

**ANNEX 10**

**CASE STUDY**

**OF**

**TELECOMMUNICATION NETWORK IMPROVEMENT PLANS**

**FOR SAMPLE AREAS**



## Contents

	<u>Page</u>
1. Introduction .....	667
2. Survey Project Outline .....	668
3. Sample Area Selection .....	668
3-1 Jawa Tengah Province .....	668
3-2 Riau Province .....	669
4. Sample Area Field Surveys .....	669
4-1 Demand Investigation .....	670
4-2 Social and Economic Situation Investigation ...	670
4-3 Telecommunication Facilities Investigation ....	686
5. Demand Forecast, Traffic Forecast .....	695
5-1 Demand Forecast .....	695
5-2 Traffic Forecast .....	699
6. Applicable System, Network Configuration, Work Planning .....	700
6-1 Applicable System, Network Configuration .....	700
6-2 Work Planning .....	713
7. Construction Work Cost Estimate .....	715
8. Construction Work Execution Plan (draft) .....	717
9. Financial and Economic Analysis .....	720
10. ANNEX .....	727



## 1. Introduction

The Government of Indonesia has already carried out the national telecommunication network improvement and expansion plans three times since 1969, each as an integral part of the corresponding National Development Five-Year Plan. Since 1984, the fourth series of telecommunication network improvement and expansion plan is being carried out.

In spite of these plans and their implementation, the national telecommunication network is not yet improved and expanded to the extent it can satisfy the whole telephone demand. Especially in the rural areas, telecommunication systems are extremely underdeveloped so that, in the aspect of telephone service, the rural areas lag far behind the urban areas where telephone service is well developed.

The Government of Indonesia attaches utmost importance to rural telecommunication network improvement as one of key projects in the on-going fourth five-year telecommunication network improvement and expansion plan and further series to follow. For survey and planning aimed at the formulation of Master Plan, the Government of Indonesia requested the Government of Japan to provide assistance. In response, the Government of Japan dispatched a preliminary survey team to Indonesia in February 1984 and, through the team, arranged with competent authorities of Indonesia concerning Scope of Work of the main study. The agreement was reached.

## 2. Survey Project Outline

The main study coverage area consisted of the whole rural areas in Indonesia. For sample areas where to make case study, one area each was selected in Jawa Tengah Province and Riau Province. Furthermore, five Kabupatens were selected in the said two Provinces, where field surveys were carried out and work plans were studied.

The five Kabupatens selected are:

- Jawa Tengah Province
  - Kabupaten Cilacap
  - Kabupaten Banyumas
  - Kabupaten Purbalingga
  
- Riau Province
  - Kabupaten Kampar
  - Kabupaten Indragiri Hulu

## 3. Sample Area Selection

### 3-1 Jawa Tengah Province

For sample areas in Jawa Tengah Province, three Kabupatens, i.e., Cilacap, Banyumas and Purbalingga, were selected. Reasons for selection are:

- a) Cilacap faces Indian Ocean and holds port and harbor installations. It is designated as local development area.

Banyumas and Purbalingga are located in the mountain area. Both are distant from the Province capital. Industrial activity is not brisk.

- b) Kabupaten archives and Bupati comments disclose that the three Kabupatens are intimately interrelated socially and economically.

- c) In the telecommunication network configuration, all three Kabupatens belong to the same Primary Trunk Center (PTC) area. The status quo of telecommunication installations also indicate that the three Kabupatens constitute typical rural areas.

### 3-2 Riau Province

- a) The whole Province is sparsely populated. Urbanization is at a low level. There is much to expect from telecommunication role as public service.
- b) Kabupaten Indragiri Hulu is located in the remote area. It is the target area of transmigration policy of the Government. Infrastructure requires improvement. Desas are scattered along rivers.
- c) Kabupaten Kampar features long distance from Kabupaten capital, Bangkinang, to each Kecamatan capital. The average distance is 65 km. The distance to Kecamatan Tambusai is as long as 118 km. Thus the whole Kabupaten can be regarded as a typical rural area.

### 4. Sample Area Field Surveys

For 45 Kecamatans selected in the five Kabupatens of Cilacap, Banyumas, Purbalingga, Indragiri Hulu and Kampar, field surveys were carried out for a period of about three months from October 1984. Main items of field survey were the following three:

- a) Demand investigation
- b) Social and economic situation investigation
- c) Telecommunication facilities investigation

#### 4-1 Demand Investigation

Demand investigation results obtained by field surveys of 45 Kecamatans in five Kabupatens are:

Subscriber Category	Scope of Demand
Category PDA (Public Demand A) Telephone demand among government related organizations (including public telephones)	15 - 106
Category PDB (Public Demand B) Telephone demand among social service related organizations	3 - 38
Category ID (Industry and Shop Demand) Telephone demand among factories and shops	0 - 327
Category RD (Residence Demand) Demand for residence telephones	0 - 125

The interview formats for demand survey are shown in ANNEX 1 (1/2 - 2/2).

For further details, refer to ANNEX 2: Results of Demand Survey.

#### 4-2 Social and Economic Situation Investigation

##### 4-2-1 Objective and Methodology

Objective of social and economic situation investigation is to clarify the structure of communication in rural areas and to evaluate social and economic impact accruing to rural areas from introduction of telecommunication as a means of present-day communication.



Means of communication selection basically depends upon the level of social and economic activities. In this study, comparison is made for user cost required for utilization of communication media and calculation is made for the degree of cost reduction resulting from introduction of telecommunication system.

Methodology of investigation consisted of interviews with subscribers in Kecamatans with telephone facilities, chosen out of the five sample Kabupatens. Subscribers interviewed were of the following categories:

Administrative organizations:

Bupati/Camat/Desa

Social service organizations:

Clinics/Post Office/ High Schools/Village Cooperatives

Business organizations:

Large shops (drug stores)/large factories

Investigation by interview format is shown in ANNEX 3 - 5.

Information obtained by interviews is compiled in the succeeding Paragraphs.

#### 4-2-2 Social and Economic Situation

##### (1) Riau Province

Riau Province occupies the central part of Sumatera Island which faces Malaysia and Singapore across Malacca Straits. Total area is 94,562 m<sup>2</sup> or about 10% of the whole area of Indonesia.

Population numbers 2,169,000 as of 1980, occupying only 1.47% of the whole population of Indonesia.

Population density of 22.9/km<sup>2</sup> is considerably smaller than the national average of 160/km<sup>2</sup>.

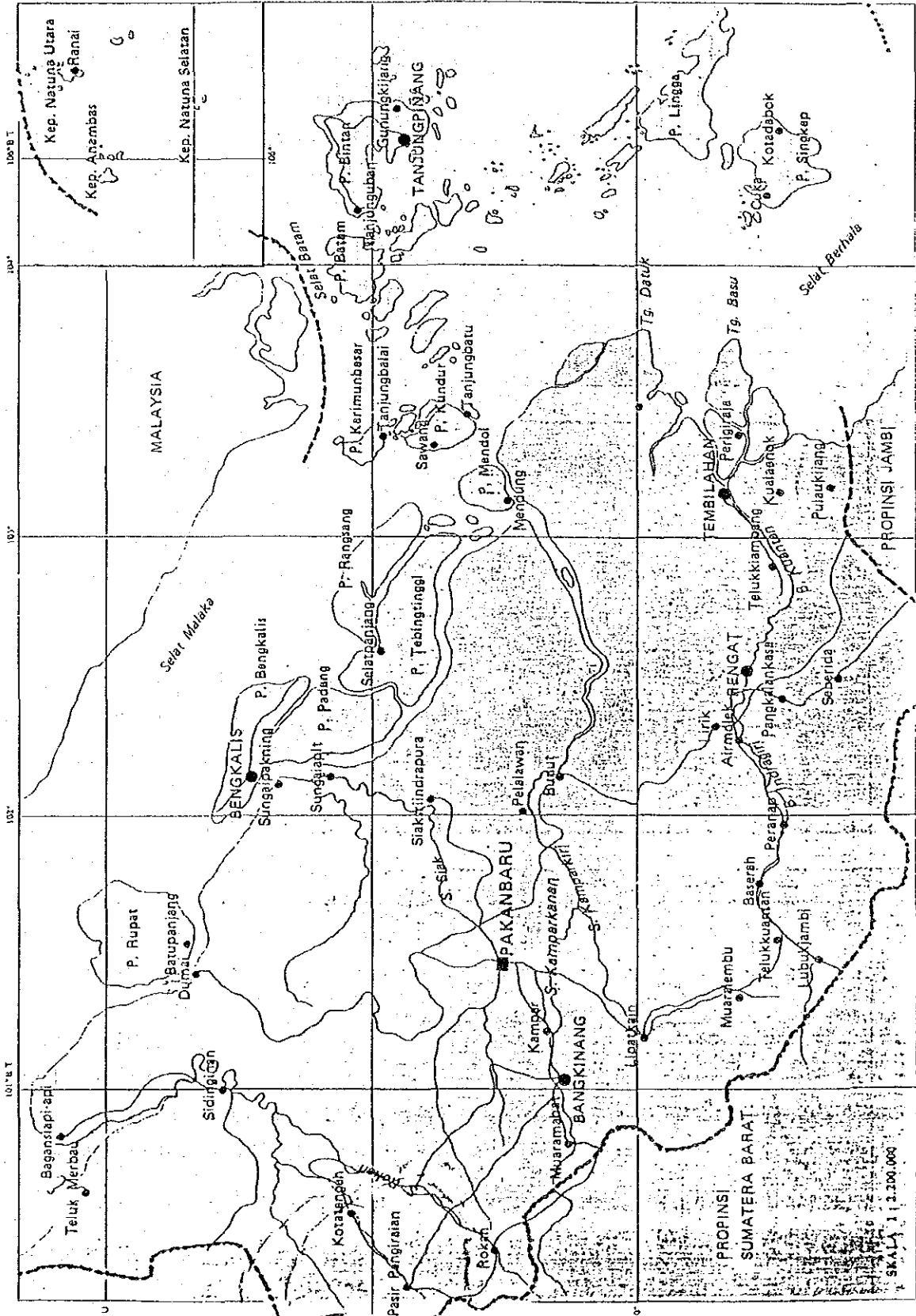
Riau Province is divided into five Kabupatens and one Kotamadya. It comprises 72 Kecamatans and 1,110 Desas. Outlines of Kabupaten Indragiri Hulu and Kabupaten Kampar, selected as sample areas, this time, are given in Table 1. Both Kabupatens are characterized by large size of each Kecamatan, hence small population density. For the whole of Riau Province, telephone diffusion is at the level of national average; however, in Kabupatens Indragiri Hulu and Kampar, the rate of telephone diffusion is especially low and the telephone system leaves large room for improvement. Especially so in Kabupaten Kampar. There, the average size of Kecamatan is so large that it is comparable to Kalimantan area.

The biggest industry in Riau Province is the petroleum industry. Crude oil production in Riau Province alone accounts for about 25% of the total production in Indonesia. GRDP of Riau Province as of 1980 occupies as much as 83% of the national total. GRDP per capita in 1980 amounts to 781,000 Rp., taking second place in the whole country. When the petroleum industry share is excluded, GRDP per capita in 1980 drops to 109,000 Rp., placing 10th in the national list. This fact shows that the industrial structure of Riau Province is essentially agriculture oriented.

In the on-going fourth National Development Five-Year Plan (PELITA IV), the economic growth rate in Riau Province is set at 6.0% in annual average, i.e., higher than the national average of about 5.0%. Development policy planks consist of road construction from each Kecamatan capital to each Desa, installation of communication media including post offices and telephone system, as well as construction of industrial, sanitation and education facilities.

Figure 1

PROPINSI RIAU



In the amount of development investment, Kabupaten Kampar takes the lead with 1,674,600 million Rp. or 29% of the total for the whole Province.

Development investment for Kabupaten Indragiri Hulu amounts to 751,600 million Rp. which account for 13% of the total.

(2) Jawa Tengah Province

Jawa Tengah Province is located in the central part of Jawa Island. Jakarta - Surabaya and Jakarta - Bandung - Jogjakarta land routes run in the Province. Total area is 34,531 km<sup>2</sup> which occupy 1.8% of the total national area of Indonesia. Population numbers 25,373,000 or 17.2% of the national total. Population density registers 735/km<sup>2</sup> which by far exceed the national average of 160/km<sup>2</sup>.

Jawa Tengah Province is divided into 29 Kabupatens and six Kotamadyas, and further into 490 Kecamatans and 8,456 Desas. General features of Cilacap, Banyumas and Purbalingga, the three Kabupatens selected as sample areas, are in Table 1. These three Kabupatens are about 150 km (in crow flight) distant from Semarang, the capital city of Jawa Tengah Province. All are located in the extreme southwest of the Province. Transmigration from Jawa Tengah to Sumatera and Kalimantan islands is in progress, causing the annual population growth rate in the Province to lower to 1.6% during 1971 through 1980. The population growth rate is especially low in Kabupaten Purbalingga located in the mountain region.



Table 1 Socio-Economic Indicator of Sample Area (1980)

	Kabupaten	Ibukota	Area ( km <sup>2</sup> )	Population (Person)	Density (Perkm <sup>2</sup> )	No. of Kecamatan	No. of Desa	Clow Dis. from Capital	Pop Growth Rate 71-80	Size of Kecamatan ( km <sup>2</sup> )	Telephone Density
Riau	Indragiri Hulu Kampar	Rengat Bankinang	15.854 28.292	245.322 394.045	15 14	9 15	292 211	156 50	1.67 3.79	1761.6 1886.1	0.1 0.01
Province	Pekanbalu	—	94.561	2.169.000	24	72	1.110	—	3.11	1.313.4	0.24
Java Tengah	Cilacap Banyumas Purbalingga	Cilacap Purwokerto Purbalingga	2.335 1.311 767	1.333.395 1.225.471 666.145	571 935 869	17 24 13	214 328 237	175 140 125	1.28 1.78 1.42	137.4 54.0 59.0	0.08 0.15 0.05
Province	Semarang	—	34.521	25.372.889	735	490	8456	—	1.64	43.0	0.16
Indonesia	—	—	1.919.443	147.470.300	160	3.420	64.680	—	2.32	561	0.25

Real GRDP per capita as of 1980 amounts to 69,000 Rp. With this, Jawa Tengah Province ranks 22nd out of all 25 Provinces. The average annual growth rate during 1976 through 1980 is also low at 6.0%. In PELITA IV, GRDP per capita growth rate is planned to be 10.6% (nominal) in annual average. When the inflation rate is set at 8%, the planned growth rate is reduced to 2.6% in real terms. This growth rate is lower than the national average.

As for GRDP per capita among the three sample Kabupatens Cilacap leads with 71,763 Rp. Banyumas places second with 56,385 Rp. and Purbalingga third with 49,330 Rp. Annual growth rates from 1975 forward are 5.2% for Cilacap, 6.4% for Banyumas and 5.8% for Purbalingga.

#### 4-2-3 Communication Structure

In the sample areas, the following media are used for bothway communication:

- Private Means of Transportation used by people to exchange information (Mobile)
- Public Means of Transportation (Public Bus)
- Mail
- Telegram
- H.F. Radio (S.S.B.)
- Telephone
- Traditional Means of Exchanging information (Boat, Foot)

How these media are used are shown in average modes and classified by types of users in Figure 3 through Figure 7. Characteristics of each communication category are described below.

(1) Administrative Organizations

In Riau Province, High Frequency (S.S.B.) is most commonly used as means of communication. Kecamatan Office are without telephone. Conversely, in Jawa Tengah Province, each Kecamatan Office is equipped with at least one telephone and High Frequency is less used.

In Riau Province, the distance between Kabupaten capital, on one hand, and Kecamatan capital and Desa center, on the other, is long, and covering this distance requires much time. In the areas where road construction is delayed, the need for communication media is great.

The other parties of communication are limited to the inside of each organization. Change in this communication architecture is seldom seen. As each organization grows in scale, geographical distance to the other parties of communication is expected to shorten.

(2) Social Service Organizations

Medical organizations elsewhere than the Kabupaten capital use automobiles only. In Riau Province, inhabitants must proceed to Kecamatan and Kabupaten capitals to do business in almost all cases. Hence limited accessibility to communication media. In case of emergency, High Frequency Radio system installed in each Kecamatan Office is utilized.

In Jawa Tengah Province, Subscriber Unit is installed in each Desa Office. Distance between Desa Office and inhabitants is short. Improvement of communication media to Desa center is the immediate requirement.



In the educational field, primary and middle schools are established on Desa base. High schools are established on Desa base. High schools are established in Kabupaten and Kecamatan capitals. Communication media consist of correspondence by manpower in many cases. Communication is limited to communication between schools and communication to/from Education Division of Province Office.

(3) Business Organizations

In Jawa Tengah Province, wholesalers themselves take care of physical distribution, whereas in Riau Province, shop owners must personally proceed to the marketplace to purchase products they deal in.

The other parties of communication are widely scattered, some located in nearby big cities and some as far as Jakarta. Users change parties with whom they communicate in consideration of service charge variations.

As commercial activities pull up momentum, the number of times of communication to/from big cities is bound to increase.

Breakdown of telephone subscribers in the sample areas, as well as the number of interlocal calls and their shares in call charges by zone, appears in Table 2.

Data in this table show that in Purwokerto (Kabupaten capital) and Pekanbaru (Kotamadya), both located in urban areas, the subscriber breakdown is almost the same, and when Purwokerto is compared with Bankinang and Rengat as Kabupaten capitals in Riau Province, the number of administrative organization subscribers is larger in the former than in the latter two.

Furthermore, trends are that the smaller the share of administrative organization subscribers in the total number of subscribers, the greater the share of long distance calls in the classification of calls.

Table 2 No. of Existing Subscribers by Categories in Sample Area (1983)

Name of Kabupaten	Total sub	Share Total			Interlocal			Share Total (%)			Call/Sub/ Month
		Adm.	Social	Business	Resident	Call/month	0-25km	25-100km	100-200km	200-300km	
Java Tengah											
Maos	20	25	0	3.5	40	579	80				29
Kroya	80	7.5	1.3	7.5	83.7	820	30	28			10
Majenang	189	10	1.6	4.2	84.2	1508	5	36			8
Kuluwung	20	15	0	15	70	1022	12	25			51
Banyumas	840	2.1	2.1	33.2	62.6	1067	79				1
Sokaraja	69	10.1	0	15.9	74	470		14	60		7
Purbalingga	284	22.9	4.9	7.7	64.5	3278	50	8	13		12
Riau											
Bankinang	77	49.4	13	10.4	27.2	525		82	12		7
Taluk Kuantan	161	7.5	4.4	23.6	64.5	108			87		0.7
Air Molek	24	16.7	16.7	16.7	49.9	51		49	27		2
Rengat	108	51.9	5.6	14.8	27.7	964		10	43		9
Purwokerto	2.069	18.2	3.4	18.2	60.2	-		-	-		-
Pekanbalu	2.528	18.4	3.7	17.9	60.0	-		-	-		-

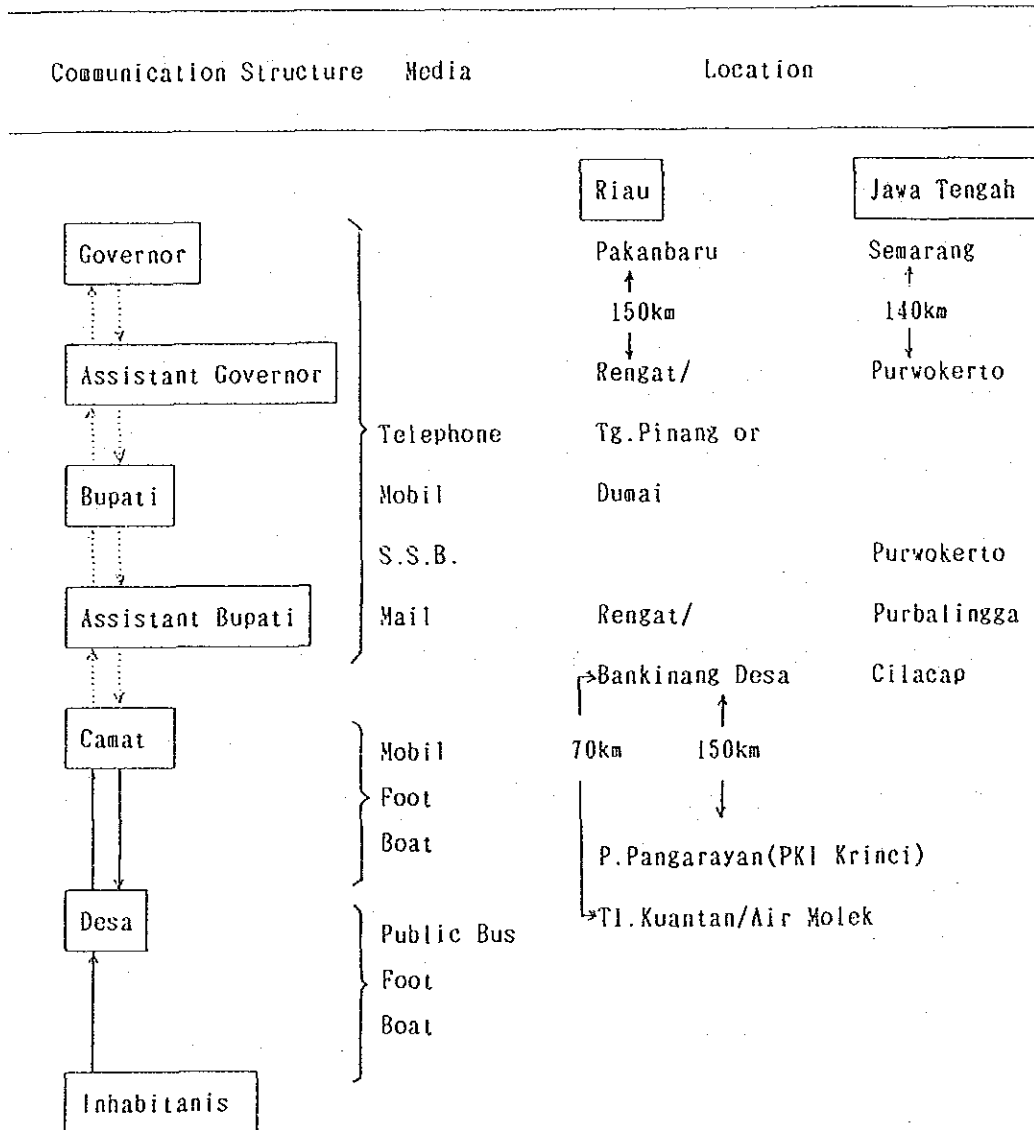


Figure 3 The Current Communication Structure of Administration Office

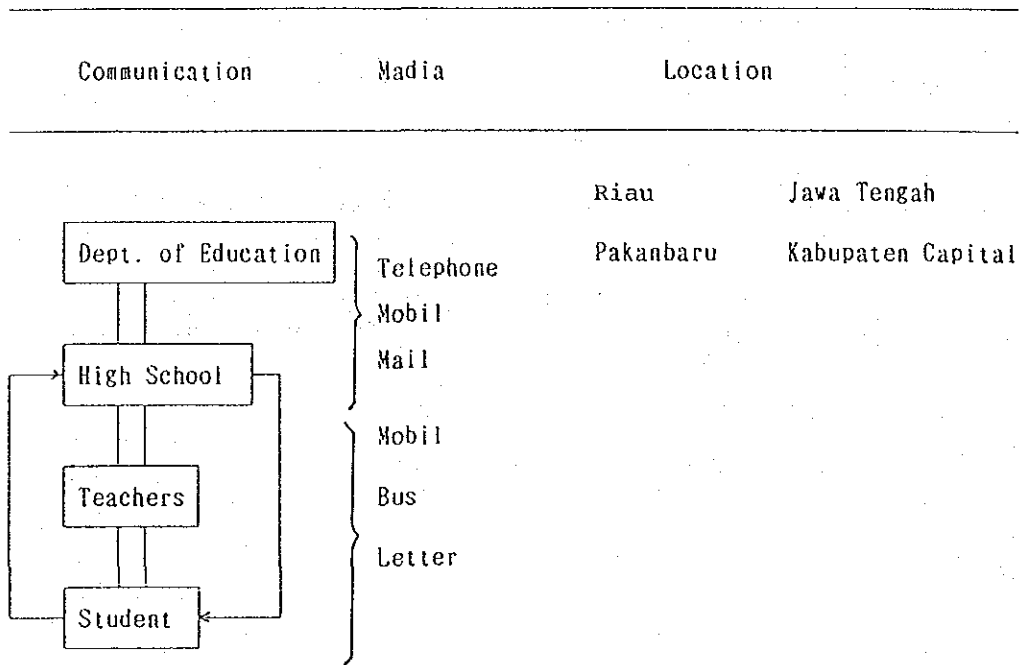


Figure 4. The Current Communication Structure of School

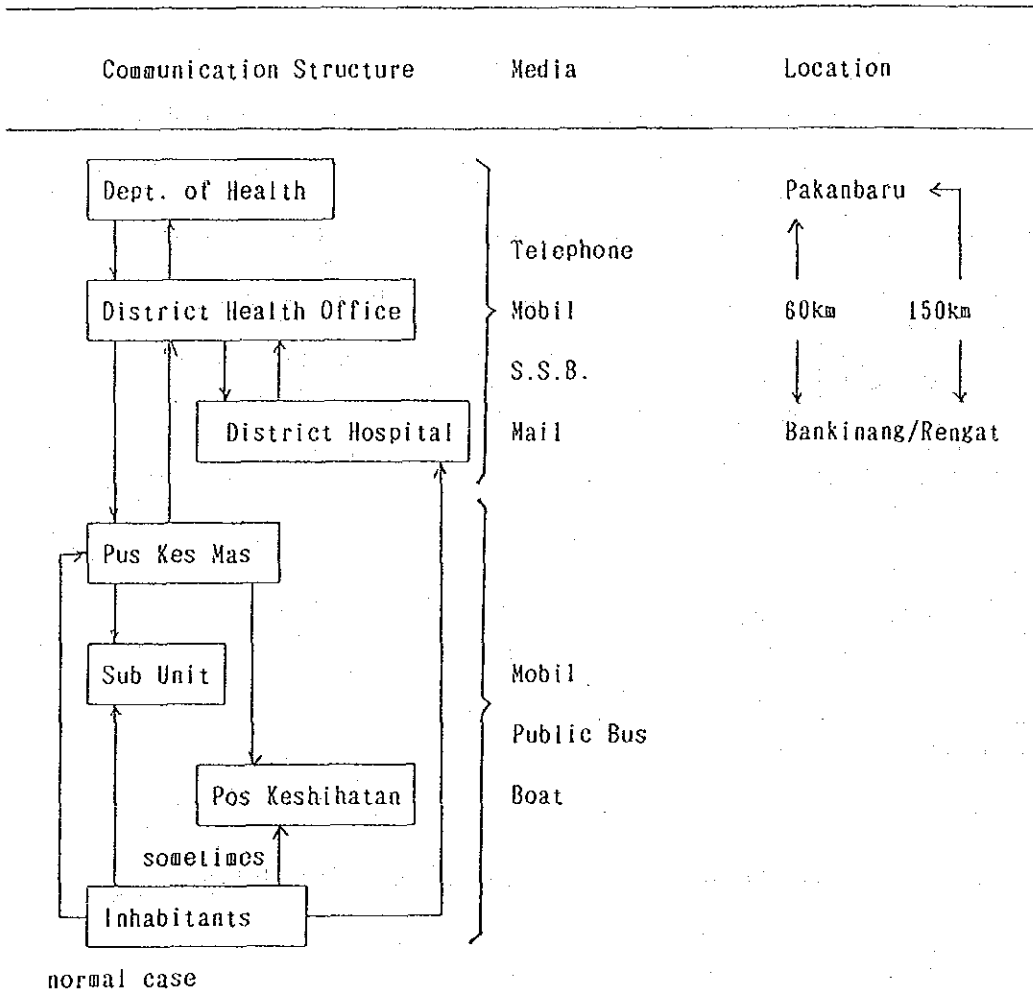


Figure 5 The Current Communication Structure of Health Office

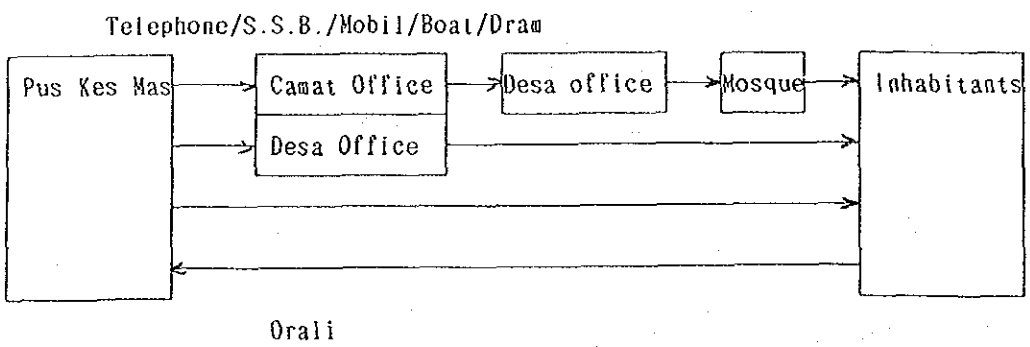


Figure 6 The Current Communication Structure of Haelth Office ( Emergency Case )

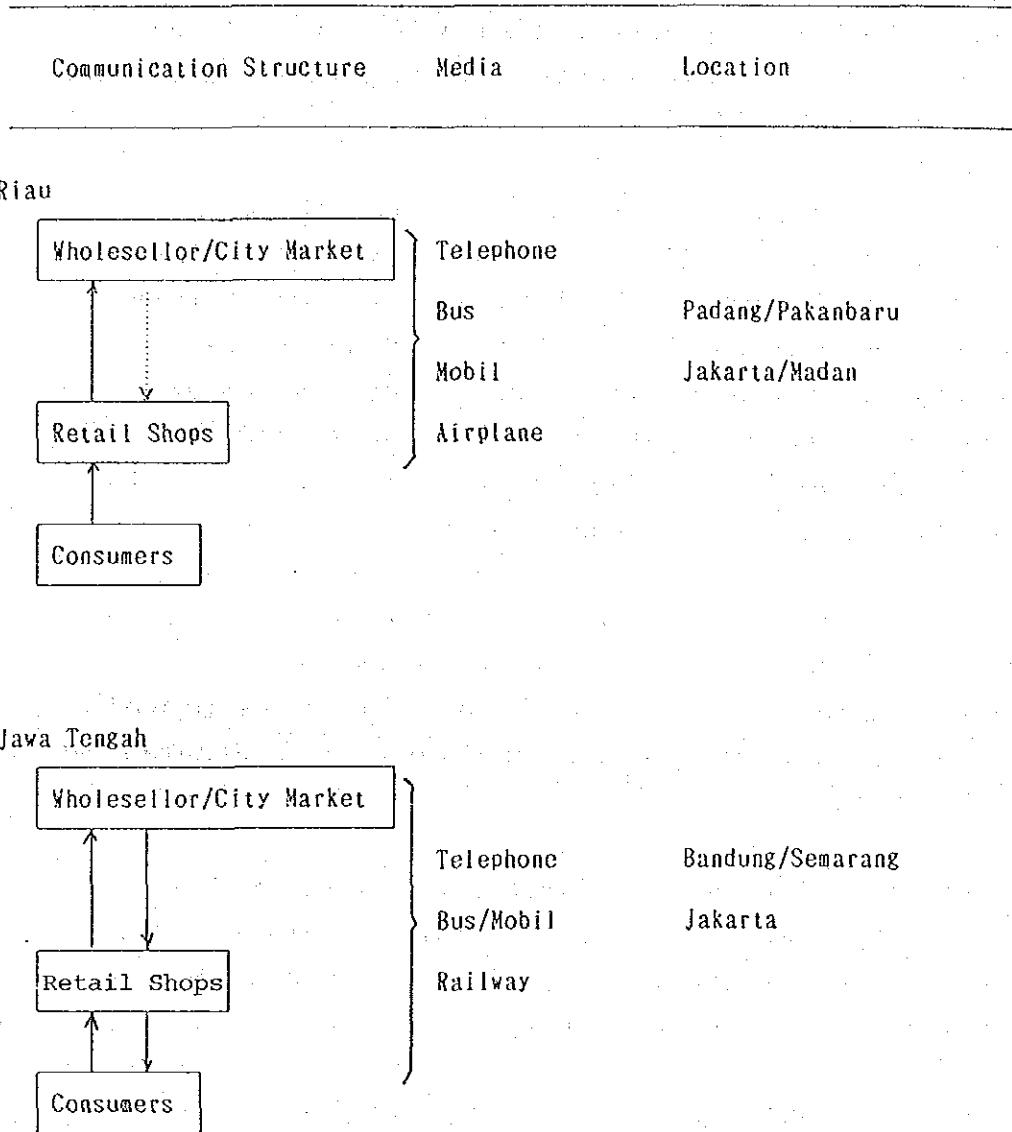


Figure 7 The Current Communication Structure of Large Retail Shops

#### 4-3 Telecommunication Facilities Investigation

##### 4-3-1 Status Quo

Conditions of existing telecommunication facilities clarified by field surveys are shown in Table 3 and Table 4. The telecommunication survey formats are shown in ANNEX 6 (1/4 - 4/4).

Kabupaten Cilacap, Jawa Tengah Province, there exist Primary Trunk Center (PTC), Cilacap automatic telephone exchange and four manual exchanges, i.e., Maos, Kroya, Majenang and Meluwung. In Kabupaten Banyumas are Secondary Trunk Center (STC), Purwokerto automatic telephone exchange and two, i.e., Banyumas and Sokaraja, manual exchanges. In Kabupaten Purbalingga, the sole manual exchange exists in Kecamatan Purbalingga.

For Riau Province, STC and Pekanbaru automatic exchange exist in Kabupaten Kampar. Manual exchange is at Bankinang. In Kabupaten Indragiri Hulu, three manual exchanges exist. They are Rengat PTC, Taluk Kuantan PTC and Air Molek.

Existing satellite system earth station and radio station arrangements appear in Table 4. Figure 8 to Figure 12 present schematic configuration of existing telecommunication network in the sample areas.

At present, in the sample areas, non-PERUMTEL communication systems identified below are in operation for HF/VHF radio communication.

- |                  |                           |
|------------------|---------------------------|
| - Administrator  | - Sea Com                 |
| - Police         | - PERTAMINA               |
| - Army           | - Ministry of Agriculture |
| - Forestry       | - PLN                     |
| - Transmigration | - Other                   |



These communication facilities, except part of them, will presumably be replaced with PERUMTEL facilities in the future as rural telecommunication network improvement progresses.

Out of PERUMTEL facilities now in operation, manual exchanges are magneto switchboards for the most part and they are considerably time-worn. As for subscriber's lines, up to 90% are aerial line or open wire facilities. Almost all these facilities are considered to be not fit for utilization when the rural telecommunication network improvement and expansion plan is implemented. Poles for subscriber's line installation and existing satellite system earth station facilities can possibly be utilized.

#### 4-3-2 Fourth Five-Year Plan Schedules in Sample Areas

In the on-going fourth five-year plan for telecommunication network improvement and expansion, new and/or additional switching equipment installation in the sample areas is not scheduled. Work schedules include construction of small type earth stations (S.B.K.) for satellite communication system at Taluk Kuantan in Kabupaten Indragiri Hulu, Riau Province, and Pasir Pangaraian in Kabupaten Kampar, Riau Province. For Jawa Tengah Province, work schedule is to construct spur transmission systems, one connecting Cilacap, Siddarejo and Majenang and the other connecting Purwokerto, Purbalingga, Banjarnegara and Wonosobo.

Table 3 Existing Switching Facilities

as of Dec. 1984

No. Exchange	Type	Equip.	Capacity	Sub.	Waiting Sub	Primary Cable	E/G	PLN	(**) O/M	Establishment	Remarks
1 Cilacap	Auto	EMD	2,000	1,300	565	4,350	Yes	Yes	25	1980.11.25	" 282" PTC
2 Maos	Manual	ABK	50	27	50	50	No	Yes	3	1951	
3 Kroya	"	"	200	89	25	100	No	Yes	4	1977.6.15	
4 Majenang	"	ABH	400	195	43	500	No	Yes	8	1983.12.8	
5 Meluwang	"	ABK	50	17	3	20	No	No	4	1974.10.1	
6 Purwokerto	Auto	EMD/CIT	3000/600	1809/188	800	2,700	Yes	Yes	30	1980.8.18	" 281" PTC/ "28" STC
7 Banyumas	Manual	ABK	100	63	37	67	No	Yes	8	1976	
8 Sokaraja	"	ABK	100	71	20	80	No	Yes	6	1963.12.17	
9 Purbalingga	"	ABK	400	332	75	388	No	Yes	12		
10 Pekanbaru(*)	Auto	ARF/ARM	5000/600	2876/60	1,670	3,800	Yes	Yes	30	1978.7	" 761" PTC/ "76" STC
11 Bangkinang	Manual	ABK	200	126	10	200	No	YES	7	1964	
12 Taluk Kuantan	"	"	200	61	6	300	No	Yes	11	1969	
13 Air Molek	"	ABH	130	44	15	-	No	Yes			
14 Rengat	"	ABJ	300	175	-	835	Yes	Yes	10		

Note: \* This exchange is located in KOTAMADYA where is not included in this Project

\*\* The figure in this column shows the number of personnel for operation and maintenance(O/M).

Table 4 Existing Transmission Facilities

1. Earth Station

- |              |  |
|--------------|--|
| 1) Cilacap   | SBS TYPE<br>SCPC 3 ch<br>Antenna 10 m $\phi$               |
| 2) Pekanbaru | SBB TYPE<br>SCPC 34 ch + 11 ch (PA)<br>Antenna 10 m $\phi$ |
| 3) Rengat    | SBK TYPE<br>SCPC 2 ch + 1 ch (PA)<br>Antenna 4.5 m $\phi$  |

2. Radio Station

- |              |   |
|--------------|---|
| 1) Cilacap   | VHF TYPE<br>165 MHZ 3 ch<br>Cilacap to Nusa Kambangan |
| 2) Pekanbaru | HF TYPE<br>1 ch<br>Pekanbaru to an island             |

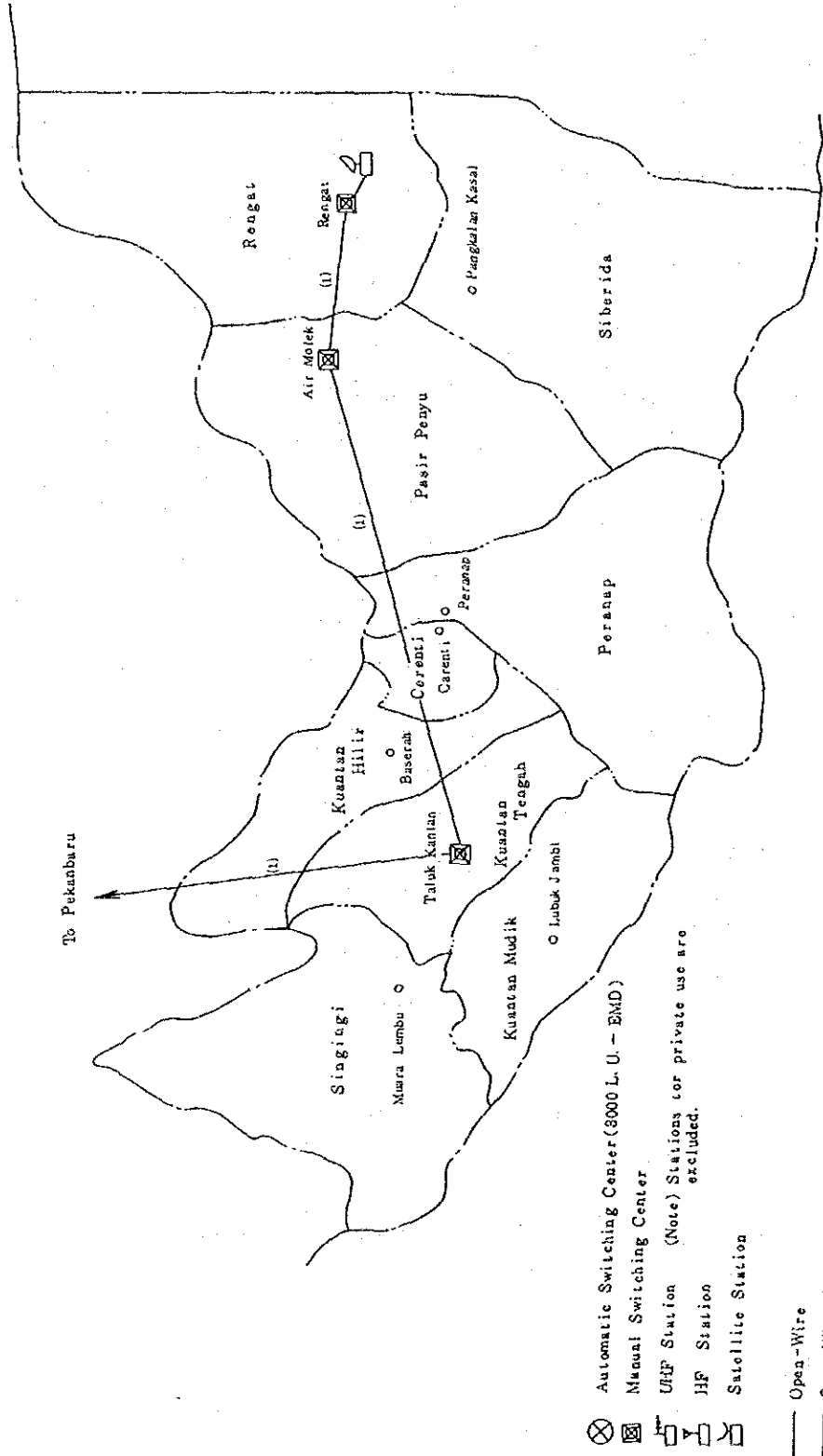
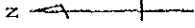


Figure 8 Existing Telecom. Network in Indragiri Hulu

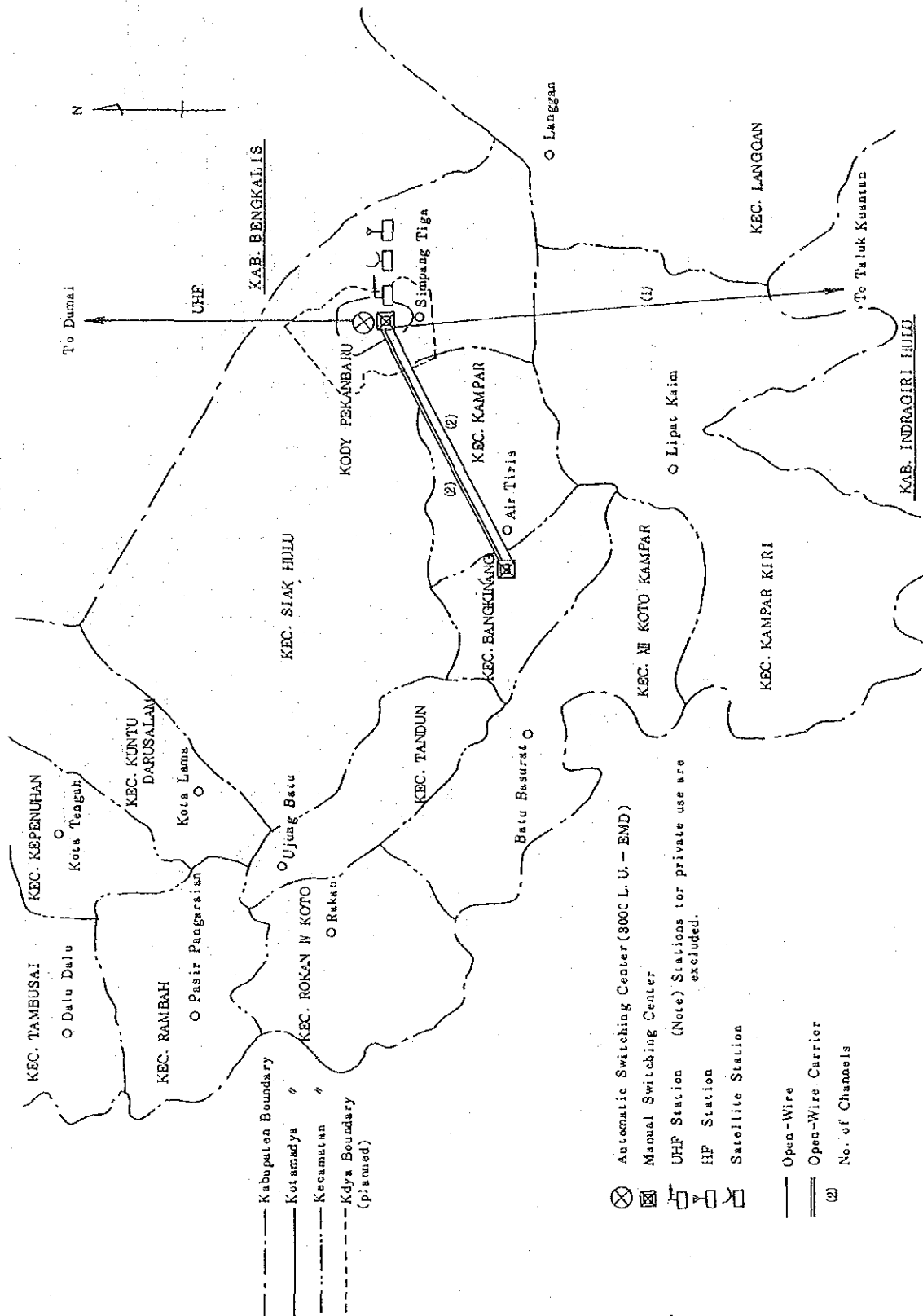


Figure 9 Existing Telecom. Network in Kampar

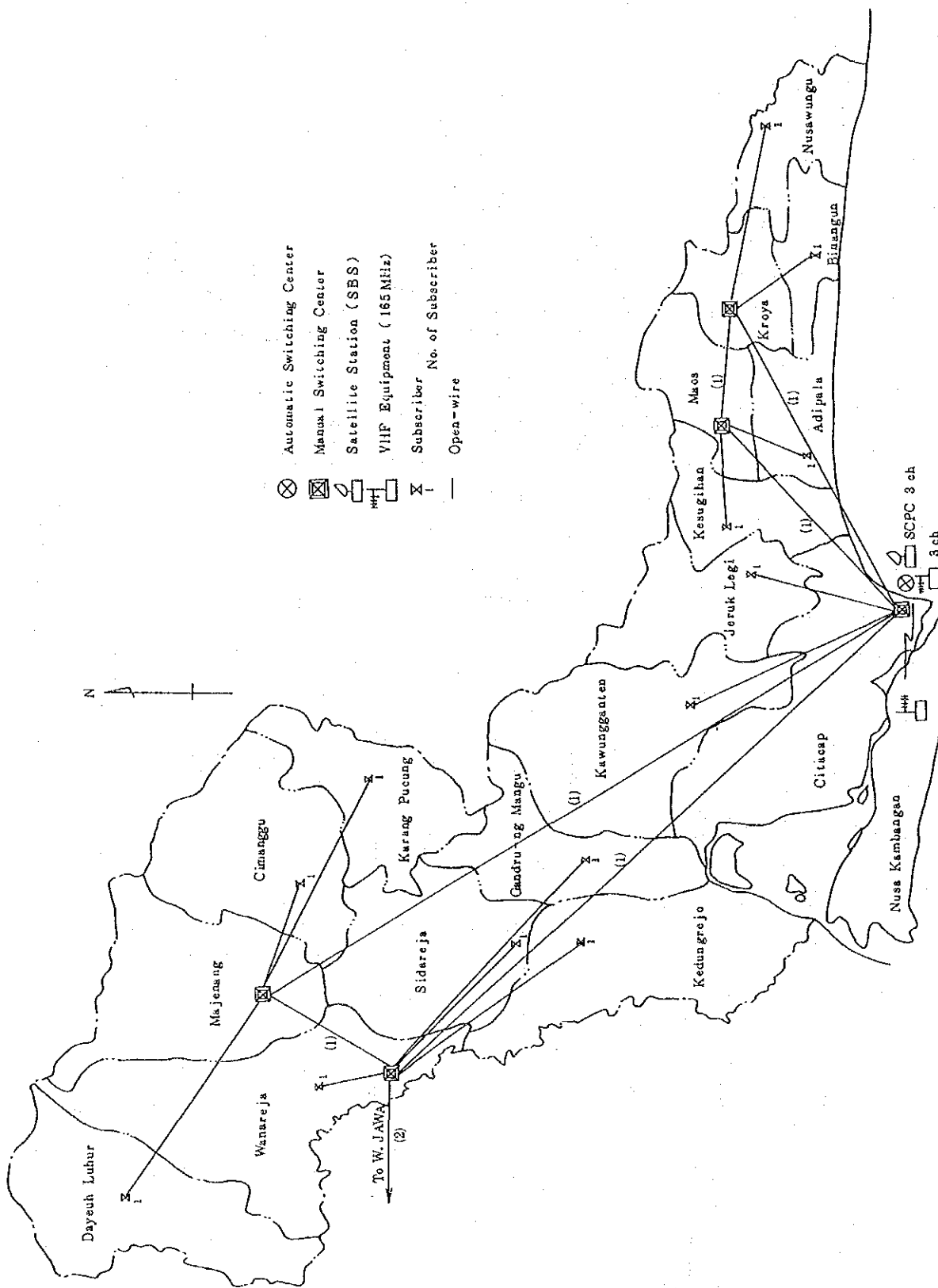


Figure 10 Existing Telecom. Network in Cilacap

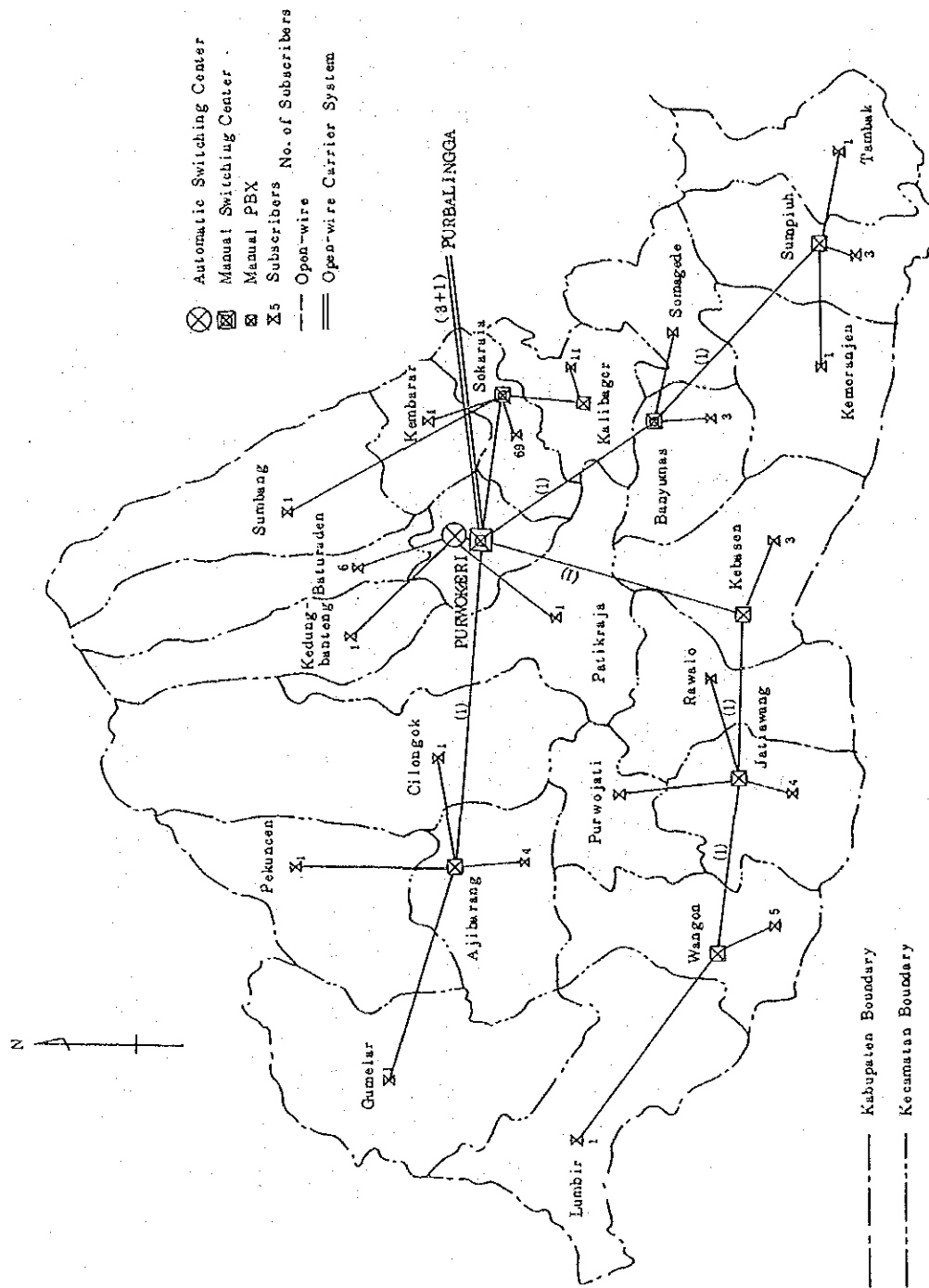


Figure 11 Existing Telecom. Network in Banyumas

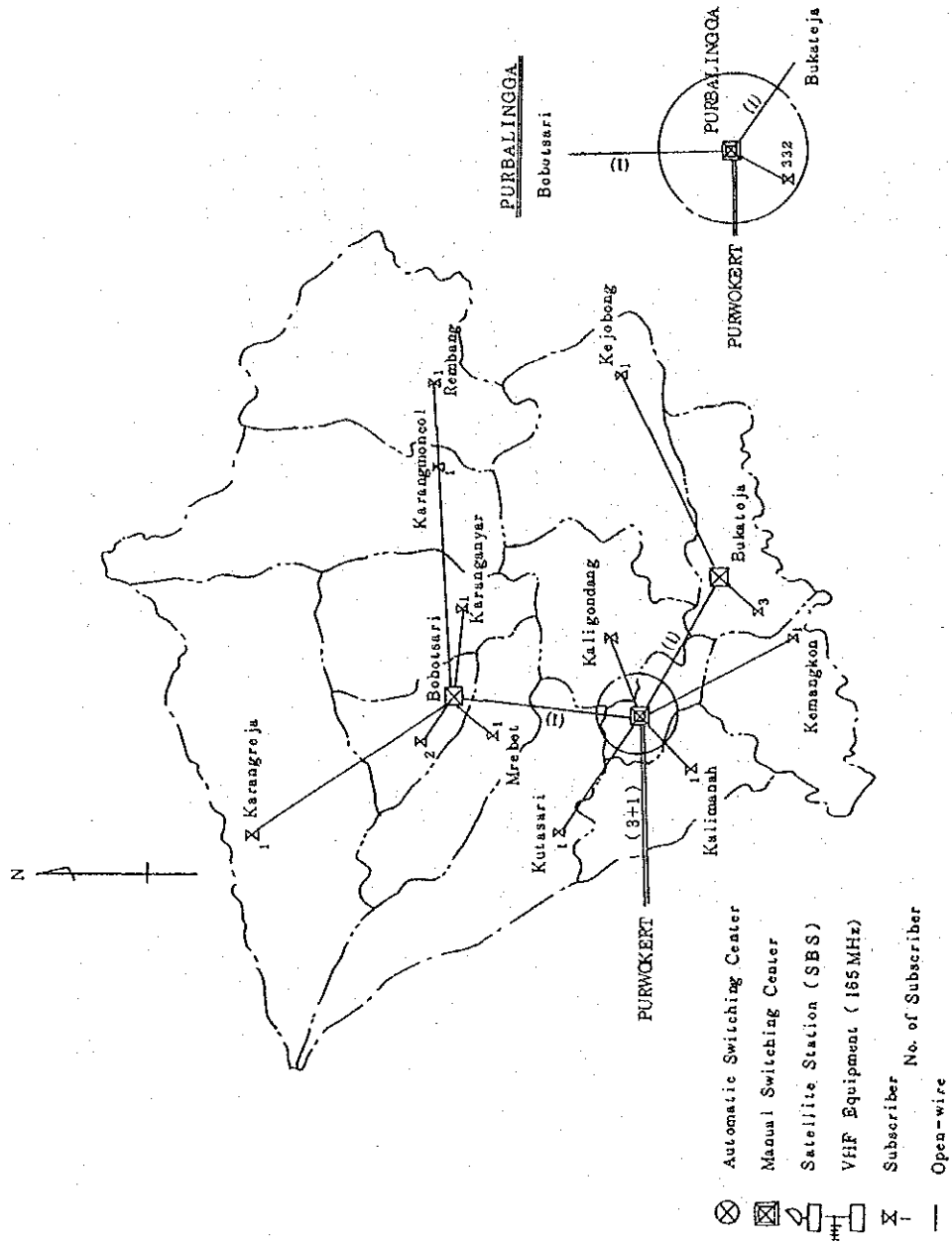


Figure 12 Existing Telecom. Network in Pubralingga



## 5. Demand Forecast, Traffic Forecast

### 5-1 Demand Forecast

For five Kabupatens in the sample areas, telephone demand as of the year 2000 compared with 1984, classified by subscriber categories, is estimated as under. For this estimate, the demand forecast method described in Chapter 4, Section 1 is used.

Subscriber Category	Total	PDA	PDB	ID	RD
Kabupaten					
Cilacap	<u>4,452</u> 11,959	<u>960</u> 1,139	<u>194</u> 238	<u>1,591</u> 2,493	<u>1,707</u> 8,089
Banyumas	<u>3,873</u> 9,485	<u>798</u> 899	<u>147</u> 170	<u>1,469</u> 2,184	<u>1,459</u> 6,232
Purbalingga	<u>1,965</u> 4,049	<u>438</u> 487	<u>68</u> 77	<u>905</u> 1,302	<u>554</u> 2,183
Kampar	<u>1,803</u> 3,867	<u>512</u> 748	<u>111</u> 178	<u>703</u> 1,127	<u>477</u> 1,814
Indragiri Hulu	<u>1,094</u> 1,986	<u>309</u> 423	<u>57</u> 84	<u>502</u> 744	<u>226</u> 735

Note: Top figure is for 1984.

Bottom figure is for 2000.

Kecamatan base breakdown of the above demand estimate on Kabupaten base appears in Table 5.

For each of five Kabupatens in the sample areas, telephone demand estimate is classified by Kabupaten capital, Kecamatan capitals and Desas as Table 6.

Table 5 (1/2) Demand Forecast by Kecamatan

KECAMATAN	1984	2000	KACAMATAN	1984	2000	KACAMATAN	1984	2000
Kedungrejo	160	429	Lumir	43	106	Kemangkon	68	140
*Cilacap	242	6504	Wangon	135	333	Bukateja	128	264
Kesugihan	102	276	Jatilawang	68	167	Kejobong	122	251
Adipeia	95	255	Ravalo	42	102	Kailgondang	92	190
Binangun	76	204	Kebasen	49	120	*Purbalingga	595	1226
Nusawungu	65	174	Kemranjen	62	151	Kalimatuh	126	259
Kroya	173	464	Sampyoh	49	120	Kulosari	152	312
Maos	161	434	Tambak	45	109	Mreret	100	206
Jeruk Legi	85	228	Somagede	32	79	Bobotsari	227	467
Kawungganien	120	338	Kalibagor	42	102	Karangreja	113	234
Gandrung Mangu	130	349	Banyumas	182	446	Karanganya	87	180
Sidarejo	323	869	Patik Raja	43	106	Karang Moncol	74	152
Karang Pacung	98	263	Purwojati	20	49	Rembang	81	168
Cimangg	121	325	Ajibarang	242	594			
Hajonang	193	518	Gumejar	22	53			
Wanareja	74	198	Pakuncen	63	153			
Dayeuhluhur	49	131	Cilongoh	94	231			
			Karang Lews	55	134			
			*Purwo Kerto	2251	5512			
			Sokaraja	144	354			
			Kembaran	52	127			
			Sumbang	37	90			
			Baturaden	52	127			
			Kedung Dateg	49	120			
Total	4452	11959	Total	3873	9485	Total	1965	4049

\*... Kabupaten Capital



Table 6

Kabupaten	Total	Kabupaten Capital	Kecamatan Capitals	Desas
Cilacap	11,959 (100%)	6,400 (53.5%)	4,896 (40.9%)	663 (5.6%)
Banyumas	9,485 (100%)	5,512 (58.1%)	3,419 (36.0%)	554 (5.9%)
Purbalingga	4,049 (100%)	1,226 (30.3%)	2,259 (55.8%)	564 (13.9%)
Indragiri Hulu	1,986 (100%)	537 (27.0%)	897 (45.2%)	552 (27.8%)
Kampar	3,867 (100%)	1,124 (29.1%)	1,827 (47.2%)	916 (23.7%)

## 5-2 Traffic Forecast

The most part of existing manual exchanges in the sample areas are magneto switchboards. A small number of terrestrial toll transmission lines accommodated in those switchboards are open wires in most cases and they are time-worn. Service failures are considered to be frequent.

Under such circumstances, correct traffic observation is impossible. Therefore, based on existing nationwide traffic data of PERUMTEL, traffic estimates are made. Mean originating calling rate of subscribers and local to toll traffic ratio in the sample areas are as under.

### 5-2-1 Mean Originating Calling Rate of Subscribers

- a) General subscribers ..... Approx 0.02 Erlang
- b) Public telephone subscribers ... Approx 0.06 Erlang

Terminating traffic volume is assumed to be the same as originating traffic volume.

### 5-2-2 Local to Toll Originating Traffic Ratio

Based on study result concerning existing subscriber traffic flow, the local to toll traffic ratio is assumed to be 7 : 3. For toll traffic, traffic in the same PTC area versus traffic to other TC area is estimated at 1 : 1.

### 5-2-3 Traffic Routing

Traffic routing in rural areas is simple. Both traffic to other TC and traffic in the same PTC area are carried via home PTC. In other words, the network between lowest ranking exchange and higher ranking home PTC is the star network in all cases.

## 6. Applicable System, Network Configuration, Work Planning

### 6-1 Applicable System, Network Configuration

Based on demand forecast in Section 5 and by selection method for applicable system as per Chapter 5, Section 4, applicable system for the sample areas and required network, configuration were determined, and schematic system design was made.

#### 6-1-1 Jawa Tengah Province

Typical schematic system design, where telephone demand as of 2000 in three Kabupaten, i.e., Cilacap, Banyumas and Purbalingga, in Jawa Tengah Province is duly considered, is shown in Figure 13 - 18.

Table 7 Telephone Demand and Demand Density

Name of Kabupaten	Area Code	Demand (as of 2000) (1)	Area (sq. km) (2)	(1)/(2)
Cilacap	282	*11,959	2,338	5.12
Banyumas	281	*9,485	1,310	7.24
Purbalingga	281	4,049	765	5.29

Note: \* Telephone demand in Cilacap and Banyumas as of 2000 includes demand at existing Cilacap and Purwokerto automatic exchanges.

In Kabupaten Banyumas, distance from Kabupaten capital to Kecamatan Wangon is 32.5 km so that, for transfer link in this section, cable PCM system which is less expensive than radio system is to be adopted.

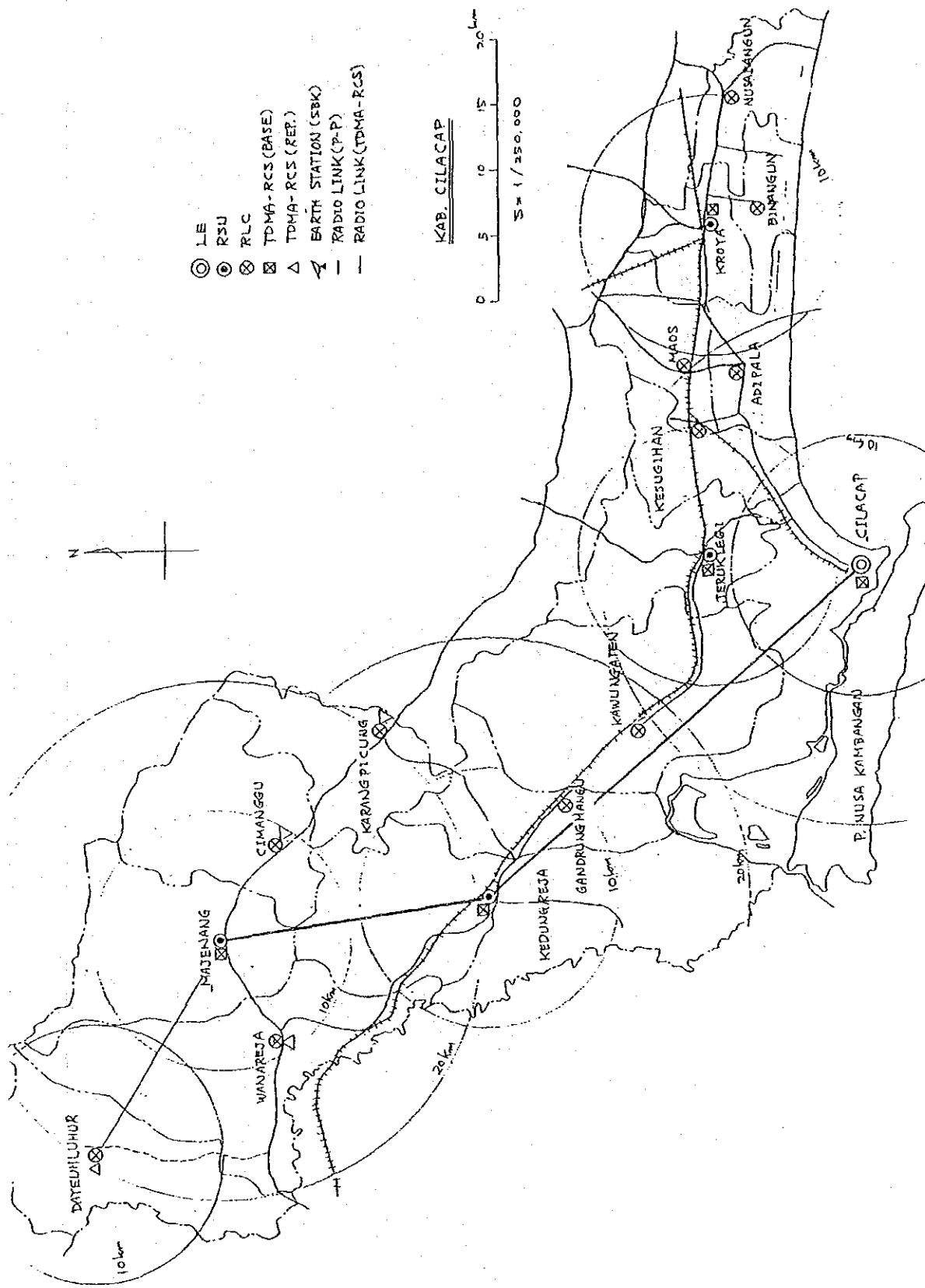


Figure 13 T.D.M.A. - R.C.S. in Sample Area

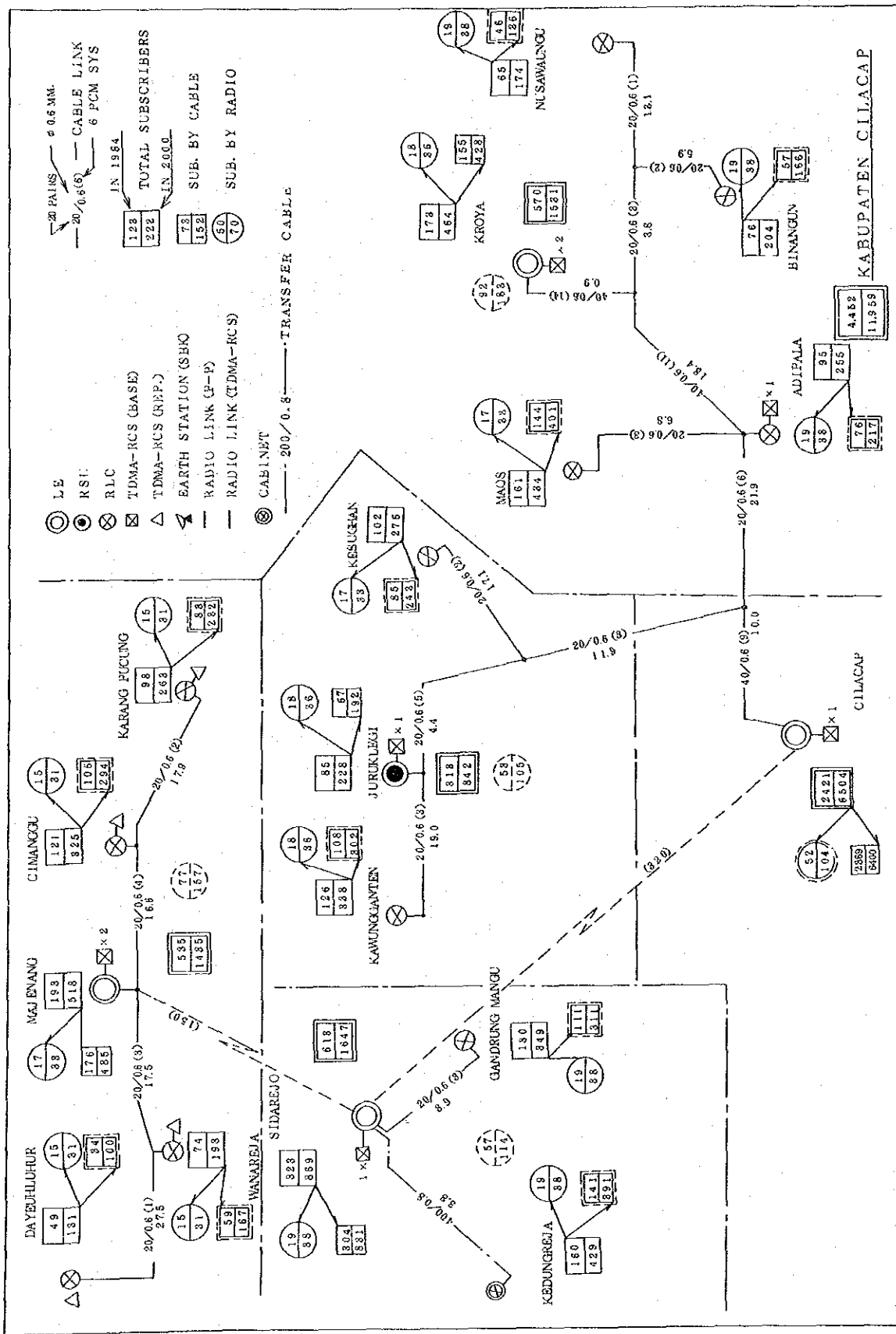


Figure 14 System Design for Sample Area



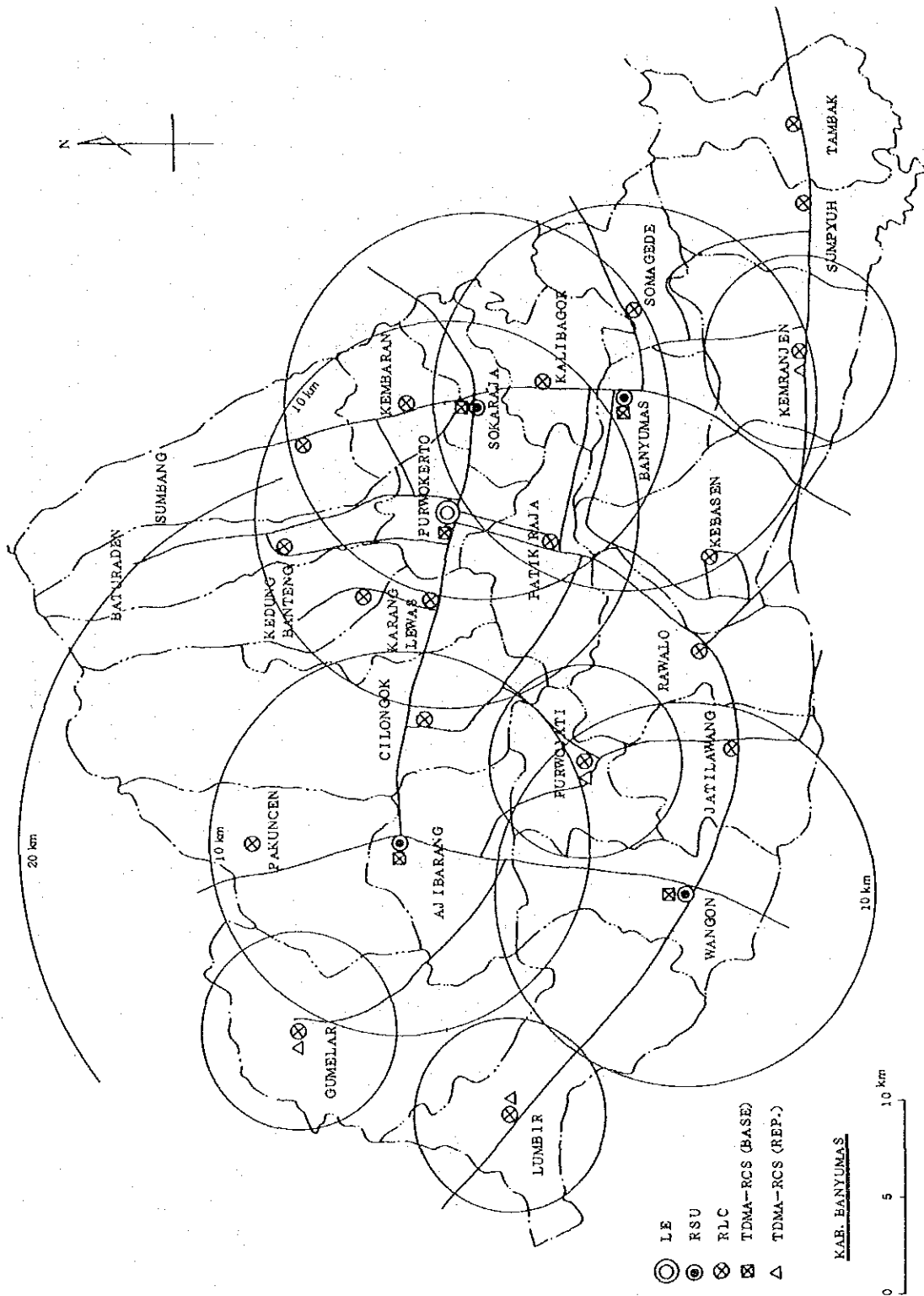


Figure 15 T.D.M.A. - R.C.S. in Sample Area

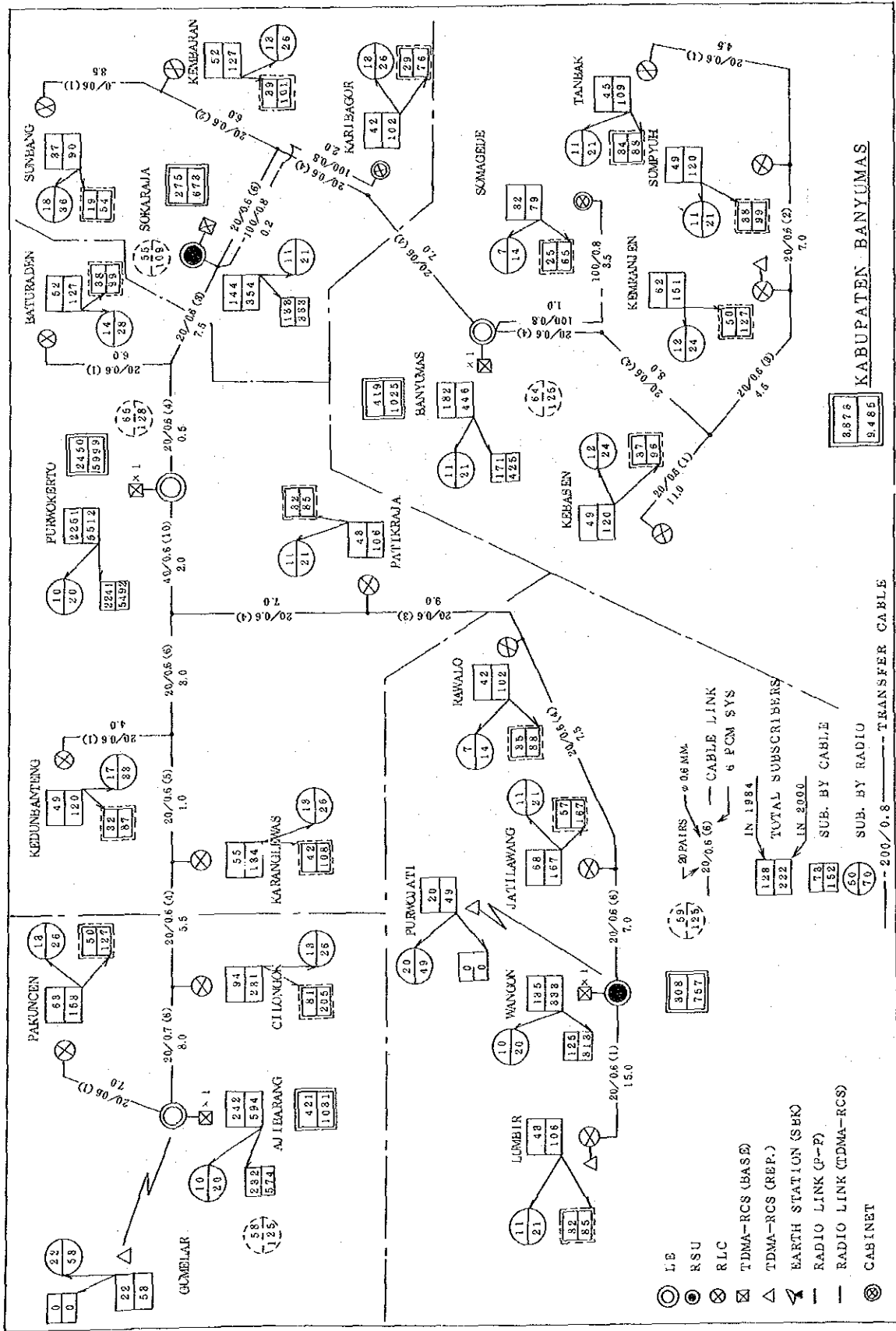


Figure 16 System Design for Sample Area

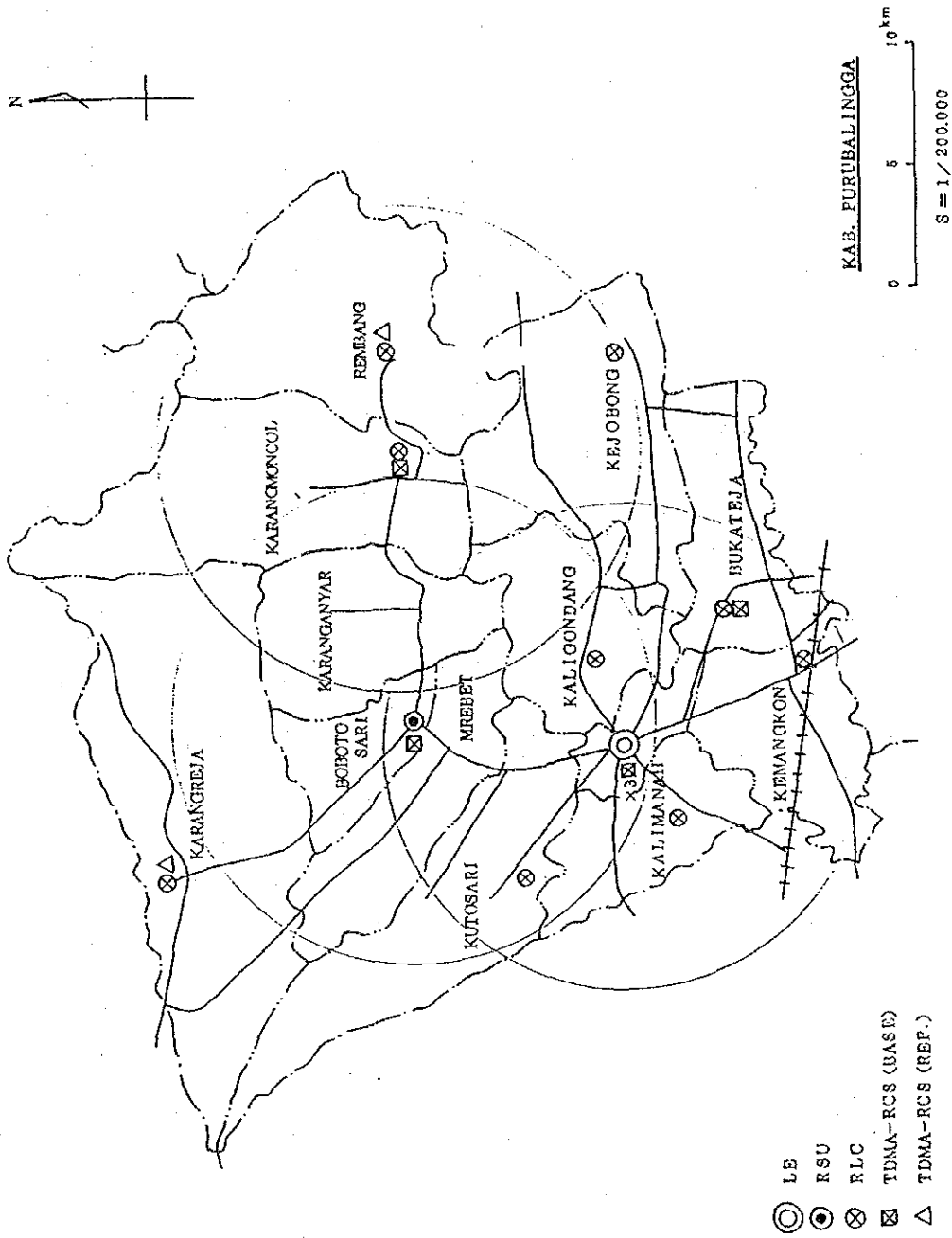


Figure 17 T.D.M.A. - R.C.S. in Sample Area

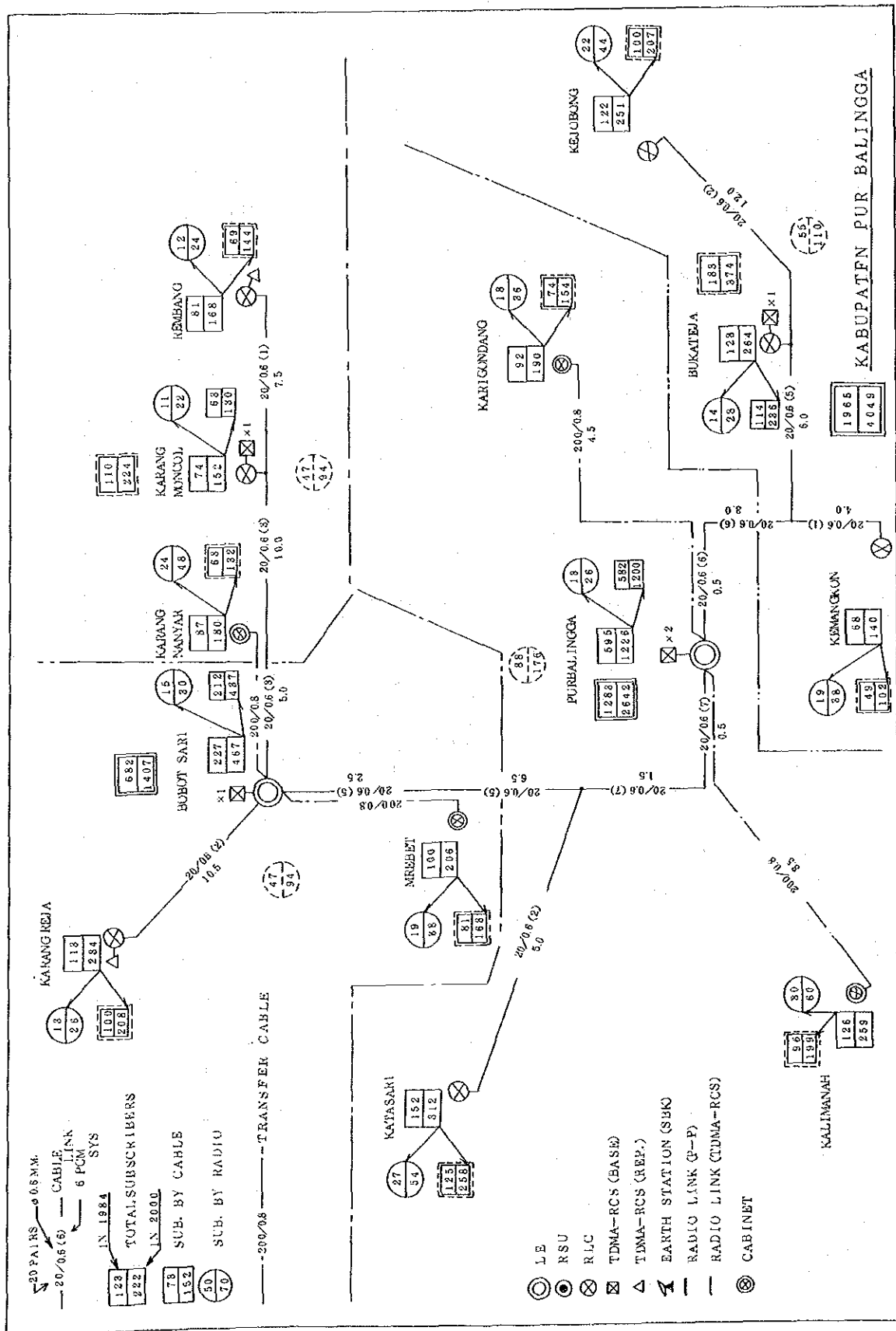


Figure 18 System Design for Sample Area

6-1-2 Riau Province

For Riau Province, schematic system design was made for Kabupaten Indragiri Hulu and Kabupaten Kampar.

In Kabupaten Kampar, distance from Kabupaten capital, Bankinang, to each Kecamatan capital is long. Average distance is 65 km. Distance to the farthest Kecamatan capital is 118 km. Thus, for transfer link to Remote Switching Unit (RSU) and Remote Line Concentrator (RLC), digital radio link is applied.

Beyond 10 km from RSU and RLC, 1-5 subscribers are scattered. To relieve those subscribers, Digital Radio Concentrator System (DRCS) is to be positively introduced, whereby establishing base station.

Table 8 presents telephone demand and demand density in Kabupatens Indragiri Hulu and Kampar.

Table 8 Telephone Demand and Demand Density

Name of Kabupaten	Area Code	Demand (as of 2000) (1)	Area (sq. km) (2)	(1)/(2)
Indragiri Hulu	*769,760	1,986	15,855	0.13
Kampar	762	3,867	28,291	0.14

Note: \* In Kabupaten Indragiri Hulu, three manual exchanges i.e., Rengat, Taluk Kuantan and Air Molek, exist. For Rengat and Air Molek, area code is "769" and PTC is Rengat. Taluk Kuantan is PTC and its area code is "760".

Typical schematic system design, where telephone demand as of 2000 in two Kabupatens, i.e., Indragiri Hulu, and Kampar in Riau Province is duly considered, is shown in Figure 19-22.

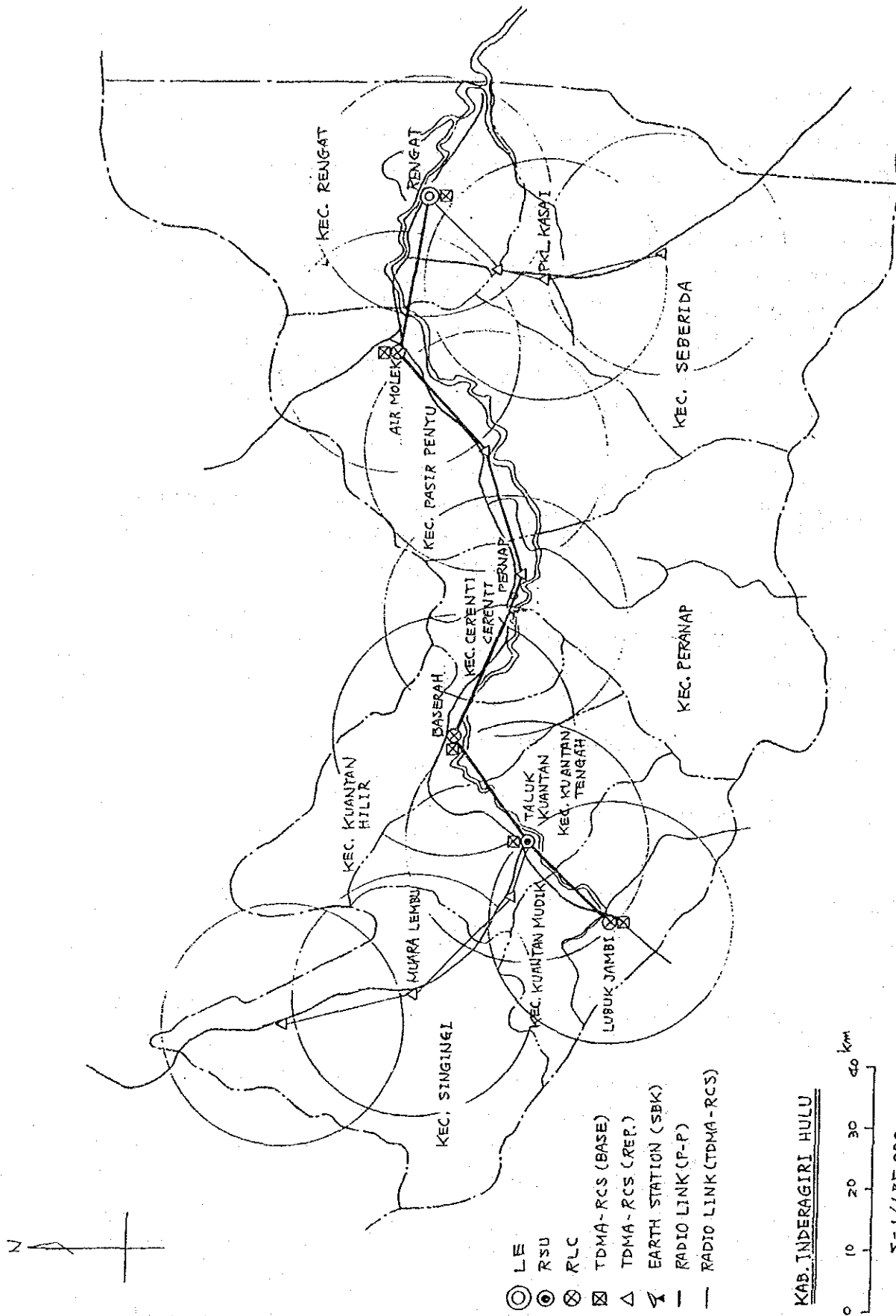


Figure 19 T.D.M.A. - R.C.S. in Sample Area

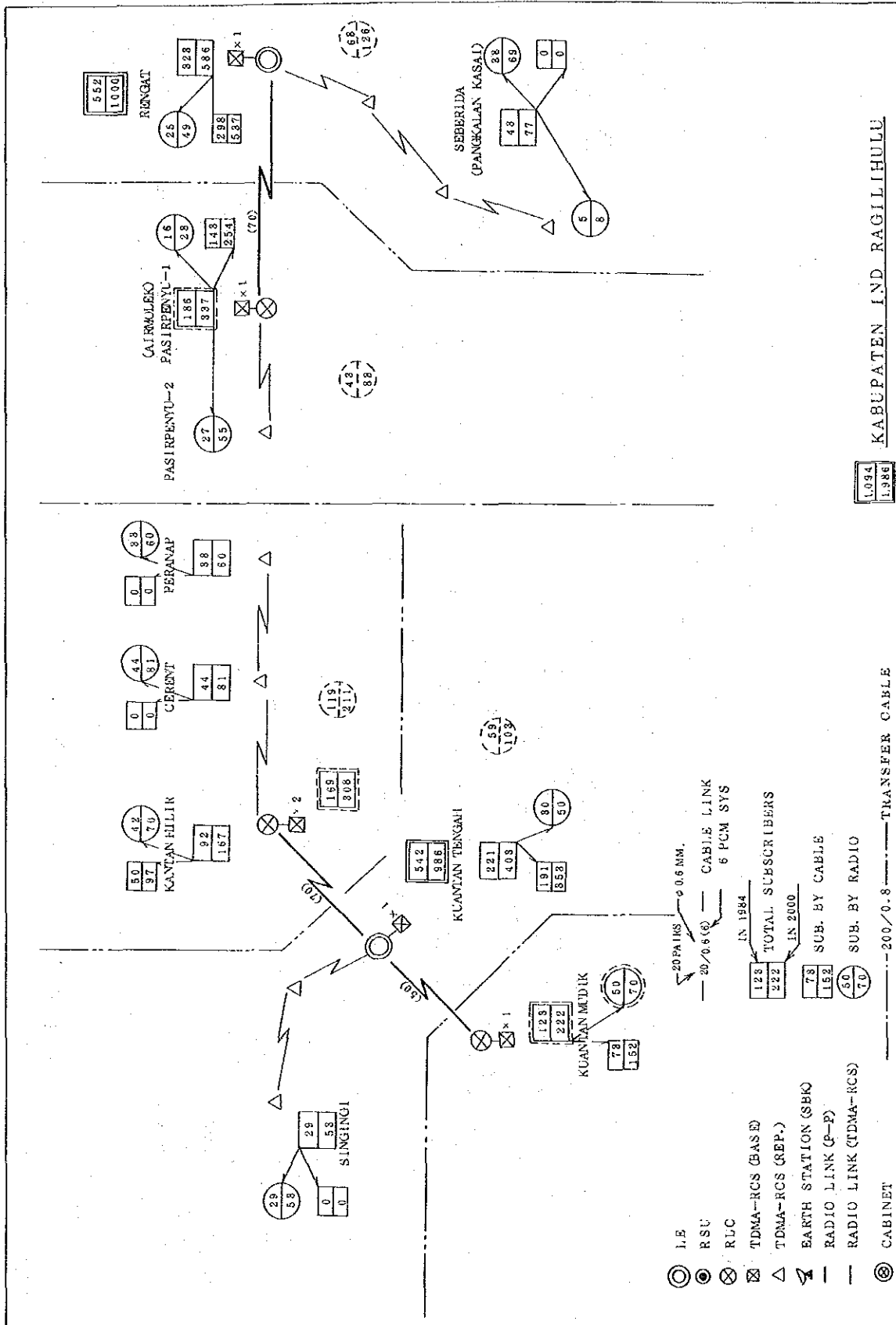


Figure 20 System Design for Sample Area

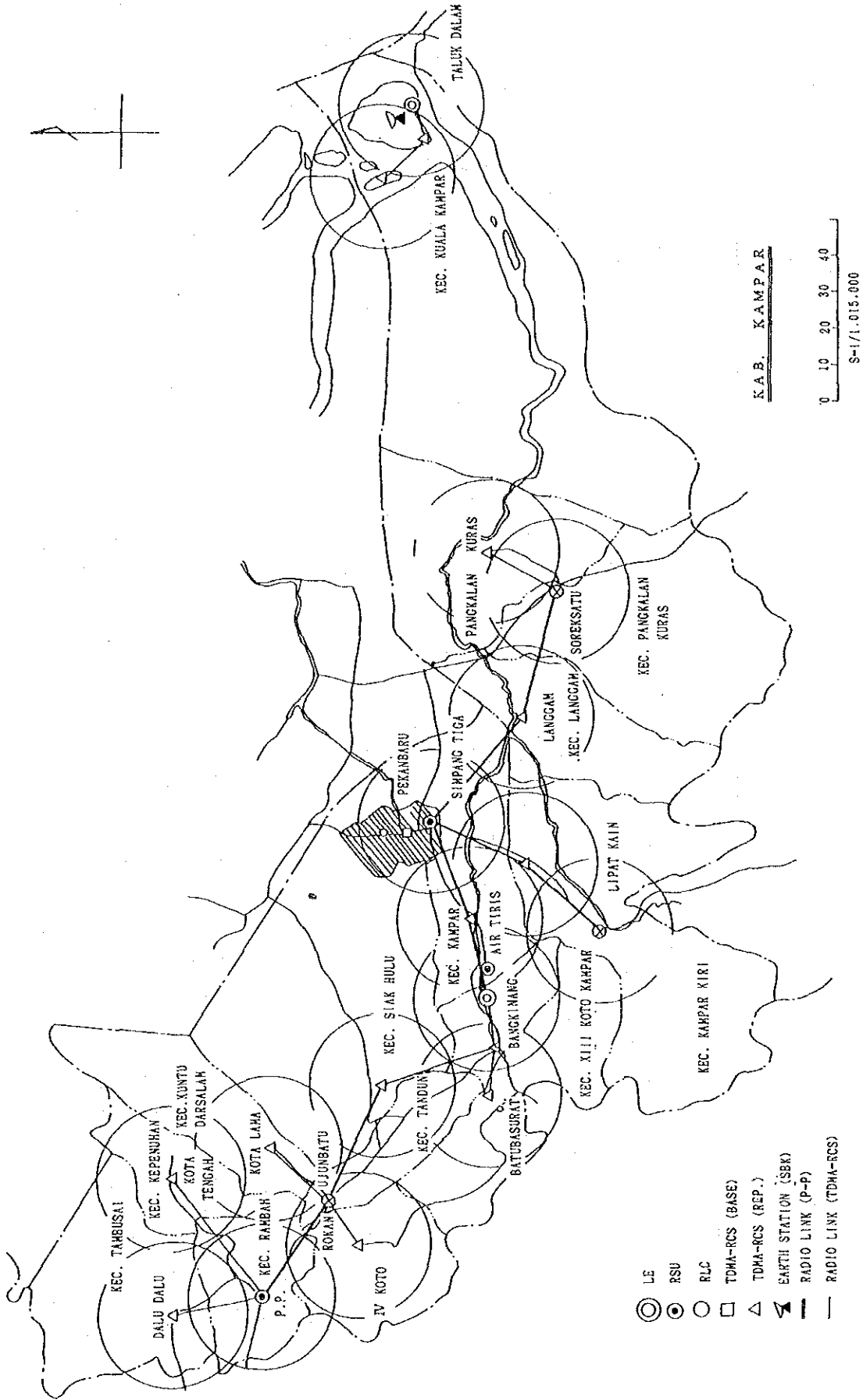


Figure 21 T.D.M.A. - R.C.S. in Sample Area



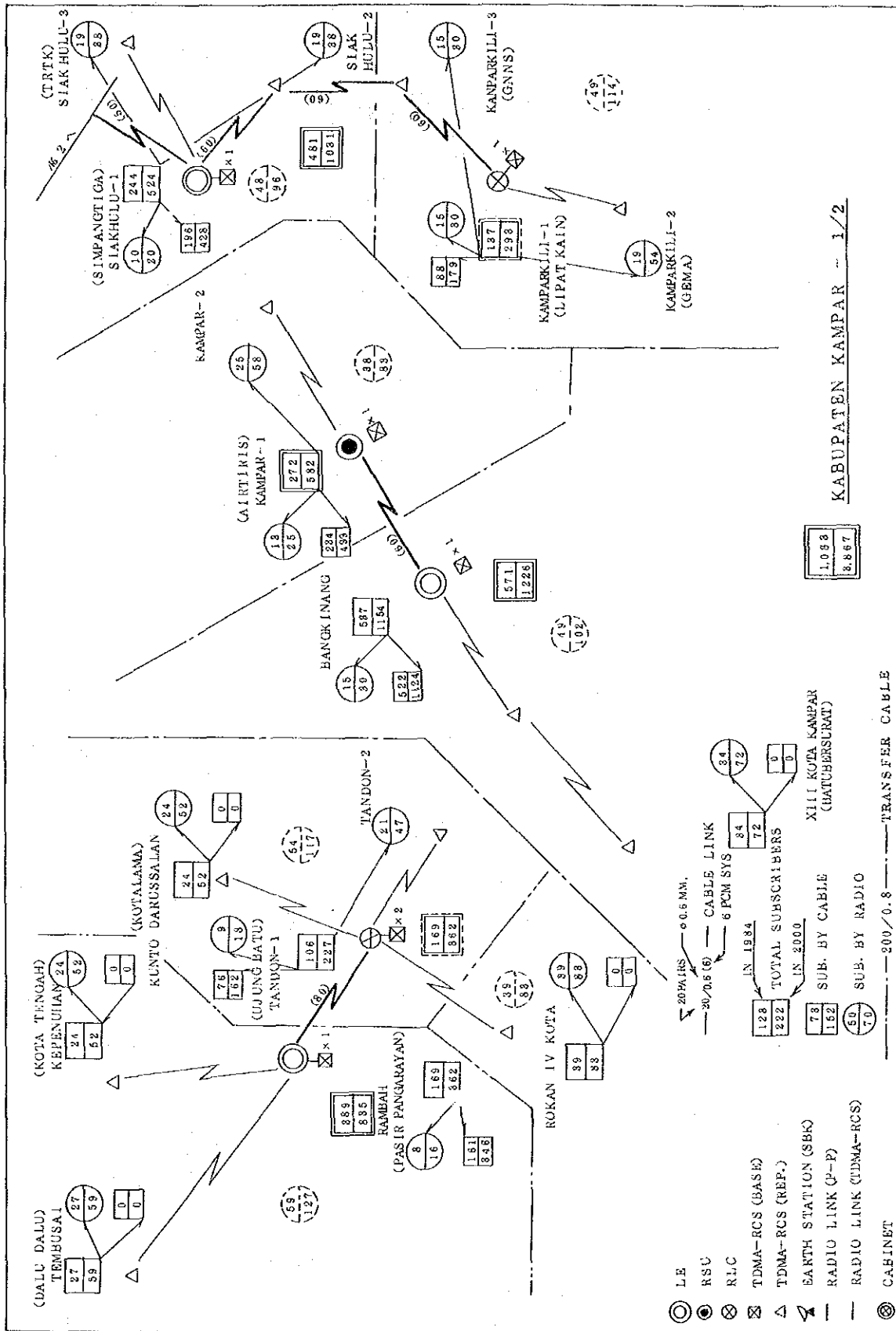
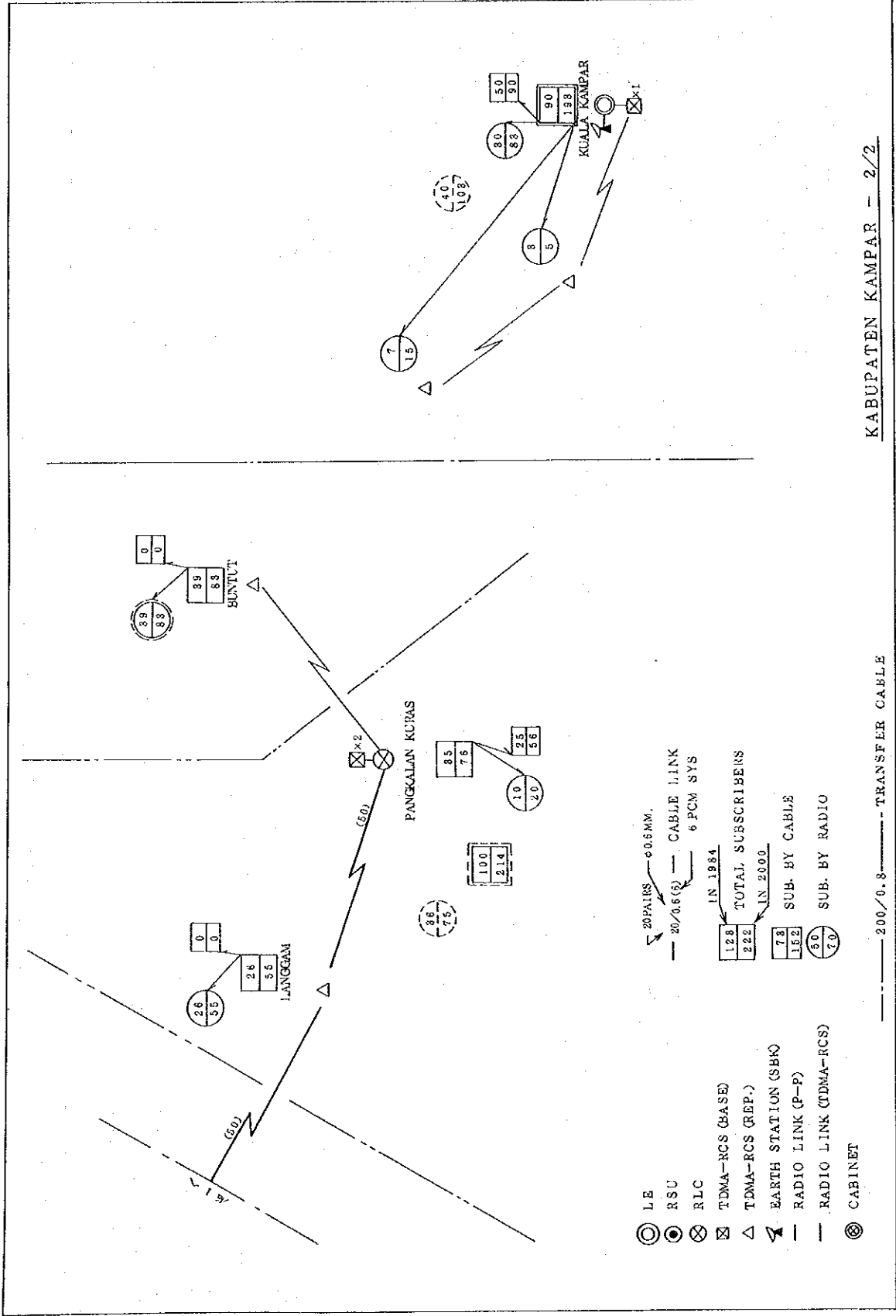


Figure 22 (1/2) System Design for Sample Area



KABUPATEN KAMPAR - 2/2

Figure 22 (2/2) System Design for Sample Area

## 6-2 Work Planning

Work planning for the five sample Kabupatens is given Table 9.

At present, in the capitals of Kabupatens Cilacap and Banyumas, automatic exchanges are in operation. Cilacap Exchange capacity is of 2,000 line units and Purwokerto Exchange (in Kabupaten Banyumas) holds capacity of 3,000 line units. Thus, for both Kabupatens, the number of line units required for fulfilling demand minus the number of existing line units is to be newly installed by work schedule, this time.

As for construction of toll transmission routes, spur route construction relating to the remote project to be implemented by the on-going fourth five-year plan for the sample areas (refer to Section 4-3-2) is excluded from the work schedule introduced above.

Table 9 Work Planning for Sample Area (Case Study)

WORK ITEM or CLASSIFICATION	PROP or KAB ITEM	PROP JAWA TENGAH			PROP RIAU			TOTAL
		**KAB CILACAP	**KAB BANYUWAS	KAB PURBALINGGA	KAB INDRAGIRI HULU	KAB KANPAR		
SWITCH	S.M. (LU/EX)	9.200/4	5100/3	4100/2	2000/2	3300/4	23700/15	
	R.S.U (LU/SU)	900/1	1500/2			600/1	3000/4	
	R.L.C (LU/LC)	2.600/11	1700/15	1600/7	900/3	900/3	7700/39	
	F.CABLE (KM)	4.	8	17			29	
TRANSFER	T.CABLE (KM)	222	145	75			442	
	P.C.M (Case)	106	65	34			205	
	P.C.M (Rep)	403	192	94			689	
	P.C.M (Mux)	32	31	18			81	
	RADIO LINK							
DISTRIBUTION	TOWER				3	7	10	
	S.K.B.				5	10	15	
	CIVIL (KM)	8	5	3		1	1	
	D1 CABLE (KM)	11	7	3	2	4	22	
	D2 CABLE (KM)	243	165	96	2	4	27	
	S.D.WIRE (KM)	305	213	143	28	67	599	
	T.D.M.A.-RCS (Base)	6	5	5	89	160	910	
	T.D.M.A.-RCS (Rep)	4	4	2	5	9	32	
	T.D.M.A.-RCS (Sub)	670	620	480	8	16	34	
	TOWER (Base)	3	5	4	600	1000	3370	
TOWER (Rep)	4	4	2		1	13		
TOWER (Sub)	670	620	480	8	13	31		
				600	1000	3370		

## 7. Construction Work Cost Estimate

Construction cost calculation is by the following conditions:

- Construction work contract be on turn-key basis.
- Power supply to radio and transmission equipments to be installed in telephone exchanges be available from power supply system of telephone exchanges.
- Terminal exchange buildings excluding terminals of radio and transmission equipments to share buildings with telephone exchanges be the shelter type.
- Commercial power supply be on around-the-clock basis in Kabupaten capital and on limited night hour basis in Kecamatan capitals and Desas.
- Required construction cost be estimated in local currency (Rp.), in principle.
- Work items already scheduled to be executed in the fourther five-year plan be excluded from work schedule, this time.
- Subservient existing facilities, such as poles and satellite system earth stations, be fully utilized and cost of such facilities be excluded from construction work cost, this time.
- Cost of one-year maintenance guidance be included in construction work cost, this time.
- Personnel training cost be included in construction work cost, this time.

Construction work cost estimate obtained by the foregoing conditions appears in Table 10.

Table 10 Construction Cost on Sample Area ( Case Study )  
UNIT : MILLION RP

WORK ITEM or CLASSIFICATION	PROP or KAB ITEM	PROP JAWA TENGAH			PROP RIAU			TOTAL
		KAB CILACAP	KAB BANYUMAS	KAB. PURBALINGGA	KAB INDRAGIRI HULU	KAB KAMPAR		
Switch	S.W. (LU/EX)	3.815	2.389	1.773	1.228	2.275	11.480	
	R.S.U (LU/SU)	532	933			396	1.861	
	R.L.C (LU/LC)	1.962	1.448	1.175	642	647	5.874	
Transfer	F.CABLE (KM)	167	295	726			1.188	
	T.CABLE (KM)	4.875	3.190	1.841			9.706	
	P.C.M (Case)	119	70	40			229	
	P.C.M (Rep)	176	84	40			300	
	P.C.M (Mux)	889	858	497			2.244	
	RADIO LINK				814	1.905	2.719	
	TOWER				348	691	1.039	
S.K.B.					440	440		
Distribution	CIVIL (KM)	669	387	220	114	308	1638	
	D1 CABLE (KM)	466	277	110	57	154	1064	
	D2 CABLE (KM)	4.268	2.891	1.876	475	1.166	10.476	
	S.D.WIRE (KM)	4.026	2.803	1.874	1.170	2.103	11.976	
	T.D.M.A.-RCS (Base)	1.760	1.100	1.100	1.100	1.980	7.040	
	T.D.M.A.-RCS (Rep)	409	409	207	818	1.641	3.484	
	T.D.M.A.-RCS (Sub)	2.741	2.530	1.962	2.451	4.066	13.750	
	TOWER (Base)	207	348	277		70	902	
	TOWER (Rep)	114	114	57	229	374	888	
	TOWER (Sub)	1.166	1.078	836	1.043	1.729	5.852	
SVB TOTAL	28.861	21.204	14.211	10.489	19.945	94.210		
ENGINEERING and OTHERS	1.417	1.060	708	524	999	4.708		
CONTINGENCY	2.978	2.226	1.492	1.101	2.094	9.891		
G.TOTAL	32.756	24.490	16.411	12.114	23.038	108.809		

## 8. Construction Work Execution Plan (draft)

### 8-1 Supply Scenario

For supply scenario, three types are conceivable. They are:

- a) To comprise the whole Kabupaten in one work process.
- b) To divide work process in two, i.e., Kabupaten capital and Kecamatan capital work segment and Desa work segment.
- c) To divide work process in three, i.e., Kabupaten capital work segment, Kecamatan capital work segment and Desa work segment.

Above three types are applied on the sample areas and the study results appear in Table 11.

### 8-2 Execution Plan

Construction work execution plan (draft) for the sample areas is given in Figure 23.

This work execution plan is so arranged that the work be initiated in the first year wherein to complete detail design, and specifications, tender, big evaluation and contract award with equipment manufacture by contractor. The second year is for execution of main construction work. System service-in on commercial basis is scheduled at the end of the fourth year.

Table 11 Network Coverage Comparison

	Cost Ratio	Work Execution Feasibility	Impartiality (Equality) among Kabupaten
i) Kabupaten-Kecamatan-Desa work in 1 phase	1.0	Simple	Inequal
ii) Kabupaten-Kecamatan and Desa work in 2 phases	1.1	Complicated	Equal
iii) Kabupaten, Kecamatan and Desa work in 3 phases	1.2	Most Complicated	Most Equal



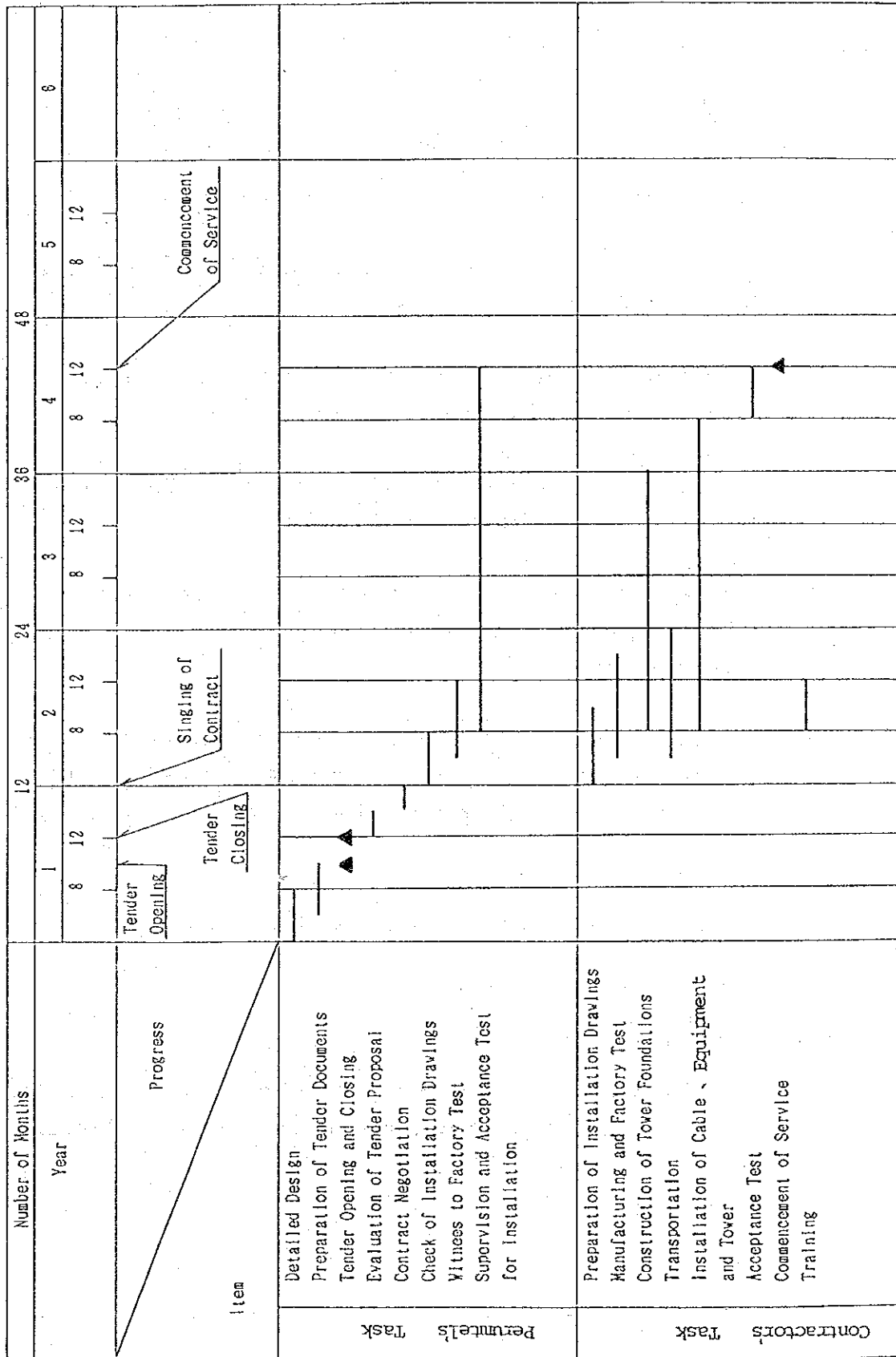


Figure 23 Execution Plan (Draft)

## 9. Economic and Financial Analysis

### 9-1 Financial Analysis

#### 9-1-1 Preconditions

- (1) Only telephone service should be covered.
- (2) Revenue items will be telephone only. The service period will be 20 years.
- (3) Inflation is not considered. The price at 1985 constant should be used as basic price.
- (4) An foreign exchange rate of Rp. 1,100 = Yen 250 = US\$ 1 should be used in this analysis.
- (5) The period of service should be 20 years, on the basis of the service life of the equipment. No salvage value should be allowed for.
- (6) The objective range of the construction excludes the long-distance network. Therefore, 85% of the gross revenues will be considered as the revenue of this plan.
- (7) Loans for the plan are not considered.

#### 9-1-2 Expenditures of the project

##### (1) Initial investment

The initial investment is established separately by the different construction methods in the following manner:

Table 12 Initial investment by construction methods

<u>Construction</u>	<u>Area</u>	<u>Construction period</u>	<u>Construction costs</u>
construction in one phase	(1) Kabupaten Kecamatan Desa	4 years	25%/year
construction in two phase	(1) Kabupaten Kecamatan	3 years	33%/year
	(2) Desa	2 years	50%/year
construction in three phase	(1) Kabupaten	2 years	50%/year
	(2) Kecamatan	2 years	50%/year
	(3) Desa	2 years	50%/year

The implementation program is indicated in Figure 24.

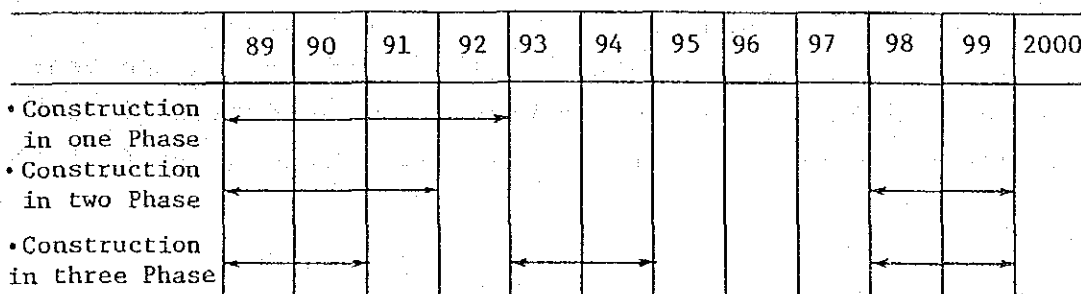


Figure 24 IMPLEMENTATION PROGRAM FOR EACH CONSTRUCTION METHODS

(2) Working capital

This is estimated at 30% of the difference in revenue between the relevant year and the preceding year.

(3) Maintenance costs

The maintenance costs are fixed at 3% of the investment.

(4) Operation costs

Material costs will be 25% of the revenues, and the personnel expenses will be estimated from the past expenditure in PERUMTEL.

9-1-3 Revenues from the project

Revenue is calculated for each of the categories by using the following equations:

Revenue per annum  
installation fee = (Number of services newly generated in the year) x Rp. 125,000

Revenue per annum  
annual rental = (Newly accumulated number of generated) x R. 2,000 x 12 months

Revenue per annum  
call charges = (Newly accumulated number of generated in Services) x Pulses per subscriber x Rp. 75

The number of pulses per subscriber excludes public telephone calls. The number of pulses in the provinces in the year 2000 is applied for the number of pulses per subscriber in the sample Kabupatens. (For details, refer to Chapter 4 of the main text.)

9-1-4 Analysis results

The financial internal rate of return (FIRR) for the five sample Kabupatens and for the whole nation are indicated in Table 13.

The FIRR is more strongly related to the construction cost per subscriber than to the revenue (number of pulses). Cilacap has the highest FIRR. In terms of construction methods, both Jawa Tengah and Riau have the highest FIRR in two phase construction.

Table 13 Financial Results of Sample Area

CODE KAB. NAME	TTL. DEM (2000)	IKK+KEC DEMAND (IKK)	DEMAND (KEC)	DEMAND (DESA)	TFC/SUB (2000)	TTL. COST (MIL.RP)	IKK+KEC (MIL.RP)	IKK.COST (MIL.RP)	KEC.COST (MIL.RP)	DESA.COST (MIL.RP)	IRR1	IRR	IRR3
1401 INDRAGIRI HULU	1986	1393	537	856	593	15.761	11014	1750	2658	6606	5.9%	7.2%	5.3%
1404 KAMPAR	3867	2884	1124	1760	983	15.761	20942	3367	6113	11462	6.2%	7.5%	5.8%
3301 CILACAP	9959	9296	4400	4896	663	12.782	29780	8144	14147	7489	11.2%	12.5%	12.4%
3302 BANYUMAS	6485	5873	2492	3381	612	12.782	22264	5165	10526	6573	9.3%	10.3%	9.6%
3303 PURBALINGGA	4049	3575	1200	2375	474	12.782	14921	3090	6615	5216	8.3%	9.5%	8.1%
INDONESIA	1126966	941560	340400	601160	185406	13.287	5130883	426570	2362131	2342182	6.1%	7.1%	6.0%

## 9-2 Economic analysis

### 9-2-1 Economic benefits

#### (1) Consumer's surplus

Consumer's surplus of the sample area are indicated in Table 14. (For estimating the consumer's surplus, refer to Chapter 8 of the main text).

According to this table, Cilacap has the highest consumer's surplus, which is similar to those results obtained in the interviews from the sample survey.

#### (2) Comparison of the media costs

The substitution effect in the distance from 0 km to 200 km) per subscriber caused by the introduction of telephones (automatic) is estimated to be 35 million Rp. per year for both Riau and Jawa Tengah. (Refer to Chapter 8 of the main text). These figures are estimates from the sample survey in 1984. Considerations for the increment of the total volume of communication in both area in the future have not been made.

### 9-2-2 Results of Analysis

Within the substitution effects of the media, the parts that are related to non-transmission expenses are included in the consumer's surplus (installation fee). The substitution effect of the media cannot be measured exactly because the number of calls by charging zones cannot be estimated in the telephone traffic forecast.

Therefore, only the consumer's surplus will be added up as the economic benefits. The economic internal rate of return is indicated in Table 15. (The cost is not converted to "Economic Cost" in this analysis.)

TABLE 14 CONSUMER SURPLUS IN THE SAMPLE AREA

CODE	NAME OF KABUPATEN	TOTAL DEMAND		CONSUMER SURPLUS		CONSUMER SURPLUS		AVERAGE		TOTAL SURPLUS (1000Rp)
		2000	92 (1000Rp)	19	00 (1000Rp)	20	(1000Rp)	(1000Rp)	(1000Rp)	
1401	INDRAGIRI HULU	1989	351	677	514	1022346				
1404	KAMPAR	3867	351	677	514	1987638				
3301	CILACAP	9959	182	421	302	3002639				
3302	BANYUMAS	6485	182	421	302	1955228				
3303	PURBALINGGA	4049	182	421	302	1220774				

TABLE 15 ECONOMIC IRR IN THE SAMPLE AREAS

CODE	NAME OF KABUPATEN	ECONOMIC I.R.R.		WILLINGNESS TO PAY.PRICE		WILLINGNESS TO PAY.PRICE	
		1992 (1000Rp)	2000 (1000Rp)	1992 (1000Rp)	2000 (1000Rp)	1992 (1000Rp)	2000 (1000Rp)
1401	INDRAGIRI HULU	9.5%	1603	2976	2976		
1404	KAMPAR	6.2%	1603	2976	2976		
3301	CILACAP	11.2%	797	1680	1680		
3302	BANYUMAS	9.3%	797	1680	1680		
3303	PURBALINGGA	8.3%	797	1680	1680		





## **ANNEX FOR CASE STUDY**

**ANNEX 1 QUESTIONNAIRE TO KECAMATAN OFFICE**

**ANNEX 2 RESULTS OF DEMAND SURVEY**

**ANNEX 3 QUESTIONNAIRE TO ADMINISTRATION**

**ANNEX 4 QUESTIONNAIRE TO INDUSTRY**

**ANNEX 5 COMMUNICATION SURVEY**

**ANNEX 6 TELECOMMUNICATION FACILITIES SURVEY**



ANNEX 1 (1/2) QUESTIONNAIRE TO KECAMATAN OFFICE  
(Pertanyaa untuk Kantor KECAMATAN)

1. Name of Area \_\_\_\_\_ , \_\_\_\_\_  
(Nama Daerah) (KECAMATAN) (KABUPATEN)

2. Name of Capital : \_\_\_\_\_  
(Nama Ibcikota)

3. Number of Officers : \_\_\_\_\_ ( )  
(Jumlah Pegawai)

4. Method to contact/communicate to KABUPATEN Offices concerned :  
(Cara menghubungi Kantor KABUPATEN yang bersangkutan dengan)  
mail / telegram / radio / telephone / other  
(surat)(telegram) (radio) (telepon) (lain-lain)  
( ) ( ) ( ) ( ) ( )

5. Area of this KECAMATAN : \_\_\_\_\_ ( )  
(Luas KECAMATAN ini)

6. Number of DESA's : \_\_\_\_\_ ( )  
(Jumlah DESA)

7. Population of this KECAMATAN: \_\_\_\_\_ ( )  
(Jumlah Penduduk KECAMATAN ini)

8. Number of Households : \_\_\_\_\_ ( )

9. Number of Social Facilities :  
post office / police station / hospital(or clinic) / hotel  
( ) ( ) ( ) ( )  
primary school / junior high school / senior high school  
( ) ( ) ( )  
theater / bank / factory(or company) / store / other  
( ) ( ) ( ) ( ) ( )

\* REMARKS; \_\_\_\_\_ : at present (as of 1984)  
\* ( ) : in future (after 5 yeqrs)

ANNEX 1 (2/2)

10. Number of Personal Belongings :

T.V. set / motor-bike / automobile

(       )       (       )       (       )

11. Number of Letters :

Incoming ; \_\_\_\_\_ /month

Outgoing ; \_\_\_\_\_ /month

12. Simplified Map :

- (1) KECAMATAN (whole)
- (2) Capital of KECAMATAN
- (3) Others

13. Others

ANNEX 2 (1/5) Results of Demand Survey

Propinsi : JAWA TENGAH		Kabupaten : PRUBALINGGA										
Name of Kecamatan		Pruba- lingsa	Kemang- kon	Bukateja	Kalima- nah	Kutosari	Bobot- sari	Karang- anyar	Karang- moncol	Rembang	Karang- reja	
Telecom. Facilities	Telephone Office	0	X	X	X	X	X	X	X	X	X	
Telecom. Facilities	Telegraph Office	0	X	X	X	X	X	X	X	X	X	
Area	(sq.km)	15	45	42	40	85	29	68	65	92	121	
Population		47461	47015	53227	66894	84892	41436	56572	38902	51742	45903	
Total Number of Desa		13	19	14	30	27	15	24	11	12	13	
Number of Urban Desa		8	-	-	2	-	2	1	1	-	-	
Urbanization Rate (%)		62	0	0	7	0	13	4	9	0	0	
Government Offices		17	5	10	12	10	15	5	8	7	9	
	Post Office	1	-	1	1	2	1	-	1	1	1	
	Police Station	1	1	1	2	1	1	1	1	1	1	
	Hospital/Clinic	8	2	3	3	2	1	3	2	3	4	
	Bank	3	3	3	2	2	1	3	1	2	1	
	Hotel	4	-	-	-	-	-	-	-	-	-	
	Theater	1	-	-	1	-	-	-	-	-	-	
	Senior High School	9	-	1	3	-	3	1	1	-	-	
	Junior High School	11	5	3	5	4	4	4	6	3	3	
	Primary School	44	69	41	74	85	38	61	46	31	43	
	Large	3	2	-	-	-	1	-	-	-	2	
	Medium	9	8	13	5	-	1	5	8	4	1	
	Small	?	50	821	401	350	?	130	?	182	85	
	Large	15	2	10	-	-	12	-	3	6	8	
	Medium	274	8	32	36	69	83	5	6	20	12	
	Small	?	?	?	332	1506	176	130	?	75	?	
	Official Use	?	2	3	5	1	?	1	1	1	1	
	Public Use	?	37	60	99	64	?	26	33	22	59	
	Private Use	426	1	26	7	?	102	3	3	-	9	
Letters <I/O> (per month)		?	750 / ?	120 / 120	500 / 500	600 / 350	?	3600 / ?	2700 / 1200	500 / 700	1800 / 1500	
Telephone Demand	Govt. Office	22	10	15	17	15	20	10	13	12	14	
	Social Facilities	27	6	9	12	7	8	8	6	7	8	
	Public (P.C.O.)	13	19	14	30	27	15	24	11	12	13	
	Sub-Total	62	35	38	59	49	43	42	30	31	35	
	Demand Density	0.13	0.07	0.07	0.09	0.06	0.10	0.07	0.08	0.06	0.08	
Telephone Demand	Industry/Company	12	10	13	5	0	1	5	8	4	3	
	Shop	289	10	42	36	69	95	5	9	26	20	
	Residence	125	5	16	7	10	50	24	18	10	39	
	Sub-Total	426	25	71	48	79	146	34	35	40	62	
	Demand Density	0.90	0.05	0.13	0.07	0.09	0.35	0.06	0.09	0.08	0.14	

ANNEX 2 (2/5) Results of Demand Survey

Propinsi : JAWA TENGAH		Kabupaten : BANYUMAS									
Name of Kecamatan		Banyumas	Sokaraja	Sumpyuh	Ajibarang	Cilongok	Gumelar	Purwojati	Jatilawang	Sumbang	Wangon
Telecom. Facilities	Telephone Office	0	0	X	X	X	X	X	X	X	X
Telecom. Facilities	Telegraph Office	X	X	X	X	X	X	X	X	X	X
Area	(sq.km)	45	30	60	67	105	94	38	48	53	61
Population		42367	60034	45980	71731	87673	43854	29132	42483	59869	57306
Total Number of Desa		12	18	14	15	20	9	10	11	18	11
Number of Urban Desa		2	5	2	3	2	-	-	1	-	-
Urbanization Rate (%)		17	28	14	20	10	0	0	9	0	0
Government Offices		39	30	12	30	13	6	5	10	9	17
	Post Office	1	1	1	1	1	-	1	1	-	1
	Police Station	1	1	1	1	1	1	1	1	1	1
	Hospital/Clinic	2	3	5	2	2	1	1	1	2	1
	Bank	3	2	1	1	2	1	1	2	1	3
	Hotel	1	-	-	1	-	-	-	-	-	1
	Theater	-	-	1	1	-	-	-	-	-	1
	Senior High School	5	2	6	2	1	-	-	4	-	1
	Junior High School	6	8	7	6	5	3	3	6	3	6
	Primary School	?	63	48	51	53	41	28	42	46	54
	Large	2	-	1	5	1	-	-	1	2	-
	Medium	3	3	3	24	1	9	-	-	2	8
	Small	750	?	620	-	6953	1096	4	1787	16	4900
	Large	10	8	-	20	-	-	5	9	-	77
	Medium	120	104	15	205	85	-	4	50	10	47
	Small	2380	?	2379	?	3908	158	115	151	158	269
	Official Use	5	15	2	5	2	1	?	6	2	5
	Public Use	64	101	87	123	144	32	14	73	31	114
	Private Use	36	43	8	30	1	1	?	2	18	26
Letters <IC/OG> (per month)		?	?	2940/4860	?	?	750/1000	200/200	500/500	300/250	500/525
Telephone Demand	Govt. Office	44	35	17	35	18	11	10	15	14	22
	Social Facilities	13	9	15	9	7	3	4	9	4	9
	Public (P.C.O.)	12	18	14	15	20	9	10	11	18	11
	Sub-Total	69	62	46	59	45	23	24	35	36	42
	Demand Density	0.16	0.10	0.10	0.08	0.05	0.05	0.08	0.08	0.06	0.07
Telephone Demand	Industry/Company	5	3	4	29	1	9	0	1	2	8
	Shop	130	112	15	225	85	0	9	59	10	124
	Residence	55	30	8	30	5	3	0	5	8	20
	Sub-Total	190	145	27	284	91	12	9	65	20	152
	Demand Density	0.45	0.24	0.06	0.40	0.10	0.03	0.03	0.15	0.03	0.27

ANNEX 2 (3/5) Results of Demand Survey

Propinsi : JAWA TENGAH		Kabupaten : CILACAP									
Name of Kecamatan		Kawung- ganten	Majenang	Kroya	Sidarejo Luhur	Dayeuh Luhur	Nusa- wungu	Maos	Karang Pucung	Wanareja	Kesugi- han
Telecom. Facilities	Telephone Office	X	O	O	X	X	X	O	X	O	X
Telecom. Facilities	Telegraph Office	X	O	O	X	X	X	O	X	X	X
Area (sq. km)		357	139	59	176	185	61	55	115	191	82
Population		114233	98955	79665	95758	40551	59361	67815	60152	80299	80124
Total Number of Desa		14	13	14	10	12	15	17	12	11	13
Number of Urban Desa		-	2	2	3	-	-	-	-	-	-
Urbanization Rate (%)		0	15	14	30	0	0	0	0	0	0
Government Offices		9	13	17	18	9	4	16	8	9	5
	Post Office	1	1	1	1	1	-	2	1	1	1
	Police Station	1	1	1	1	1	1	1	1	1	1
	Hospital/Clinic	2	1	1	1	1	10	2	1	1	4
	Bank	1	11	2	2	2	2	4	2	1	2
	Hotel	-	4	2	2	-	-	-	-	-	-
	Theater	-	1	1	1	-	-	-	-	-	-
Social Facilities	Senior High School	2	3	10	8	1	-	3	-	-	2
	Junior High School	8	10	13	14	5	7	12	5	5	5
	Primary School	115	72	66	61	43	69	70	65	66	62
Industries /Companies	Large	-	-	2	2	-	-	-	4	-	-
	Medium	38	20	2	20	6	24	27	12	6	35
	Small	7	25	7	7	255	1799	76	579	739	65
	Large	7	15	1	40	-	-	40	-	-	-
	Medium	43	75	96	188	12	4	19	41	5	30
	Small	422	274	7	?	75	22	?	200	60	7
Shops	Official Use	2	7	2	7	6	1	10	2	7	2
	Public Use	68	107	178	5	35	20	150	37	20	33
	Private Use	-	-	35	187	5	3	27	5	2	4
Letters <IC/OG> (per month)		4500/2100	3000/1000	?	?	510 / 325	1500/ ?	1500/ ?	1000/ 750	1125/ 900	5850/3900
Telephone Demand	Govt. Office	14	18	22	23	14	9	21	13	14	10
	Social Facilities	7	22	18	16	5	13	13	5	4	10
	Public (P.C.O.)	14	13	14	10	12	15	17	12	11	13
	Sub-Total	35	53	54	49	31	37	51	30	29	33
	Demand Density	0.03	0.05	0.07	0.05	0.08	0.06	0.08	0.05	0.04	0.04
Telephone Demand	Industry/Company	38	20	2	22	6	24	27	16	6	35
	Shop	50	90	97	228	12	4	59	41	5	30
	Residence	8	35	25	30	5	5	30	16	39	10
	Sub-Total	96	145	124	280	23	33	116	73	50	75
	Demand Density	0.08	0.15	0.16	0.29	0.06	0.06	0.17	0.12	0.06	0.09

ANNEX 2 (4/5) Results of Demand Survey

Name of Kecamatan	Kabupaten : KAMPAR					Tembusai Kampar Kiri
	Slak Hulu	Kampar	Bangkai- nag	Tandung	I3 Koto Kampar	
Telecom. Facilities	X X	X X	O O	X X	X X	X X
Area (sq. km)	4275 76318	1004 74967	547 46820	1008 17031	1752 18428	1525 32787
Total Number of Desa	26	27	14	7	13	20
Number of Urban Desa	-	-	-	-	-	-
Urbanization Rate (%)	0	0	0	0	0	0
Government Offices	11	2	51	5	2	19
Post Office	-	-	1	1	-	1
Police Station	1	6	1	1	2	1
Hospital/Clinic	7	8	5	3	4	4
Bank	1	1	1	0	-	1
Hotel	1	-	4	2	-	-
Theater	1	-	1	1	-	1
Senior High School	7	11	6	1	-	2
Junior High School	12	34	8	3	3	8
Primary School	79	139	46	16	25	75
Industries /Companies	?	?	?	?	?	?
Large	?	4	-	-	-	-
Medium	?	-	-	-	-	-
Small	?	-	-	-	-	-
Shops	?	?	50	-	-	-
Large	?	80	100	30	-	31
Medium	?	?	?	?	?	?
Small	?	10	30	8	4	13
Automobiles	?	227	57	42	49	14
Official Use	?	-	-	-	-	-
Public Use	?	-	-	-	-	-
Private Use	?	-	-	-	-	-
Letters <IC/OG> (per month)	?	?	?	?	?	?
Govt. Office	16	7	56	10	7	24
Social Facilities	18	26	19	9	6	10
Public (P.C.O.)	26	27	14	7	13	20
Sub-Total	60	60	89	26	26	54
Demand Density	0.08	0.08	0.19	0.15	0.14	0.07
Industry/Company	?	4	1	0	0	0
Shop	?	80	150	30	0	31
Residence	?	30	100	15	0	25
Sub-Total	?	114	251	45	0	56
Demand Density	?	0.15	0.54	0.26	0.00	0.08
Letters <IC/OG> (per month)	?	?	?	?	?	?
Govt. Office	16	7	56	10	7	24
Social Facilities	18	26	19	9	6	10
Public (P.C.O.)	26	27	14	7	13	20
Sub-Total	60	60	89	26	26	54
Demand Density	0.08	0.08	0.19	0.15	0.14	0.07
Industry/Company	?	4	1	0	0	0
Shop	?	80	150	30	0	31
Residence	?	30	100	15	0	25
Sub-Total	?	114	251	45	0	56
Demand Density	?	0.15	0.54	0.26	0.00	0.08



ANNEX 2 (5/5) Results of Demand Survey

Propinsi : RIAU

Kabupaten : INDRAGIRI HULU

Name of Kecamatan	Rengat	Peranap	Cerenti	Kuantan Hillir	Kuantan Tengah	Kuantan Mudik	Singingi
Telecom. Facilities	o	x	x	x	o	x	x
Telegraph Office	o	x	x	x	o	x	x
Area (sq. km)	2131	1701	906	789	587	1936	3485
Population	45601	13602	17532	33889	46639	28679	8992
Total Number of Desa	25	11	20	50	43	51	9
Number of Urban Desa	1	-	-	-	1	-	-
Urbanization Rate (%)	4	0	0	0	2	0	0
Government Offices	21	3	4	5	22	3	4
Post Office	1	1	1	1	1	1	1
Police Station	7	2	1	2	1	1	1
Hospital/Clinic	15	3	7	4	18	8	2
Bank	3	-	1	1	1	1	-
Hotel	5	-	-	2	2	-	-
Theater	2	1	-	-	1	-	-
Senior High School	5	1	2	1	5	2	-
Junior High School	8	3	4	7	11	10	1
Primary School	62	24	33	43	56	43	13
Industries /Companies	-	2	-	-	-	-	-
Large	-	-	-	1	2	-	3
Medium	-	-	-	-	2	-	-
Small	?	-	-	-	?	-	-
Large	50	-	-	-	24	-	-
Medium	100	10	10	20	60	30	10
Small	?	?	?	?	?	?	?
Official Use	32	10	8	10	24	7	8
Public Use	92	10	9	24	57	30	16
Private Use	-	-	-	-	-	-	-
Letters <IC/OG> (per month)	?	1500/1800	?	?	4500/6000	?	200 / 200
Telephone Demand	26	8	9	10	27	8	9
Govt. Office	38	8	12	9	29	13	4
Social Facilities	25	11	20	50	43	51	9
Public (P.C.O.)	89	27	41	69	89	72	22
Sub-Total	0.20	0.20	0.23	0.20	0.21	0.25	0.24
Demand Density							
Telephone Demand	0	2	0	1	2	0	3
Shop	150	10	10	20	84	30	10
Residence	100	0	0	10	50	30	0
Sub-Total	250	12	10	31	136	60	13
Demand Density	0.55	0.09	0.06	0.09	0.29	0.21	0.14

ANNEX 3 (1/2) QUESTIONNAIRE TO ADMINISTRATION (Camat Office)

A. GENERAL

1. Name and Address,

2. Size of your Office

No. of Staffs (Year )	Persons	Annual Salary	Annual Working Hours
Class I			
Class II			
Class III			

Annual Budget per Item (Year )

Revenue 1.	Amount
2.	
3.	
Expenditure	Amount
1.	
2.	
3.	

3. Organizational Structure and its activity/ Contents of service per each section.

ANNEX 3 (2/2)

4. Your communication structure/network inside and outside organization

5. What is your communication media/means ?

Telephone, H.F radio, Letter or Telegram, Auto mobil,

Others( )

A. GENERAL

1. Name and Address,
2. Sales Commodity
3. Size of Firm

No. of Employees

	Person	Annual Salary	Annual Working Hours
Class I			
Class II			
Class III			

Amounts of Capital

Revenue Items

Sales Amount

- 1.
- 2.
- 3.

Expenditure

- 1.
- 2.
- 3.
- 4.

4. Organization Structure and its activity per each division.

ANNEX 4 (2/2)

5. Your communication structure/network inside and outside firm

6. What is your communication media/means ?

Telephone, H.F radio, Letters and Telegram, Auto Mobil,

Others ( )

ANNEX 5 (1/14) Communication Survey (Camat Office in Kab. Kampar)

	Kab. Kampar	Kec. Bangkinang	Kec. Kampar	Desa Kampar	Kec. Rambah
<b>Telephone</b>					
No. of line	2 (8)	1	0 (at tele.office)	0	0
To where	Peka. Jkt. Padang	Bupati	People go to		
Frequency	40-50/day	10/day	Pakanbaru for		
Time to connect	1/15 (success)		telephone		
Holding time	10 minutes	3 minutes			
<b>HF Radio</b>					
No. of operator	5		not so	0	3 (7 hrs)
Service hour	7 time/7 time	not so			12 hours
To where	Gove	Camat (Orazi)			Bupati
Frequency	3-15/day	5/day			7/day
Other					from Bupati
					10/month
<b>Letter</b>					
To where	Gove	Camat		Camat	Bupati, Desa
Frequency	20-25/day	10/day	not so	4/month	20/month
Time to send					2 km
<b>Mobil</b>					
No. of equipment	7, 12 (cycle)	1	1, 3 (cycle)	Public Bus	1
To Bupati	15/day (Gove)	2/month (Gove)	10/month	2/week (Camat)	1/week (2)
From			2-3/month (5-6)*	1/month (2)	10/month
Time (Max.)	1.2 hour	1.2 hours	10 km		2.5 hours
To Desa	2/month (Camat)	20/month	3-4/month (10)		15/month (10)
From	1/month	1/week	2/month		2/week/Desa
Time (Max.)		17 km	67 km		37 km
<b>Other</b>					
Desa to people				Everyday 1.5km	18 km
Location of P.C.O	Install. tele.		Desa, Market,	Desa, Market	Desa, Market
	Kecamatans which		School		
	road condition				Transmigration
	is not good at				Future, 4 Desa
	first		At present, staff		/Location
			should go to Desa		(16 Desa)
			Office before the		
			meeting.		
			Problems in Bang-		Agri. 70%
			kinang Telephone		Service 30%
			Office		

\* Note: Bracket indicates the trip frequency of Camat's staff

ANNEX 5 (2/14) Communication Survey (Camat Office in Kab. Indragiri Hulu)

	Kab. Indragiri Hulu	Kec. Kuantan Tengah	Kec. Singingi	Kec. Kuantan Mudik	Desa Tebing Tinggi
<b>Telephone</b>					
No. of Line	1	1	0	0	0
To where	Pekanbaru	Bupati, Local			
Frequency	3/day	sometimes			
Time to connect	quick use				
Holding time	secret matter	3 minutes			
<b>HF Radio</b>					
No. of operator	3	1	3 (7 hours)	3	0
Service hour	24 hours	12 hours	9-11, 13-15, 21	9, 11, 13, 15, 21	
To where	Gove. Camat	Bupati	Bupati	Bupati	
Frequency	routine use	9/day	5/day	5/day	
Other			5-15 minutes	10-15 minutes	
<b>Letter</b>					
To where	many	Bupati, Gove.	Bupati, Desa	Bupati	
Frequency		8/day	100/month (people)	150/month	
Time to send			23 km		
<b>Mobil</b>					
No. of equipment	18	1, 3 (cycle)	1	1, 7 (cycle), 1	Public Bus
To Bupati		3/month	1/month	3/week (Camat)	
From		2/month	1/2 month (2)		
Time (Max.)		6-24 hours	3 hours		
To Desa	70-80%/year	12/month	2-3/month	20/month	
From	7/month/boat	20/month	1/week	1/week-1/month	
Time (Max.)		20km, 60 km (Transmigration)	3 hours (boat)		
<b>Other</b>					
Desa to people	10-15 km	3 km	1 km (?)	3 km	Desa, Market
Location of P.C.O	Desa, Market	Desa, Market	Desa, Market		
Camat to Desa	70-80%/year				
Distance	60 km	Rubber (Raw Material) To Pekan, Padang	Gold, Rubber, Coffee		People call to Pekan., Padang, Bukittinggi, JKT
		Agri. 80.00%	Agri. 65%		
		Industry 0.75%	Industry 5%		
		Trade 6.50%	Other 30%		
		Govt. 9.50%			
		Other 3.25%			

ANNEX 5 (3/14) Communication Survey (Clinic in Kab. Kampar)

	D.K.K. Kampar	Kec.Kampar	Kec.Rambah
Telephone No. of Line To where Frequency Time to connect Holding time	1 Pekanbaru 3/week 1 hour 3 minutes	at Bangkinang Padang/JKT	0
HF Radio No. of equip. To where Purpose	Bupati/Camat Emergency		at Camat Office  1 month
Letter To where Frequency Time to send			
Mobil No. of equip. To D.K.K. From Time To Sub Unit To Pos Kesehatan Time	1, (8 total) 2/week (Pekan)  1/month (Puskes.) 1/1-2 month	1  everyday 2/week 1 hour	1 1/month (1) 2/month 2.5 hours 1/month (22 km) 1/3 month 17 km
Other People to Sub Unit to PusKes.	18 units Max. 1 week  Need Meeting 1/week  Telecom as extension service  Medicin supply 1 month to each Puskesmas	4 units 5km (30 min.)	5 units 10 km (Puskes.) 27 km  <u>Emergency</u>  Puskesmas ↓ Camat/Desa ↓ Mesjid(57 unit) ↓ Inhabitas



## ANNEX 5 (4/14) Communication Survey

(Clinic in Kab. Indragiri Hulu)

	D.K.K. Indragiri Hulu	Kec.Singingi	Kec.Kuantan Tengah
Telephone No. of Line To where Frequency Time to connect Holding time	1 Pekanbaru 5/month quick matter secret matter	0	1 Pekan./Rengat 2-3/month  3 minutes
HF Radio No. of equip. To where Purpose	Bupati office Pekanbaru Not so hurry (10/month)	Camat Rengat	If not good in tele., use HF, Orari sometimes
Letter To where Frequency	Pekanbaru 3-5/day	Rengat sometimes	Rengat/JKT buy magazine 8/month
Mobile No. of equip. To D.K.K. From Time To Sub Unit To Pos Kesehatan Time	1, 1 (cycle) 2-3/month 1-2/month 2/month 1-2 month 30 km	1 sometimes " 4/month	1 1/month 4/year 6-24 hours 2/month(3/week)
Other People to Sub Unit to Puskes.	10/day 22-30/day 5-10 km  Emergency .. "Orari" .. Camat/Desa  Total staff 192 (Doctor 15)	3 units  42 km  Emergency Desa/Mosque  No. Pus Kes 2 sub unit are under construction	7 units, 5km(?)  come to Puskes.  Emergency 4-10/month (use ambulance) to Pekanbaru Camat Office

ANNEX 5 (5/14) Communication Survey (Large Shop in Kab. Kampar)

	Kec. Bangkinang	Kec. Bangkinang	Kec. Kampar	Kec. Rambah
Telephone				
To where	1 Padang, Pekanbaru JKT, Medan	At Tele. office Local call	Bangkinang Pekanbaru/JKT sometimes 30 minutes	0
Frequency	5, 7, 2, 2/month			
Time to connect	15 minutes			
Holding time	5 minutes			
Letter				
To where		Medan		
Frequency	2/month	sometimes		
Time to send		(telegram)		
Mobil				
No. of equip. to distribution	JKT 1/2 month Padang 3/month Pekanbaru 6/month sometimes	Medan 1/month Pekan. 2/month	0 Pekan. 4/month JKT 1/month Padang 1/month	0 (bus) Bukittinggi 1/month (200 km, 5 hours) JKT 1/month (cosmetic)
From				
Time				
Consumer	Tundun, Rambah	Tundun, Rambah	15 km (max.)	
No. of Employee	6 (family)	2 (family)	2 (family)	2 (family)
Sales amount (Rp)	1.5 M/month	200,000/month	200,000/month	
Expense on Comm.	500,000/month	shoes, electric.	16,000/month	cloth, living goods
Sales commodity	for living	cloth	market day 1/week	market day 2/week
Stock level (%)	250%	160%	200%	
Change market	Padang, Pekanbaru to Medan, JKT			Here 50 large shops Needs of tele. in future
Reduction of trip	50%			Most of shopowner is local people
		Medan 70% Pekan. 30% Price 15% different	Pekan. /Tj. Pinang 30% Jkt/Padang 70% Price 15% different	
			Here about 170 shops	



ANNEX 5 (7/14) Activities of Pos dan Giro (Riau)

Name of Pos dan Giro	Bangkinang	P. Pangarayan	Rengat	Tl. Kuantan	Air Molek
Size (Class)	Kp	Kp	Kpb	Kp	Kp
No. of Letters					
In-coming	300/day	150/day	600/day	190/day	90/day
Out-going	200/day	110/day	600/day	490/day	100/day
Official/Private					
In-coming	45/55(%)	20/80	35/65	18/22	
Out-going	30/60(%)	20/80	35/65	25/74	
Destination					
In-coming	Pekan. 45%	Pekan. 10%	Pekan. 25%	Riau 15%	Pekan. 40%
	JKT 20%	Jawa 90%	JKT	Sumatera 35%	JKT 50%
	Other 35%	(Transmigration)	Medan 75%	Jawa 50%	Other 10%
Out-going	Pekan. 30%	Pekan. 10%	Tj. Pinang	Riau 10%	Pekan. 40%
	JKT 20%	Jawa 90%		Sumatera 35%	JKT 50%
	Other 45%			Jawa 45%	Other 10%
Giro Sending	Rp. 30 M/month	Rp. 125,000/month	Rp. 140 M/month	Rp. 1 M/month	Rp. 4 M/month
	(Tax, Insurance)	(Tax, Insurance)			
Receiving	Rp. 600 M/month	Rp. 9 M/month	Rp. 400 M/month	Rp. 94 M/month	Rp. 7 M/month
	(salary to Govt)	(salary to Govt)			
Destination					
Sending	Pekan. 100%	Pekan. 100%	Pekan. 75%	Pekan. 100%	Pekan. 80%
			JKT, Padang 25%		JKT 20%
Receiving	Pekan. 100%	Pekan. 100%	Pekan. 80%	Pekan. 100%	Pekan. 90%
			JKT, Padang 20%		JKT 10%
Saving					
In-coming		Rp. 100,000/month	Rp. 15 M/month	Max. Rp. 30,000 x	
Out-going			Rp. 8 M/month	15 persons/month	
Money order					
In-coming		Rp. 2.5M/month	Rp. 90M/month	Rp. 5000-25,000	
Out-going		Rp. 5000-250,000/ person	Rp. 60M/month	496 persons/month	
				Rp. 30,000 x 525 persons/month (to Jawa)	
Covering Area					
(Max. distance to distribution)	Kec. Bangkinang	Kec. Rambah	Rengat (4 km)	Kec. Kuan. Tengah	Kota
	Kec. Kampar	Kec. Tempusai	Kec. Rengat (22 km)	Kec. Singingi	4 Desa (50 km)
	Kec. XIII Koto Kampar	Kec. Kepenuhan (45 km)	Kec. Siberida	Kec. Kuan. Hilir	6 Desa
				Kec. Kuan. Mudik	
Frequency for Distribution	Daily	1/week	Daily	Daily (by cycle)	Daily
		2/month	2/week	1/week	1/week
		2/month (by bus only)		Daily	Depend on Lurah
				Daily	To Pekan. every day

ANNEX 5 (8/14) Communication Survey (Camat Office in Jawa Tengah)

	Kec. Sidarjo	Kec. Kroya	Kec. Ajibarang	Kec. Sokaraja	Kec. Bobotsari	Kec. Purbalingga	Kab. Purbaling
Telephone							
No. of line	1	1	1	1	1	1	5
To where	Bupati	Bupati	Bupati	Bupati/other	Bupati	Bupati	Camat, Govern other
Frequency	2/day	3-5/day	1 - 6 month	6/day	3 - 5/day	20/day (business)	2-3/day 2-3/ month
Time to connect	3 min/call	2 minutes	many trouble	1 - 2 time	3 - 5 min.	10 min.	
Holding time		1-10 min.	0.5 - 10 min.	3 - 5 min.			
H.F. Radio							
No. of equip.	1	1	)	)	)	)	2 (HF. VHF)
No. of operator	1 (7 hours)	1 (7 hours)	)	)	)	)	4 ( 2x2 )
To Where	Bupati	Bupati	) Not Working	) Not Working	) Not Working	)	Camat, Govern
Frequency	1 / day	15 / month	)	)	)	)	5/day, 2/day
Time to connect		1 - 3 min	)	)	)	)	
Holding time	5 - 10 min.		)	)	)	)	
Letter							
To where	Bupati						
Frequency							
Time to send			8/month				
			1 - 20 min.				
Mobil							
No. of equip.	2 (Veh cycle)	3 (camat, privat)	6 (Veh 1. cycle 5)	1 (private)	1 (minibus)	1	2
To Bupati	10/month	8/month	7/month	5/month	10/month	10/month	2 - 3 day
From	6 - 8/month	sometime	1/month	1/3 month	1/3 month	1 month	4 month
Time	- 1.5 hours	0.5 hours	everiday	everiday	everiday	5/week	
To Desa	2/day	10/month	everiday	everiday/gesa	everiday	everiday	
From	everiday	everiday	everiday	everiday	everiday	everiday	
Time	- 1.5 hours	0.16-0.5hour	3 - 10/month	10/month	2 day		
To Others	4 / week	everiday	many	many	everiday		
From	Every 20	1 / week					

ANNEX 5 (9/14) Communication Survey (Camat Office as PCO in Jawa Tengah)

	Kec.Sidarejo	Kec.Kroya	Kec.Ajlbarang	Kec.Sokaraja	Kec.Bobotsari	Kec.Purbalingga
Telephone						
No. line	1		1		1	1
To where	Purwokerto, Jkt, Semarang		Purwokerto, JKT Solo, Yogya		Purwokerto, JKT	
Frequency	5/day	—	10/day	—	10 - 25/day	20/day
Time to connect	Manual		many trouble		Manual	Manual
Holding time	3 mini		0.5 - 10 mini		3 - 5 min.	10 min.
Charge/call (mini)	Rp. 1000		Rp. 500		—	—

ANNEX 5 (10/14) Communication Survey (Clinic in Jawa Tengah)

	Kec. Ajibarang	Kec. Sokarja	
Telephone No. of line To where Frequency Time to connect Holding time	1 (Camat office) DKK, Medical clinic Hospital 2/week-15 days 15 min. - 24 hrs	1 (Doctor) DKK 1/day Manual 3 minutes	* Sokarja When no telephone, mobil was used for taking 10-15 min. * If telephone in- stalled to each De- sa, 85-90% of people could alive.
Letter To where Frequency Time to send	other clinic 3 / day - 3 hours	4 / month 0.5 hour	
Mobil No. of equip. To Kab. From Time To Desa From Time	0 15 - 20 month - 1.5 hours Both way 3 hours	3(ambulance, cycle) 2/month, Many 1/month 2/month, 3/week everyday - 1 hour	

ANNEX 5 (11/14) Communication Survey (Large Shop in Jawa Tengah)

	Kec. Ajibarang	Kec. Sidarejo	Kec. Sokarja	
Telephone				
No. of line	Camat office	Camat office	1	*Stock
To where	Jakarta	Solo, Yogya, Jkt. Semarang, Bandung	Semarang, Bandung, Jakarta	level
Frequency	2/week-business everiday-private	5-6/month	2 / day	Kec. Sidarejo 10 times
Time to connect	0.5-1 hours	1 - 2 hours	Manual	Kec. Sokarja 1.5 times
Holding time	-	5 minutes	5 minutes	
Letter			Semarang, Bandung.	
To where	)		1 - 2/ week	
Frequency	) Almost	-	5 minutes	
Time to send	) Nothing			
Mobil				
No. of equip.	1	1 (by shopowner)	1	
To distribution	4/month	3/month	5/week	
From	2/week	1/month-1/week		
Time			sometimes	
To consumer	1/week	-		
From			5 hours	
Time				
Revenue	Rp. 30 million/ month	Rp. 10-15 million / 1 month	Rp. 15.000/day	
Expenses on Commu nication	Rp. 600.000/ month	--	Rp. 100,000	
Charge per call	Rp. 500 (min)	Rp. 1000 (mini)	After telepho ne buying pri ce reduc 5%	
Installation cost	Rp. 1 million (24 people)	Rp. 100.000 (100 people) waiting 3 years	on average	



ANNEX 5 (12/14) Communication Survey (Large Industry,  
Noodle Production, in Jawa Tengah)

	Kec. Sokarja	Kec. Kroya	
No of Employees	63	130	* Stock level  Kec. Sukarja 1-3 times  * Both factory installed tele- phone when they open their factory
Salary	Rp.25,000/month	Rp.30.000/month	
Revenue	Rp.1.5 million/ day	Rp. 3-4 million/ day	
Expense of Commu- nication	Rp.15,000/day	Rp. 100,000/day	
Telephone No of line To Retailer From To Distributor From Holding time	1 8/month 10/month  6 month 5 minutes	—	
Letter To where Frequency Time to send	20/week 1 minutes	—	
Mobil No.of equip. To retailer From Time To Distributor From Time	2 5/week  (Jawa Tengah)  1/week (Semarang/JKT)	—	
	—	Open factory just two month ago.	

ANNEX 5 (13/14) Activity of Pos dan Giro

Name of Pos dan Giro	Banyumas	Bobotsari	Purbalingga	Kroya	Sidarejo
Size and Class	Kpp	Kpp	Kp	Kpp (Kp)	Kp
<b>No. of Letters</b>					
In-coming	2,350/month	135/day	26,508/month	10,900/month	340/day
Out-going	9,750/month	100/day	25,362/month	9,500/month	420/day
<b>Official/Private (%)</b>					
In-coming	40	81	23	82	9
Out-going	4.6	80	23	81	5
<b>Destination</b>					
In-coming	JKT 50	JKT 50	-	JKT 50	JKT 60
	Other 50	Outer Jawa 30		Outer Jawa 20	
	JKT 50	Other 20		Other 30	
Out-going	JKT 50	-	-	-	-
	Other 50				
<b>Giro Sending</b>					
Sending	2.4M/month	900,000/month	30.4M/month	17.4M/month	
Receiving	39.3M/month	20M/month	952.7M/month	1.6M/month	
<b>Destination</b>					
Sending	Purwokerto 100%	JKT 10			
		Purwokerto 90			
		JKT 25			
		Purwokerto 75			
<b>Receiving</b>					
Saving					
In-coming	37.5M/month	60,000/month	12.2M/month	2.4M/month	
Out-going	1000-600,000		13.4M/month	3.2M/month	
	15 persons/day				
<b>Money Order</b>					
In-coming	500,000/day	3M/month	36.4M/month	13.7M/month	
	(10 persons/day)				
Out-going	100,000/day	15M/month	101.4M/month	36.2M/month	
	(30 persons/day)				
	JKT				
<b>Covering Area</b>					
	Kota (Mail Box)	same	same	same	same
	Kecamatan				
	Other				
<b>Frequency for Distribution</b>					
	Daily	same	same	same	same
	Daily (Desa Office)				
	3/week (Kecamatan Office)				

ANNEX 5 (14/14) Communication Needs at High School (Riau and Jawa Tengah)

Location of High School	Bangkinang	Air Tiris	Taluk Kuantan	Bobotsari	Kroya
Size No. of Student	599	585	486	360	693
Location (max)	12 km (Air Tiris)	15 km (Kuok)	10 km Singingi Peranap Seranti	15 km	38 km (Cilacap)
No. of Teachers	26	26	26	22	35
Location (max)	Bangkinang	10 km Bangkinang	same	30 km Purwokerto	48 km (Purbalingga)
Distribution of Text Book	JKT-Pekan. - High School 1/year	same	same	same	From JKT directly
Communication between School/Student	By letter (via friends)	same	same	same	same
Teacher/School	By letter	By letter	By letter/mobli	By letter via friends	By letter via friends
Telephone to where Frequency	0	0	1	0	0
Students After High School (University) After University	-	Pekan. 120 JKT 2-3 Back to Pekan.	Teacher's course 40% Other Good job being teacher Back to Pekan.	75% go to Univ. (Purwokerto)	10% Purwokerto Semarang Yogya Not back to here Yogya/Semarang/JKT
Teacher's Life At School	-	Shift (morning evening)	7:00-1:15 high school 1:30-6:00 private	7:30-1:00 work at private school	7:00-12:45 1:00-5:30
Training Book/Information	-	Pekan./JKT/Padang From Padang by mail	By mail, JKT/Bandung 10/year/teacher	Semarang/Purwokerto	Semarang/Yogya/ Purwokerto 10/year
Salary at School	-	-	RP. 60,000 RP.150,000 Private	-	-
Other	-	-	RP.2.500/hour	-	-
Telephone Needs	-	Needs between school and Pekan.	-	Needs telephone but in future Use tel. friends/relatives	Needs local call to Cilacap/meeting between schools 3/month interlocal to Semarang in future teacher's house

ANNEX 6 (1/4) Telecommunication Facilities Survey

1. Time Distance From

- i) Capital of Each Kecamatan to Capital of Kabupaten
- ii) to Capital of Province

2. Telephone Demand for

- Administration
- Public Service
- Industry
- Residence
- Others

3. Telecommunication Needs

- Grades of Service
- Ratio of City Calls(Traffic) and Outside City Calls
- Facsimile

4. Origin and Destination of Postal Letters, Money Order and Telegrams

Please ask Pos and Giro to conduct this survey for two weeks.

- i) Origin and Destination of Letters, Money Orders and Telegrams per Each Desa. (Date, )
- ii) Purpose (Private or Business Use) should be noted.

5. Electricification Development plan per Each Kecamatan

I. Investigation Items on Telecommunication Facilities  
(Bahan2 Penyelidikan untuk Sarana Telekomunikasi)

1. Name of Office : \_\_\_\_\_  
Nama Kantor
2. Location/Address : \_\_\_\_\_  
Alamat
3. Kind of Facilities : a) Switching Equipment; Auto / Manual  
Peralatan Switching; Otomatis/manual  
b) Radio Equipment ; HF/VHF/UHF/SHF  
Peralatan Radio; HF/VHF/UHF/SHF  
c) Earth Station  
Setasiun Bumi  
d) Repeater Station ; Radio / Cable  
Setasiun Pemancar; Radio/Kabel
4. Class of Office : TTC / STC / PTC / Te / STE / RLU / RSU  
Jenis Kantor
5. Name of Equipment : \_\_\_\_\_ X \_\_\_\_\_  
Nama Peralatan
6. Date of Manufacture : (D) \_\_\_\_\_ (M) \_\_\_\_\_ (Y) \_\_\_\_\_  
Tanggal Pembuatan (Tanggal) (Bulan) (Tahun)
7. Date of Establishment : (D) \_\_\_\_\_ (M) \_\_\_\_\_ (Y) \_\_\_\_\_  
Tanggal Pemasangan (Tanggal) (Bulan) (Tahun)
8. Exchange Capacity : Trunk \_\_\_\_\_, \_\_\_\_\_ cct/ch ( \_\_\_\_\_, \_\_\_\_\_ cct/ch)  
Kapasitas Sentral L.U.Cap. \_\_\_\_\_, \_\_\_\_\_ L.U.  
Sub. \_\_\_\_\_, \_\_\_\_\_ L.U. ( \_\_\_\_\_, \_\_\_\_\_ L.U. )
9. Cable Capacity : Type of Cable \_\_\_\_\_  
Kapasitas Kabel Jenis Kabel  
No. of Pairs \_\_\_\_\_ pairs  
Jumlah saluran sambungan \_\_\_\_\_ pasang
10. Frequency/Output Power : \_\_\_\_\_, \_\_\_\_\_ MHz / \_\_\_\_\_ Watts  
Frekuensi/ Yang terpakai
11. Waiting Subscribers : \_\_\_\_\_, \_\_\_\_\_ sub.  
Jumlah Calon Langganan
12. Traffic : \_\_\_\_\_, \_\_\_\_\_ call/sub. hour  
Lalu-Lintas \_\_\_\_\_, \_\_\_\_\_ sec./sub.  
\_\_\_\_\_, \_\_\_\_\_ erl./sub.
13. Power Supply : a) Engine Generator ; YES / NO  
Sumber Tenaga berasal dari Generator; Ya/Tidak  
b) Commercial Power ; YES / NO  
Listrik; Ya/Tidak  
c) Availability ; Full/Limited(\_\_\_\_h.)  
Kekuatan Penuh/Terbatas  
of C. Power from \_\_\_\_\_ to \_\_\_\_\_  
Listrik dari \_\_\_\_\_ ke \_\_\_\_\_  
d) Supplier ; PLN / Private  
Pensuplai PLN/Swasta
14. Operation/Maintenance : a) Attendant / Unattendant  
Pengoperasian/Pemeliharaan: Ditunggu/Tidak ditunggu  
b) No. of Persons ; Daytime \_\_\_\_\_  
Jumlah orang Pagi \_\_\_\_\_  
Nighttime \_\_\_\_\_  
Malam \_\_\_\_\_

ANNEX 6 (3/4)

II. Investigation Items on the Local Network and Others  
(Bahan2 Penyelidikan untuk Jaringan Lokal dan lain2)

1. Name of Area : \_\_\_\_\_  
Nama Daerah
2. Subscriber Lines : Overhead / Underground / Radio  
Sambungan Langganan : Kabel Udara/Kabel Bawah Tanah/Radio
3. Cable : a) No. of Pairs \_\_\_\_\_ pairs/km  
Kabel Jumlah Saluran Sambungan pasang/Km
- b) Diameter \_\_\_\_\_ mm  
Diameter
- c) Remark \_\_\_\_\_  
Catatan
4. Other Facilities : \_\_\_\_\_  
Sarana Lainnya
- \_\_\_\_\_
- \_\_\_\_\_

III. Location Map of Objective Area  
(Lokasi Peta dari Daerah yang dituju)

Please refer to the following page.  
(Harap lihat halaman berikutnya)

ANNEX 6 (4/4) IV. Trunking Diagram of Existing System  
(Saluran Diagram dari Sistim yang dipakai)

Incoming Masuk	Traffic Lalu-lintas	cct.	cct.	Traffic Lalu-lintas	Outgoing Keluar















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