

## 2.2.11 その他の原料資源

### 2.2.11.1 Jepara

Jepara の長石については MTRDC/BBK のデータベースにも、DSM の調査報告書にも記載が見られず、鉱山の状況、鉱量、品質など詳細は不明である。ただしインドネシアにおける衛生陶器の最大手メーカーである PT. Indo American Ceramic (KIA Group) がマレーシア産の長石と合わせて実際に使用していることから、品質的には期待される原料と見られる。

### 2.2.11.2 Bangka

Bangka 島には PT. Putra Kusuma Abadi など 8 社の採掘業者が事業を行っており、最大の採掘量は 1 社で 6 万トン/年の企業もあり、Bangka 島全体では精製カオリンおよび原鉱の合計で 30 万トン/年に達する。8 社中 3 社はイギリスや台湾から導入した新しい精製設備を有している。上述の企業ではウォーターサイクロンは台湾製、試験機器とロータリードライヤーはイギリス製であり、来年はさらに 1 ラインの増設を予定している。Bangka 島では 4 年ほど前から精製を始めたが、以前は日本への輸出はカオリン分の多い部分を選んで採鉱して原鉱のまま出荷していた。輸出先からはケーキ状（フィルタープレスを掛け、乾燥した状態）ではなく、粉末状で出荷するよう要求があり、これに対応している。

Bangka 島産のカオリンは Belitung 島産のものに比べ全体としてはカオリン分は多いが、品質が一定ではなく、カオリン分の多いもの、少ないものなど特色を生かして利用されている。日本では Bangka 島から種々の品質のサンプル見本が持ち込まれているが、逆に品質が安定しないという不安感を与え警戒されている。



表2-1 セラミック原料の埋蔵地、量および品質 (1/5)

Kind of Raw Material	Location	Occurrence	Estimation of Reserve	Chemical Analysis										Mineral Composition
				SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	ILO		
1. Kaolin	Belitung Island	・ Sedimentary residual ・ Host rock granite	+7,000,000 t.	47.14	35.47	0.44	0.26	0.19	0.04	1.18	0.26	0.26	13.13	Kaolinite, Quartz, Serpicite, Gibbsite
2. Kaolin	Bangka Island	・ Sedimentary residual ・ Host rock granite	+6 billion t.	44.23	37.70	0.64	0.52	0.06	0.19	0.67	-	14.44	Kaolinite, Quartz, Serpicite, Gibbsite	
3. Kaolin	Pajantan West Kalimantan	・ Hydrothermal ・ Host rock granite	+2,400,000 t.	72.38	17.94	0.80	0.07	0.14	-	1.39	0.65	7.14	Kaolinite, Quartz,	
4. Kaolin	Bandarpulan North Sumatra	Hydrothermal of volcanic tuff	+60,000 t.	42.92	36.72	0.49	0.59	0.21	0.07	0.20	0.33	17.14	Halloysite, Quartz Gibbsite	
5. Kaolin	Bonjol West Sumatra		Million t.	64.46	23.13	0.75	0.81	0.17	0.17	2.41	-	7.94	Kaolinite, Quartz	
6. Kaolin	Karaha West Java	Post volcanic activity (hydrothermal andesitic rock)	+7,000,000 t.	47.14	35.47	0.44	0.26	0.19	0.04	1.18	0.26	13.13	Kaolinite, Tridymite Plagioclase	
7. Kaolin	Cikadu West Java	Hydrothermal of andesitic rock	+67,500 t.	58.69	20.84	0.10	-	-	-	-	-	-	Tridymite Plagioclase	
8. Kaolin	Bintahan South Kalimantan	Sedimentary deposit rock	+3,168,000 t.	72.96	24.61	1.76	-	0.64	0.86	1.80	-	9.86		
9. Kaolin	Argasari Kebumen Central Java	Hydrothermal of andesitic rock	+100 ha	45.79	36.81	0.60	-	0.23	0.63	0.05	-	14.13		
10. Kaolin	Tatakan South Kalimantan	Sedimentary deposit	+150,000 t.	62.17	35.75	1.46	-	0.56	0.22	0.32	-	12.60		

表2-1 セラミック原料の埋蔵地、量および品質 (2/5)

Kind of Raw Material	Location	Occurrence	Estimation of Reserve	Chemical Analysis										Mineral Composition
				SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	ILO		
11. Clay	Wonotirto East Java	Hydrothermal activity on volcanic tuff	?	74.26	15.32	1.12	0.60	0.39	-	1.93	-	7.18	Quartz, Plagioclase Sericite, Halloysite Montmorillonite	
12. Clay	Cipeundeuy West Java	Post volcanic activity	?	45.22	30.15	1.84	1.36	0.17	0.33	0.11	0.14	20.66	Halloysite, Cristobalite Tridymite, Quartz	
13. Ball Clay	Belitung Island	Sedimentary Kaolin	?	54.00	28.79	0.80	0.63	0.10	-	0.23	-	14.89	Halloysite	
14. Ball Clay	Parungpanjang West Java	Weathering of acid volcanic tuff	+96,000,000 M	49.75	29.73	1.46	0.69	0.45	-	2.42	-	12.81	Kaolinite, Sericite, Quartz, Plagioclase Montmorillonite	
15. Ball Clay	Gunung Guruh West Java	Sedimentary deposit	+96,000,000 M	66.52	17.24	2.33	0.90	1.50	0.82	1.38	0.20	8.24	Quartz, Halloysite Sericite, Feldspar	
16. Ball Clay <sup>*</sup>	Monterado West Kalimantan	-	-	52.59	33.73	0.38	0.94	0.29	0.07	0.78	1.25	9.16		
17. Silica	Bojong West Java	Weathering of volcanic tuff	+400 ha	71.49	17.03	0.57	0.07	0.10	0.77	2.27	1.10	5.09	Halloysite, Tridymite Plagioclase	
18. Sand (Quartz)	Narawita West Java	Weathering of liparitic tuff	+75 ha	93.03	3.83	0.12	0.02	0.84	0.14	0.33	0.46	0.55	Tridymite, Plagioclase	
19. Quartz Sand Stone	Ngepon Tuban Central Java	Sanddune (reworked deposit)	+124 t.	95.70	1.05	1.68	0.05	-	-	-	-	-		
20. Quartz Sand Stone	Gedongmeneng South Sumatra	Sedimentary rock	n.a.	99.54	0.13	0.07	0.08	-	-	-	-	-		

表2-1 セラミック原料の埋蔵地、量および品質 (3/5)

Kind of Raw Material	Location	Occurrence	Estimation of Reserve	Chemical Analysis										Mineral Composition			
				SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	ILO					
21. Quartz Sand Stone	Gunung Pasir East Kalimantan	Sedimentary rock	Million t.	99.20	0.27	0.20	-	-	-	-	-	-	-	-	-	-	-
22. Quartz Sand	Belitung Island	Sedimentary rock	Million t.	99.50	0.27	0.15	-	-	-	-	-	-	-	-	-	-	-
23. Feldspar	Lodoyo East Java	Weathering of liparitic tuff	+40,000 t.	78.37	10.90	0.25	0.34	0.13	-	7.75	-	0.88	-	-	-	-	Quartz, Orthoclase Plagioclase, Kaolinite
24. Feldspar	Lampung	· Dike in granite bodies · Pegmatite	?	64.91	19.45	0.17	0.03	0.21	-	11.91	3.86	-	-	-	-	-	Orthoclase Plagioclase, Quartz
25. Feldspar	Bonti West Kalimantan	· Dike in granite bodies · Pegmatite bodies	?	65.90	19.44	0.15	0.03	0.25	0.44	10.99	0.44	-	-	-	-	-	Microcline Plagioclase, Quartz
26. Feldspar <sup>*</sup>	Pangaribuan North Sumatra	-	-	62.57	21.58	0.34	-	1.12	-	13.82	1.00	0.40	-	-	-	-	Orthoclase, Alpha Quartz
27. Feldspar	Banjarnegara Central Java	Meta sediment (arcosic rock) Melange	+642,000 t.	77.83	12.29	0.33	0.08	0.09	0.07	4.74	4.34	0.86	-	-	-	-	Quartz, Potassium feldspar, Sodium feldspar, Sericite
28. Sanidine	East Coast of North Sumatra	Weathered of liparitic rock	Million t.	86.00	8.74	0.16	0.04	0.67	0.31	3.14	1.45	-	-	-	-	-	Quartz, Sanidine Biotite, Aragonite
29. Feldspar Saparua Moleceas	Saparua Moleceas	Pegmatite(?)	n.a.	76.28	14.25	0.48	-	1.19	0.47	3.28	3.48	-	-	-	-	-	Orthoclase, Plagioclase Quartz
30. Pyrophyllite	Pacitan East Java			84.58	12.614	0.11	0.56	0.10	-	0.21	0.28	3.01	-	-	-	-	Quartz, Pyrophyllite Kaolinite

表2-1 セラミック原料の埋蔵地、量および品質 (4/5)

Kind of Raw Material	Location	Occurrence	Estimation of Reserve	Chemical Analysis										Mineral Composition			
				SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	ILO					
31. Pyrophyllite	Ngebo Trenggalek East Java	Hydrothermal of dacitic rock	n.a.	56.07	31.274	0.89										9.69	
32. Dolomite	Sekapuk, Gresik East Java	Replacement process of limestone	+50,000,000 M	0.00	0.22	-	29.50	7.08	-	-	-	-	-	-	-	46.20	
				0.59	0.74	47.10	20.84	20.84									
33. Dolomite	Gumng Kaklak Gresik East Java	Replacement process of limestone	+70,000,000 M	0.10	0.20		31.40	9.07								45.70	
				1.40													
34. Limestone	Cipanas West Java	Coral reef (Bioherm)		0.28	0.33		53.94	0.85								42.97	P <sub>2</sub> O <sub>5</sub> =0.02
35. Limestone	Cibinong West Java	Coral reef (Bioherm)	Hundred Million t.	0.06			51.00	0.90								41.00	
				0.10													
36. Limestone	Tagogapu West Java	Coral reef (Bioherm)	Ten Million t.	0.13			56.94	-								43.36	H <sub>2</sub> O (110°C)=0.20
37. Limestone	Bongas/Palimanan West Java	Coral reef (Bioherm)		2.30	10.48	0.39	53.37	1.00								43.42	
38. Limestone	Karangbolong Central Java	Coral reef (Bioherm)	Hundred Million t.	0.20	0.03	0.22	54.70	0.20								43.72	H <sub>2</sub> O (110°C)=0.20
39. Limestone	Pamotan Central Java	Coral reef (Bioherm)	85 Million t.	1.04	0.77	0.34	52.64	0.93								42.93	
40. Limestone	Wuryantoro & Watukale Central Java	Coral reef (Bioherm)	Ten Million t.	0.60			52.64	0.93								42.93	H <sub>2</sub> O (110°C)=0.20

表2-1 セラミック原料の埋蔵地、量および品質 (5/5)

Kind of Raw Material	Location	Occurrence	Estimation of Reserve	Chemical Analysis										Mineral Composition	
				SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	ILO			
41. Limestone	Tuban East Java	Coral reef (Biohem)		0.33 <sup>-</sup> 2.12	1.00	1.00		44.80	0.10 <sup>-</sup>					42.30	P <sub>2</sub> O <sub>5</sub> =0.10
42. Limestone	Gunung Kidul Central Java	Coral reef (Biohem)			1.10	0.07		55.30	7.40					45.50	SO <sub>3</sub> =0.10
43. Bauxite	Bintan Island Riau	Weathering of shale	+14,000,000 t.	54.90	54.90	10.20	0.80	-	-	-	-	-	-	-	
44. Bauxite	Kijang Island Riau	Weathering of shale	+100,000 t.	3.44	61.59	1.94	2.12	-	-	-	-	-	-	-	
45. Magnesite	Padamarang Island	Pocket in ultra basic rock	+2,000 t.	11.10	-	0.76	-	trace	43.08	-	-	-	-	-	
46. Magnesite	Labuan Dalam Riau	Pocket in ultra basic rock	+1,000 t.	9.86	-	1.76	-	-	40.42	-	-	-	-	-	
47. Chromite	Pleihari Kalimantan	Residual deposit of ultra basic rock	+10,000 t.							13.00 <sup>-</sup>					Cr <sub>2</sub> O <sub>3</sub> =31.0-32.0 Fe <sub>2</sub> O <sub>3</sub> =13.0-14.0
48. Chromite	Latan Sulawesimantan	Beach sand	+3,000 t.												Cr <sub>2</sub> O <sub>3</sub> =50.0-32.0

Note: \*) Additional information of BBK

表2-2 セラミック原料賦存データ(1/2)

Location	Estimated Areas/Reserves	Number of Company	Production Cap	Users	Land Ownership	Others
1. Feldspar (1) Ds. Kalitengah Kec. Purwanegara Kab. Banjarnegara Prop. Java Tengah (Central Java)	4,950,000 m <sup>2</sup> Thickness: 60 m	5	15 - 20 t/d	PT. Queen Ceramics (Semarang) PT. KLA (Bekasi) PT. Super Itali	Private	The calculation is based on: - Surface distribution of feldspar out crop - Test pit/channel
(2) Ds. Kebon Dalem Kec. Purwanegara Kab. Banjarnegara Prop. Java Tengah (Central Java)	19,200,000 m <sup>2</sup> Average Thickness: 50 m	3	20 - 25 t/d	Ditto	Private	False correction = 30% Impurity materials = 20%
(3) Ds. Kebutuh Jurang Kec. Purwanegara Kab. Banjarnegara Prop. Java Tengah (Central Java)		2	20 t/d	Ditto	Private	
(4) Cicadas Ds. Narawita Kec. Cicalengka Kab. Bandung Prop. Java Barat (West Java)	+ 35 Ha Thickness + 30 m + 10,500,000 m <sup>2</sup> (27,300,000 ton)	1 CV. Pusaka Jaya	+ 50 t/d	PT. Raja Keramik Indah		
(5) Penengahan Ds. Muara Bakau Ds. Harapan & Ds. Hatta Kec. Penengahan Kab. Prop. Lampung	+ 50 Ha + 12,500,000 m <sup>3</sup>		100 t/d	Based on order for building materials	Individual ownership	



表2-2 セラミック原料賦存データ (2/2)

Location	Estimated Areas/Reserves	Number of Company	Production Cap	Users	Land Ownership	Others
2. Ball Clay (1) Cileketan Ds. Gorowong Kec. Parungpanjang Kab. Bogor Prop. Java Barat (West Java)	+ 40 Ha Thickness + 45 m	1	+ 200 t/d	PT. Bermis PT. IKAD PT. KIA PT. Indopotlen	Mr. H. Makmur	Estimated areas and reserves is according to the owners
(2) Padaraang Ds. Simaresmi Kec. Cisaat/Gunung Guruh Kab. Sukabumi Prop. Java Barat (West Java)	+ 500 Ha Thickness + 20 m	1	+ 100 t/d	PT. Masterina PT. Roman PT. Super Itali PT. IKAD PT. KIA	Local government	Estimated areas and reserves is according to the chief of local government
3. Refractory Clay (1) Cipeundeuy Ds. Cikarang Kec. Malangbong Kab. Garut Prop. Java Barat (West Java)	+ 27 Ha Thickness + 18 m + 4,860,000 m <sup>3</sup> (12,150,000 ton)	1 CV. Bumi Kita	50 t/d	PT. Indopotlen	Mr. H. Ono	Estimated areas and reserves is according to the owners

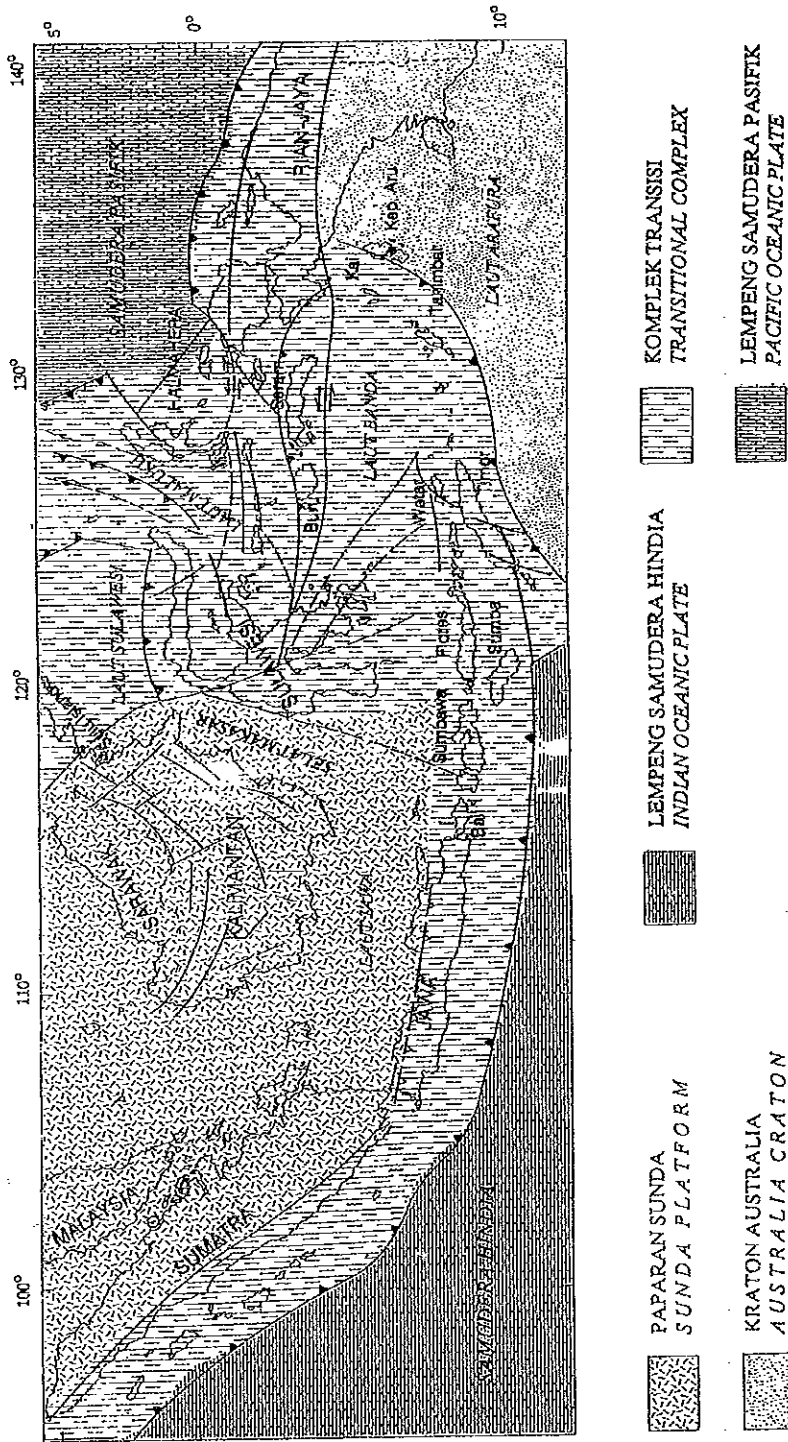
Note: Ds.- Desa (Village), Kec.- Kecamatan (District), Kab.- Kabupaten (Prefecture), Prop.- Propinsi (Province)

表2-3 西 Kalimantanの粘土鉱床

No.	Name	Location			Areal Ha
		Desa	Kecamatan	Kabupaten	
1	A		Pajintan	Ketapang	502.15
2	B	Mandor	Sungai Raya	Sambas	600.00
3	C		Pajintan	Ketapang	260.00
4	D	Mandor	Sungai Raya	Sambas	122.50
5	E	Sagu	Teluk Kramat	Sambas	1,000.00
6	F	Sagu	Teluk Kramat	Sambas	975.00
7	D	Mandor	Sungai Raya	Sambas	1,000.00
8	D	Pangkalan Pauh	Sungai Pinyuh	Pontianak	1,000.00
9	G	Bangkal Serai / Bentawan	Kendawangan	Ketapang	25.00
10	H	Sagu	Teluk Kramat	Sambas	25.00
11	D	Mandor	Sungai Raya	Sambas	24.00
12	B	Pengkalan Makmur	Sungai Raya	Sambas	25.00
13	I	Pewangi / Mandor	Sungai Raya	Sambas	25.00
14	J	Pewangi / Mandor	Sungai Raya	Sambas	25.00

Note: No. 9-14: License by provincial government

図2-1 インドネシアの地殻構造図



Peta dasar dibuat oleh Seksi Kartografi, Pusat Penelitian dan Pengembangan Geologi (PPPG) dari Peta U. S. Geological Survey, 1978 (Hamilton, 1978) Sekala 1:5.000.000.  
 Base map Compiled by Cartography Section, Geological Research and Development Centre (GRDC) from U. S. Geological Survey, 1978 (Hamilton, 1978) Scale 1:5.000.000.

図2-2 インドネシア全土の地質図

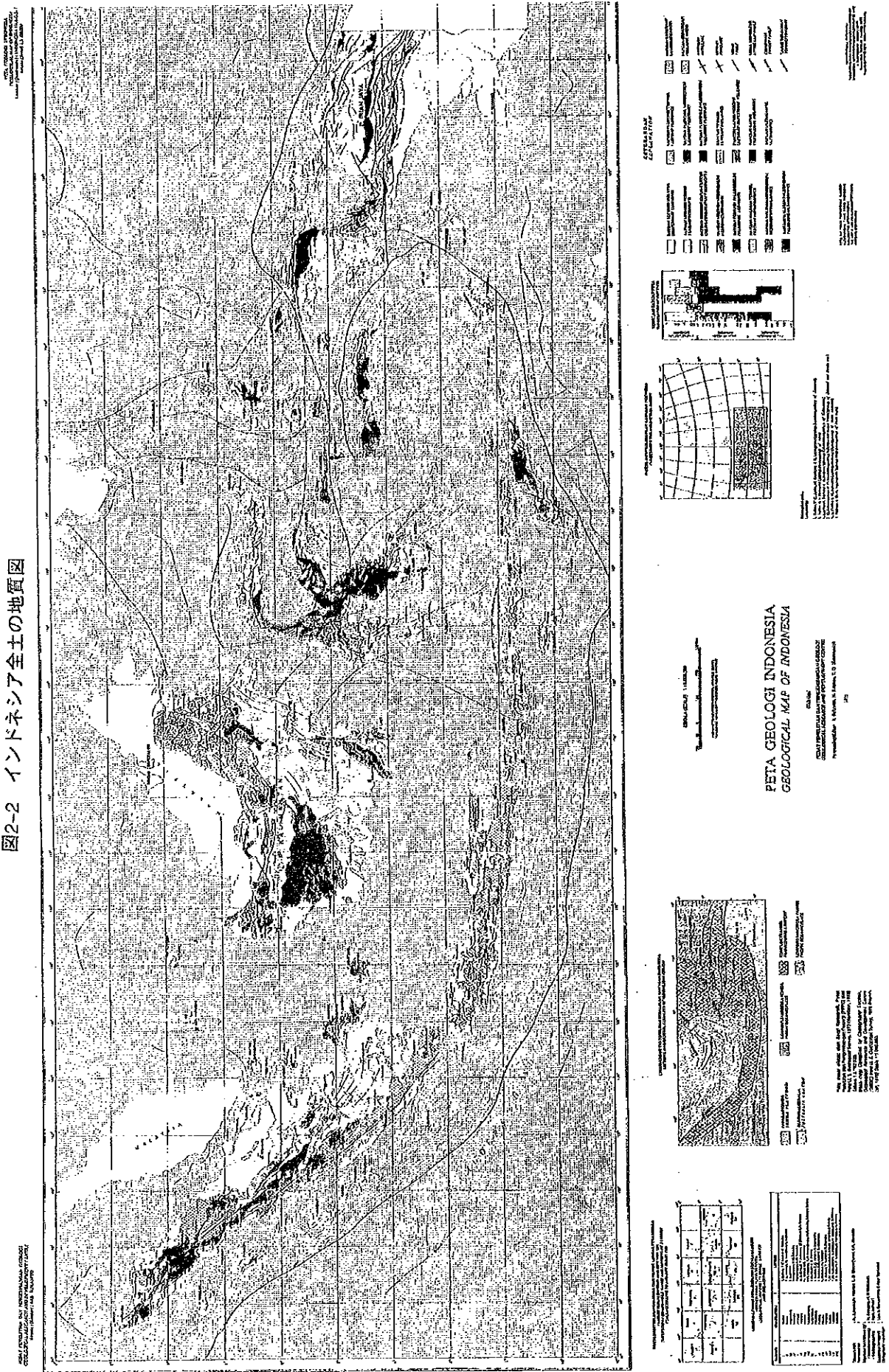


図2-3 Parungpanjang および Sukabumi周辺の地質図

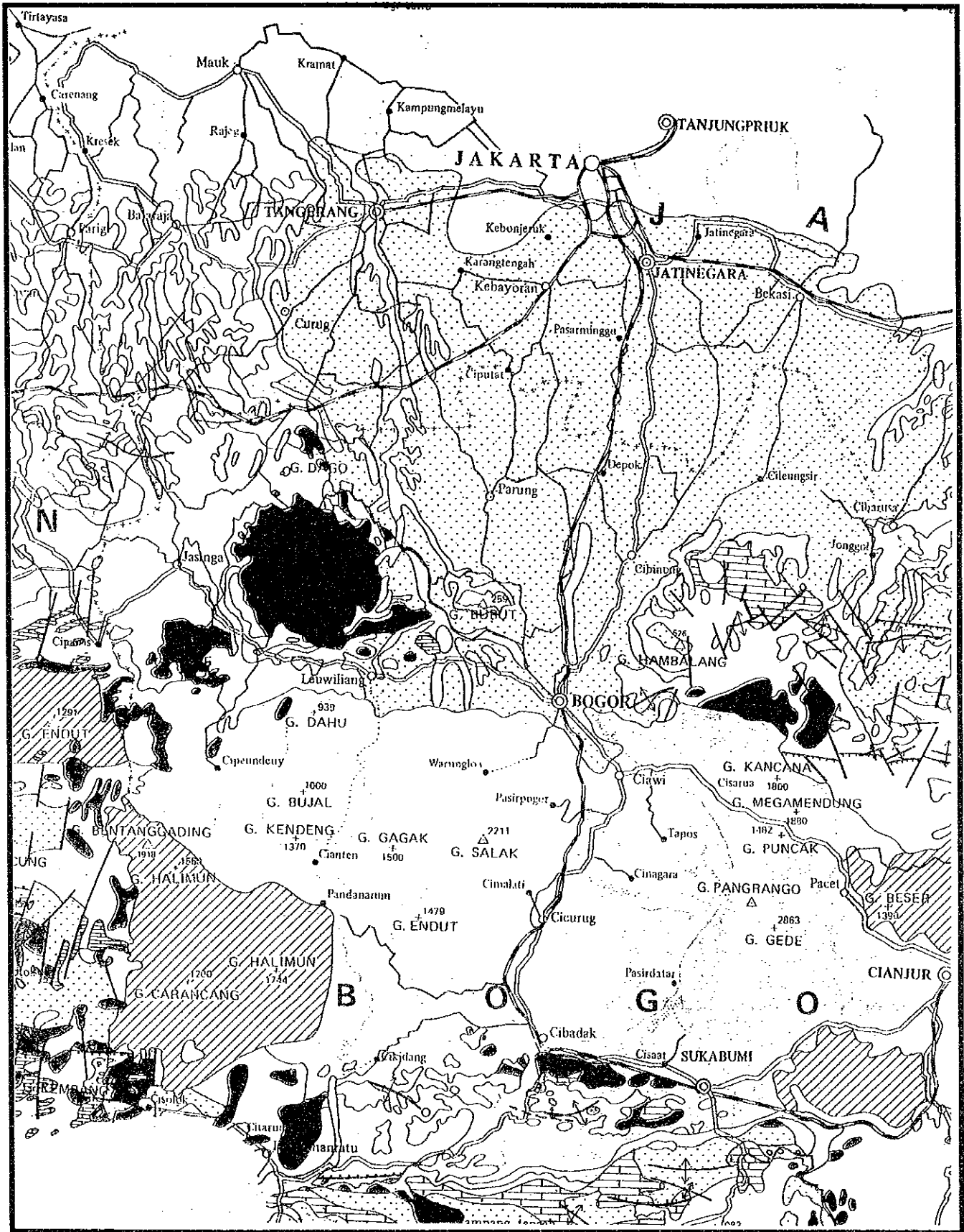


図2-4 Sukabumi, Narawita および Cipeundeuy周辺の地理図 (1:650,000)

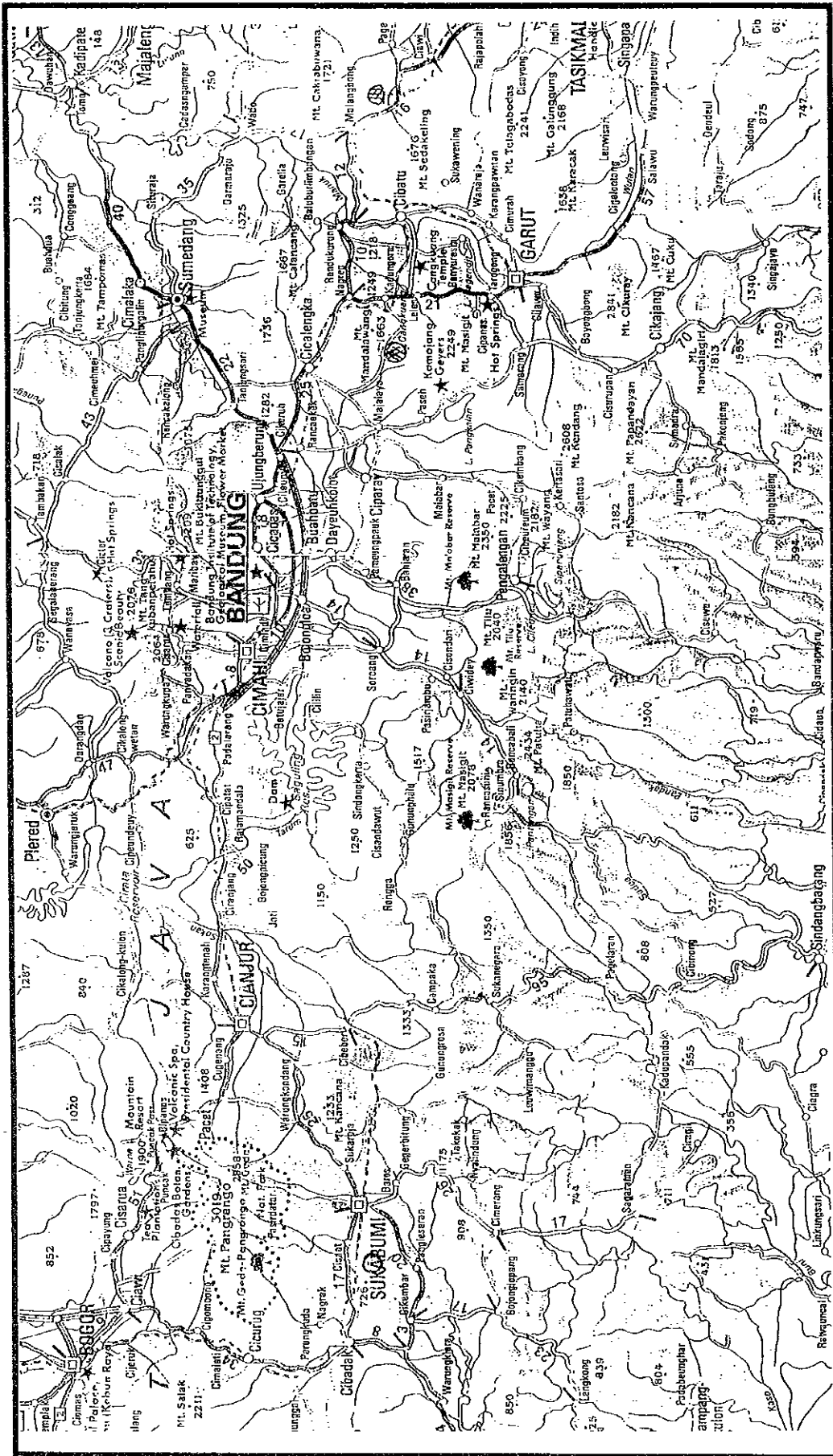


図2-5 Sukabumi周辺の地形図 (1:71,400)

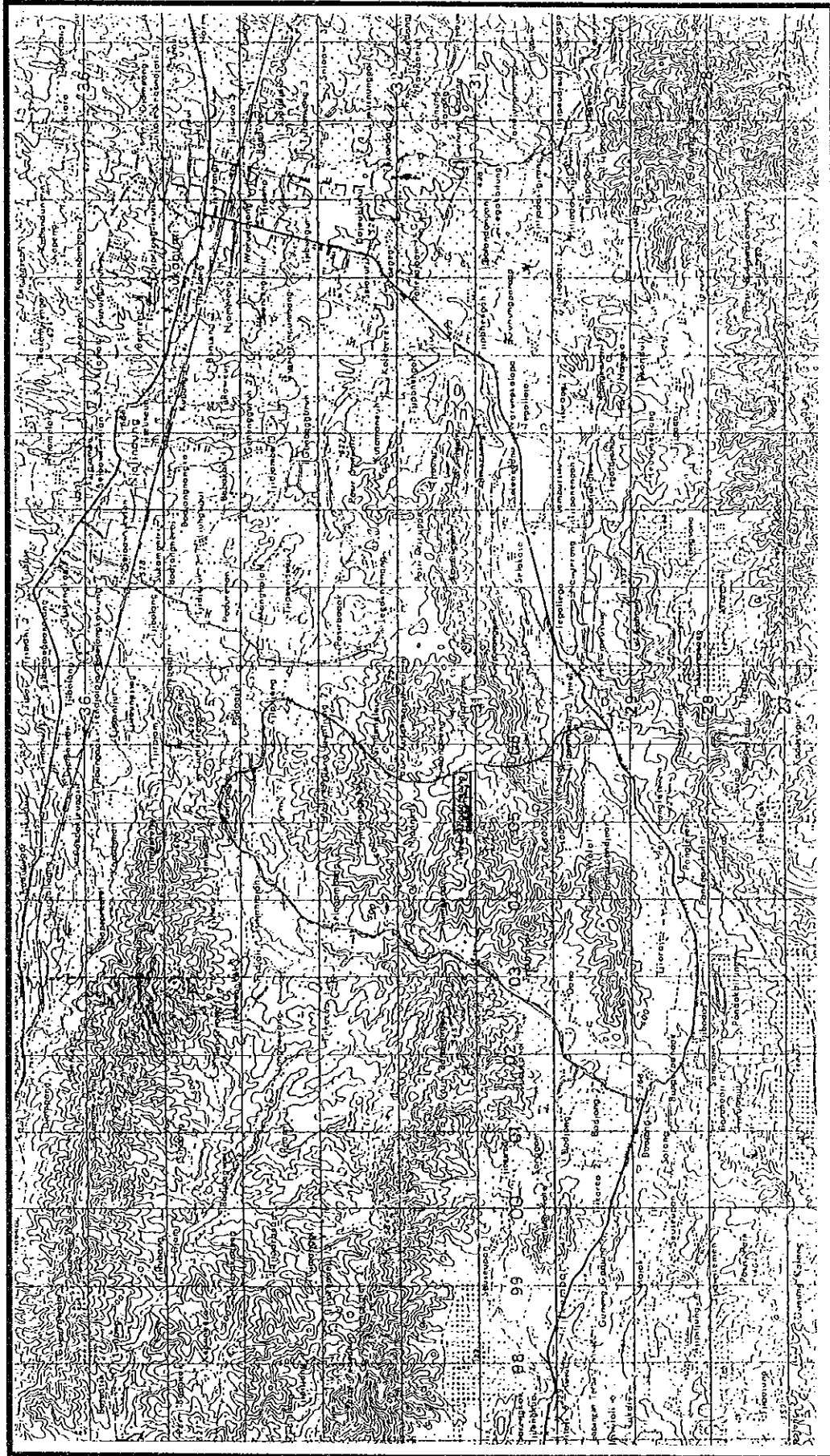


図2-6 Parungpanjang周辺の地理図 (1:650,000)

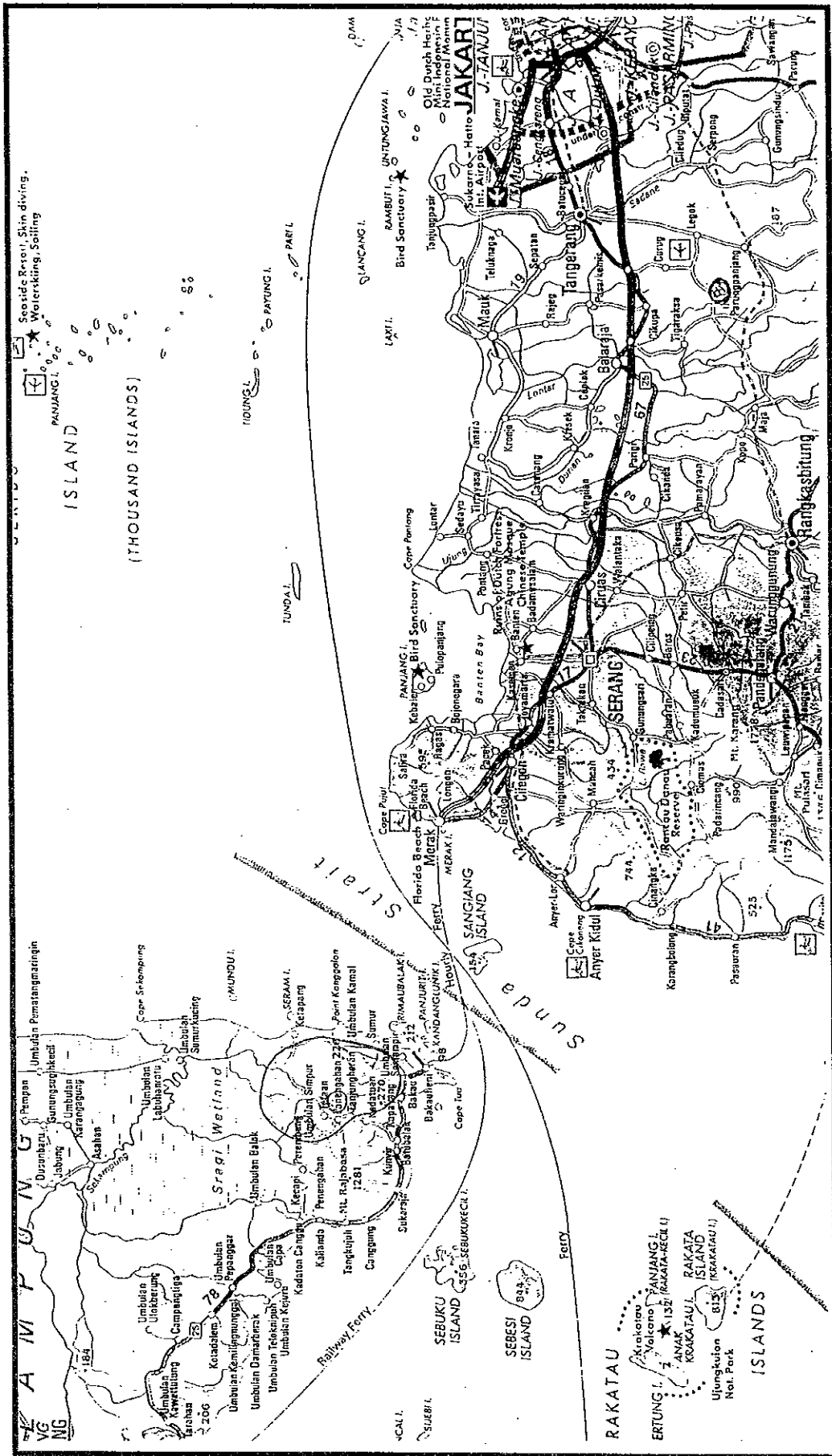
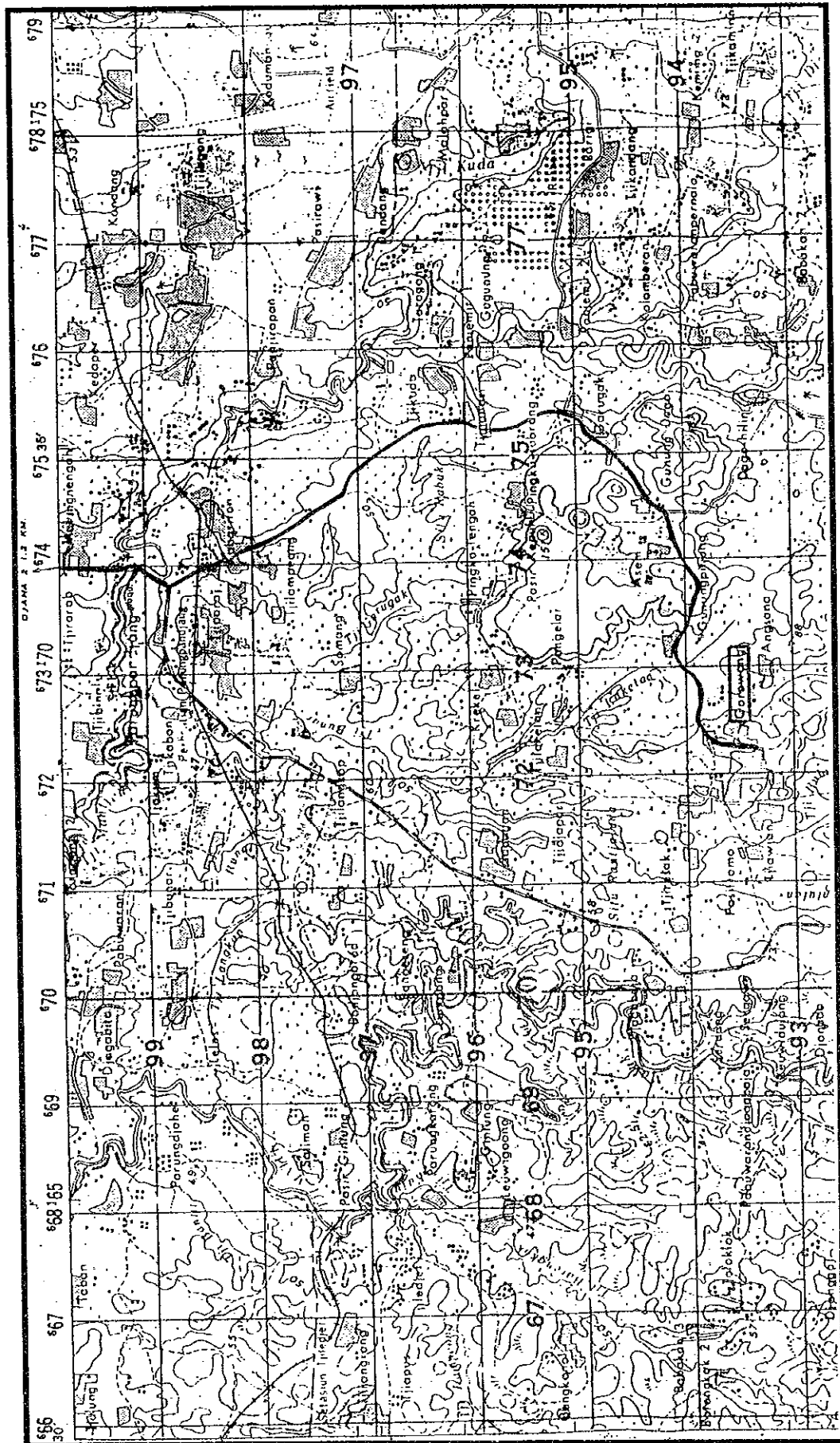




図2-7 Parungpanjang周辺の地形図 (1:500,000)



JAVA 1:50,000

図2-8 Parungpanjang周辺の地形図 (1:35,700)

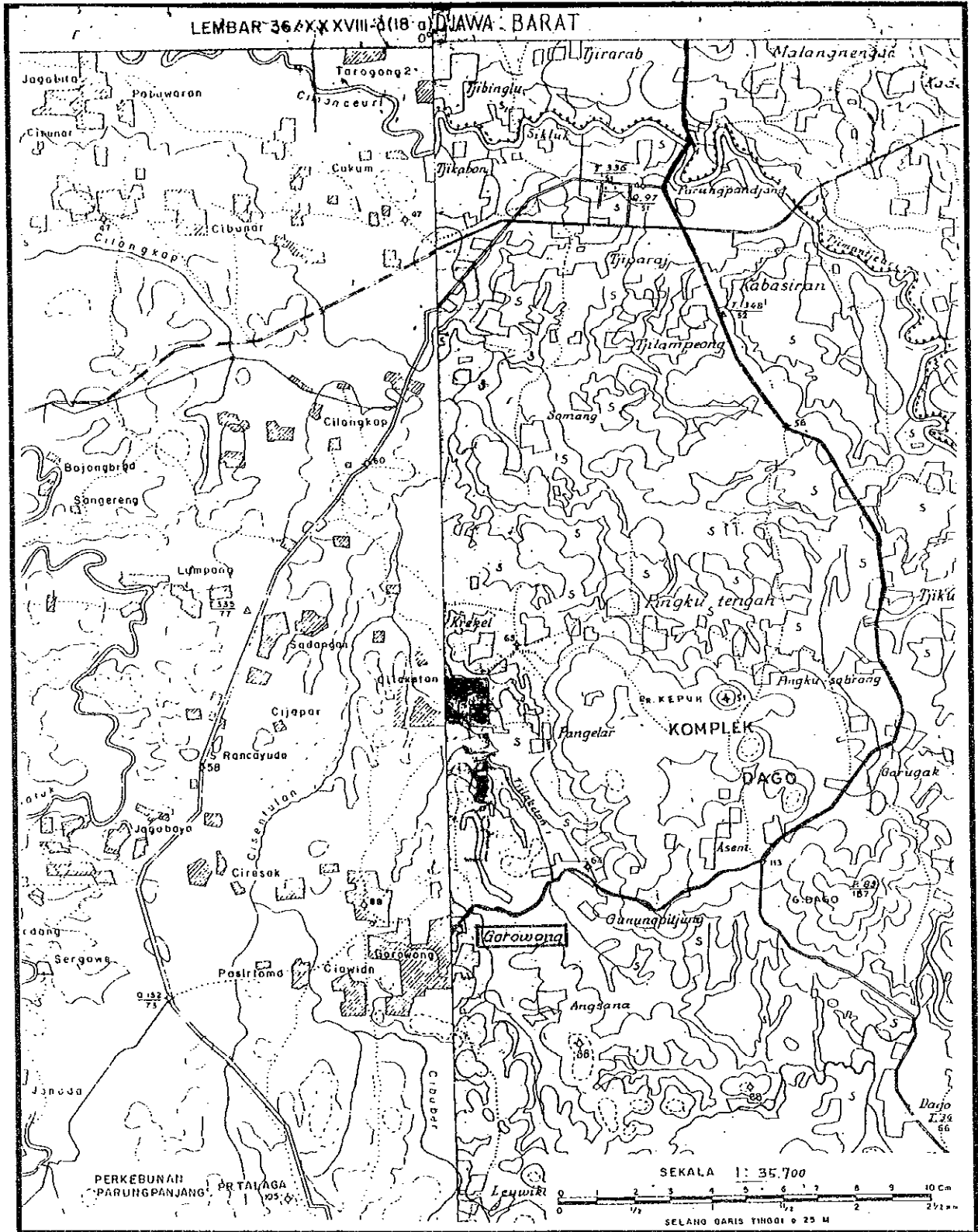


図2-9 Narawita および Cipeundeuy周辺の地質図

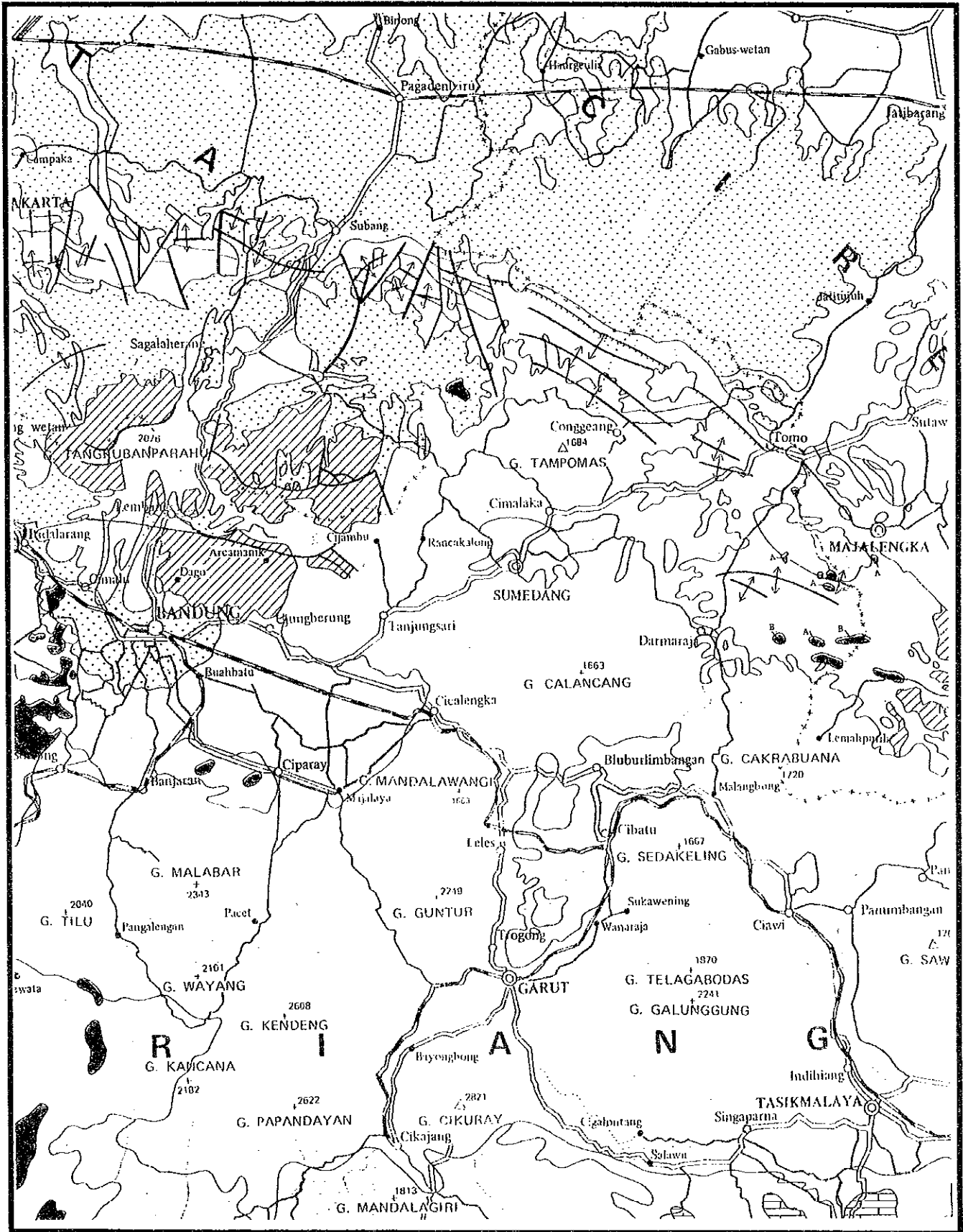


図2-10 Cipeundeuy周辺の地形図 (1:50,000)

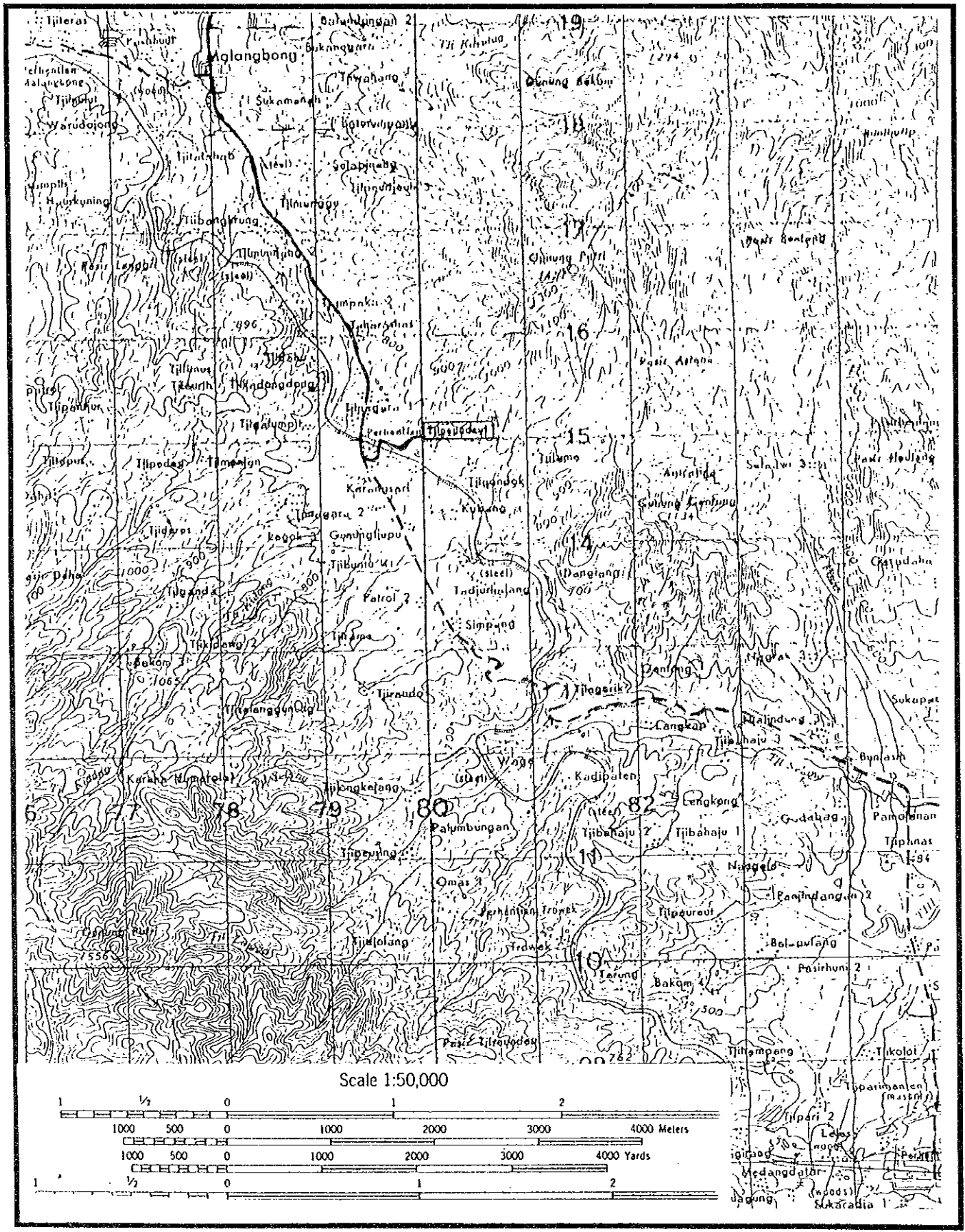


図2-11 Cipeundeuy周辺の地形図 (1:25,000)

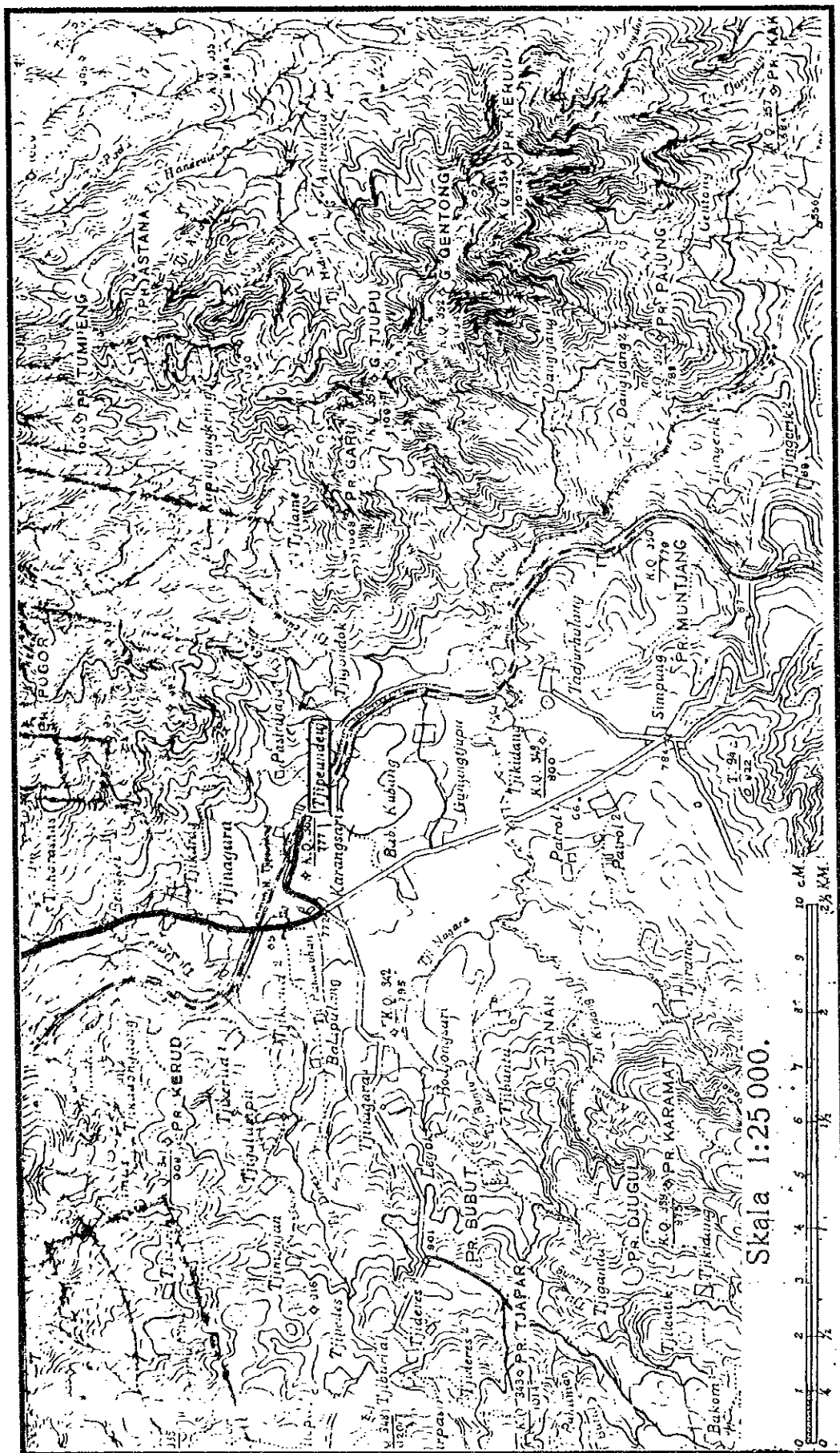


圖2-12 新採掘場

圖2-13 旧採掘場

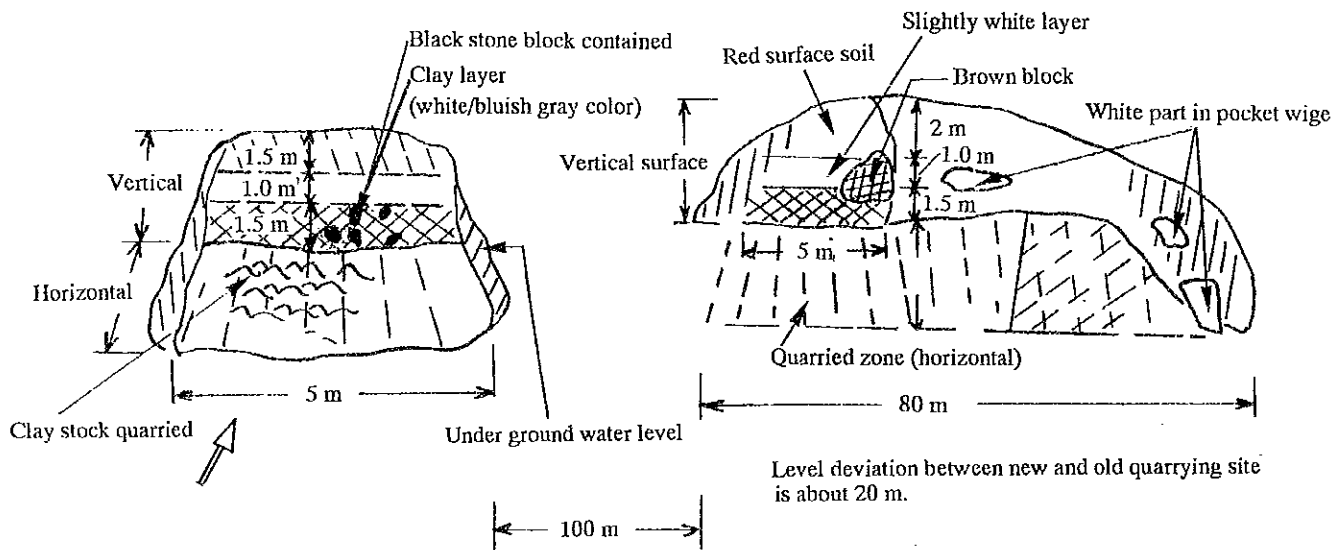


図2-14 採掘場の現状（旧採掘場）

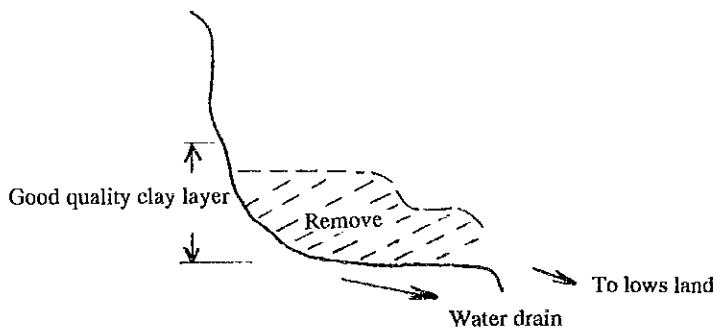


図2-15 改善案

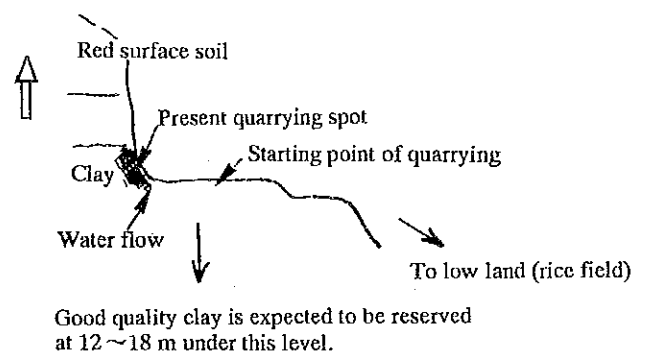


図2-16 Kalimantan島の地質図

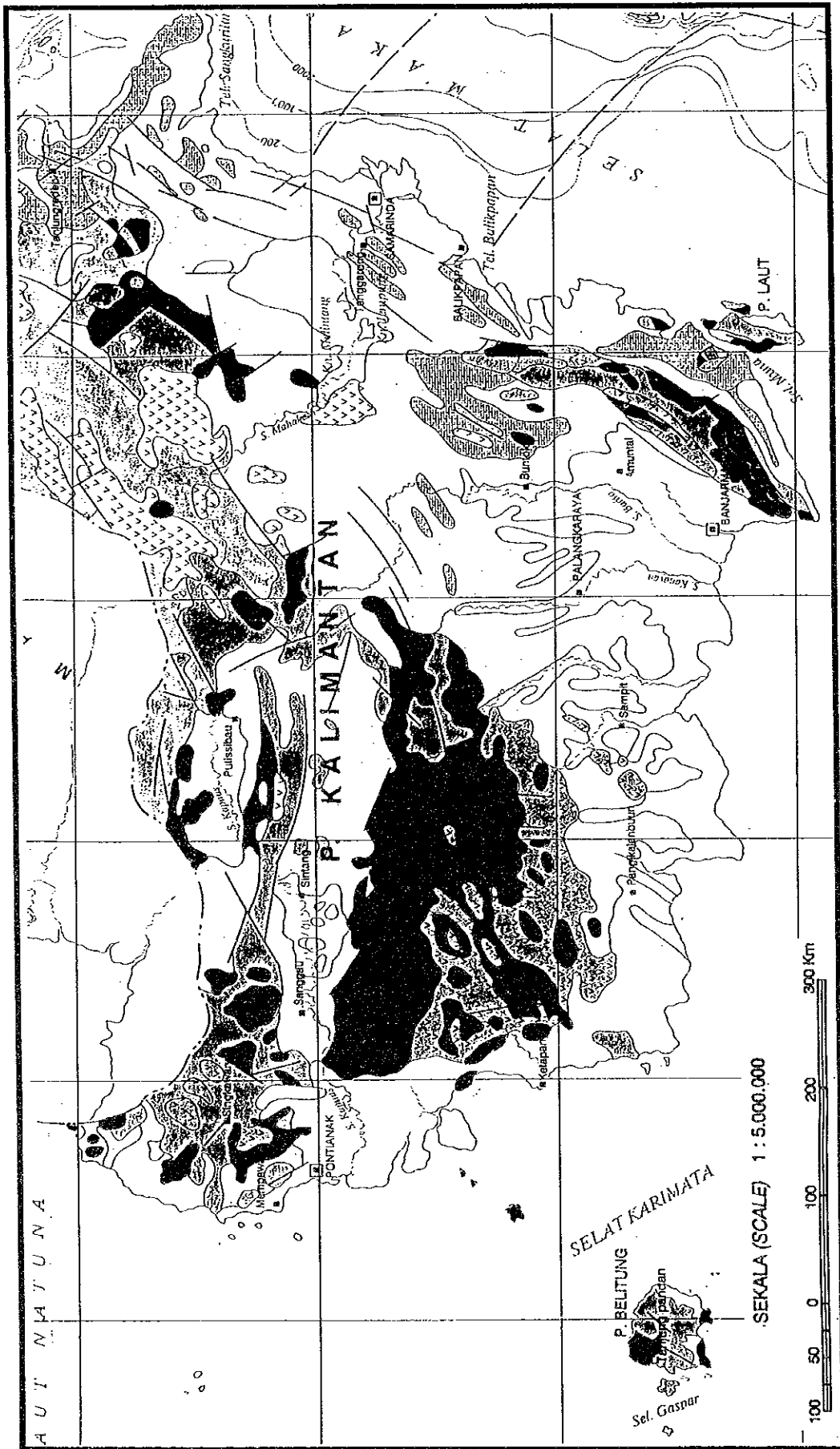




図2-17 西Kalimantanの地理図

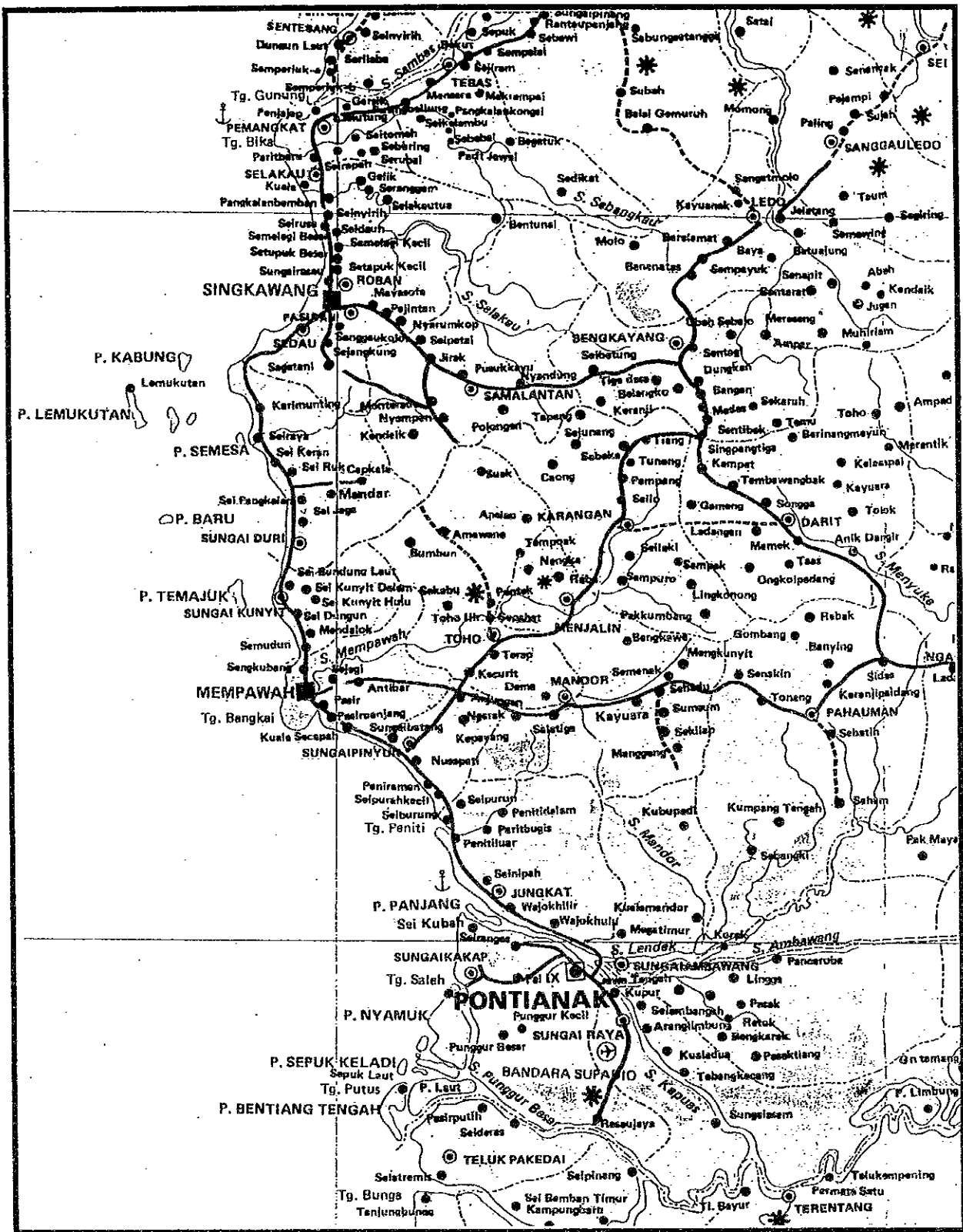




図2-19 Banjarnegara周辺の地質図

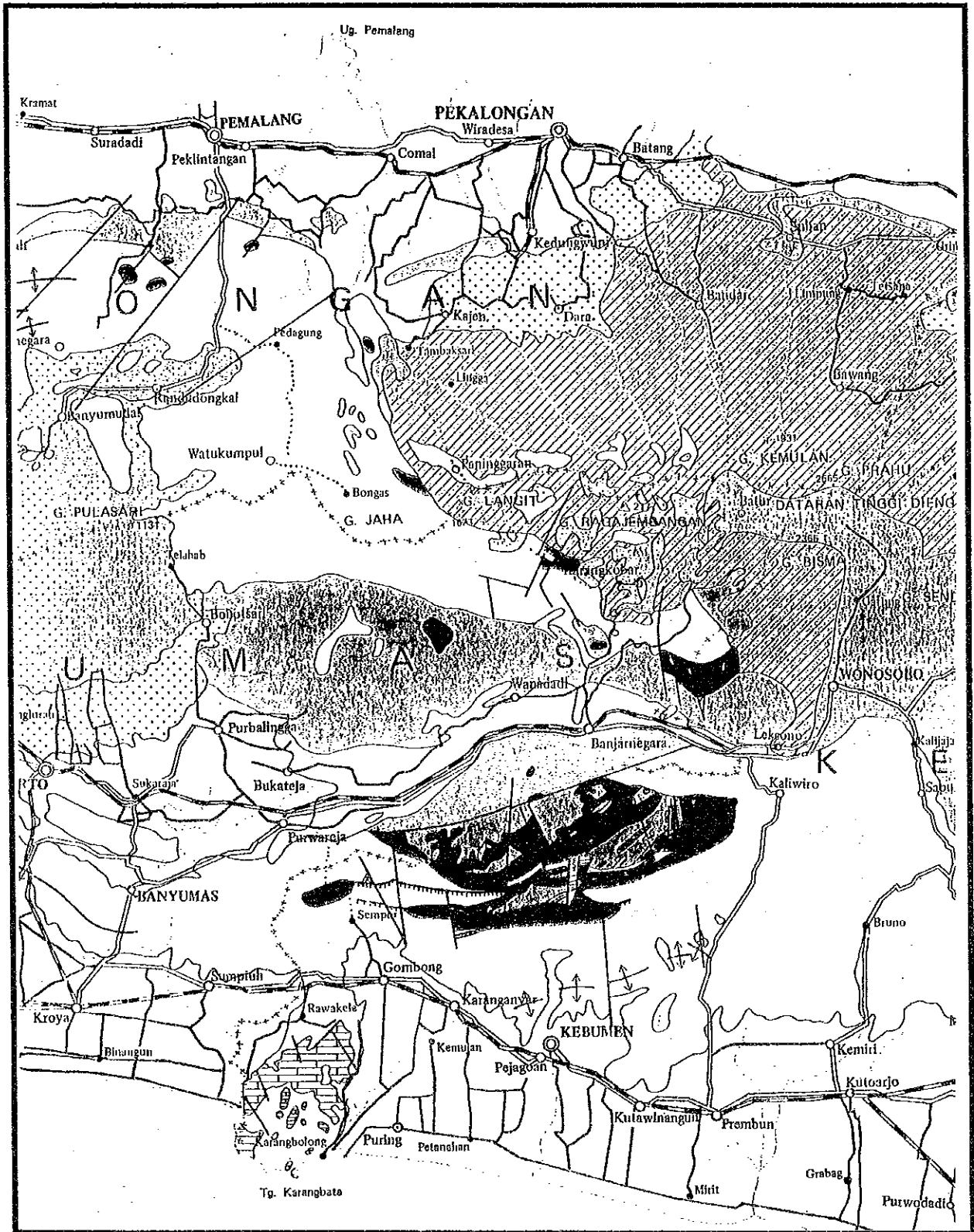


図2-20 Banjarnegara周辺の地理図 (1:650,000)

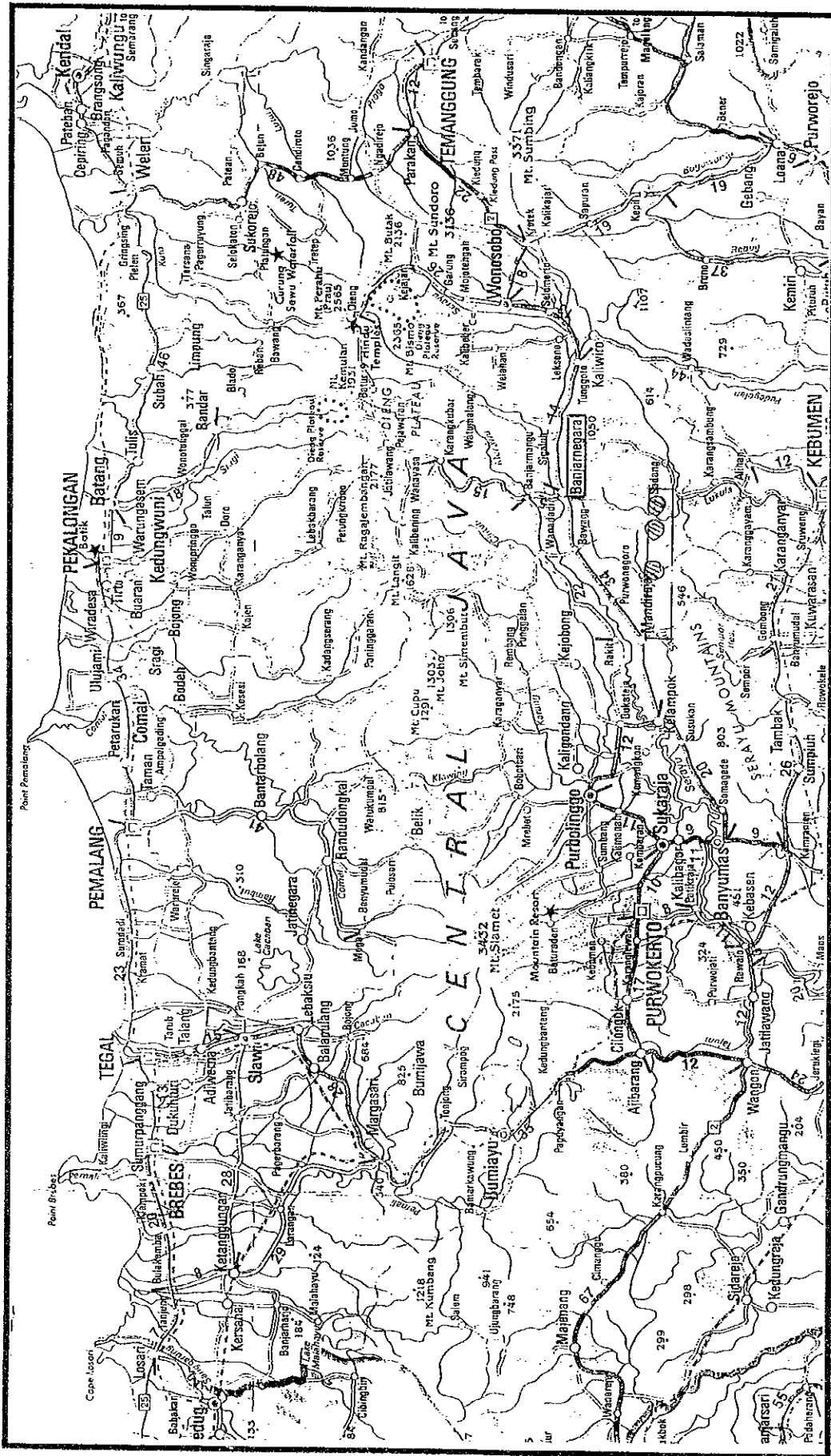


図2-21 Banjarnegara周辺の地形図 (1:71,400)

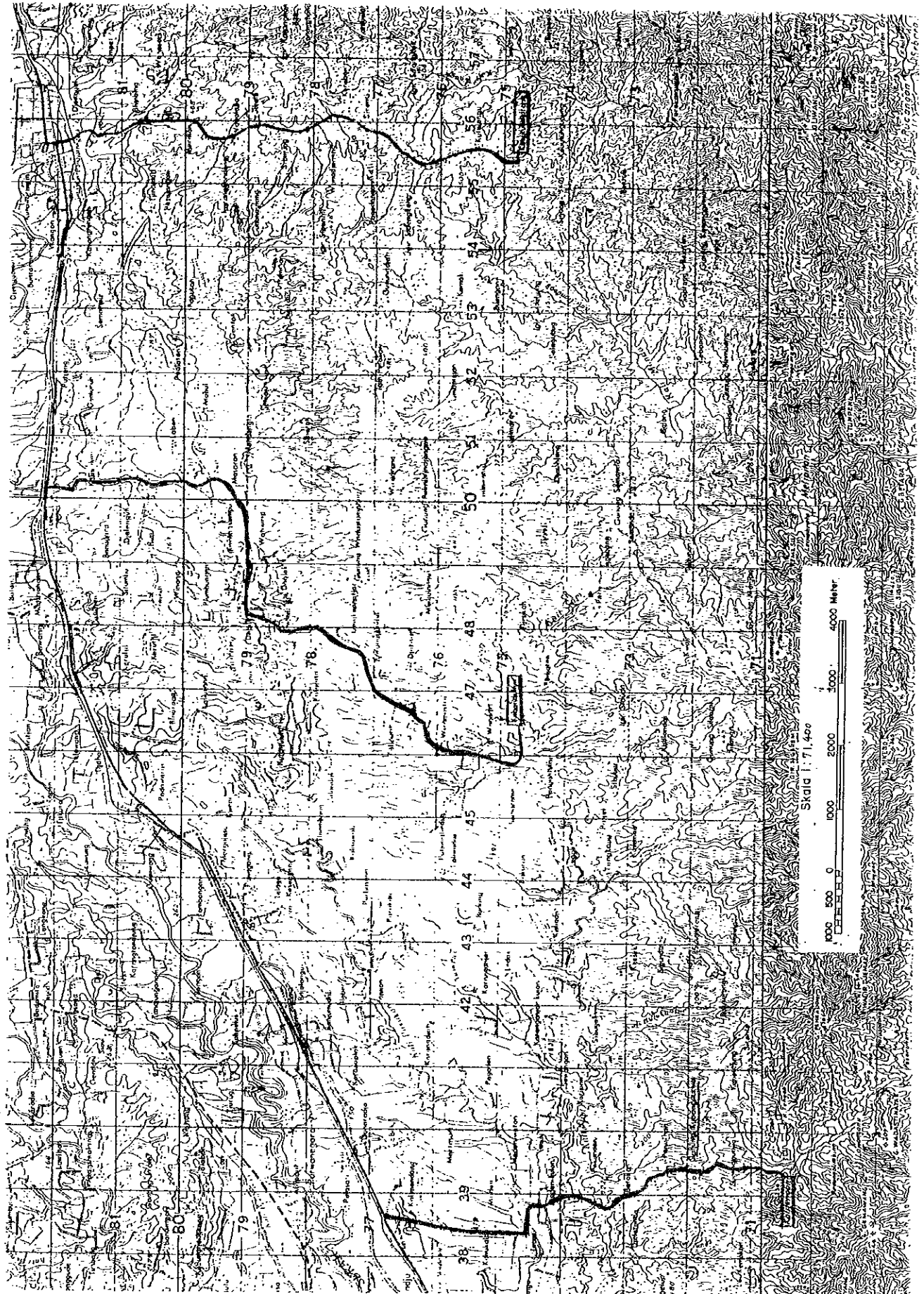


図2-22 Kalitengah採掘場 (険しい山)

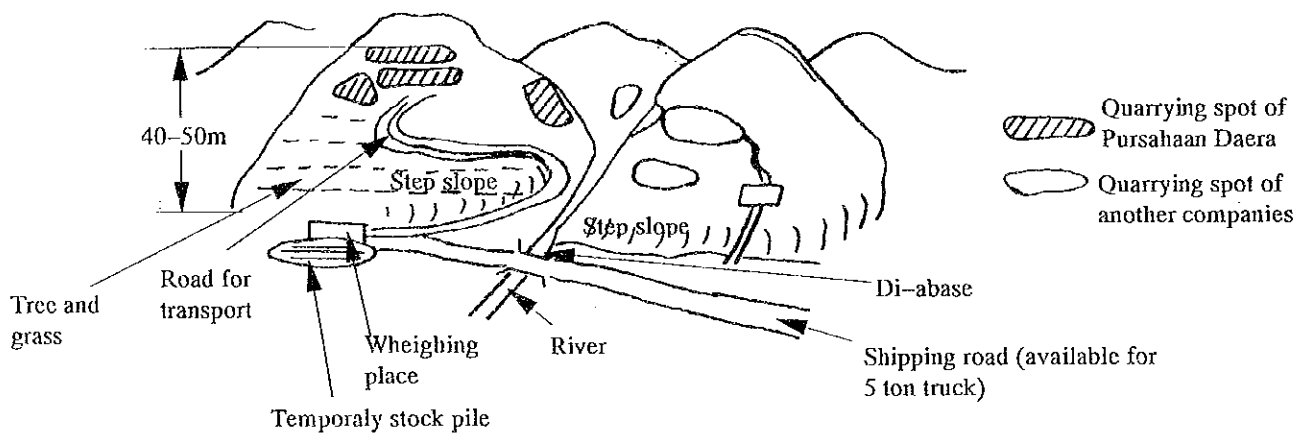


图2-23 Kebon Dalem採掘場

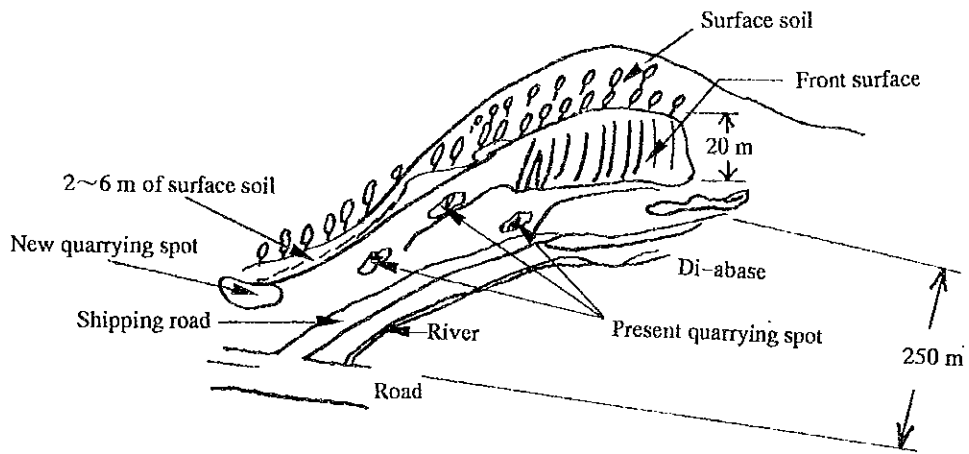


图2-24 Kebutuh Jurang, 探掘場

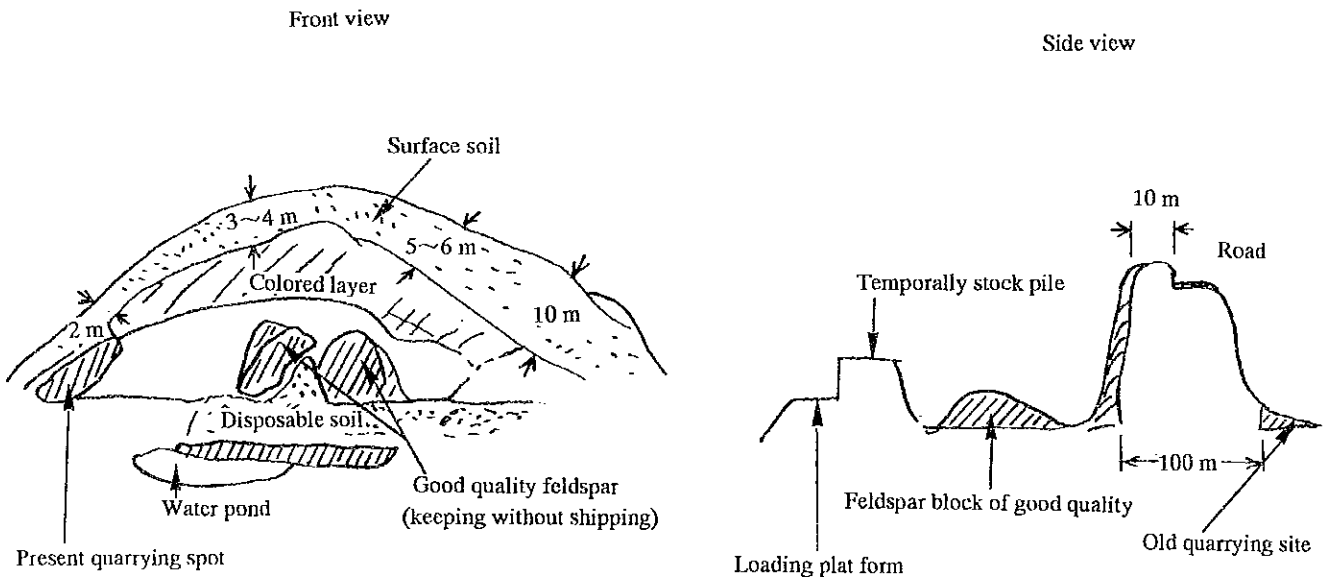






図2-26 Pangaribuan周辺の地理図

# SUMATERA UTARA

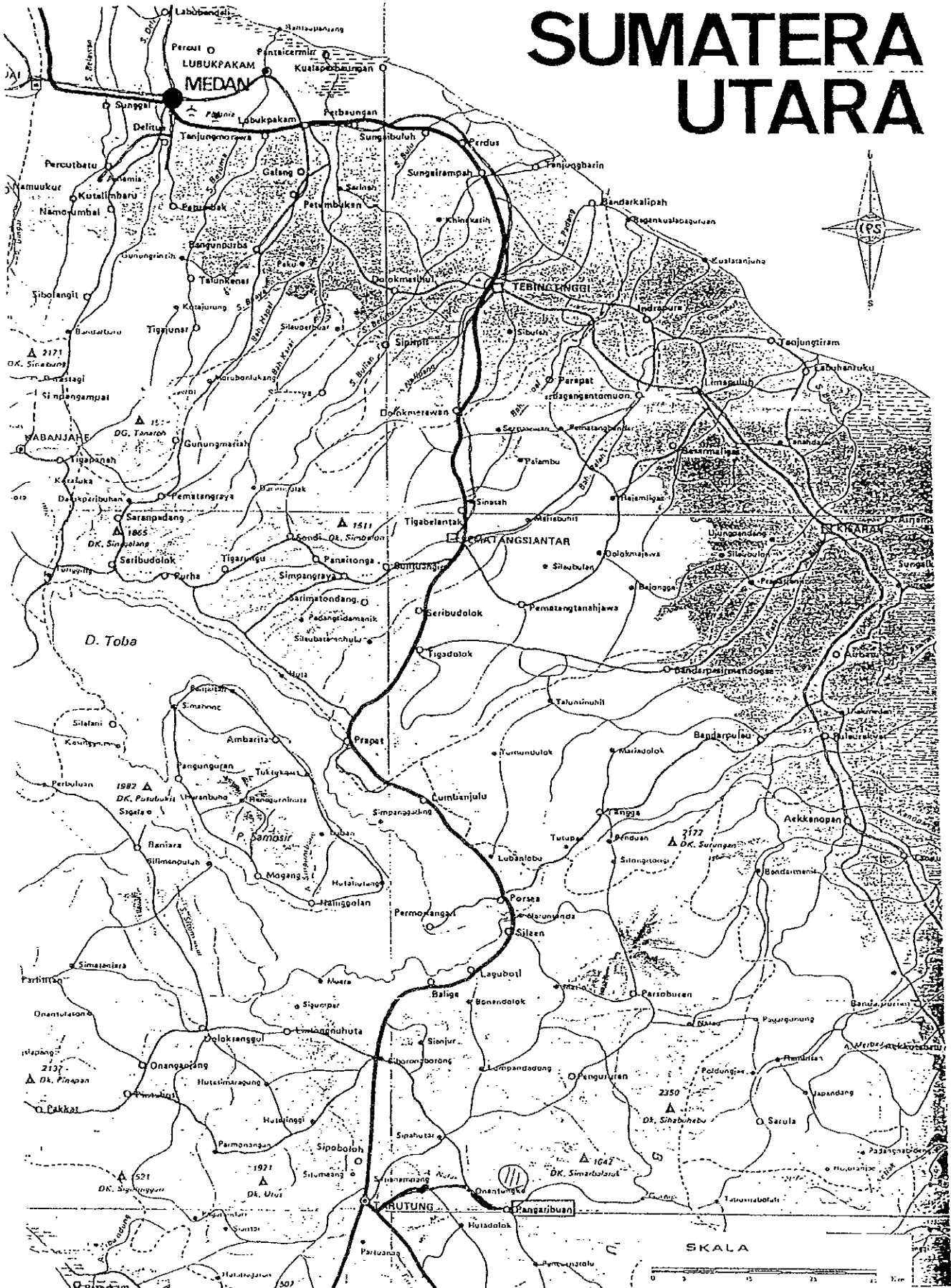


図2-27 Pangaribuanの長石採掘場

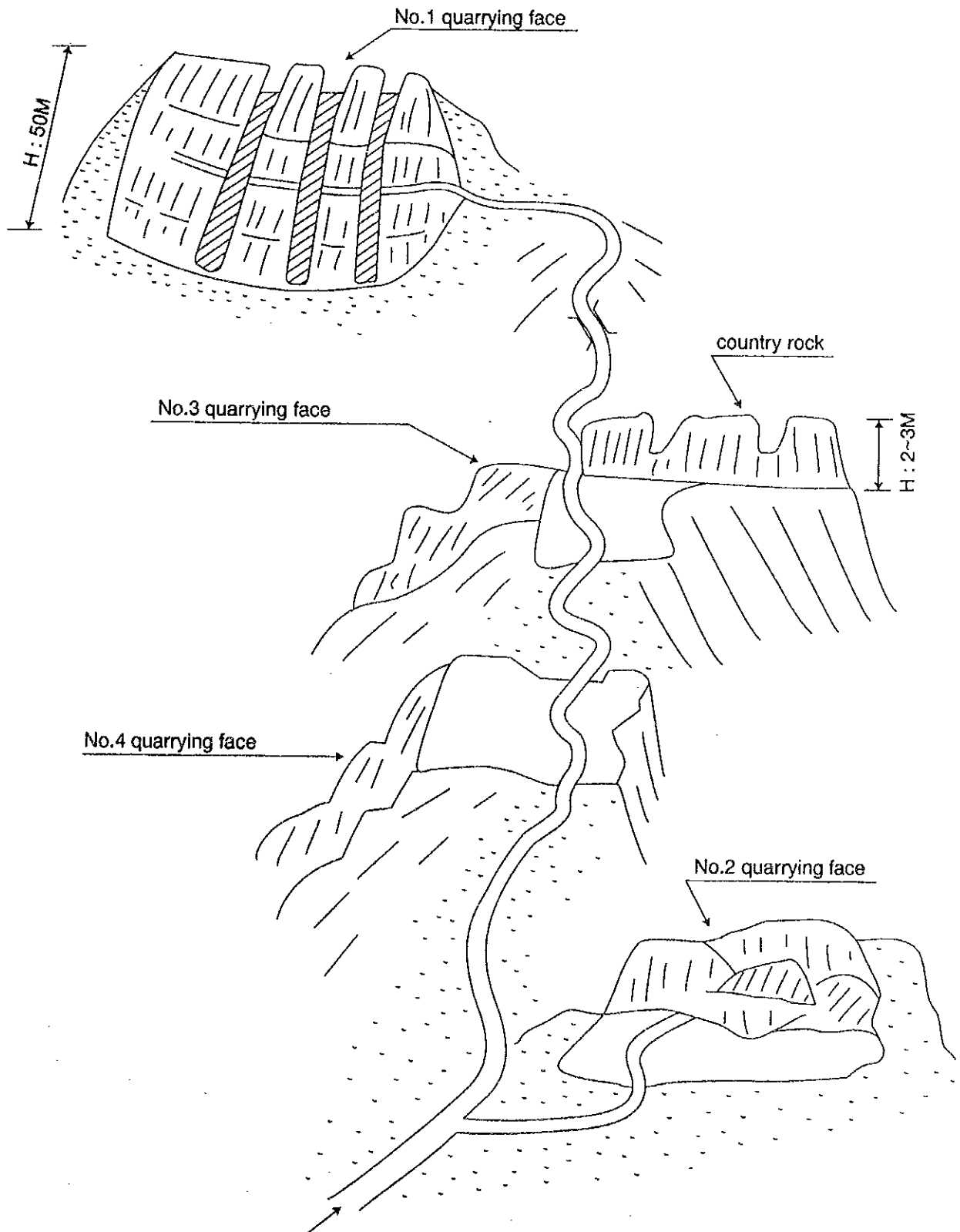


図2-28 Narawita周辺の地形図 (1:25,000)

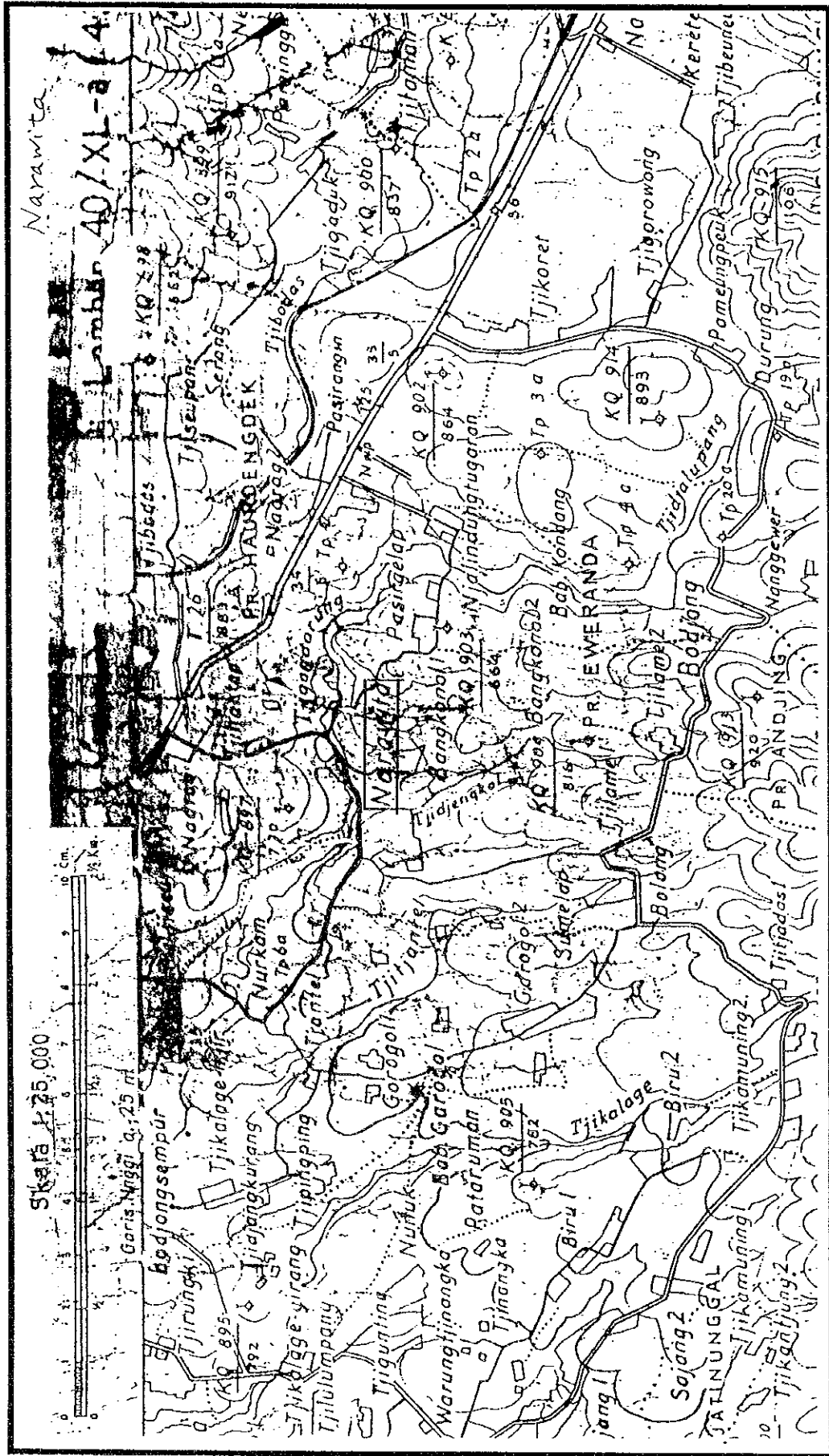
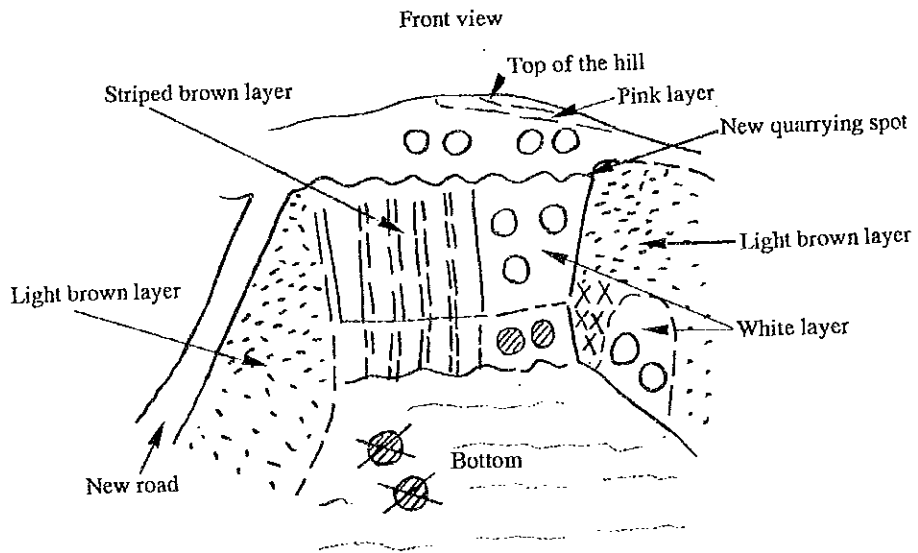


圖2-29 Narawita長石採掘場



- New mining hole
- ⊘ Old mining hole
- ⊗ Old mining hole buried by soil

図2-30 Lampung周辺の地理図 (1:714,000)

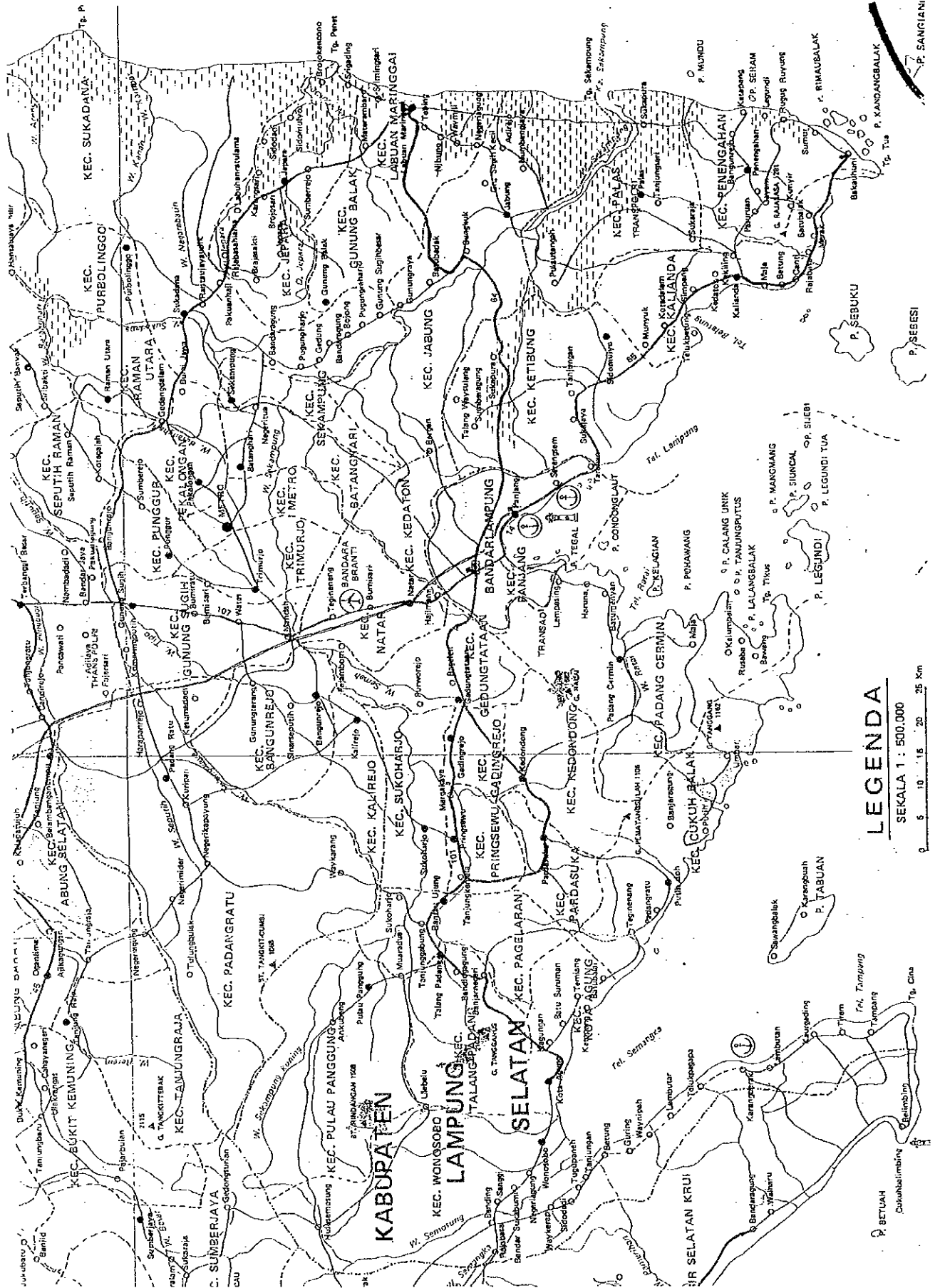
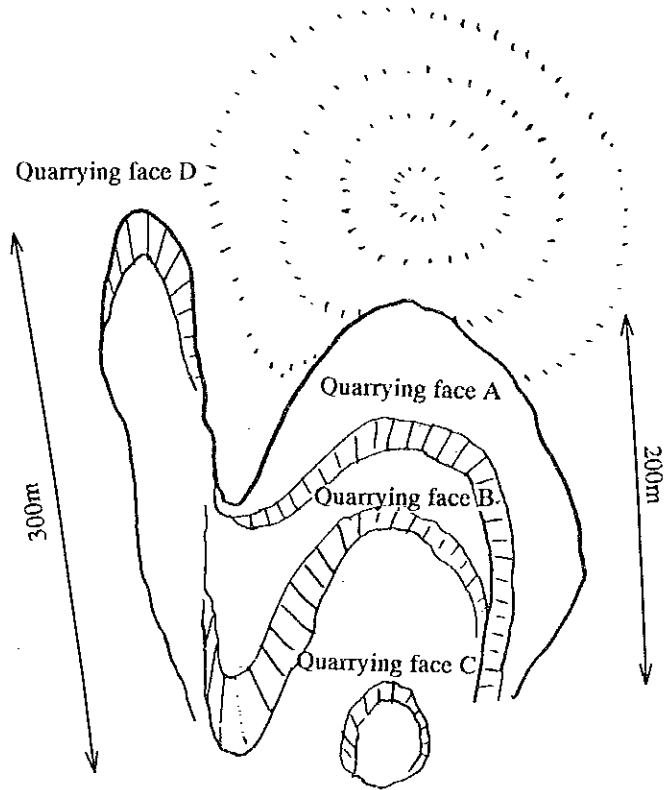


图2-31 Kalimati探掘場

(1) Over View



(2) Front View

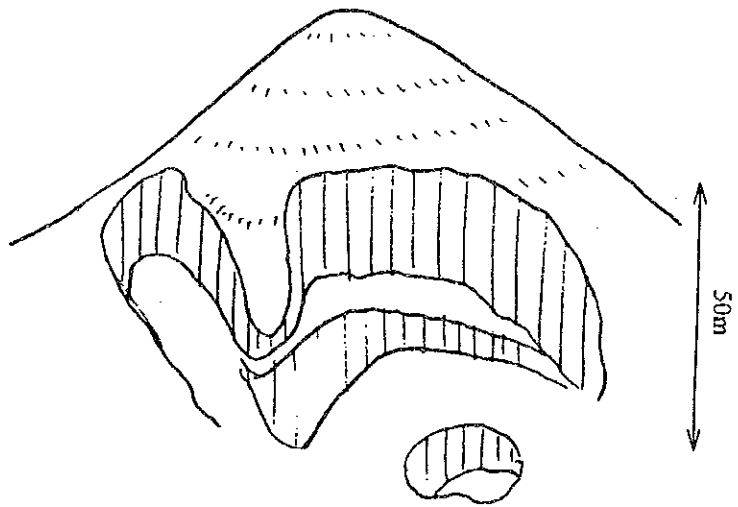
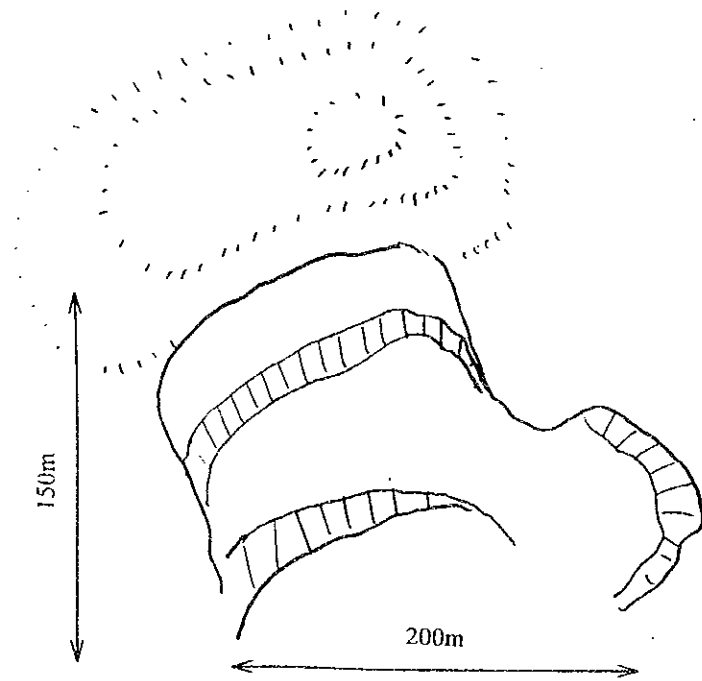


图2-32 Trenggalok採掘場

(1) Over View



(2) Front View

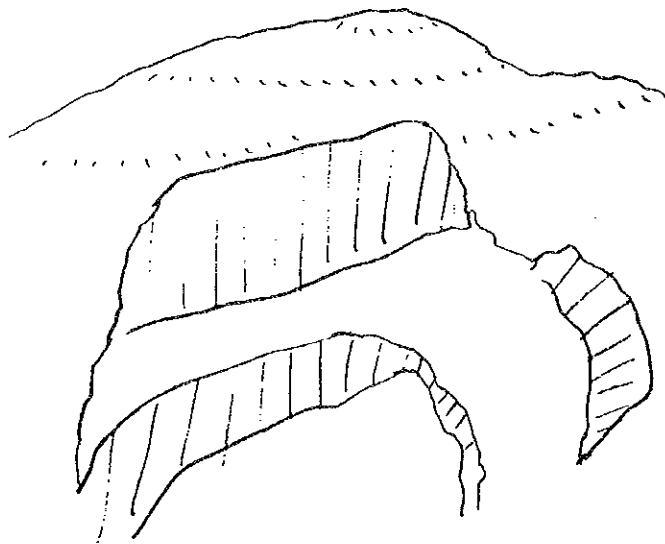




図2-33 BelitungのKadin探掘場

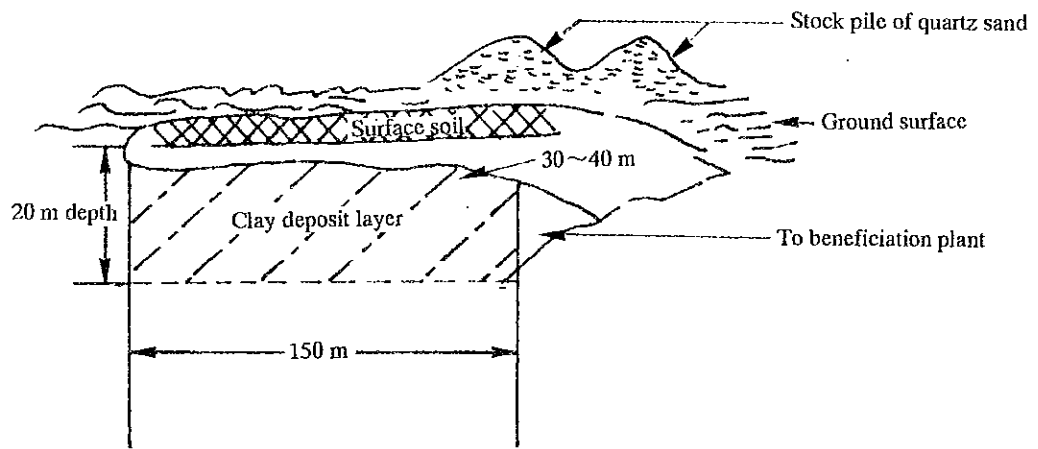


図2-34 Belitung Kaolinの水簸プロセス

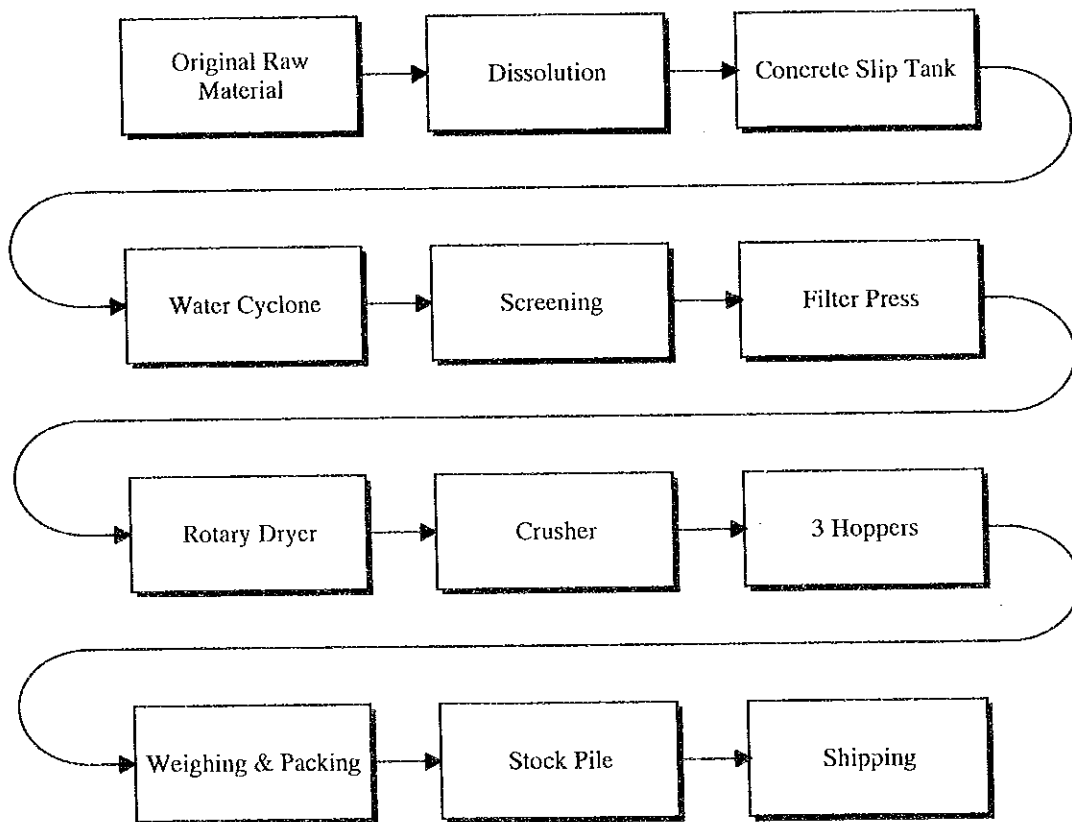


図2-35 Pacitanの地質図(1:50,000)

