total	4,653 3,051 7,704	$\frac{1}{0.61} = 1.639$	Local Local Total	4,574 2,999 7.573
30	$\frac{1}{0.51} = 1.961$	Local Foreign Total	5,473 3,589 9,062	$\frac{1}{0.51} = 1.961$	Local Foreign Total	5.473 3,589 9.062

13. Partial loading cost of river sand and gravel per m3 (cubic meter)

(1) Working time of wheel loader (with dozer work)

$\frac{1 \times 1.05}{21.6} = 0.0486$ hours 5% is loss

(2) Wheel loader

0.0486 X (local) 6,028 = Rp 293

(foreign) 7,056 = Rp 343

(3) Bulldozer

0.0486 X (local) 7,347 = Rp 357

(foreign) 10,334 = Rp 502

(4) Portable compressor 175 cfm

0.0486 X (local) 2,228 = Rp 108

(foreign) 1,733 = Rp 84

(5) Hand Hammer

2 X 0.0486 X (local) 563 = Rp 27

(foreign) 305 = Rp 15

(6) Fuel Tank Truck

0.0486 X 1/4 X (local) 3,367 = Rp 41

(foreign) 3,183 = Rp 39

(7) Bits and rods of hand hammer

(assuming 1/4 of river gravel is oversize requiring hand hammer)

bits $1 \times \frac{1/4}{250} = 0.001$ 0.001 X Rp 62,000 = Rp 62

rods $1 \times \frac{1/4}{350} = 0.00071$ 0.00071 X Rp 3,000 = Rp 2

(8) Foreman 1 $1 \times \frac{0.0486 \times 1,500}{7} = 10$

(9) Labor 6 $\times \frac{0.0486 \times 1,000}{7} = 42$

Total cost of partial crushing and loading cost of river and gravel per m^3

Local 293 + 357 + 108 + 27 + 41 + 10 + 42 = Rp 878

Foreign 343 + 502 + 84 + 15 + 39 + 62 + 2 = Rp 1,047

Grand Total 1,925 Rp/m^3

14. Crushing and loading and river stone per m^3 (cubic meter)

(1) Portable crusher (including 5% loss)

$\frac{1 \times 1.05}{20\ t/1.9\ t/m^3} = 0.0998$

0.0998 X (local) 7,190 = Rp 718

(foreign) 11,871 = Rp 1,185

(2) Bulldozer

0.0998 X (local) 7,337 = Rp 732

(foreign) 10,344 = Rp 1,032

(3) Wheel Loader

0.0998 X (local) 6,028 = Rp 602

(foreign) 7,056 = Rp 704

(4) Fuel Tank Truck

$\frac{1}{3}$ X 0.0998 X (local) 3,367 = Rp 336

(foreign) 3,183 = Rp 318

(5) Foreman 2 X $\frac{0.0998}{7}$ X 1,500 = Rp 43

(6) Labor 8 X $\frac{0.0998}{7}$ X 1,000 = Rp 114

(7) Temporary work Rp 200

Total cost pf crushing of river stone per m^3 (cubic meter)

Local 718 + 732 + 602 + 336 + 43 + 114 + 200 = Rp 2,745

Foreign 1,185 + 1,032 + 704 + 318 = Rp 3,239

Grand Total Rp 5,984

15. Crushing and loading of boulder or mountain rock per m^3 (cubic meter)

(1) Working time of pr rortable crusher (including 5% loss)

$$\frac{1 \times 1.05}{\frac{20t}{1.9t}/m^e} = 0.0998 \text{ hours}$$

0.0998 X (local) 7,190 = Rp 718

(foreign) 11,871 = Rp 1,185

(2) Bulldozer

0.0998 X (local) 7,337 = Rp 732

(foreign) 10,344 = Rp 1,032

(3) Wheel loader

0.0998 X (local) 6,028 = Rp 602

(foreign) 7,056 = Rp 704

(4) Portable compressor 250 cfm

0.0998 X (local) 3,035 = Rp 303

(foreign) 2,253 = Rp 225

(5) Leg Drill

2 X 0.0998 X (local) 610 = Rp 61

(foreign) 430 = Rp 43

(6) Hand hammer

2 X 0.0998 X (local) 563 = Rp 56

(foreign) 308 = Rp 31

(7) Fuel Tank Truck

1/3 X 0.0998 X (local) 3,367 = Rp 336

(foreign) 3,183 = Rp 318

(8) Dinamite and percussion cap

Dinamite 0.11 Kg/m^3 X 2,500 Rp/m^3 = Rp 275

Percussion cap 0.3 unit X 250 Rp/m^3 = Rp 75

(9) Bits and Rods

Bits 1/250 = 0.004 0.004 X Rp 62,000 = Rp 248

Rods 1/350 = 0.00286 0.00286 X Rp 3,000 = Rp 9

(10) Foreman $2 \times \frac{0.0998}{7} \times 1{,}500$ = Rp 43

(11) Labor $12 \times \frac{0.0998}{7} \times 1{,}000$ = Rp 171

(12) Temporary Rp 200

Total cost of crushing and loading of crushed stone per m^3 (cubic meter)

Local 718 + 732 + 602 + 303 + 61 + 56 + 336 + 275 + 75 + 43 + 171 + 200 = Rp 3,572

Foreign 1,185 + 1,032 + 704 + 225 + 43 + 31 + 318 + 248 + 9 = Rp 3,795

Grand Total Rp 7,367

16. Concrete pipe culvert (ϕ 80 cm)

(1) Concrete ; 3.14 X 0.9 X 0.1 = 0.2827 m^3/m

0.2827 X 18,500 Rp/m^3 = Rp 5,230.-

(2) Form ; 3.14 X (0.8 + 1.0) = 5.655 m^2/m

5.655 X 500 Rp/m^2 = Rp 2,828.-

(3) Reinforce bar ; 0.2827 m^3 X 40 kg/m^3 = 11.388 kg/m

11.388 X 180 Rp/kg = Rp 2,035.-

(4) Joint mortar ; 0.1 X 0.05 X 3.14 X 0.9 = 0.0141 m^3/m

0.0141 X 27,000 Rp/m^3 = Rp 381

(5) Excavation ; 1.4 X 1.7 X 1 = 2.38 m^3/m

2.38 X 1,000 Rp/m^3 = Rp 2,380

(6) Sand Bed ; 1.4 X 0.2 = 0.28 m^3/m

0.28 X 5,000 Rp/m^3 = Rp 1,400

(7) Back fill ; 1.4 X 1.7 - ¼ X 3.14 X 1^2 = 1.60 m^3/m

1.60 X 500 Rp/m^3 = Rp 800

(8) Pipe laying ;

Transportation (10 km)	150
Laying 4 labor X 1,000 =	4,000
	Rp 4,150

(9) Miscellaneous work (10%)

0.1 X (5,230 + 2,828 + 2,035 + 381 + 2,380 + 1,400 +800 + 4,150)

= 0.1 X 19,204 = Rp 1920

(10) Total Cost Rp 21,124.-

17. Maintenance Cost (per Km per year)

(1) Reshaping

a) Reshaping with Grader

3.5 m X 1,000 m / 1,500 m^2/h = 2.33 hours/Km (3 pass)

2.33 X 3 times/year = 7.0 hours/Km

7.0 X (local) 6,404 = Rp 44,828

(foreign) 7,914 = Rp 55,398

(2) Regravelling

Supply up gravel, 10 m^3/Km/year

a) Gravel 10 m^3 X 3,000 = Rp 30,000

b) Transportation cost (L = 5 km)

10 X (local) 1,142 = Rp 11,420

(foreign) 749 = Rp 7,490

c) Labor

1 X 30 days X 1,000 = Rp 30,000

d) Total cost

Local; 30,000 + 11,420 + 30,000 = Rp 71,420

Foreign; = Rp 7,490

Rp 78,910

(3) Shoulders and Drainage maintenance

a) Grass cutting on shoulders and sideditchs (3 to 4 times a year)

b) Cleaning and minor repair to roadsides, drains and culverts (4 times a year)

c) Embankment repair

Glanular borrow 5 m^3 X 2,000 = Rp 10,000

Labor 1 X 115 days X 1,000 = Rp 115,000

Local = Rp 125,000

(4) Total cost for maintenance

Local; 44,828 + 71,420 + 125,000 = Rp 241,248

Foreign; 55,398 + 7,490 = Rp 62,888

Total = Rp 304,136 Km/year

APPENDIX G-3 COST ESTIMATE OF MAIN SUPPORT WORK

COST ESTIMATES (TOTAL COST)

PROVINCE	KABUPATEN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELING (2) x (3) x 10^3Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3Rp.	(7) DITCHING (1)x29.2 x 10^3Rp.	(8) COST OF CULVERTS x 10^3Rp.	(9) TOTAL (4)+(6)+(7)+(8) x 10^3Rp.	(10) 10^6-Rp./km (9)/(1)x1,000	(11) (9)/(2) (Rp./m^2) 10^3Rp.
RIAU	Kampar	(3)	1,600	6,400	181	1,158	-	0	47	62	1,267	0.79	198
		(5)	5,980	24,650	506	12,473	-	0	175	233	12,881	2.14	523
		(6)	2,292	7,375	860	6,343	137	555	67	89	7,054	3.08	956
		(7)	108,731	321,258	962	309,050	6,059	24,539	3,175	4,241	341,005	3.14	1,061
		(8)	92,653	289,908	1,218	353,108	5,152	20,866	2,705	3,613	380,292	4.10	1,312
		(9)	2,125	6,375	1,195	7,618	118	478	62	83	8,241	3.88	1,293
		(10)	125	375	1,468	551	7	28	4	5	588	4.70	1,568
		Total	213,506	656,341		690,301	11,473	46,466	6,235	8,326	751,328	3.52	1,140
	Kepulauan Riau	(5)	28,205	118,569	558	66,162	-	-	824	1,213	68,199	2.42	575
		(6)	28,638	106,850	962	102,790	1,592	6,448	836	1,231	111,305	3.89	1,042
		(7)	75,619	269,036	1,076	289,483	4,204	17,026	2,208	3,252	311,969	4.13	1,160
		(8)	71,269	289,189	1,340	387,513	3,963	16,050	2,081	3,065	408,709	5.73	1,413
		(10)	20,763	78,248	1,571	122,928	1,154	4,674	606	893	129,101	6.22	1,650
		(11)	16,728	61,101	2,022	123,546	930	3,767	488	719	128,520	7.68	2,103
		Total	241,222	922,993		1,092,422	11,843	47,965	7,043	10,373	1,157,803	4.80	1,250
SUMATRA SELATAN	Lahat	(3)	3,900	13,300	208	2,766	-	-	114	335	3,215	0.82	242
		(4)	4,800	15,100	312	4,711	-	-	140	413	5,264	1.10	349
		(5)	2,767	11,300	586	6,622	-	-	81	238	6,941	2.51	614
		(6)	2,250	7,500	1,018	7,635	236	956	66	194	8,851	3.93	1,180
		(7)	31,731	127,430	1,137	144,888	2,219	8,987	927	2,729	157,531	4.96	1,236
		(8)	30,476	120,067	1,407	168,934	2,428	9,833	890	2,621	182,278	5.98	1,510
		(9)	40,840	157,990	1,433	226,400	2,088	8,456	1,193	3,512	239,561	5.87	1,516
		(10)	22,533	67,600	1,627	109,985	2,320	9,396	658	1,938	121,977	5.41	1,804
		Total	139,297	520,287		671,941	9,291	317,628	4,069	11,980	725,618	5.40	1,390
	O.K.I.	(5)	29	200	898	180	-	-	1	2	183	6.31	915
		(6)	4,723	24,334	1,642	39,956	326	1,320	138	279	41,693	8.83	1,713
		(7)	77,224	444,001	1,824	809,858	5,054	20,469	2,255	4,556	837,138	10.84	1,885
		(8)	104,712	542,276	2,149	1,165,351	5,843	23,664	3,058	6,178	1,198,251	11.44	2,210
		(10)	100	700	2,250	1,575	11	45	3	6	1,629	16.29	2,327
		Total	186,788	1,001,511		2,016,920	11,234	45,498	5,455	11,021	2,078,894	11.12	2,070

PROVINCE	KABUPATEN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELING (2) x (3) x 10^3Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3Rp.	(7) DITCHING (1)x2@.2 x 10^3Rp.	(8) COST OF CULVERTS x 10^3Rp.	(9) TOTAL (4)+(6)+ x 10^3Rp.	(10) 10^6 Rp./km (9)/(1)x1,000	(11) (9)/(2) Rp./m^2 10^3Rp.
SUMATERA SELATAN (continue)	O.K.U.	(4)	4,667	18,000	312	5,616	-	-	136	639	6,391	1.37	355
		(6)	12,000	36,000	1,018	36,648	2,002	8,108	350	1,644	46,750	3.90	1,299
		(7)	22,117	70,350	1,137	79,988	3,911	15,840	646	3,030	99,504	4.50	1,414
		(8)	86,592	375,575	1,407	528,434	9,328	37,778	2,528	11,863	580,603	6.71	1,554
		(9)	9,600	28,800	1,433	41,270	1,601	6,484	280	1,315	49,349	5.14	1,714
		Total	134,976	528,725		691,956	16,842	68,210	3,940	18,491	782,397	5.80	1,480
	LIOT	(3)	4,975	16,200	208	3,370	-	-	145	507	4,022	0.81	248
		(4)	6,394	25,075	312	7,823	-	-	187	652	8,662	1.35	345
		(5)	3,617	13,300	586	7,794	-	-	106	369	8,269	2.29	622
		(6)	9,396	32,950	1,018	33,543	884	3,580	274	958	38,355	4.08	1,164
		(7)	49,424	166,000	1,137	188,742	5,198	21,052	1,443	5,041	216,278	4.38	1,303
		(8)	39,181	134,625	1,407	189,417	3,913	15,848	1,144	3,996	210,405	5.37	1,563
		(9)	12,175	39,200	1,433	56,174	1,349	5,463	356	1,242	63,235	5.19	1,613
		(10)	3,321	11,250	1,627	18,304	264	1,069	97	339	19,809	5.96	1,760
		(11)	2,267	6,900	2,028	13,993	129	522	66	231	14,812	6.53	2,147
		Total	130,750	445,500		519,160	11,737	47,534	3,818	13,335	583,847	4.46	1,310
LAMPUNG	Lampung Utara	(6)	200,000	600,000	1,642	985,200	11,120	45,036	5,840	14,400	1,050,476	5.25	1,750
		(7)	11,517	38,600	1,824	70,406	1,525	6,176	336	829	77,747	6.75	2,014
		(8)	5,879	20,575	2,149	44,216	807	3,268	172	423	48,079	8.18	2,337
		(9)	5,132	16,365	2,369	38,769	753	3,050	150	370	42,339	8.25	2,587
		Total	222,528	675,540		1,138,591	14,205	57,530	6,498	16,022	1,218,641	5.47	1,800
	Lampung Selatan	(5)	2,884	8,650	586	5,069	-	-	84	317	5,470	1.90	632
		(6)	6,450	19,350	1,018	19,698	1,059	4,289	188	710	24,885	3.86	1,286
		(7)	34,843	104,525	1,137	188,845	5,678	22,996	1,017	3,833	146,691	4.21	1,403
		(9)	19,905	59,725	1,433	85,586	3,236	13,106	581	2,190	101,463	5.10	1,700
		(10)	83	250	1,627	407	14	57	2	9	475	5.72	1,900
		(11)	613	1,850	2,028	3,752	103	417	18	67	4,254	6.94	2,300
		Total	64,778	194,350		233,357	10,090	40,865	1,890	7,126	283,238	4.37	1,450

PROVINCE	KABUPATEN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELLING (2) x (3) x 10^3Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3Rp.	(7) DITCHING (1)x29.2 x 10^3Rp.	(8) COST OF CULVERTS x 10^3Rp.	(9) TOTAL (4)+(6)+ x 10^3Rp.	(10) 10^6 Rp./km (9)/(1)x1,000	(10) (9)/(1)x1.000 10^3Rp.
NUSA TENGGARA TIMUR	Manggarai	(3)	5,027	24,600	208	5,117	-	-	147	4,947	10,211	2.03	415
		(6)	9,045	38,355	1,018	39,045	503	2,037	264	8,900	50,246	5.56	1,310
		(7)	36,094	137,179	1,137	155,973	2,050	8,303	1,054	35,516	200,846	5.56	1,464
		(8)	41,723	152,484	1,407	214,545	2,320	9,396	1,218	41,055	266,214	6.38	1,746
		(9)	27,232	108,000	1,433	154,764	1,514	6,132	795	26,796	188,487	6.89	1,743
		(10)	4,093	17,328	1,627	28,193	253	1,025	120	4,028	33,366	8.15	1,926
		(11)	6,651	23,836	2,028	48,339	392	1,588	194	6,545	56,666	8.52	2,377
		Total	129,865	501,782		645,976	7,032	28,481	3,792	127,787	806,036	6.20	1,600
	Belu	(5)	4,666	21,000	586	12,306	-	-	136	1,059	13,501	2.89	643
		(6)	7,664	29,486	1,018	30,017	426	1,725	224	1,740	33,706	4.40	1,143
		(7)	42,591	154,789	1,137	175,995	3,146	12,741	1,244	9,668	199,648	4.69	1,290
		(8)	75,833	297,267	1,407	418,255	4,216	17,075	2,214	17,214	454,758	6.00	1,530
		(10)	19,789	66,811	1,627	108,701	1,656	6,707	578	4,492	120,478	6.09	1,803
		(11)	67,867	252,663	2,028	512,401	4,552	18,436	1,982	15,406	548,225	8.08	2,170
		Total	218,410	822,016		1,257,675	13,996	56,684	6,378	49,579	1,370,316	6.27	1,660
SULAWESI UTARA	Bolaang Mongondow	(3)	2,381	9,675	204	1,974	-	-	70	886	2,930	1.23	303
		(4)	600	1,800	307	553	-	-	18	223	794	1.32	441
		(5)	23,321	82,850	574	47,556	-	-	681	8,675	56,912	2.44	687
		(6)	24,747	83,095	997	82,846	1,794	7,266	723	9,206	100,041	4.04	1,204
		(7)	58,922	185,971	1,113	206,986	3,991	16,164	1,721	21,919	246,790	4.19	1,327
		(8)	105,211	321,572	1,381	444,091	5,935	24,037	3,072	39,138	510,338	4.85	1,587
		(9)	5,544	22,925	1,401	32,118	620	2,511	162	2,062	36,853	6.65	1,608
		(10)	1,507	5,825	1,605	9,349	108	437	44	561	10,391	6.90	1,784
		(11)	38,406	115,848	2,057	238,299	2,263	9,165	1,121	14,287	262,872	6.84	2,269
		Total	260,639	829,561		1,063,772	14,711	59,580	7,612	96,957	1,227,921	4.71	1,480
	Gorontalo	(5)	67,606	250,444	574	143,755	-	-	1,974	13,927	159,656	2.36	637
		(6)	62,595	199,248	997	198,650	3,480	14,094	1,828	12,893	227,467	3.63	1,142
		(7)	176,976	834,209	1,113	928,475	17,522	70,964	5,168	36,457	1,041,064	5.88	1,248
		(8)	372,268	1,344,634	1,381	1,856,940	22,778	92,251	10,870	76,687	2,036,748	5.47	1,515
		(9)	6,897	32,650	1,401	45,743	1,136	4,601	201	1,421	51,966	7.53	1,592
		(10)	3,483	10,450	1,605	16,772	410	1,661	102	717	19,252	5.53	1,842
		(11)	7,250	23,350	2,057	48,031	1,154	4,674	212	1,494	54,411	7.50	2,330
		Total	697,075	2,694,985		3,238,366	46,480	188,244	20,355	143,598	3,590,563	5.15	1,320

PROVINCE	KABUPATEN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELLING (2) x (3) x 10^3 Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3 Rp.	(7) DITCHING (1)x29.2 x 10^3 Rp.	(8) COST OF CULVERTS x 10^3 Rp.	(9) TOTAL (4)+(6)+ x 10^3 Rp.	(10) 10^6 Rp./km (9)/(1)x1,000	(11) (Rp./m^2) (9)/(2) 10^3 Rp.
SULAWESI SELATAN	Takalar	(4)	250	1,000	312	312	-	-	7	7	326	1.30	326
		(5)	5,161	22,600	586	13,244	-	-	151	145	13,540	2.20	560
		(6)	500	2,500	1,018	2,545	28	113	15	14	2,687	5.37	1,075
		(7)	52,590	197,271	1,137	224,297	3,777	15,297	1,536	1,473	242,603	4.61	1,230
		(8)	4,484	17,766	1,407	24,997	263	1,065	131	126	26,319	5.87	1,481
		(9)	6,000	24,000	1,433	34,392	667	2,701	175	168	37,436	6.24	1,560
		Total	68,985	265,137		299,787	4,735	19,176	2,015	1,933	322,911	4.68	1,210
	Bone	(4)	7,624	30,500	273	8,327	-	-	223	557	9,107	1.19	299
		(5)	7,618	30,475	506	15,420	-	-	222	556	16,198	2.13	532
		(6)	2,209	10,666	860	9,173	165	668	65	161	10,067	4.56	944
		(7)	77,956	314,475	962	302,525	12,163	49,260	2,276	5,691	359,752	4.61	1,144
		(8)	29,633	123,917	1,218	150,931	3,307	13,393	865	2,163	167,352	5.65	1,350
		(9)	16,866	74,100	1,195	88,550	1,827	7,399	492	1,231	97,672	5.79	1,318
		(10)	8,334	41,666	1,468	61,166	463	1,875	243	608	63,892	7.67	1,533
		(11)	13,000	65,000	1,919	124,735	1,112	4,504	380	949	130,568	10.04	2,009
		Total	163,240	690,799		760,827	19,037	77,099	4,766	11,916	854,608	5.23	1,230
	Sidrap	(3)	11,319	48,800	208	10,150	-	-	331	849	11,330	1.00	232
		(4)	3,069	12,750	312	3,978	-	-	90	230	4,298	1.40	337
		(5)	32,436	125,300	586	73,426	-	-	947	2,433	76,806	2.37	613
		(6)	37,569	126,396	1,018	128,671	2,551	10,332	1,097	2,818	142,918	3.80	1,130
		(7)	8,501	34,050	1,137	38,715	945	3,827	248	638	43,428	5.11	1,275
		(8)	13,212	50,138	1,407	70,544	1,149	4,653	386	991	76,574	5.80	1,527
		(9)	3,746	15,150	1,433	21,710	417	1,689	109	281	23,789	6.35	1,570
		(10)	16,485	53,581	1,627	87,176	1,069	4,329	481	1,236	93,222	5.65	1,740
		(11)	12,443	39,813	2,028	80,741	817	3,309	363	933	85,346	6.86	2,144
		Total	138,780	505,978		515,111	6,948	28,139	4,052	10,409	557,711	4.01	1,100

PROVINCE	KABUPATEN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELING (2) x (3) x 10^3 Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3 Rp.	(7) DITCHING (1)x29.2 x 10^3 Rp.	(8) COST OF CULVERTS x 10^3 Rp.	(9) TOTAL (4)+(6)+ x 10^3 Rp.	(10) 10^6 Rp./km (9)/(1) x 1,000	(11) (Rp./m^2) (9)/(2) 10^3 Rp.
SULAWESI SELATAN (continue)	Pinrang	(3)	713	2,906	208	604	-	-	21	68	693	0.97	238
		(4)	6,412	25,868	312	8,071	-	-	187	609	8,867	1.38	343
		(5)	1,480	9,645	586	5,652	-	-	43	141	5,836	3.94	605
		(6)	27,412	123,908	1,018	126,138	2,402	9,728	800	2,604	139,270	5.08	1,124
		(7)	12,453	55,014	1,137	62,551	1,282	5,192	364	1,183	69,290	5.56	1,260
		(8)	13,992	74,592	1,407	104,951	876	3,548	409	1,329	110,237	7.88	1,478
		(9)	12,859	52,075	1,433	74,623	1,243	5,043	375	1,222	81,254	6.32	1,560
		(10)	708	3,542	1,627	5,763	39	158	21	67	6,009	8.49	1,696
		Total	76,029	347,550		388,353	5,842	23,660	2,220	7,223	421,456	5.54	1,210
	Polmas	(3)	7,217	28,425	208	5,912	-	-	211	1,148	7,271	1.01	256
		(5)	15,552	81,425	586	47,715	-	-	434	2,473	50,642	3.26	622
		(6)	9,536	37,552	1,018	38,228	719	2,912	278	1,516	42,934	4.50	1,143
		(7)	23,614	102,421	1,137	116,453	1,980	8,019	690	3,755	128,917	5.46	1,259
		(8)	4,081	19,580	1,407	27,549	227	919	119	649	29,236	7.16	1,493
		(9)	3,389	12,925	1,433	18,522	359	1,454	99	539	20,614	6.08	1,595
		(10)	12,262	48,808	1,627	79,411	946	3,831	358	1,950	85,550	6.98	1,753
		(11)	5,389	20,925	2,028	42,436	403	1,632	157	857	45,082	8.37	2,154
		Total	81,040	352,061		376,226	4,634	18,767	2,366	12,887	410,246	5.06	1,160
	Enrekang	(4)	3,700	14,800	338	5,002	-	-	108	2,631	7,741	2.09	523
		(5)	16,688	58,554	637	37,299	-	-	487	11,865	49,651	2.98	848
		(6)	1,200	4,800	1,121	5,381	87	352	35	853	6,621	5.52	1,380
		(7)	9,854	32,317	1,250	40,396	561	2,272	288	7,006	49,962	5.07	1,546
		(8)	42,464	149,869	1,529	229,150	2,424	9,817	1,240	30,192	270,399	6.37	1,804
		(9)	5,125	20,500	1,587	32,534	476	1,928	150	3,644	38,256	7.46	1,866
		Total	79,031	280,840		349,762	3,548	14,369	2,308	56,191	422,630	5.34	1,500

PROVINCE	KABUPATTIN	DESIGN CATEGORY	(1) LENGTH (m)	(2) AREA (m^2)	(3) UNIT PRICE (Rp./m^2)	(4) GRAVELING (2) x (3) x 10^3 Rp.	(5) VS (m^3)	(6) SHOULDERING (5) x 4,050 x 10^3Rp.	(7) DITCHING (1)x29.2 x 10^3Rp.	(8) COST OF CULVERTS x 10^3Rp.	(9) TOTAL (4)+(6)+(7)+(8) x 10^3Rp.	(10) (9)/(1) (Rp./km) 10^6Rp	(11) (9)/(2) (Rp./m^2) 10^3Rp.
SULAWESI SELATAN (continue)	Jeneponto	(7)	30,000	137.000	1.137	155,769	2,613	10,583	876	6,120	173,348	5.78	1,265
		(8)	143,238	692,096	1,407	973,779	11,467	46,441	4,183	29,221	1,053,624	7.36	1,522
		Total	173,238	829,096		1,129,548	14,080	57,024	5,059	35,341	1,226,972	7.08	1,480
SULAWESI TENGGARA	Kendari	(3)	1,843	6,450	231	1,490	-		54	114	1,658	0.90	257
		(4)	1,929	6,750	347	2,342	-		56	120	2,518	1.31	373
		(5)	18,965	81,550	654	53,334	-		554	1,176	55,064	2.90	675
		(6)	17,346	74,673	1,155	86,247	980	3,969	507	1,075	91,798	5.29	1,230
		(7)	63,293	264,148	1,289	340,487	6,912	27,994	1,848	3,924	374,253	5.91	1,417
		(8)	141,880	625,566	1,570	982,139	8,988	36,401	4,143	8,797	1,031,480	7.27	1,649
		(9)	12,357	43,250	1,638	70,844	1,430	5,873	361	766	77,844	6.30	1,800
		(11)	103,000	449,000	2.215	994,535	5,727	23,194	3,008	6,386	1,027,123	9.97	2,288
		Total	360,613	1,551,387		2,531,418	24,057	97,431	10,531	22,358	2,661,738	7.40	1,710
	Buton	(5)	961	3,365	506	1,703	-		28	166	1,897	1.97	564
		(6)	1,115	3,900	860	3,354	62	251	33	193	3,831	3.44	982
		(7)	42,712	149,355	962	143,680	2,375	9,619	1,247	7,389	161,935	3.79	1,084
		(8)	52,878	185,080	1,218	225,427	2,940	11,907	1,544	9,148	248,026	4.69	1,340
		(9)	12,591	44,065	1,195	52,658	700	2,835	368	2,178	58,039	4.61	1,317
		(11)	202,186	707,650	1,919	1,357,980	11,242	45,530	5,904	34,978	1,444,392	7.14	2,041
		Total	312,443	1,093,415		1,784,802	17,319	70,142	9,124	54,052	1,918,120	6.13	1,750
	GRAND TOTAL		4,093,233	15,719,854		21,396,271	279,134	1,130,493	119,526	726,905	23,373,195	5.71	1,490
	Design Category	3	38,975	156,756							42,597	1.09	270
		4	39,445	151,643							53,968	1.36	360
		5	237,936	943,877							601,646	2.52	640
		6	466,687	1,568,938							2,180,955	4.67	1,390
		7	1,046,762	4,139,399							5,479,699	5.23	1,320
		8	1,471,659	5,826,776							9,289,922	6.31	1,590
		9	202,383	758,095							1,216,398	6.01	1,600
		10	113,586	406,434							705,739	6.21	1,740
		11	475,800	1,767,936							3,802,271	7.99	2,150

APPENDIX G-4. CONSULTING SERVICES

COST ESTIMATE OF CONSULTING SERVICES

I. JAPANESE YEN CURRENCY PORTION

Consulting Services (Expatriates)

COST OF THE SERVICE

1.	Professional Services (Fixed Costs)	¥180,816,000.-
2.	Direct Reimbursable Cost	¥7,948,000.-
3.	Contingency	¥31,236,000.-
	Total:	¥220,000,000.-

COST OF THE SERVICES

- BREAKDOWN -

	Yen
ENGINEERING COST	¥180,816,000.-

(1) Salaries (including overhead and engineering fees)

A. Expatriates

First Year (1981)

1. Project Manager ¥1,650,000.- x 12 m/m =	19,800,000.-
2. Senior Engineer ¥1,450,000.- x 12 m/m =	17,400,000.-
3. Civil Engineer ¥1,300,000.- x 4 x 6 months =	31,200,000.-
4. Equipment Engineer ¥1,300,000.- x 4 x 6 months =	31,200,000.-
Sub-total: 72.0 m/m	¥99,600,000.-

Second Year (1982)

1. Project Manager ¥1,749,000.- x 12 m/m =	20,988,000.-
2. Senior Engineer ¥1,537,000.- x 12 m/m =	18,444,000.-
Sub-total: 24.0 m/m	¥39,432,000.-

		Yen
Third Year (1983)		
1. Project Manager		
¥1,853,000.- x 12 m/m =		22,236,000.-
2. Senior Engineer		
¥1,629,000.- x 12 m/m =		19,548,000.-
Sub-total:	24.0 m/m	¥41,784,000.-
Expatriates Salaries Total:	120.0 m/m	¥180,816,000.-

DIRECT REIMBURSABLE COST ¥7,948,000.-

(1) Mobilization and Travel
(Tokyo - Jakarta)

a) Air Fare (Reimbursable at Cost)

Expatriates	
¥300,400.- c 12 times =	3,604,800.-
Dependants	
(over 12 years) ¥300,000.- x 5 times =	1,502,000.-
(less 12 years) ¥300,400.- x 3 times =	901,200.-
Sub-total:	¥6,008,000.-

b) Excess Baggages

(10 kgs per expatriates round-trip)	
¥2,000.- x 10 kgs x 12 times =	240,000.-
(Dependants: 30 kgs per family)	
¥2,000.- x 30 kgs x 2 families x 2 times =	240,000.-
Sub-total:	¥480,000.-

	Yen
c) Mobilization Costs including passport, visa, photo, inoculation, immigration formalities etc.	
¥73,000.- x 20 times =	1,460,000.-
DIRECT REIMBURSABLE COSTS TOTAL:	¥7,948,000.-

II. LOCAL RUPIAH CURRENCY PORTION

Consulting Services

COST OF THE SERVICES

1.	Professional Services	Rp.772,128,000.-
2.	Direct Reimbursable Cost	Rp.124,753,000.-
3.	Contingency	Rp.89,688,000.-
4.	Government Equipment	Rp.77,200,000.-
	Total:	Rp.1,063,769,000.-

Rupiah

ENGINEERING COST — Rp.772,128,000.-

(1) Local Staff (Salaries) — Rp.375,828,000.-

Position	First Year (1981)			Second Year (1982)			Third Year (1983)		
	R/M	M/M	Amount	R/M	M/M	Amount	R/M	M/M	Amount
1. Soil & Materials Engineer (4)	600	48	28,800	645	48	30,905	693	48	33,264
2. Mech/Work-shop Super-visor (4)	600	48	28,800	645	48	30,960	693	48	33,264
3. Quantity Surveyor (4)	600	48	28,800	645	48	30,960	693	48	33,264
4. Site Inspector (4)	400	48	19,200	430	48	20,640	462	48	22,176
5. Clerk/ Typist - A	110	12	1,320	118	12	1,416	126	12	1,512
6. Clerk/ Typist - B (4)	110	48	5,280	118	48	5,664	126	48	6,048
7. Driver - A	70	12	840	75	12	900	80	12	960
8. Driver - B (4)	70	48	3,360	75	48	3,600	80	48	3,840
Total		312	116,400		312	125,100		312	134,328

		Rupiah
(2)	Office Support, Staffing Housing at site and Report Preparation	
	a) Office Supporting Costs	Rp.144,000,000.-
	a-1 Communication Costs	
	Rp.500,000 x 36 months =	18,000,000.-
	a-2 Stationery Costs	
	Rp.500,000 x 36 months =	18,000,000.-
	a-3 Photo Copy Costs	
	Rp.1,000,000 x 36 months =	36,000,000.-
	a-4 Maintenance Costs	
	Office:	
	Rp.500,000 x 36 months =	18,000,000.-
	Vehicle (Fuel):	
	Rp.150,000 x 10 x 36 months =	54,000,000.-
	Sub-total:	Rp.144,000,000.-
(3)	Housing Allowance (Accommodation Expenses for Expatriates & Local Staff)	Rp.232,800,000.-
	Expatriates: Rp.500,000 x 120 months =	60,000,000.-
	Local Staff: Rp.300,000 x 192 months x 3 years =	172,800,000.-
	Sub-total:	Rp.232,800,000.-
(4)	Report Preparation (Monthly Progress Report etc.)	Rp.19,500,000.-
	Rp.150,000 x 5 x 6 months + Rp.100,000 x 5 x 30 months =	19,500,000.-
	ENGINEERING COSTS - TOTAL:	Rp.772,128,000.-

	Rupiah
DIRECT REIMBURSABLE COSTS	Rp.124,753,000.-
(1) Mobilization and Travel	Rp.17,420,000.-
a) Air Fare	Rp.15,600,000.-
a-1 Province of Sulawesi Selatan, Tenggara, Utara (Jakarta - Ujung Padang - Manado - Gorontalo - Kendari - Bau-bau)	8,500,000.-
a-2 Province of Sumatra Selatan and Riau (Jakarta - Palembang - Pakanbaru)	2,300,000.-
a-3 Province of Lampung (Jakarta - Tanjung Karang)	500,000.-
a-4 Province of Nusa Tenggara Timor (Flores) (Jakarta - Kupang - Ruteng)	4,300,000.-
Sub-total:	Rp.15,600,000.-
b) Excess baggages	Rp.1,820,000.-
20 kg per flight 364 Flight: 2 x 20 kg x Rp.550.- =	1,820,000.-
Sub-total:	Rp.1,820,000.-
Sub-total a) + b):	Rp.17,420,000.-

(2) Breakdown of OUT - OF - STATION ALLOWANCE (EXPATRIATE)

POSITION	M/M	Days / month	Total Trips	Rate (Rp.)	Total Amount(Rp.)
(A) ON DUTY IN THE PLACE OVER 60 Km					
1. Project Manager	36	5	180	25,000	4,500,000,-
2. Senior Engineer	36	5	180	25,000	4,500,000
3. Civil Engineer	24	3	72	10,000	720,000,-
4. Equipment Engineer	24	3	72	10,000	720,000
(B) ON DUTY IN THE PLACE OVER 30 Km					
1. Project Manager	36	-	-	-	0
2. Senior Engineer	36	-	-	-	0
3. Civil Engineer	24	6	144	10,000	1,440,000,-
4. Equipment Engineer	24	3	72	10,000	720,000,-
T O T A L :					Rp. 12,600,000,-

(3) Breakdown of OUT-OF-STATION ALLOWANCE (Local Staff)

Position	M/M	Days/Month	Total Trips	Rate (Rp.)	Total Amount (Rp.)
(A) ON DUTY IN THE PLACE-OVER 60 km					
1. Soils & Materials Engineer	144	3	432	15,000	6,480,000
2. Mechanical/Work shop Supervisor	144	1	144	15,000	2,160,000
3. Quantity Surveyor	144	2	288	15,000	4,320,000
4. Site Inspector	144	3	432	10,000	4,320,000
(B) ON DUTY IN THE PLACE-OVER 30 km					
1. Soils & Materials Engineer	144	3	432	15,000	6,480,000
2. Mechanical/Work shop Supervisor	144	1	144	15,000	2,160,000
3. Quantity Surveyor	144	2	288	15,000	4,320,000
4. Site Inspector	144	3	432	10,000	4,320,000
T O T A L :					34,560,000

(4) Breakdown of OUT-OF-BASE ALLOWANCE (Local Staff)

Position	M/M	Rate (Rp.)	Amount (Rp.)
1. Soils & Materials Engineer (4)	36	69,000	9,936,000
2. Mechanical/Workshop Supervisor (4)	36	69,000	9,936,000
3. Quantity Supervisory (4)	36	69,000	9,936,000
4. Site Inspector (4)	36	43,000	6,192,000
Total:			36,000,000

(5) Taxes — Rp.24,173,000.-

5.1. P.P.N. (±2.5%) Rp.872,708,000 x ±2.5% = Rp.21,818,000.-

5.2. Government Equipment Rp.94,200,000 x 2.5% = Rp.2,355,000.-

Sub-total: Rp.24,173,000.-

DIRECT REIMBURSABLE COSTS - TOTAL: Rp.124,753,000.-

CONTINGENCY

Rp.896,881,000 x 10% = Rp.89,688,000.-

	Rupiah
GOVERNMENT EQUIPMENT	Rp.77,200,000.-
a. Vehicles	
Jeep 8	40,000,000.-
Sedan 1	11,000,000.-
b. Office Desks & Chairs	
Each 26 sets	5,200,000.-
c. Electrical Tupewriter	
5 sets	5,000,000.-
d. Cabinet (Wooden & Steel)	
Each 10 sets	6,000,000.-
GOVERNMENT EQUIPMENT - TOTAL:	Rp.77,200,000.-

APPENDIX H ORGANIZATION CHART OF GOVERNMENT AGENCIES

APPENDIX H ORGANIZATION CHART OF GOVERNMENT AGENCIES

1. Central Government

Departement of Public Works,
Directorate General of Higways
The center of Education & Training, Public Works
Education & Training - Region V, in Ujung Pandang
The center of Equipment Management

2. Provincial of Government Level

Provincial Government Secretariat

D.P.U.P. (Sulawesi Selatan)
D.P.U.P. (Sulawesi Tenggara)
D.P.U.P. Division of Roads (Sulawesi Selatan)
D.P.U.P., District, Roads (Sulawesi Selatan)
D.P.U.P., Section (Sulawesi Tenggara, Kabupaten Kendari)
D.P.U.P., Section (Sulawesi Tenggara, Kabupaten Buton)

3. Kabupaten Government Level

Kabupaten Secretariat

D.P.U.K. (Sulawesi Selatan, Kabupaten Takalar)

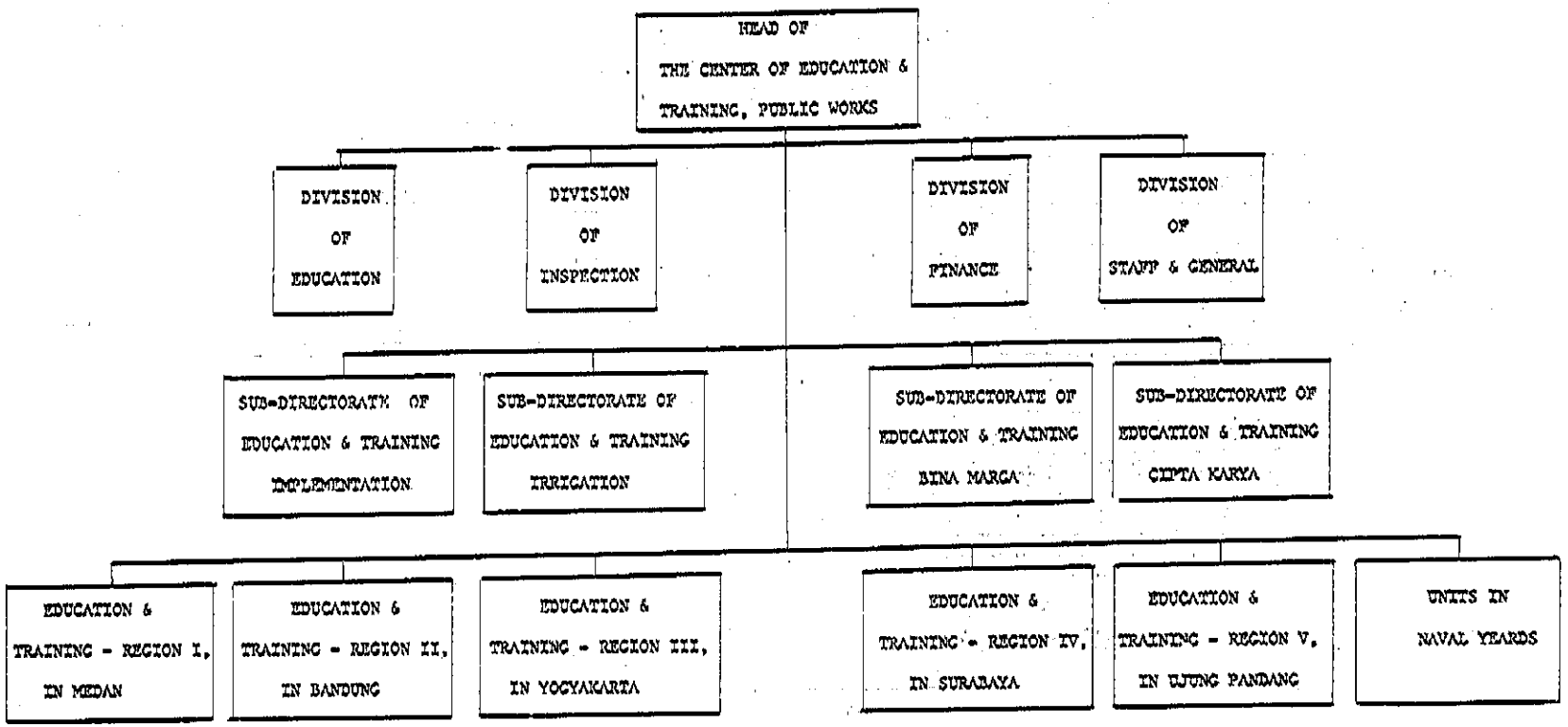
ORGANIZATION CHART
(DEPARTMENT OF PUBLIC WORKS)
MINISTER
SECRETARIAT GENERAL
INSPECTOR GENERAL
DIRECTORATE GENERAL WATER RESOURCES
DIRECTORATE GENERAL OF HIGHWAYS
DIRECTORATE GENERAL HOUSING AND BUILDING
THE CENTER OF RESEARCH AND DEVELOPMENT
THE CENTER OF EDUCATION AND TRAINING
THE CENTER OF DATA PREPARATION AND STATISTIC
EQUIPMENT MANAGEMENT CENTER
NATIONAL HOUSING CORPORATION
STATE ASPHALT CORPORATION
BUANA KARYA CORPORATION
REGIONAL PUBLIC WORKS PROVINCE
(D.P.U.P.)

ORGANIZATION CHART

(DIRECTORATE GENERAL OF HIGHWAYS)

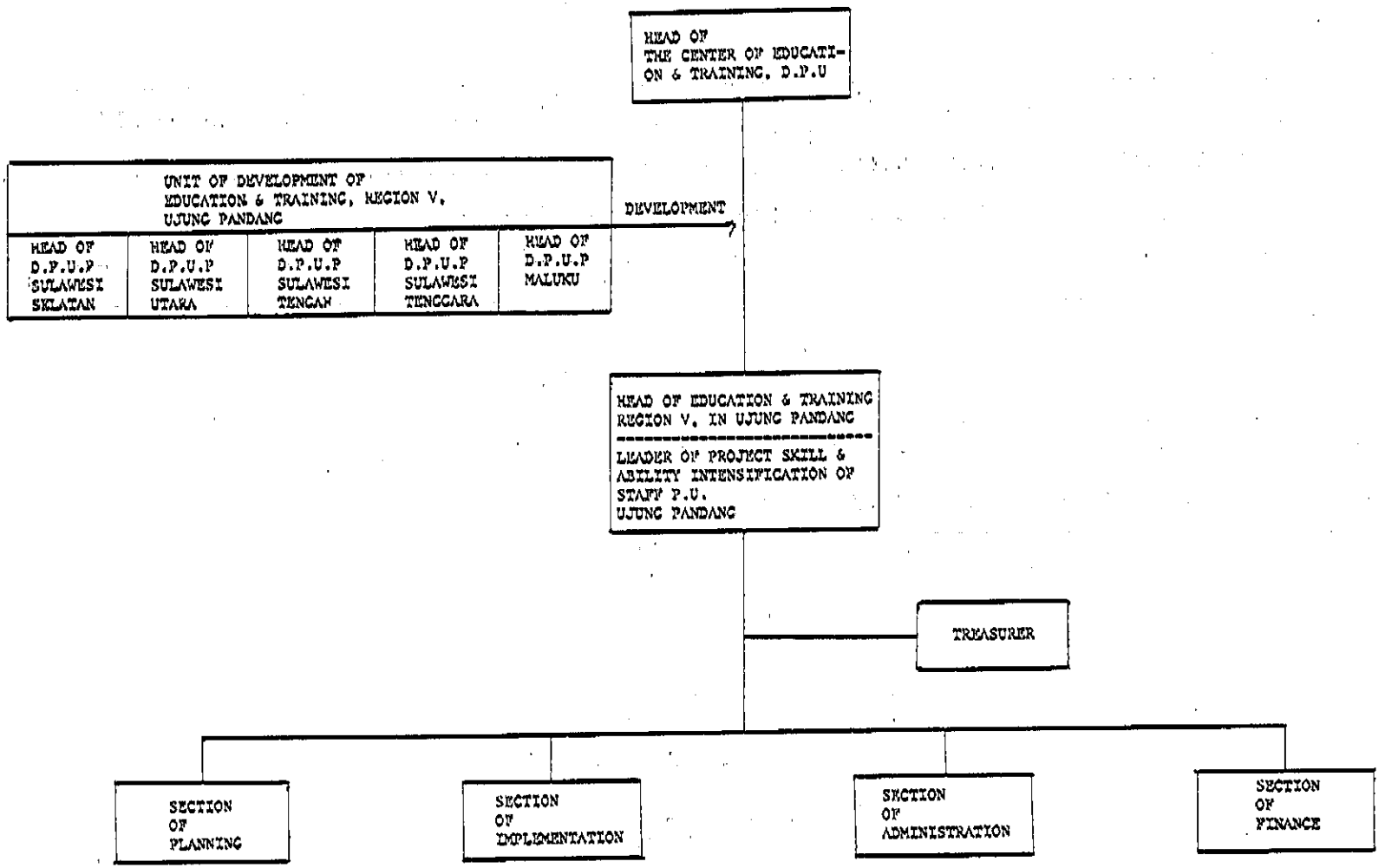
ORGANIZATION CHART

(THE CENTER OF EDUCATION & TRAINING, PUBLIC WORKS)

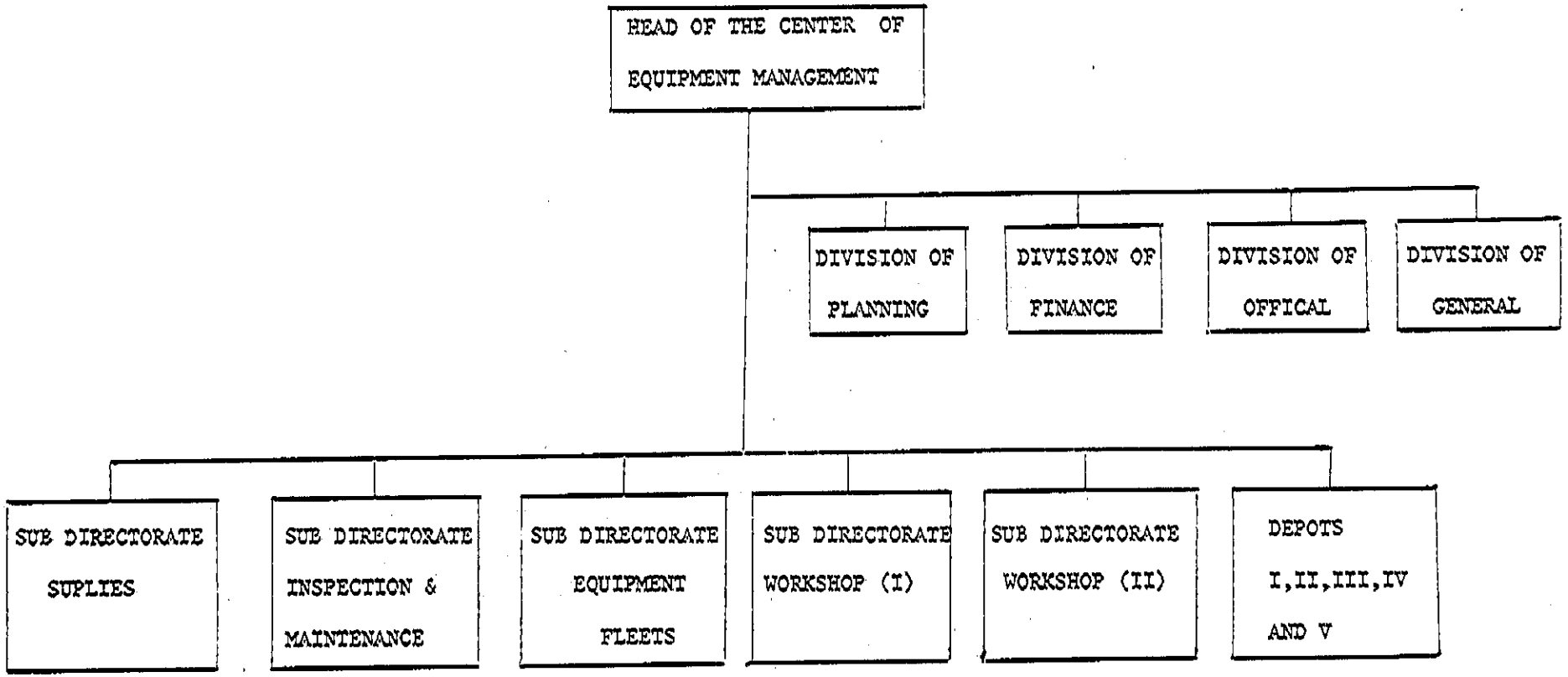


ORGANIZATION CHART

(EDUCATION & TRAINING-REGION V, IN UJUNG PANDANG)



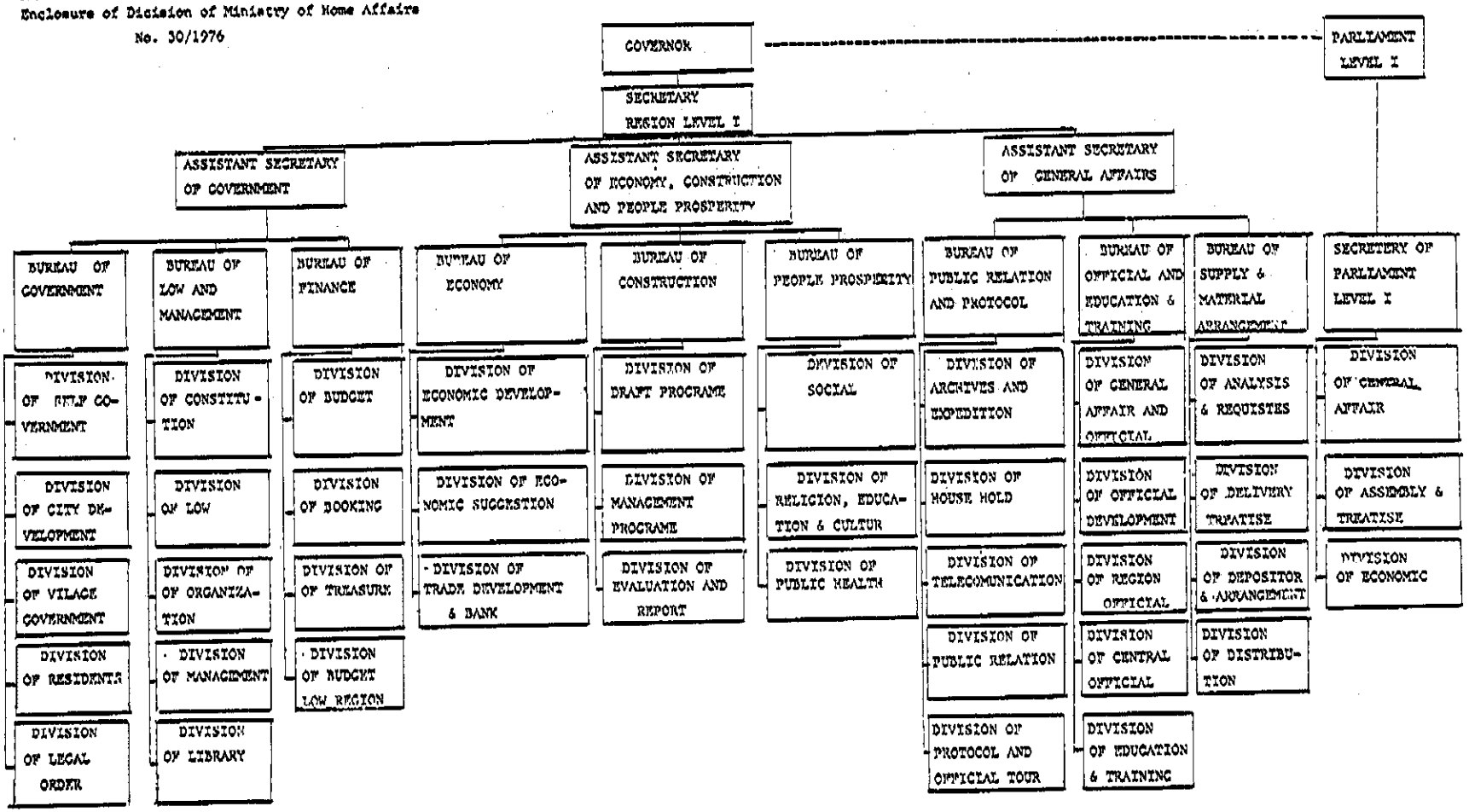
ORGANIZATION CHART
(THE CENTER OF EQUIPMENT MANAGEMENT)



ORGANIZATION CHART

(Provincial government, Secretariat of Local goverement level I)

Secretariat Daerah Local Government level I &
Secretariat Parliament Local Level I
Enclosure of Diciaion of Miniatry of Home Affairs
No. 30/1976

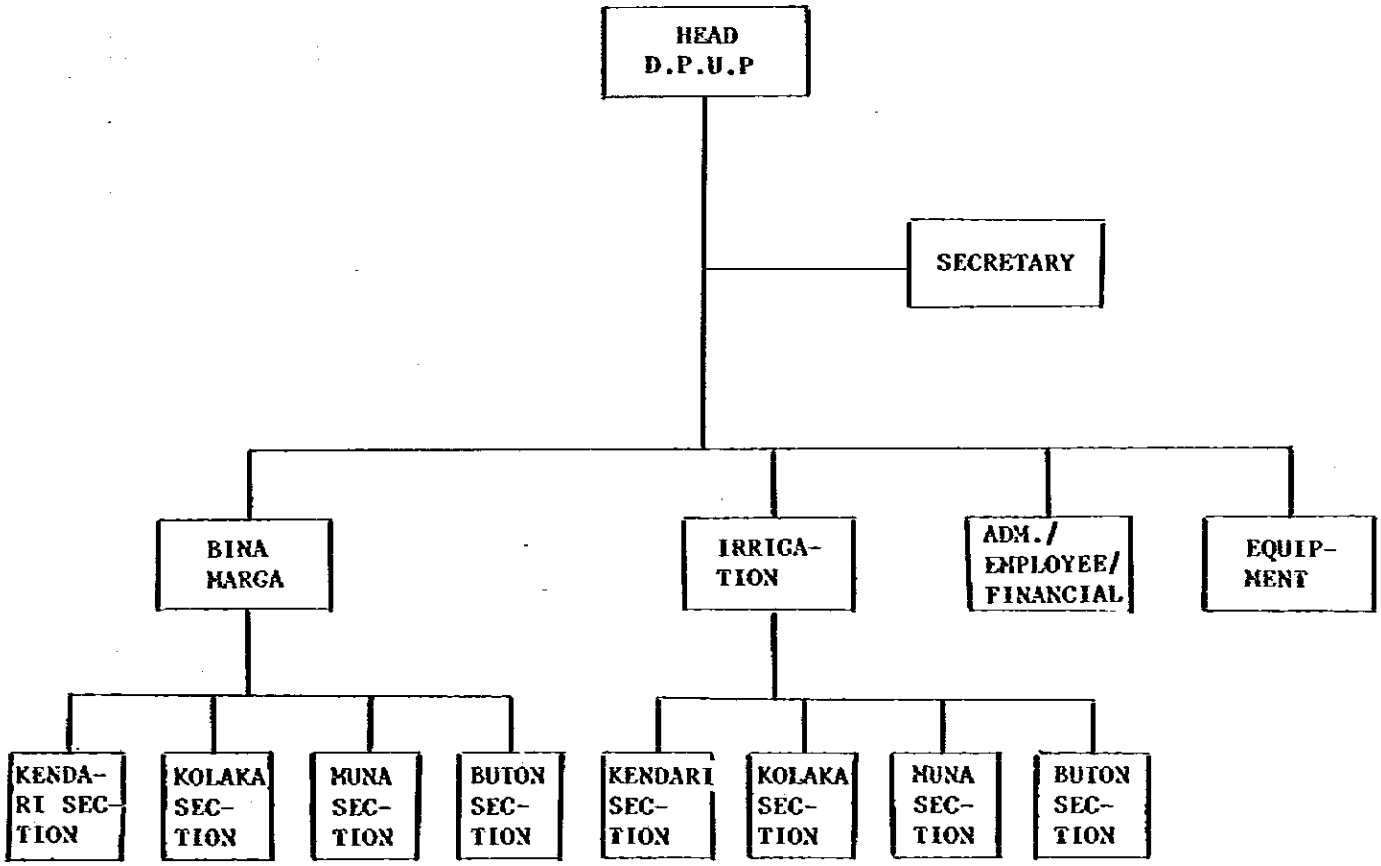


ORGANIZATION CHART
(D.P.U.P.)
PROVINCE : SULAWESI SELATAN
HEAD
D.P.U.P.
SECTION
SECRETARIAT
SUB SECTION
ADMINISTRATION
FINANCE
PERSONAL & ORGANIZATION
TECHNICAL EDUCATION
LEGAL/PUBLIC RELATION
SUPPLIES
SECTION
INTERNAL AUDIT
SUB SECTION
CONTROL & TECHNICAL EVALUATION ON
CONTROL & FINANCIAL EVALUATION
CONTROL & SECURITY EVALUATION
SECTION
PLANNING
SUB SECTION
PLANNING & PROGRAMMING
R.A.B
PHYSICAL PROGRESS REPORT
DIVISION MECHANICAL EQUIPMENT & SUPPLIES
SUB DIVISION
ADMINISTRATION
EQUIPMENT
SUPPLIES
DIVISION BUILDING
SUB SECTION
ADMINISTRATION
PLANNING
URBAN SANITARY
URBAN HOUSING
EXPLORITATION & MAINTENANCE
BUILDING RESEARCH
P.U.DISTRICT BUILDING
P.U SECTION BUILDING
DIVISION ROADS
SUB SECTION
ADMINISTRATION
PLANNING
CONSTRUCTION
MAINTENANCE
EQUIPMENT & SUPPLIES
ROAD RESEARCH
P.U.DISTRICT ROADS
P.U.DISTRICT ROADS
DIVISION IRRIGATION
SUB DIVISION
ADMINISTRATION
PLANNING
CONSTRUCTION
EXPLOITATION & MAINTENANCE
WATER RESEARCH
EQUIPMENT & SUPPLIES
P.U DISTRICT IRRIGATION
P.U.SECTION IRRIGATION
SECTION
SUB SECTION
DIVISION
SUB DIVISION

ORGANIZATION CHART
(D.P.U.P.)

PROVINCE:

SULAWESI TENGGARA



ORGANIZATION CHART

(D.P.U.P., DIVISION OF ROADS)

PROVINCE : SULAWESI SELATAN

HEAD OF SOUTH SULAWESI PROVINCIAL PUBLIC WORKS DEPARTMENT

HEAD OF DIVISION OF ROADS

SUB DIVISION OF ADMINISTRATION
- ADMINISTRATION & FINANCE
- PERSONNEL
- GENERAL AFFAIRS

SUB DIVISION OF PLANNING
- ROAD
- BRIDGE
- CONSTRUCTION

SUB DIVISION OF CONSTRUCTION
- ROAD CONSTRUCTION
- BRIDGE CONSTRUCTION

SUB DIVISION OF MAINTENANCE
- COST ACCOUNTING
- TECHNIQUE

SUB DIVISION OF EQUIPMENT & SUPPLIES
- PLANNING
- EVALUATION

SUB DIVISION OF ROADS RESEARCH
- GEO TECHNIQUE
- CONSTRUCTION
- ROAD TECHNIQUE

P.U. DISTRICT I-ROADS
- BARRU
- SIDRAP
- ENREKANG
- PINRANG
- ROKAS
- MAKASSAR/MAROS

P.U. DISTRICT II-ROADS
- BONE
- SOPPENG
- WAJO

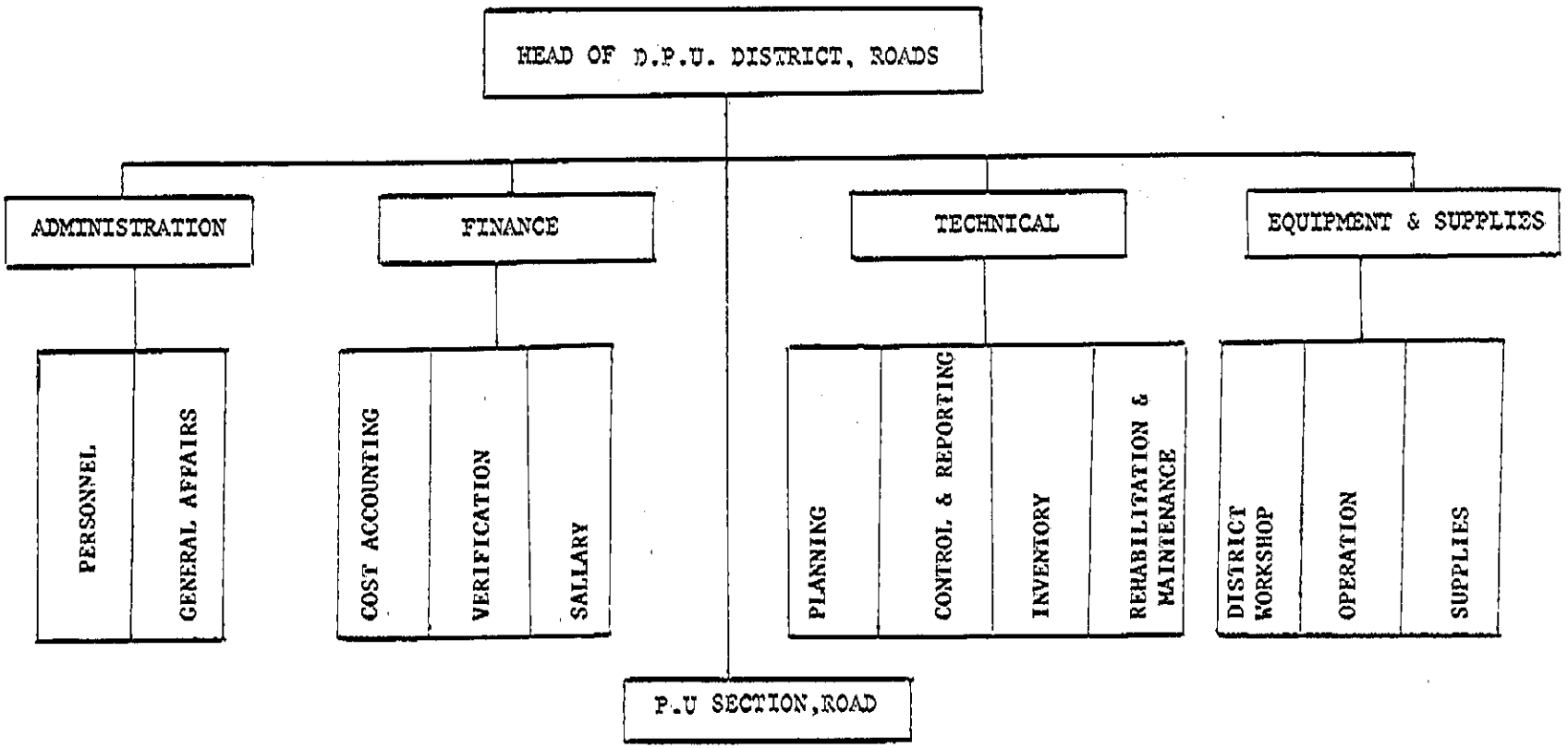
P.U. DISTRICT III-ROADS
- MAROS/PANGKEP
- GOWA/TAKALAR
- JENEPONTO
- BANTAENG/B.BULUKUMBA
- SINJAI

P.U. DISTRICT IV-ROADS
- TANA TORAJA
- LUWU UTARA
- LUWU SELATAN

ORGANIZATION CHART

(D.P.U. DISTRICT, ROADS)

PROVINCE : SULAWESI SELATAN

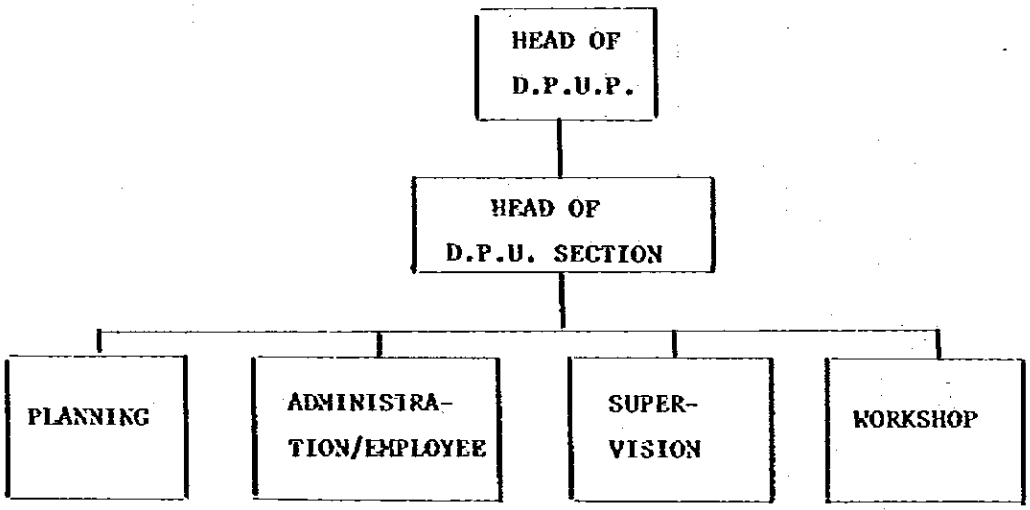


SULAWESI TENGGARA

KABUPATEN KENDARI

ORGANIZATION CHART

(D.P.U.P. SECTION)

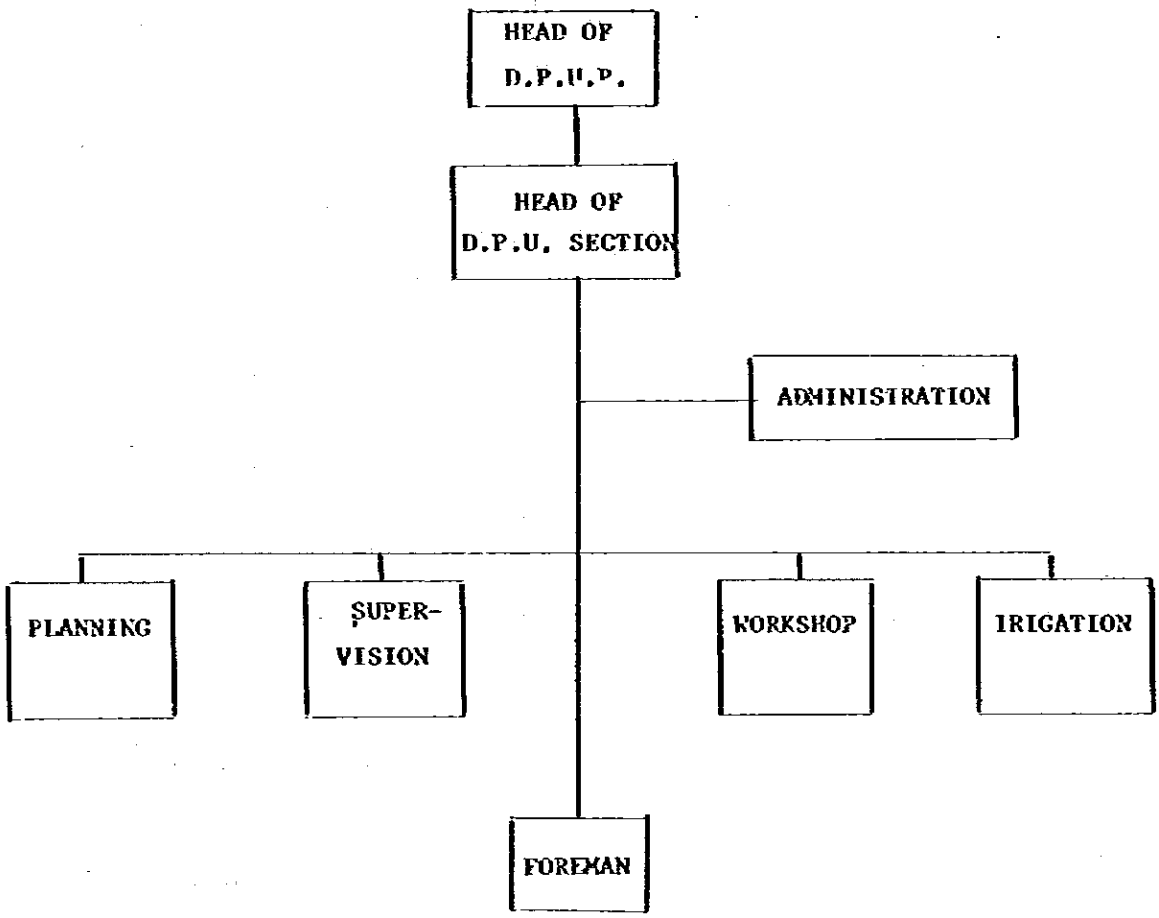


ORGANIZATION CHART

(D.P.U.P. SECTION)

SULAWESI TENGGARA

KABUPATEN BUTON

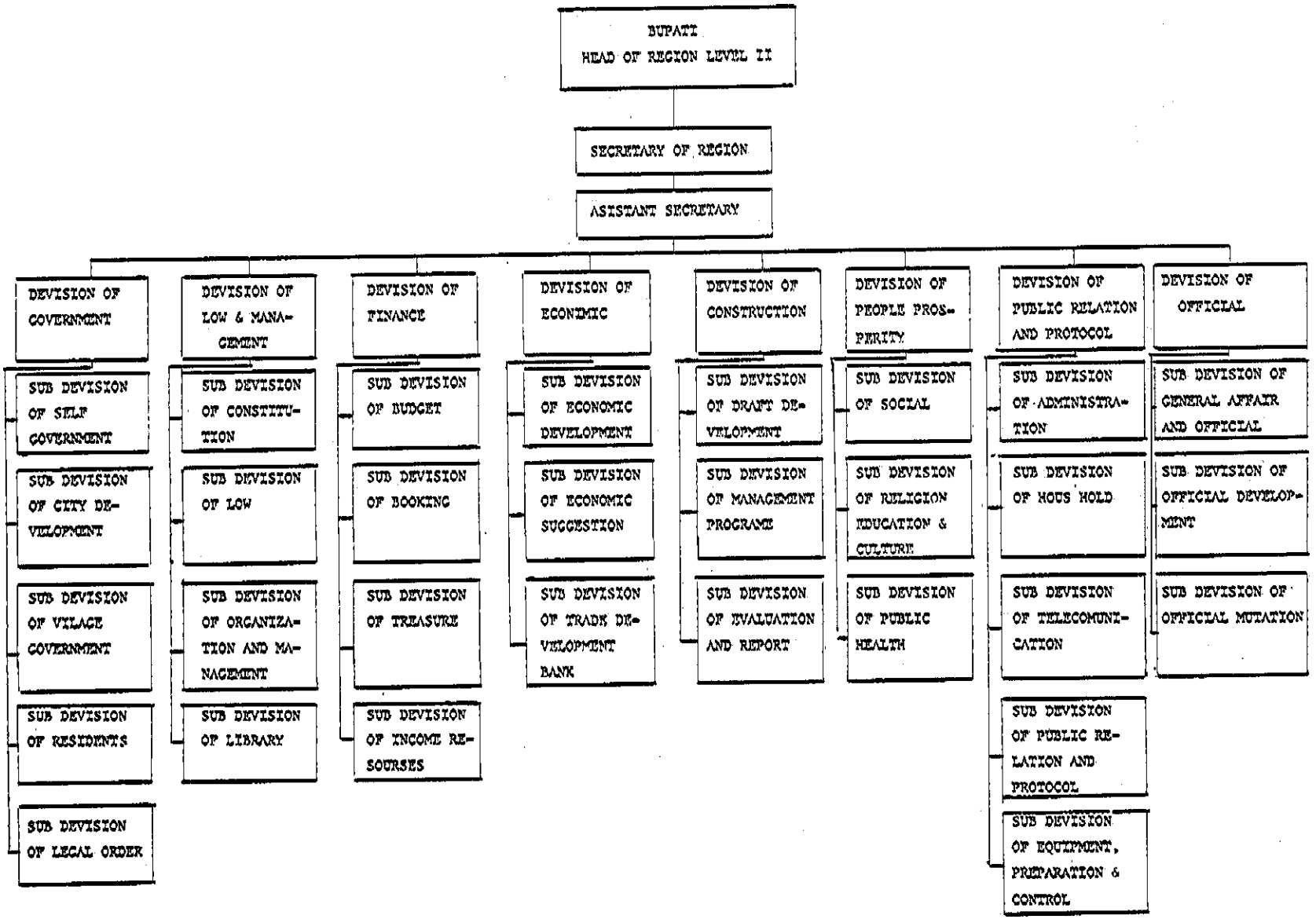


ORGANIZATION CHART

(Kabupaten Secretariat)

Province: Sulawesi Selatan

Kabupaten : Bone, Pinrang, Jeneponto.



ORGANIZATION CHART

(D.P.U.K.)

PROVINCE: SULAWESI SELATAN

KABUPATEN: TAKALAR