

Figure 3-26 Geological Map around Chongwe Dam site (No.16) 1/100,000

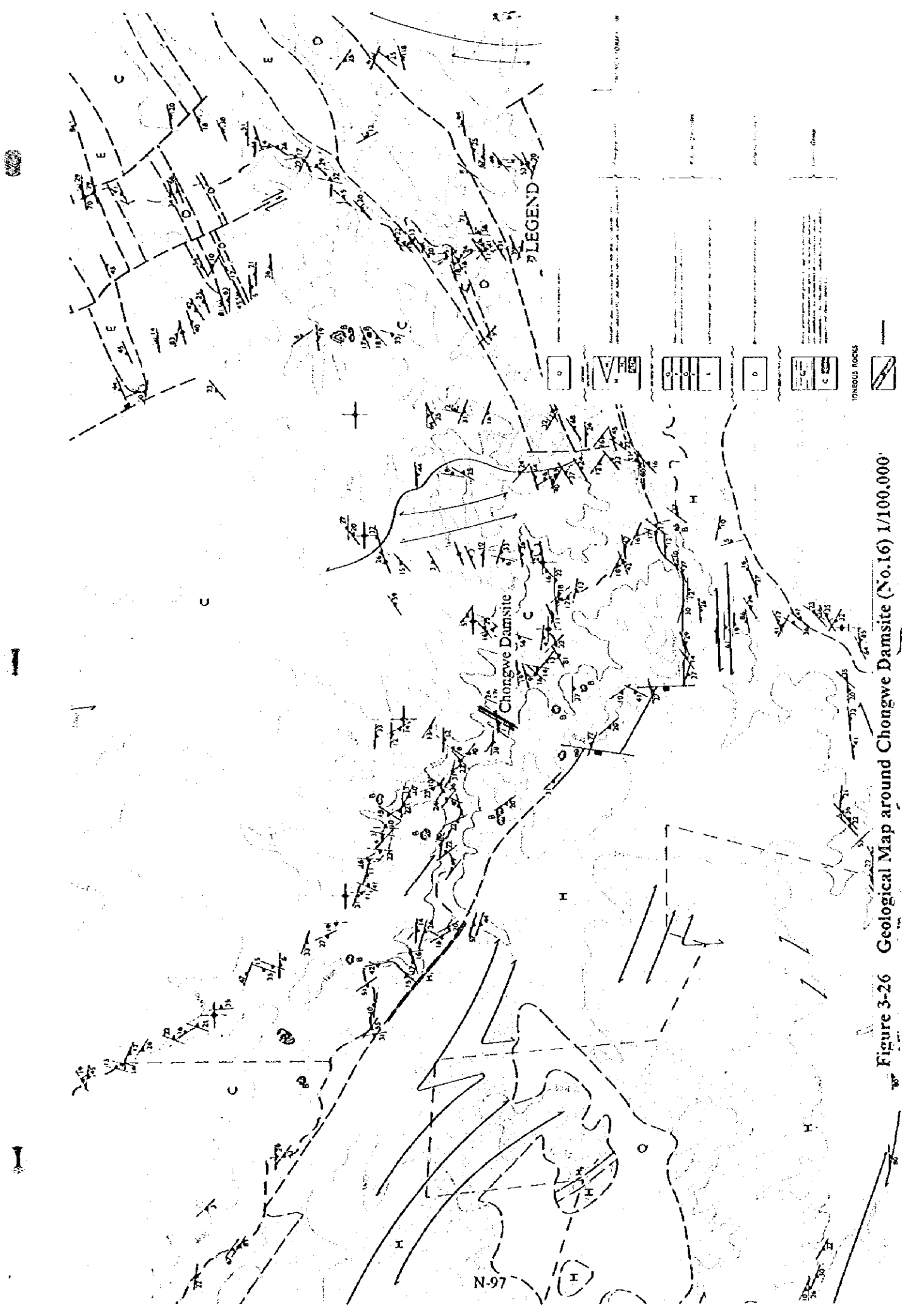


Figure 3-26 Geological Map around Chongwe Dam site (No.16) 1/100,000

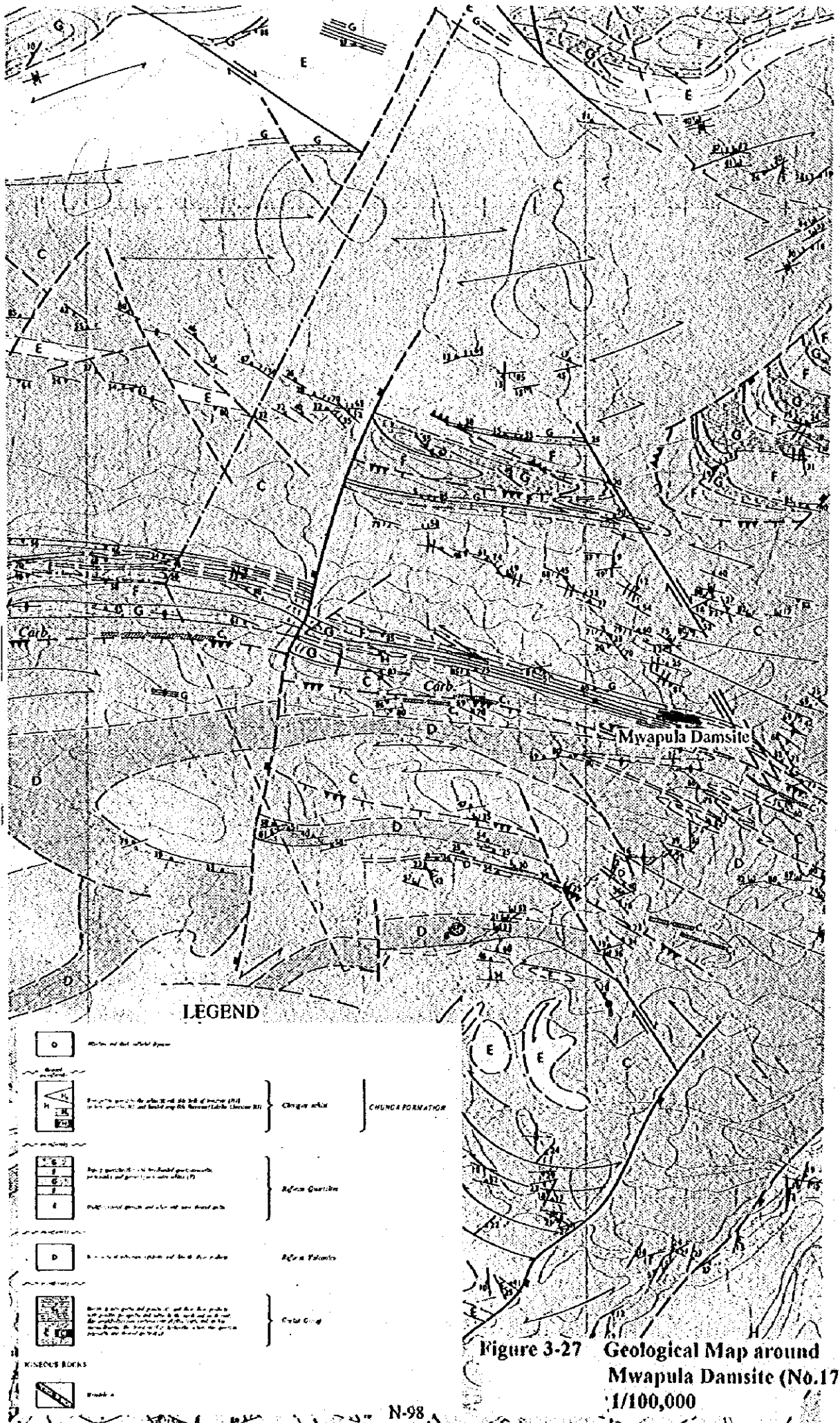


Figure 3-27 Geological Map around Mwapula Damsite (No.17) 1/100,000





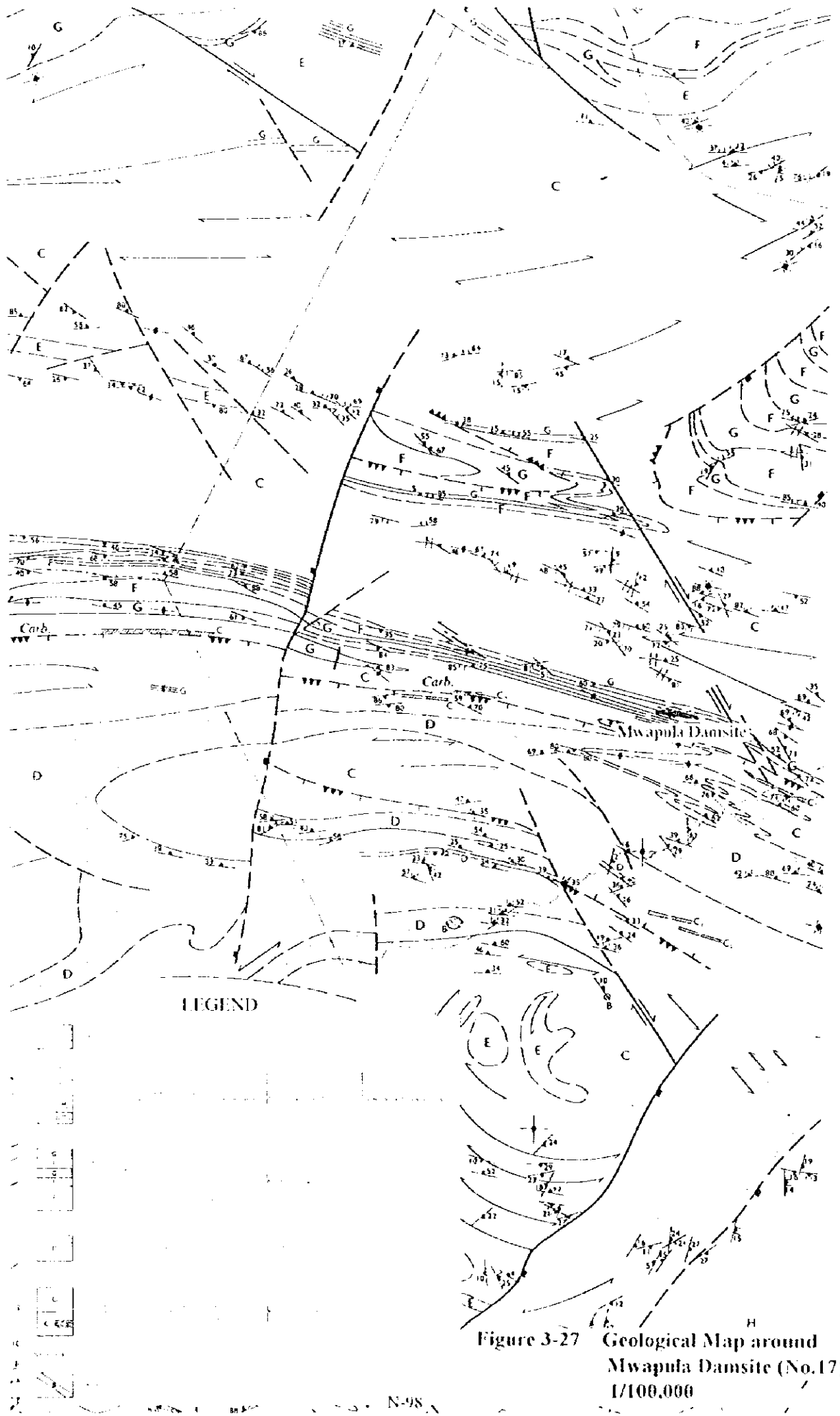


Figure 3-27 Geological Map around Mwapula Damsite (No.17) 1/100,000





# LEGEND

	TERTIARY TO RECENT	Sub-systems of this geology under-lying these groups shown as follows: C-Cretaceous, N.-Karoo, Oligocene, M. Oligocene and Karoo System.
	KAROO (Upper Cretaceous to Jurassic)	
	KATANGA (Late Precambrian and (?) Lower Palaeozoic)	
	MUYA	
	PRECAMBRIAN ROCKS OF UNCERTAIN AGE, POSSIBLY MUVA	
	PROBABLY LARGELY OLDER PRECAMBRIAN	
	LITHOLOGICAL UNITS OF VARIOUS AGES	

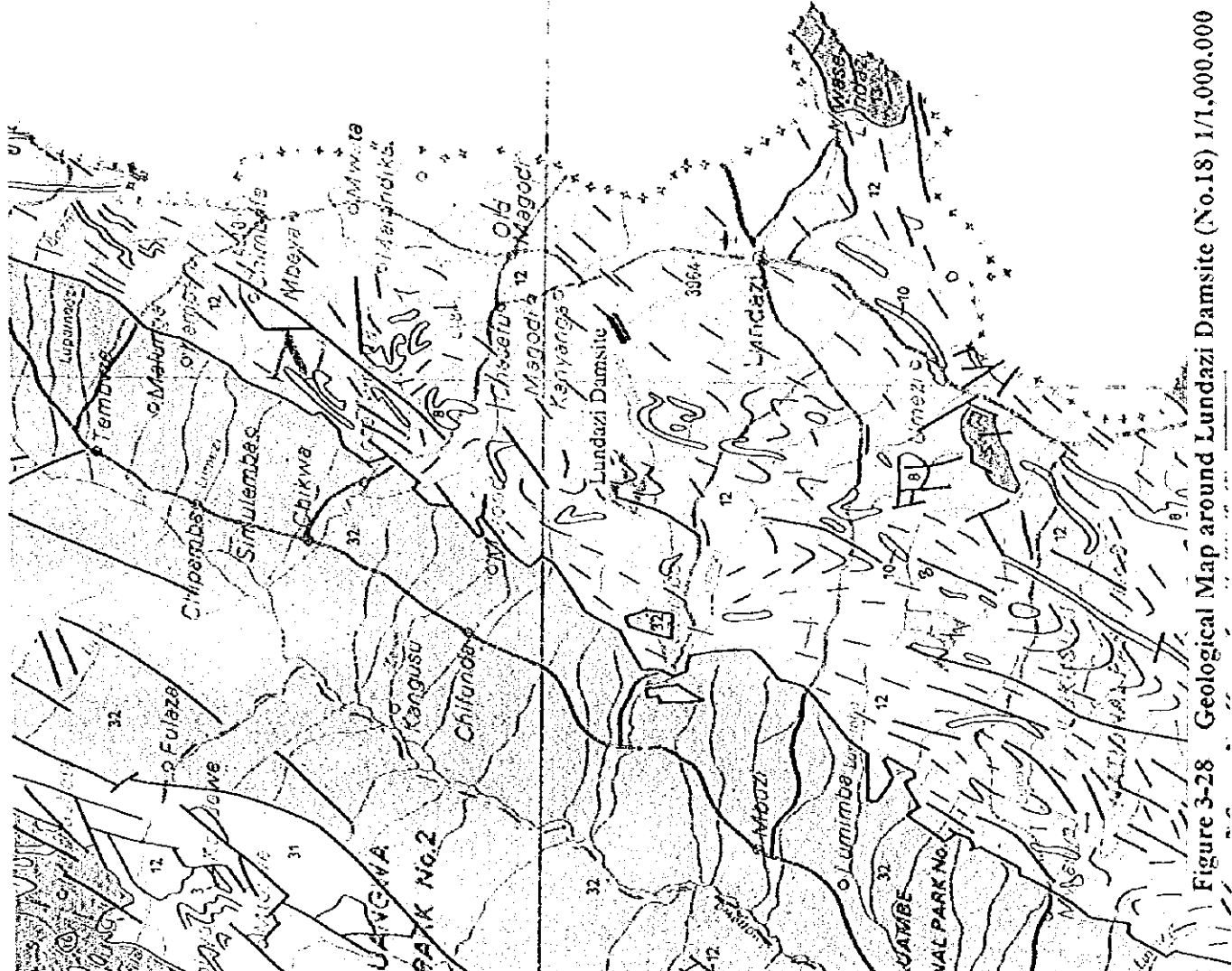


Figure 3-28 Geological Map around Lundazi Dam site (No.18) 1/1,000,000

**LEGEND**

**Secondary to Tertiary**

**Secondary to Tertiary**

**Secondary to Tertiary**

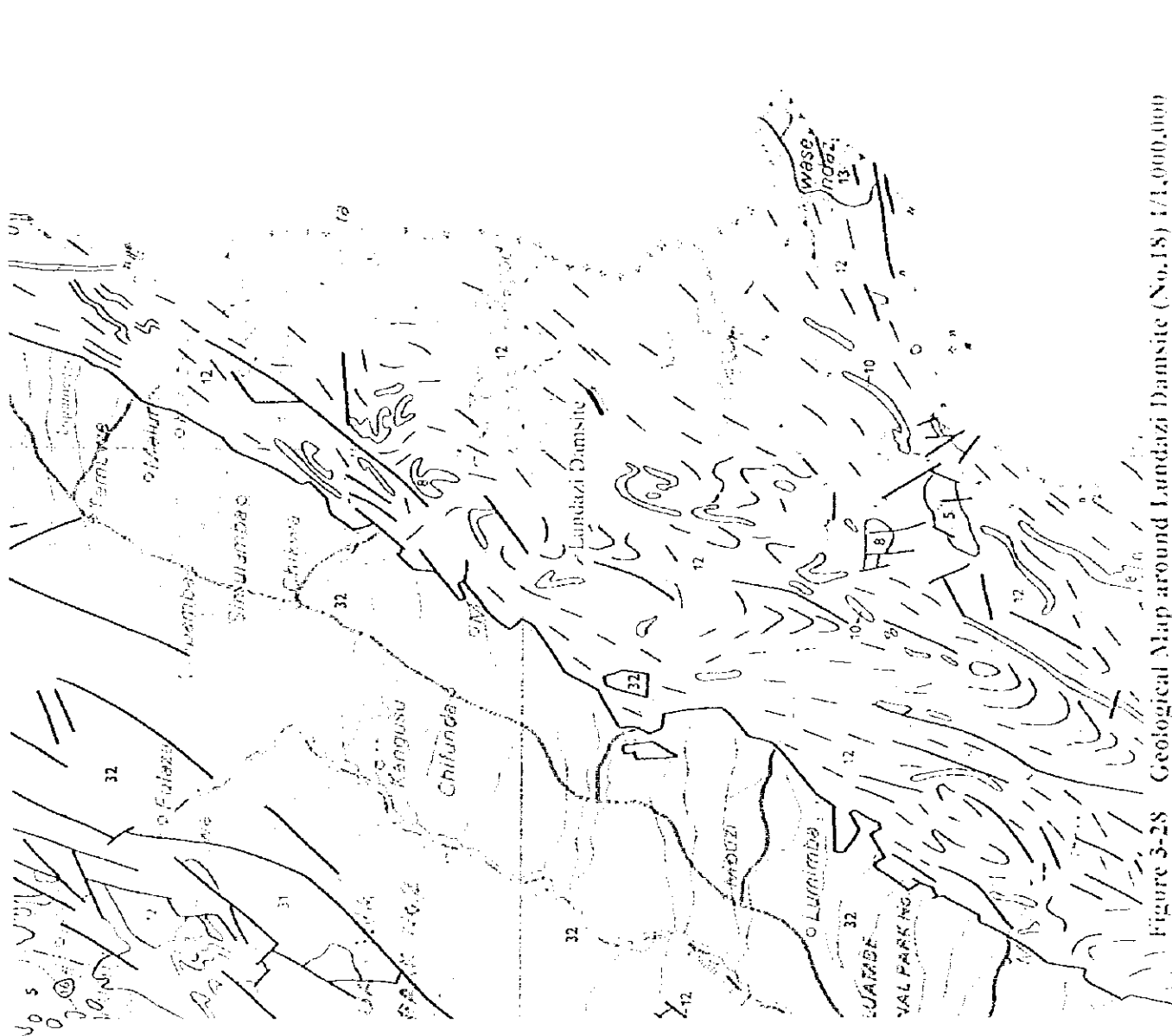
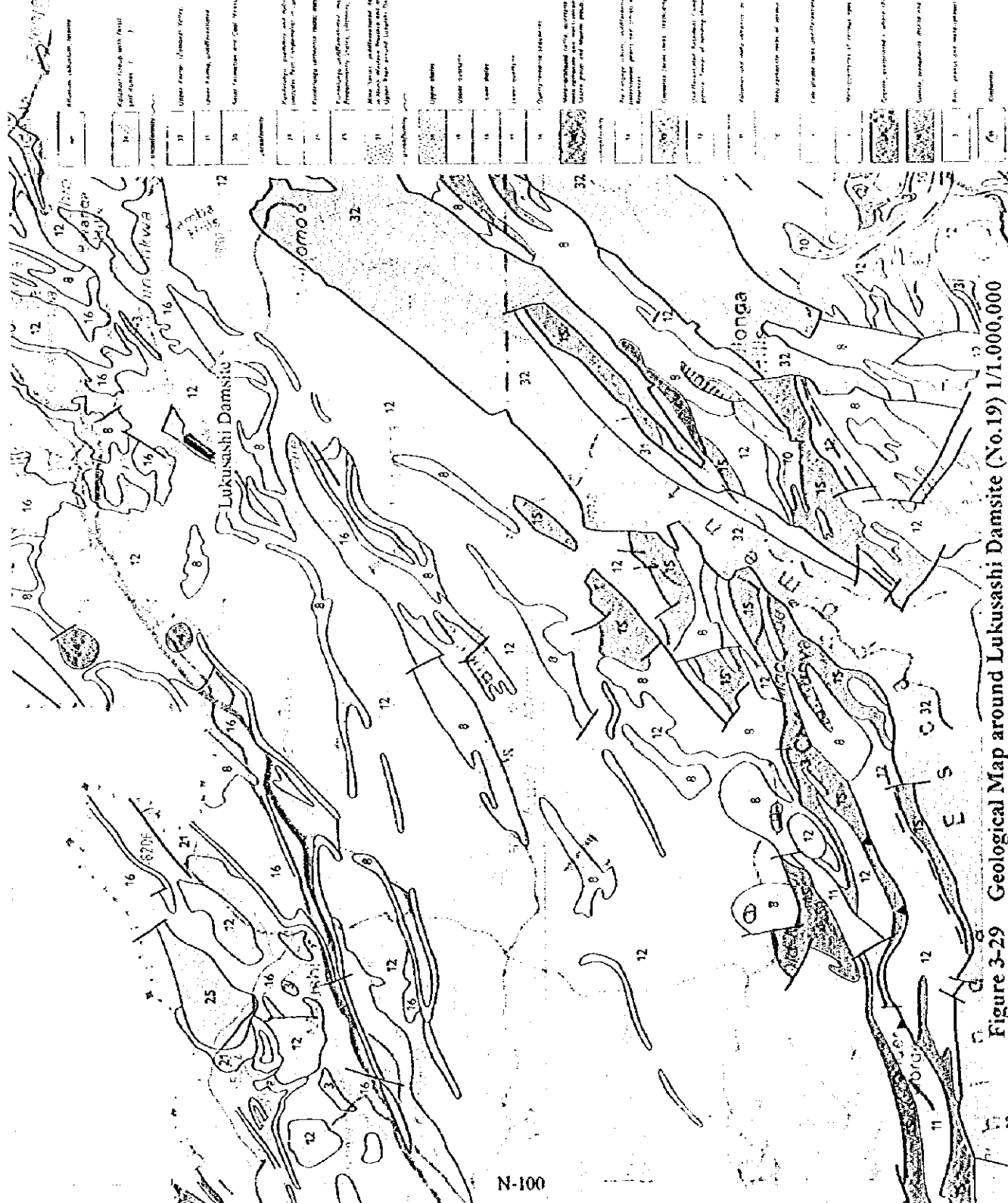


Figure 3-28 Geological Map around Landazi Dam site (No.18) 1/4,000,000



12. NATIONAL PARK



12. LEGEND

1	Minimum elevation, meters	Substratum of white quartzite underlying these groups. Includes the Karoo, Katanga, and Katanga Systems.
2	Coloured Group with fossiliferous part (see 1)	
3	Upper Karoo (Lower Karoo, Karoo, and Karoo) (Murchison)	
4	Upper Karoo, undifferentiated	
5	Lower Karoo, undifferentiated	
6	Upper Karoo, undifferentiated (Murchison)	
7	Lower Karoo, undifferentiated (Murchison)	
8	Upper Karoo, undifferentiated (Murchison)	
9	Lower Karoo, undifferentiated (Murchison)	
10	Upper Karoo, undifferentiated (Murchison)	
11	Lower Karoo, undifferentiated (Murchison)	
12	Upper Karoo, undifferentiated (Murchison)	
13	Lower Karoo, undifferentiated (Murchison)	
14	Upper Karoo, undifferentiated (Murchison)	
15	Lower Karoo, undifferentiated (Murchison)	
16	Upper Karoo, undifferentiated (Murchison)	
17	Lower Karoo, undifferentiated (Murchison)	
18	Upper Karoo, undifferentiated (Murchison)	
19	Lower Karoo, undifferentiated (Murchison)	
20	Upper Karoo, undifferentiated (Murchison)	
21	Lower Karoo, undifferentiated (Murchison)	
22	Upper Karoo, undifferentiated (Murchison)	
23	Lower Karoo, undifferentiated (Murchison)	
24	Upper Karoo, undifferentiated (Murchison)	
25	Lower Karoo, undifferentiated (Murchison)	
26	Upper Karoo, undifferentiated (Murchison)	
27	Lower Karoo, undifferentiated (Murchison)	
28	Upper Karoo, undifferentiated (Murchison)	
29	Lower Karoo, undifferentiated (Murchison)	
30	Upper Karoo, undifferentiated (Murchison)	
31	Lower Karoo, undifferentiated (Murchison)	
32	Upper Karoo, undifferentiated (Murchison)	
33	Lower Karoo, undifferentiated (Murchison)	
34	Upper Karoo, undifferentiated (Murchison)	
35	Lower Karoo, undifferentiated (Murchison)	
36	Upper Karoo, undifferentiated (Murchison)	
37	Lower Karoo, undifferentiated (Murchison)	
38	Upper Karoo, undifferentiated (Murchison)	
39	Lower Karoo, undifferentiated (Murchison)	
40	Upper Karoo, undifferentiated (Murchison)	
41	Lower Karoo, undifferentiated (Murchison)	
42	Upper Karoo, undifferentiated (Murchison)	
43	Lower Karoo, undifferentiated (Murchison)	
44	Upper Karoo, undifferentiated (Murchison)	
45	Lower Karoo, undifferentiated (Murchison)	
46	Upper Karoo, undifferentiated (Murchison)	
47	Lower Karoo, undifferentiated (Murchison)	
48	Upper Karoo, undifferentiated (Murchison)	
49	Lower Karoo, undifferentiated (Murchison)	
50	Upper Karoo, undifferentiated (Murchison)	
51	Lower Karoo, undifferentiated (Murchison)	
52	Upper Karoo, undifferentiated (Murchison)	
53	Lower Karoo, undifferentiated (Murchison)	
54	Upper Karoo, undifferentiated (Murchison)	
55	Lower Karoo, undifferentiated (Murchison)	
56	Upper Karoo, undifferentiated (Murchison)	
57	Lower Karoo, undifferentiated (Murchison)	
58	Upper Karoo, undifferentiated (Murchison)	
59	Lower Karoo, undifferentiated (Murchison)	
60	Upper Karoo, undifferentiated (Murchison)	

Figure 3-29 Geological Map around Lukusashi Damsite (No. 19) 1/1,000,000



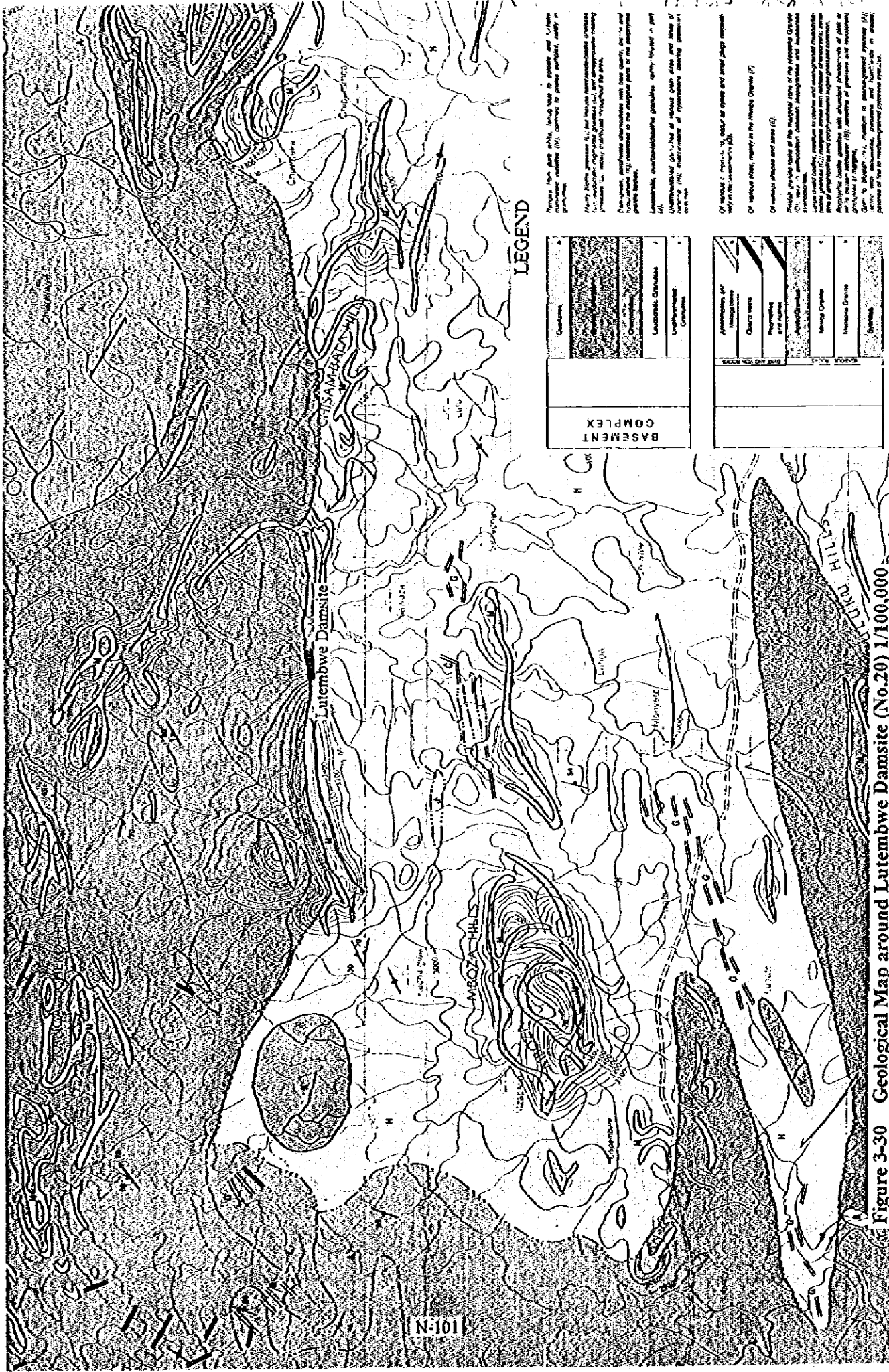


Figure 3-30 Geological Map around Lutembwe Damsite (No. 20) 1/100,000

LEGEND

Contours from 500m up to, level lines in excess of 1/2000m are shown as dashed lines (M). Contours in places marked, rarely in places.

Major fault zones (L); less intense metamorphic zones (U); metamorphic isograds (G); and synorogenic tectonic features (K) shown throughout the map.

Chert (C); phosphate (P); and barite (B) deposits (N); and magnetite (M) deposits (N); and other mineral deposits (N).

Quartzite (Q); and limestone (L); and other metamorphic rocks (M); and gneiss (G); and schist (S); and amphibolite (A); and other metamorphic rocks (M).

Unconformities (U); and other features (O).

BASEMENT COMPLEX	
[Symbol]	Quartzite
[Symbol]	Limestone
[Symbol]	Gneiss
[Symbol]	Amphibolite

[Symbol]	Quartzite
[Symbol]	Amphibolite
[Symbol]	Quartzite
[Symbol]	Quartzite
[Symbol]	Quartzite
[Symbol]	Quartzite
[Symbol]	Quartzite
[Symbol]	Quartzite
[Symbol]	Quartzite

N-101



**LEGEND**

	Quartzite
	Gneiss
	Amphibolite
	Chlorite schist
	Limestone
	Unconformity
	Fault
	Alluvium
	Quartz veins
	Magnetite
	Aegirine
	Garnet
	Epidote
	Spinel

1. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

2. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

3. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

4. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

5. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

6. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

7. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

8. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

9. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

10. The map shows the geological structure of the area around the Lutembwe Dam site. The map is based on the geological map of the area around the Lutembwe Dam site (No. 20) 1/100,000.

Figure 3-30 Geological Map around Lutembwe Dam site (No.20) 1/100,000



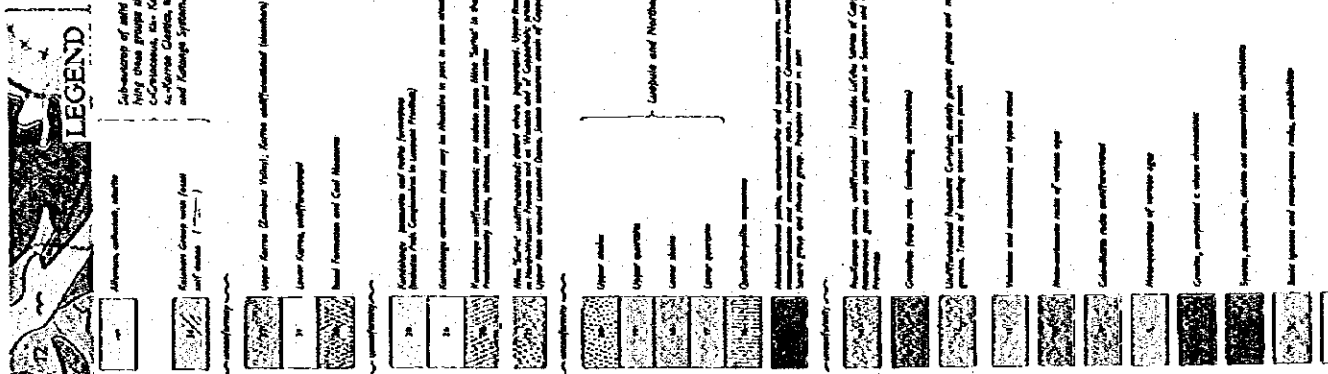


Figure 3-31 Geological Map around Katete Dam site (No. 21) 1/1,000,000

TERTIARY TO RECENT

KARROO  
Upper Carboniferous to Jurassic

KATANGA  
Late Precambrian and Lower Palaeozoic

MUVA

PRECAMBRIAN ROCKS OF UNCERTAIN AGE: POSSIBLY MUVA

PROBABLY LARGELY OLDER PRECAMBRIAN

LITHOLOGICAL UNITS OF VARIOUS AGES

LEGEND

- 1. Mafic dykes, sheet intrusions
- 2. Mafic dykes, sheet intrusions
- 3. Mafic dykes, sheet intrusions
- 4. Mafic dykes, sheet intrusions
- 5. Mafic dykes, sheet intrusions
- 6. Mafic dykes, sheet intrusions
- 7. Mafic dykes, sheet intrusions
- 8. Mafic dykes, sheet intrusions
- 9. Mafic dykes, sheet intrusions
- 10. Mafic dykes, sheet intrusions
- 11. Mafic dykes, sheet intrusions
- 12. Mafic dykes, sheet intrusions
- 13. Mafic dykes, sheet intrusions
- 14. Mafic dykes, sheet intrusions
- 15. Mafic dykes, sheet intrusions
- 16. Mafic dykes, sheet intrusions
- 17. Mafic dykes, sheet intrusions
- 18. Mafic dykes, sheet intrusions
- 19. Mafic dykes, sheet intrusions
- 20. Mafic dykes, sheet intrusions
- 21. Mafic dykes, sheet intrusions
- 22. Mafic dykes, sheet intrusions
- 23. Mafic dykes, sheet intrusions
- 24. Mafic dykes, sheet intrusions
- 25. Mafic dykes, sheet intrusions
- 26. Mafic dykes, sheet intrusions



TERTIARY TO RECENT

KAROO  
(Upper Carboniferous to Jurassic)

KATANGA  
(Late Precambrian and Lower Palaeozoic)

MUYA

PRECAMBRIAN ROCKS OF UNCERTAIN AGE: POSSIBLY MUVA

PROBABLY LARGELY OLDER PRECAMBRIAN

LITHOLOGICAL UNITS OF VARIOUS AGES

LEGEND

Schematic of field geology under-lying these groups shown in following: - Katanga Group, in alignment with Katanga System.

Upper Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

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Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Lower Karoo (Carboniferous to Jurassic)

Figure 3-31 Geological Map around Katete Dam site (No.21) 1/1,000,000

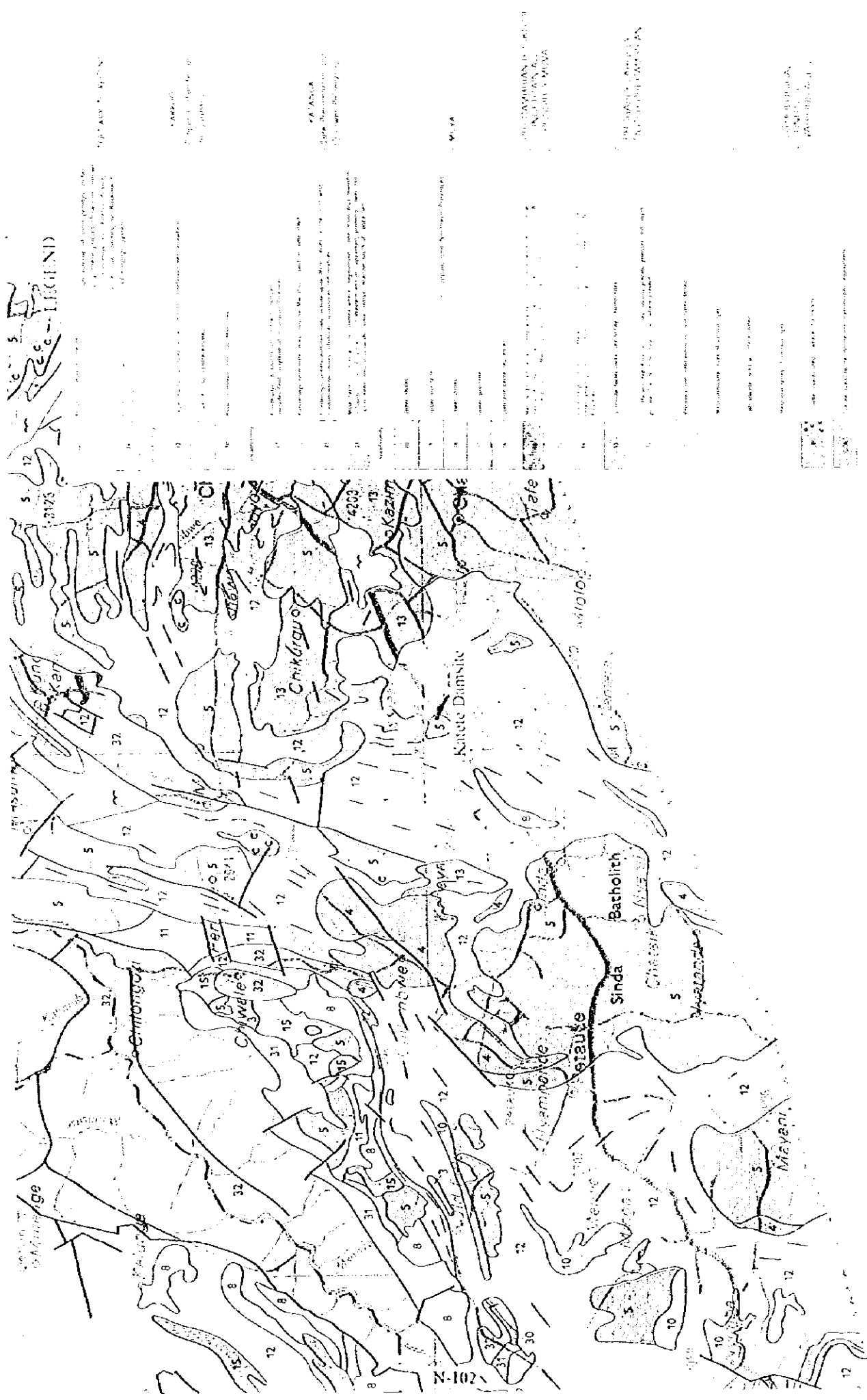


Figure 3-31 Geological Map around Katete Dam site (No.21) 1/1,000,000

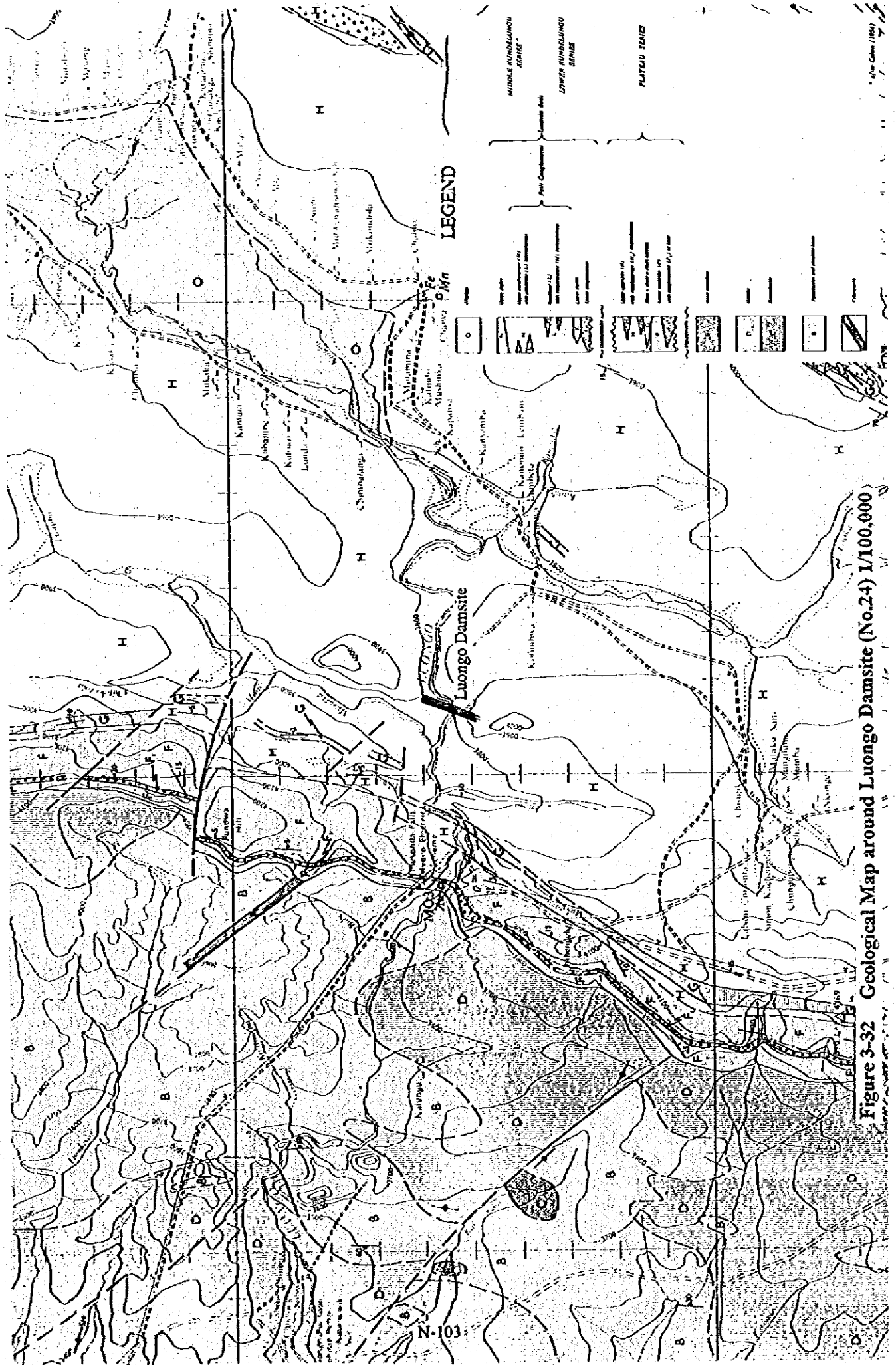


Figure 3-32 Geological Map around Luongo Dam site (No.24) 1/100,000

© 1964

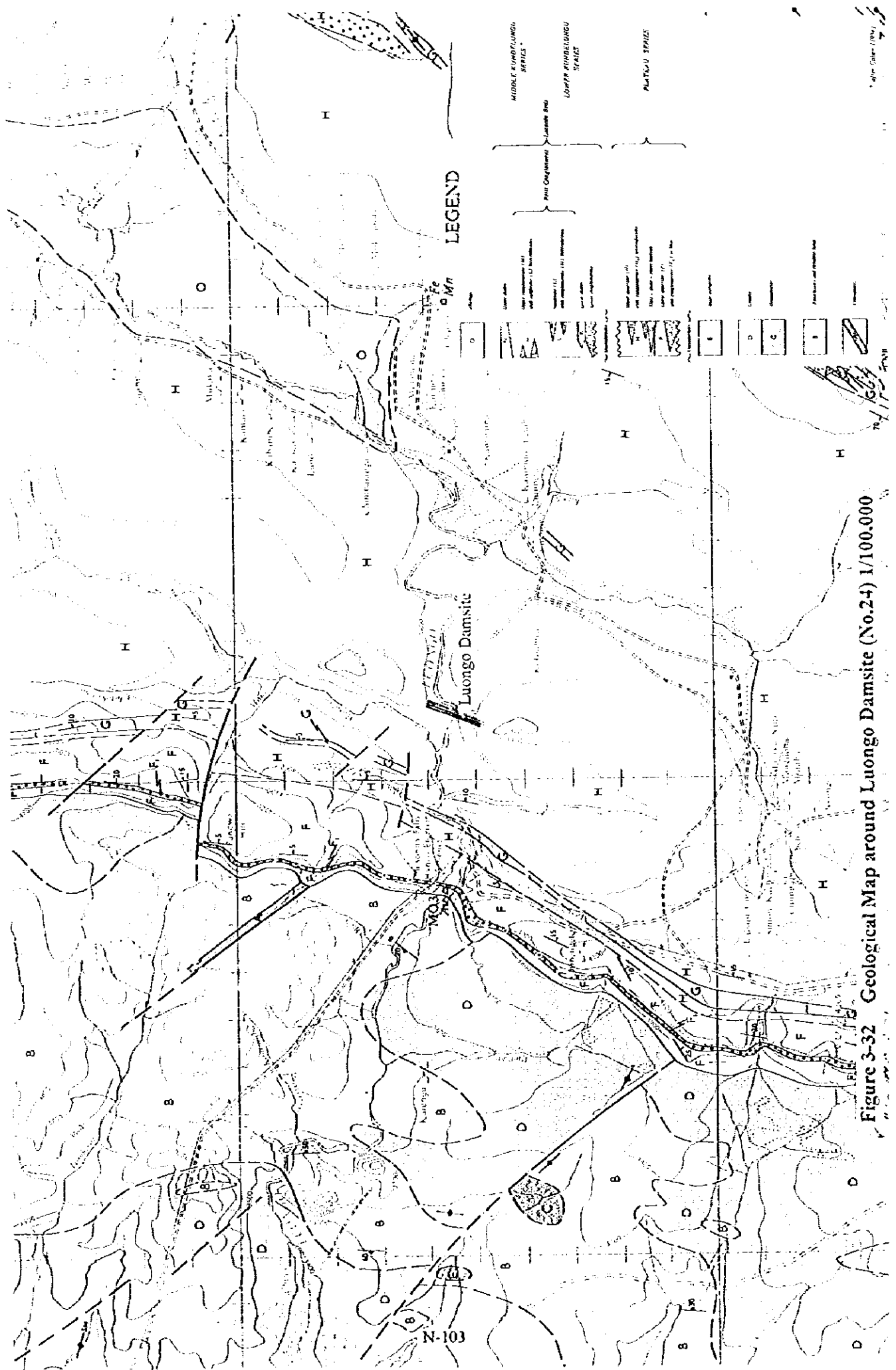


Figure 3-32 Geological Map around Luongo Dam site (No.24) 1/100,000

1/100,000

N-103

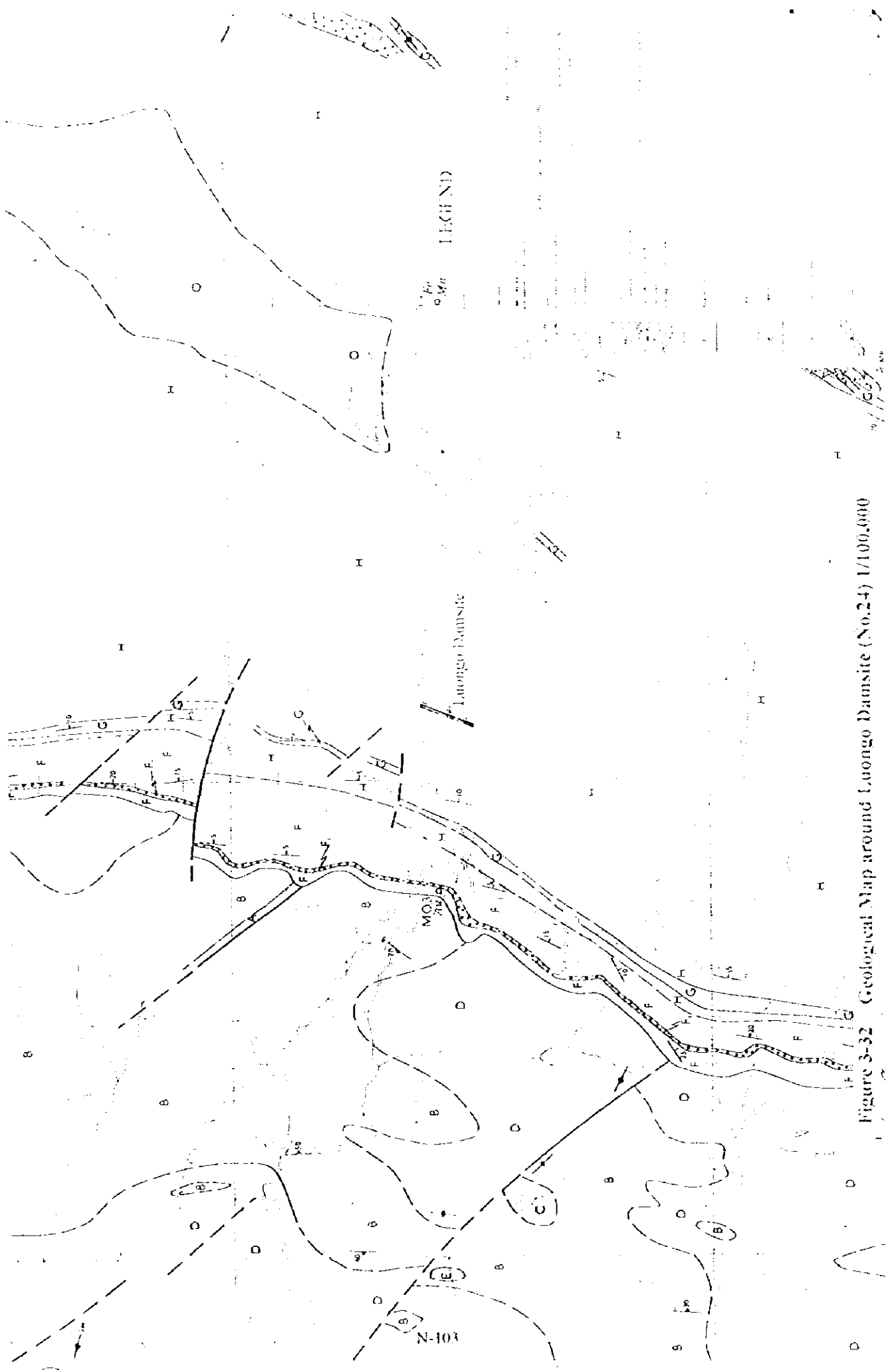


Figure 3-32 Geological Map around Luongo Dam site (No.24) 1/100,000







**LEGEND**

KADANGA SYSTEM	
	1st class road
	2nd class road
	3rd class road
	4th class road
	5th class road
	6th class road
	7th class road
	8th class road
	9th class road
	10th class road
	11th class road
	12th class road
	13th class road
	14th class road
	15th class road
	16th class road
	17th class road
	18th class road
	19th class road
	20th class road
	21st class road
	22nd class road
	23rd class road
	24th class road
	25th class road
	26th class road
	27th class road
	28th class road
	29th class road
	30th class road
RAAPMENT COMPLEX	
	1st class road
	2nd class road
	3rd class road
	4th class road
	5th class road
	6th class road
	7th class road
	8th class road
	9th class road
	10th class road
	11th class road
	12th class road
	13th class road
	14th class road
	15th class road
	16th class road
	17th class road
	18th class road
	19th class road
	20th class road
	21st class road
	22nd class road
	23rd class road
	24th class road
	25th class road
	26th class road
	27th class road
	28th class road
	29th class road
	30th class road

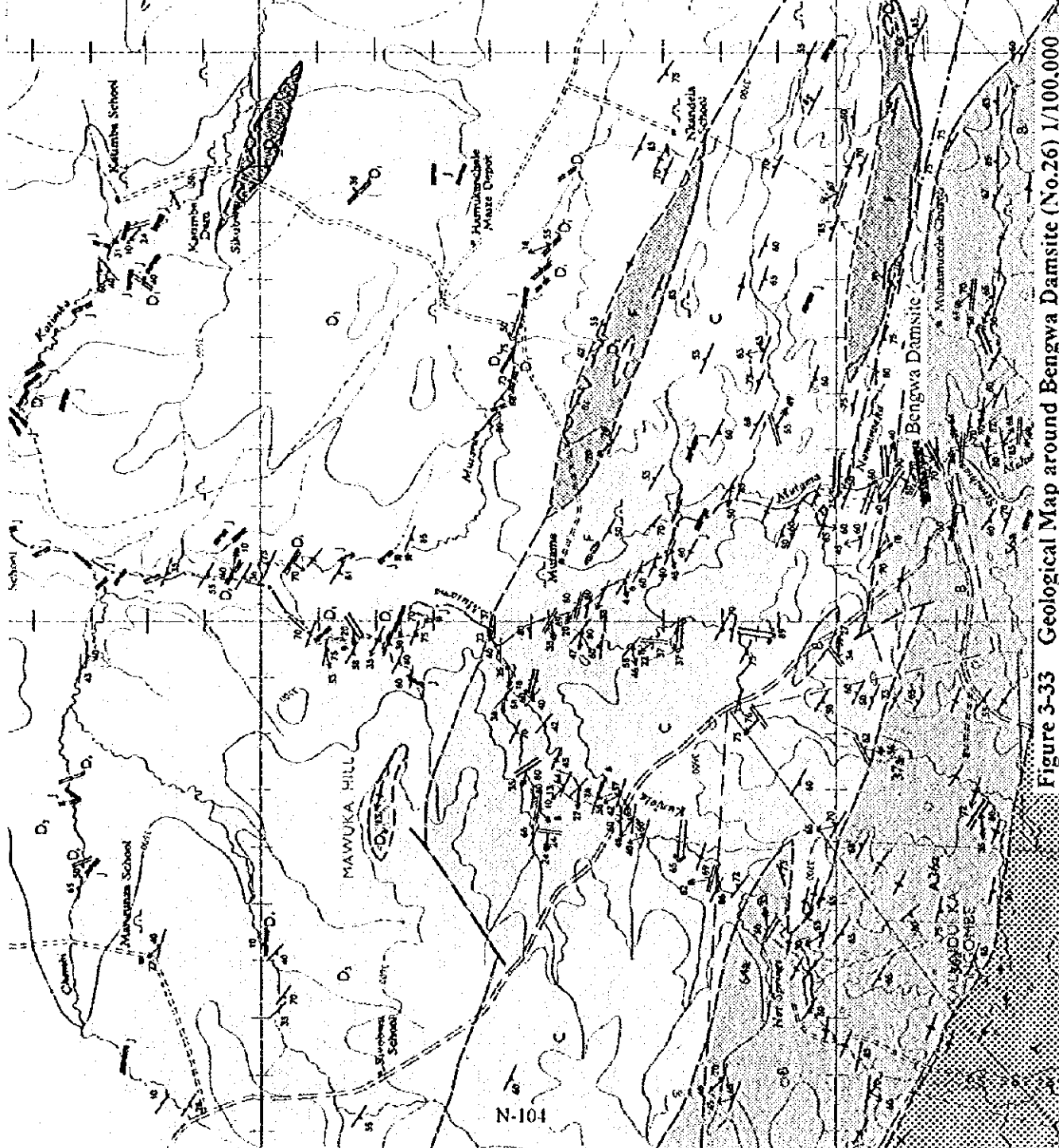


Figure 3-33 Geological Map around Bengwa Dam site (No.26) 1/100,000

LEGEND

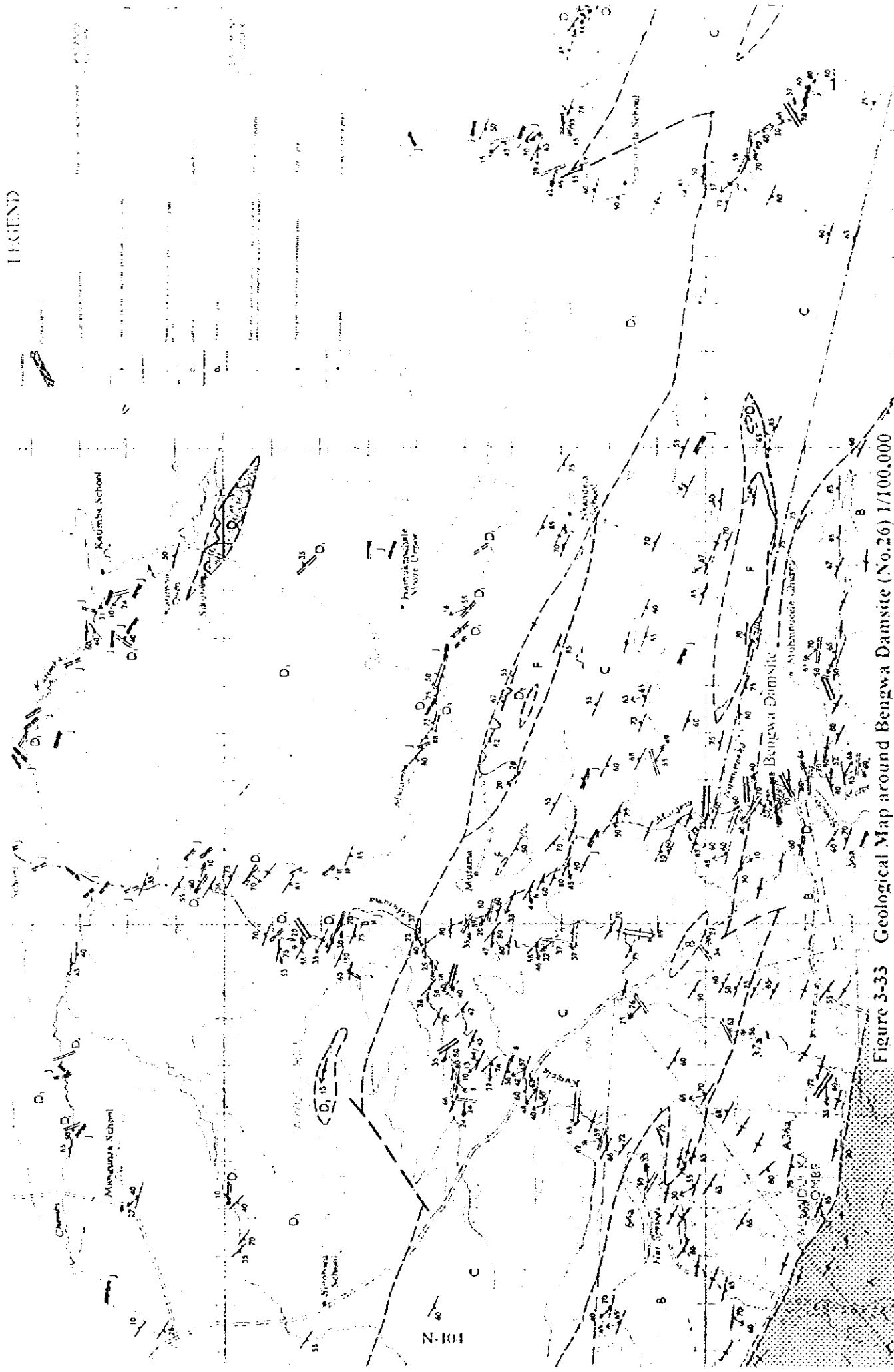
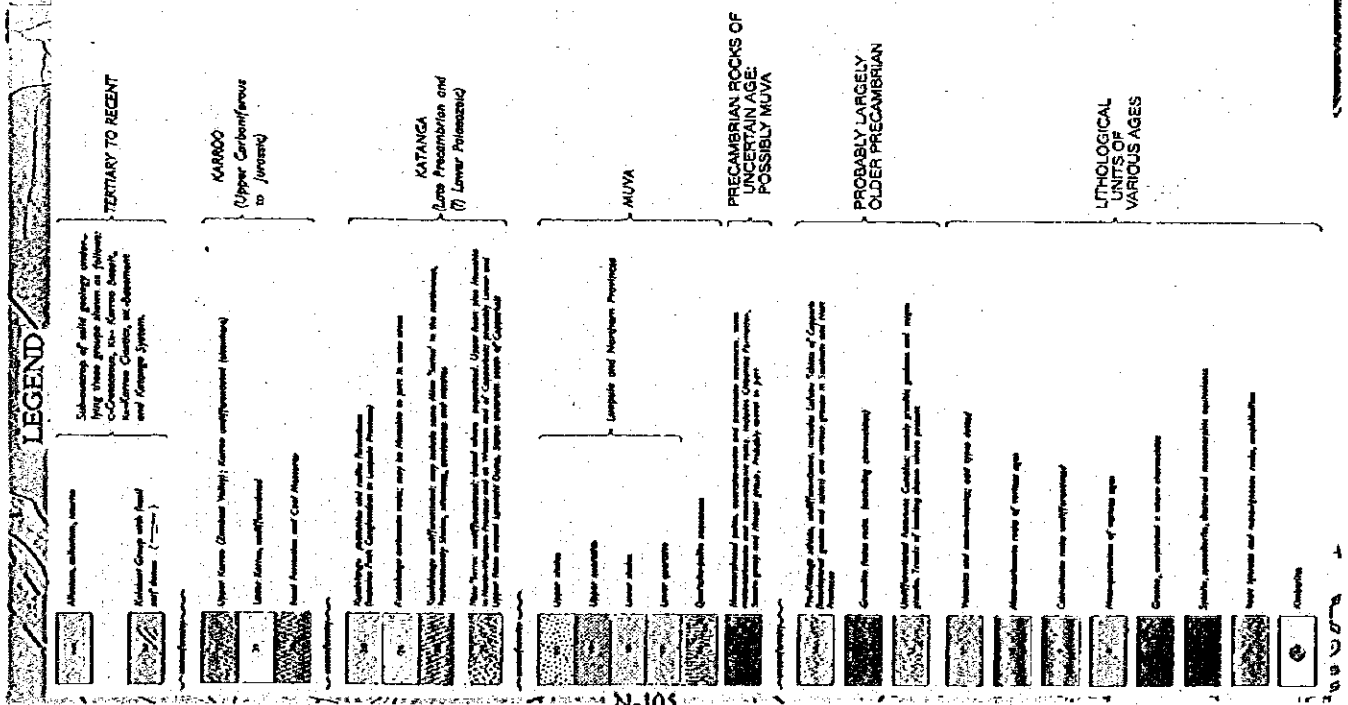


Figure 3-33 Geological Map around Bengwa Dam site (No.26) 1/100,000



Figure 3-34 Geological Map around Kalomo Dam site (No.27) 1/1,000,000



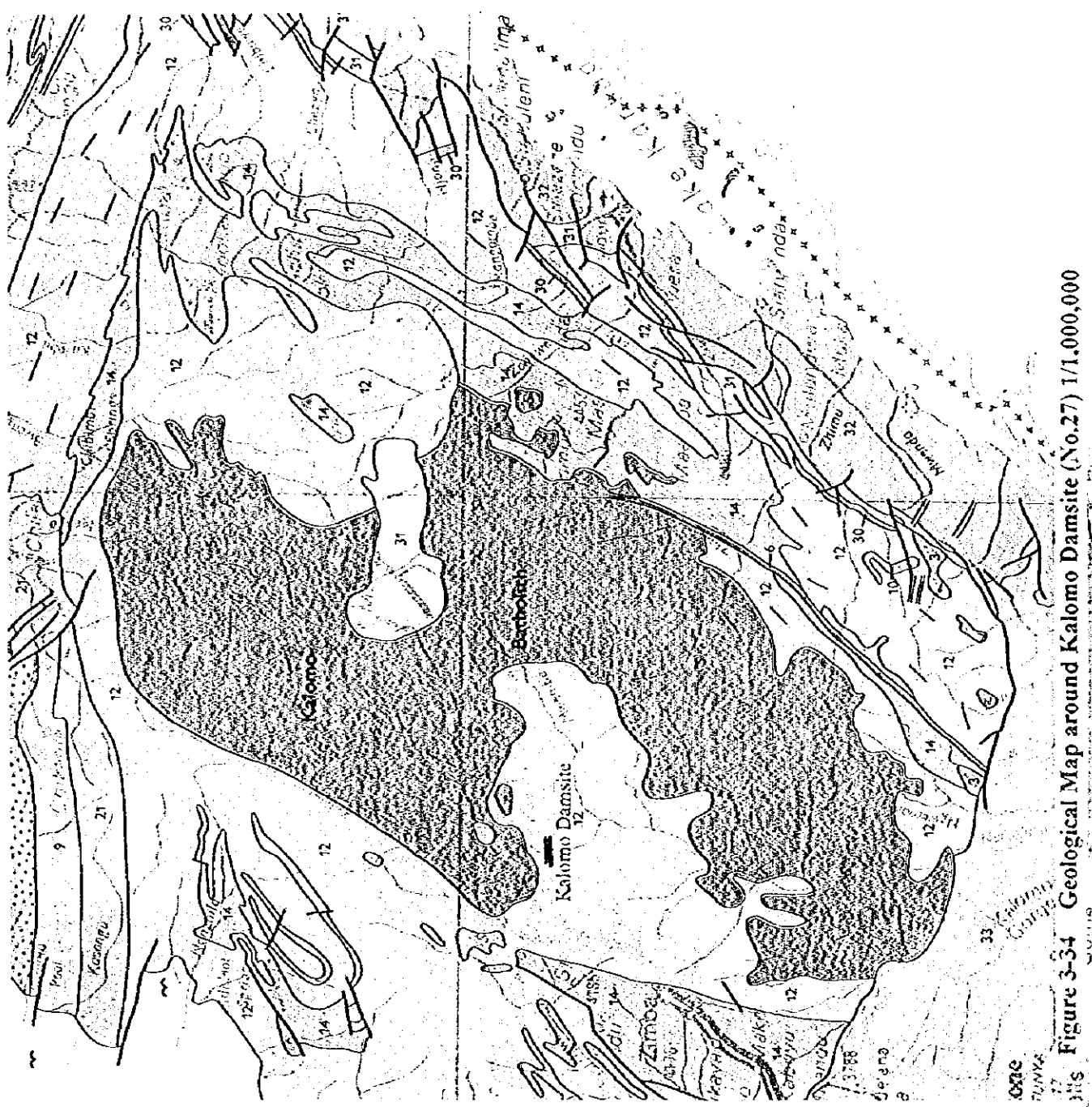


Figure 3-34 Geological Map around Kalomo Damsite (No.27) 1/1,000,000

### LEGEND

Sub-division of solid geology underlying these groups shown as follows:  
 C-Cambrian, S-Silurian, K-Karanga System, and Karanga System.

	TERTIARY TO RECENT
	KARROO (Upper Carboniferous to Jurassic)
	KATANGA (Late Precambrian and Lower Palaeozoic)
	MUVA
	PRECAMBRIAN ROCKS OF UNCERTAIN AGE: POSSIBLY MUVA
	PROBABLY LARGELY OLDER PRECAMBRIAN
	LITHOLOGICAL UNITS OF VARIOUS AGES

**Upper Karroo (Cambrian to Jurassic)**

	Upper Karroo (Cambrian to Jurassic)
	Lower Karroo (Carboniferous to Jurassic)
	Karroo sandstone and clay shales

**Katanga (Late Precambrian and Lower Palaeozoic)**

	Katanga
	Katanga
	Katanga
	Katanga
	Katanga

**Muva**

	Muva
	Muva
	Muva
	Muva
	Muva

**Precambrian rocks of uncertain age, possibly Muva**

	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva
	Precambrian rocks of uncertain age, possibly Muva

**Probably largely older Precambrian**

	Probably largely older Precambrian
	Probably largely older Precambrian
	Probably largely older Precambrian
	Probably largely older Precambrian
	Probably largely older Precambrian

**Lithological units of various ages**

	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages
	Lithological units of various ages



Figure 3-34 Geological Map around Kalomo Dam site (No.27) 1/1,000,000

**LEGEND**

**TECTONIC**

- Substrate of the granite complex
- Granite
- Granite gneiss
- Granite schist
- Granite diorite
- Granite quartzite
- Granite amphibolite
- Granite schist
- Granite gneiss
- Granite diorite
- Granite quartzite
- Granite amphibolite

**SEDIMENTARY TO BEGIAN**

- Upper Kalomo (Upper Kalomo) Formation
- Lower Kalomo (Lower Kalomo) Formation
- Upper Kalomo (Upper Kalomo) Formation
- Lower Kalomo (Lower Kalomo) Formation

**KARROO**

- Upper Karroo (Upper Karroo) Formation
- Lower Karroo (Lower Karroo) Formation
- Upper Karroo (Upper Karroo) Formation
- Lower Karroo (Lower Karroo) Formation

**KA-TANJA**

- Upper Ka-Tanja (Upper Ka-Tanja) Formation
- Lower Ka-Tanja (Lower Ka-Tanja) Formation
- Upper Ka-Tanja (Upper Ka-Tanja) Formation
- Lower Ka-Tanja (Lower Ka-Tanja) Formation

**MICA**

- Upper Mica (Upper Mica) Formation
- Lower Mica (Lower Mica) Formation
- Upper Mica (Upper Mica) Formation
- Lower Mica (Lower Mica) Formation

**THE GRANITIC COMPLEX**

- Granite
- Granite gneiss
- Granite schist
- Granite diorite
- Granite quartzite
- Granite amphibolite
- Granite schist
- Granite gneiss
- Granite diorite
- Granite quartzite
- Granite amphibolite

**SEDIMENTARY TO BEGIAN**

- Upper Kalomo (Upper Kalomo) Formation
- Lower Kalomo (Lower Kalomo) Formation
- Upper Kalomo (Upper Kalomo) Formation
- Lower Kalomo (Lower Kalomo) Formation

**KARROO**

- Upper Karroo (Upper Karroo) Formation
- Lower Karroo (Lower Karroo) Formation
- Upper Karroo (Upper Karroo) Formation
- Lower Karroo (Lower Karroo) Formation

**KA-TANJA**

- Upper Ka-Tanja (Upper Ka-Tanja) Formation
- Lower Ka-Tanja (Lower Ka-Tanja) Formation
- Upper Ka-Tanja (Upper Ka-Tanja) Formation
- Lower Ka-Tanja (Lower Ka-Tanja) Formation

**MICA**

- Upper Mica (Upper Mica) Formation
- Lower Mica (Lower Mica) Formation
- Upper Mica (Upper Mica) Formation
- Lower Mica (Lower Mica) Formation

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**REPUBLIC OF ZAMBIA  
MINISTRY OF ENERGY AND WATER DEVELOPMENT**

**THE STUDY**

**ON**

**THE NATIONAL WATER RESOURCES MASTER PLAN**

**IN**

**THE REPUBLIC OF ZAMBIA**

**FINAL REPORT**

**SUPPORTING REPORT [O]**

**DAM DEVELOPMENT PLAN**

**OCTOBER, 1995**

**YACHIYO ENGINEERING CO., LTD.  
(YEC)**

**THE STUDY ON NATIONAL WATER RESOURCES MASTER PLAN  
IN THE REPUBLIC OF ZAMBIA**

**SUPPORTING REPORT (O)  
DAM DEVELOPMENT PLAN**

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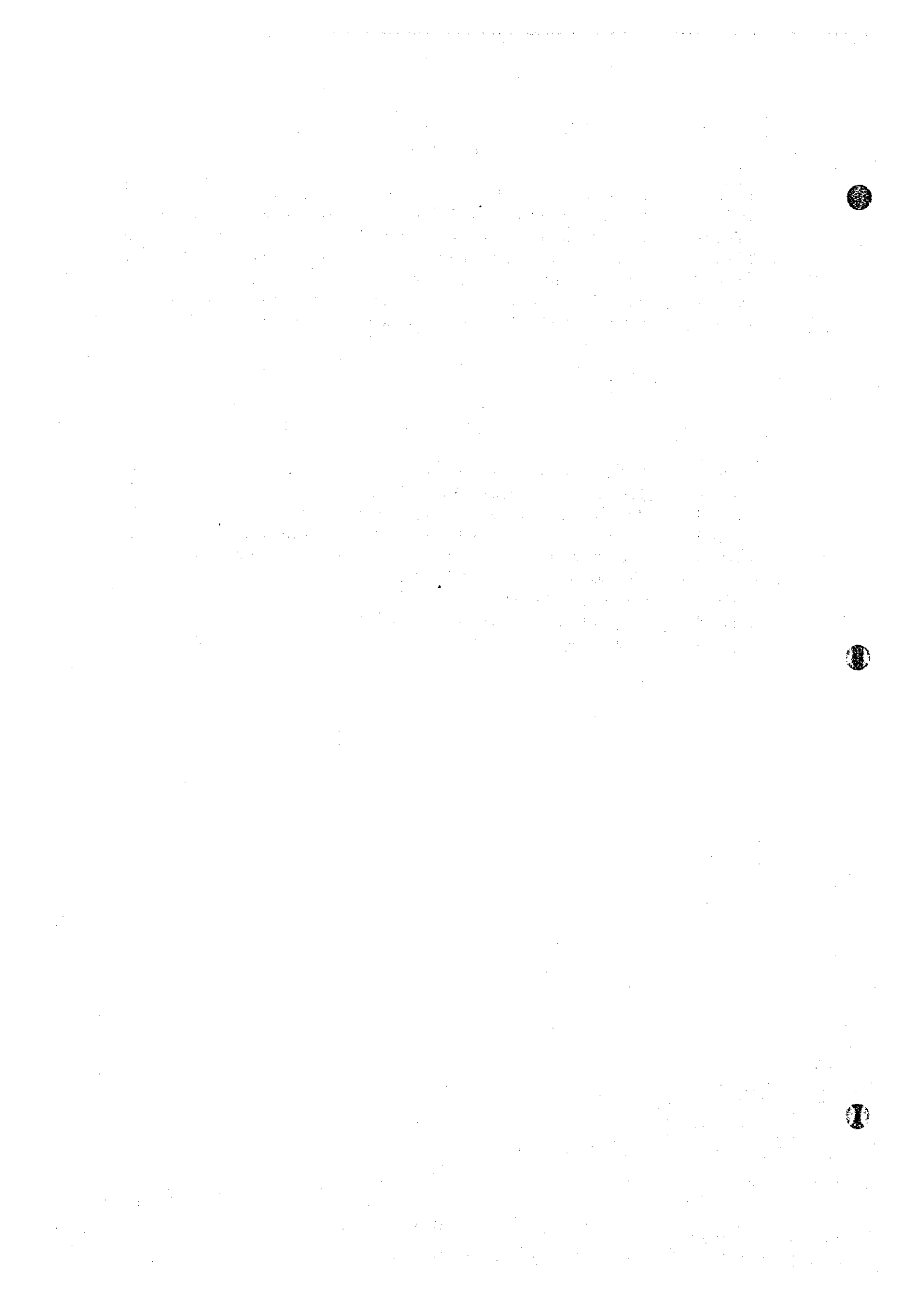
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## **CHAPTER 1 INTRODUCTION**

This supporting report deals with the dam development plan for the National Water Resources Master Plan in the Republic of Zambia (herein after referred to as "the Study").

The dam development plan for the Study aims at selecting the potential surface water sources in the country, namely, proposed dam schemes for the Study.

Chapter 2 describes the selecting of proposed damsites, and its location.

Chapter 3 presents the inventories of dam scheme together with information of the proposed characteristics such as storage - area curve and dam embankment volume of proposed damsites and presents the preliminary layout design.

Chapter 4 presents the water potential to be developed by the proposed dam sites.

Chapter 5 presents facility plan for prospective dam development scheme.