

(b) 借 款 返 済

上記仮定に基づく借款返済の検討結果は表8.4に示される様に、運転開始初年度から歳入が支出を上まわる。平均電力料金は1991年現在価格であるUS\$ 0.183/kWh に固定することを借款返済条件とする。

8.5 プロジェクトの総合評価

前節において検討された通り、本計画は経済的にも財務的にも実施可能であると評価された。また、社会環境面における負の影響は第3章で述べたごとく軽微である。

総事業費 FCFA112.7 x 10⁹ (US\$416.5 x 10⁶) は、最近の国家財政収入(表2.5)の約19%、あるいはSONELの年間財務収入(表2.24)の約180%に相当し、SONELはもとより国家にとって極めて大規模プロジェクトとして位置づけられる。従って、実施に向けては国内関係省(大蔵省、鉱山エネルギー省等)及び世銀を主とする国際援助機関との協議を踏まえ、慎重かつ丁寧な対応を計って行く必要がある。

第5章では、最大純便益の観点から将来の南部送電網開発計画としてナクティガル第1期—メンベレ第1期—ナクティガル第2期—メンベレ第2期—ナクティガル第3期の開発投入順序を提案した。しかし、この開発案は現在水力発電設備が集中しているサナガ流域に改めて開発投資することを意味する。図8.1から容易に理解されたとおり、カメルーンでは大規模送電線ルートに人口が集中しており、サナガ流域に位置するナクティガル計画を先行開発することは、この状況をさらに強める結果を招く。これに対し、もしメンベレ計画が先行開発されれば、現在全くの未開発であるヌテム流域の開発効果は計り知れないものがある。

従って、電源の分散及び未開発流域の開発を目指すならば、メンベレ計画を他の計画に先立って実施する可能性は十分にある。この時は、送電線ルートを電力需要地を考慮してカンボ・ルート(エデア市までの送電)とすることも考えられる。詳細設計段階では、開発投入時期と合わせ、送電線ルートの再検討を重要作業項目のひとつに数えるべきであろう。

表 8.1 推定代替火力費用
(Hydro Benefit)

Item	Gas-Turbine	Oil-fired Thermal	Remarks
1 Capital Cost			
a) Plant Size (MW)	20	50	
b) Construction Cost (US \$/kW)	1,000	1,500	Financial cost basis
c) Economic Construction Cost (US \$/kW)	985	1,478	(b) x (0.9 + 0.1 x 0.85)
d) Construction Period (years)	2	5	
e) Disbursement (%)	40/60	5/25/40/20/10	
f) Commissioned Factor	1,090	1,269	i = 10% assumed
g) Commissioned Cost (US \$/kW)	1,074	1,876	Cost at completion
h) Life Time (years)	15	30	
i) Discount Rate (%)	10	10	
j) Recovery Factor	0.1315	0.1061	
k) Annual Capital Charge (US \$/kW)	141.2	199.0	
l) O&M Cost (%)	2	2	
	(\$/kW/yr)	19.7	29.6
m) Total Fixed Cost (US \$/kW/year)	160.9	228.6	
n) Adjustment Factor	1.148	1.198	See Note below
o) kW Value (US \$/kW/year)	184.7	273.9	
2 Variable Cost (based on International Oil Price)			
a) Fuel			
i) Type	Gas-Oil	MFO	Based on Crude Oil Price of US\$20/bbl.
ii) Price (US \$/bbl)	32	19	
iii) Specific gravity	0.84	0.99	
iv) Calorific value (Kcal/kg)	10,800	11,000	
v) Operation efficiency (%)	26.0	29.0	
vi) Heat rate (Kcal/kWh)	3,308	2,965	
vii) Fuel cost (US \$/kWh)	0.0734	0.0325	
b) Variable O&M (US \$/kWh)	0.0030	0.0006	
c) Total Variable Cost (US \$/kWh)	0.0764	0.0331	
d) Adjustment Factor	1.007	1.028	See Note below
e) kWh Value (US \$/kWh)	0.0769	0.0340	
2' Variable Cost (based on Domestic Fuel Price)			
a) Fuel			
ii) Price (US\$/l)	0.658	0.391	US\$ 1 = F.CFA 270.6
(F. CFA/l)	(178.0)	(105.7)	
b) Variable O&M (US \$/kWh)	0.0030	0.0006	
c) Total Variable Cost (US \$/kWh)	0.2403	0.1071	
d) Adjustment Factor	1.007	1.028	See Note below
e) kWh Value (US \$/kWh)	0.242	0.110	
Note: Adjustmrnt factor			
i) Station use (%)	4.0	6.0	0.3
ii) Transmmission line loss (%)	1.0	2.0	5.0
iii) Forced outage (%)	7.0	7.0	0.5
iv) Scheduled outage (%)	8.0	10.0	2.0
v) Adjustment factors			
- kW value	1.148	1.198	
- kWh value	1.007	1.028	

表 8.2 経済キャッシュフロー

Unit: Mill. US\$

Year in order	Construction Cost	Replace, O&M Cost	Total Cost	Benefit	Net Benefit (B - C)	Present Value		Notes
						Cost	Benefit	
1	9.137	0.000	9.137	0.000	-9.137	8.307	0.000	MVL-1 construction begins.
2	45.686	0.000	45.686	0.000	-45.686	37.757	0.000	
3	91.372	0.000	91.372	0.000	-91.372	68.649	0.000	
4	121.829	0.000	121.829	45.511	-76.318	83.211	31.085	
5	36.549	0.000	36.549	68.267	31.718	22.694	42.389	MVL-1 complete (Thermal-1 put)
6	0.000	3.273	3.273	39.934	36.661	1.847	22.541	
7	0.000	3.273	3.273	39.934	36.661	1.680	20.492	
8	0.000	3.273	3.273	39.934	36.661	1.527	18.629	
9	0.000	3.273	3.273	39.934	36.661	1.388	16.936	
10	56.040	3.273	59.313	85.445	26.133	22.868	32.943	MVL-2 construction begins.
11	56.040	3.273	59.313	108.201	48.888	20.789	37.924	MVL-2 complete (Thermal-2 put)
12	0.000	4.372	4.372	53.581	49.208	1.393	17.072	
13	0.000	4.372	4.372	53.581	49.208	1.266	15.520	
14	0.000	4.372	4.372	53.581	49.208	1.151	14.109	
15	0.000	4.372	4.372	53.581	49.208	1.047	12.827	
16	0.000	4.372	4.372	53.581	49.208	0.952	11.661	
17	0.000	4.372	4.372	53.581	49.208	0.865	10.601	
18	0.000	4.372	4.372	53.581	49.208	0.786	9.637	
19	0.000	4.372	4.372	99.092	94.720	0.715	16.202	
20	0.000	4.372	4.372	121.848	117.475	0.650	18.112	(Thermal-1 replaced)
21	0.000	4.372	4.372	53.581	49.208	0.591	7.240	
22	0.000	4.372	4.372	53.581	49.208	0.537	6.582	
23	0.000	4.372	4.372	53.581	49.208	0.488	5.984	
24	0.000	4.372	4.372	53.581	49.208	0.444	5.440	
25	0.000	4.372	4.372	99.092	94.720	0.404	9.146	
26	0.000	4.372	4.372	121.848	117.475	0.367	10.224	(Thermal-2 replaced)
27	0.000	4.372	4.372	53.581	49.208	0.334	4.087	
28	0.000	4.372	4.372	53.581	49.208	0.303	3.715	
29	0.000	4.372	4.372	53.581	49.208	0.276	3.378	
30	0.000	4.372	4.372	53.581	49.208	0.251	3.071	
31	0.000	4.372	4.372	53.581	49.208	0.228	2.791	
32	0.000	4.372	4.372	53.581	49.208	0.207	2.538	
33	0.000	4.372	4.372	53.581	49.208	0.188	2.307	
34	0.000	4.372	4.372	99.092	94.720	0.171	3.879	
35	0.000	4.372	4.372	121.848	117.475	0.156	4.336	(Thermal-1 replaced)
36	0.000	4.372	4.372	53.581	49.208	0.141	1.733	
37	0.000	4.372	4.372	53.581	49.208	0.129	1.576	
38	0.000	4.372	4.372	53.581	49.208	0.117	1.432	
39	0.000	4.372	4.372	53.581	49.208	0.106	1.302	
40	0.000	121.002	121.002	99.092	-21.910	2.674	2.189	G/E & Metal [MVL-1] replaced
41	0.000	4.372	4.372	121.848	117.475	0.088	2.447	(Thermal-2 replaced)
42	0.000	4.372	4.372	53.581	49.208	0.080	0.978	
43	0.000	4.372	4.372	53.581	49.208	0.073	0.889	
44	0.000	4.372	4.372	53.581	49.208	0.066	0.809	
45	0.000	4.372	4.372	53.581	49.208	0.060	0.735	
46	0.000	40.343	40.343	53.581	13.237	0.503	0.668	G/E & Metal [MVL-2] replaced
47	0.000	4.372	4.372	53.581	49.208	0.050	0.608	
48	0.000	4.372	4.372	53.581	49.208	0.045	0.552	
49	0.000	4.372	4.372	99.092	94.720	0.041	0.929	
50	0.000	4.372	4.372	121.848	117.475	0.037	1.038	(Thermal-1 replaced)
51	0.000	4.372	4.372	53.581	49.208	0.034	0.415	
52	0.000	4.372	4.372	53.581	49.208	0.031	0.377	
53	0.000	4.372	4.372	53.581	49.208	0.028	0.343	
54	0.000	4.372	4.372	53.581	49.208	0.025	0.312	
55	0.000	97.823	97.823	53.581	-44.242	0.517	0.283	Civil [MVL-1] replaced
Total						289.328	443.014	EIRR = 16.52%

Note: Total economic cost = Mill. US \$416.652

Installed capacity = 201.2 MW in total

Capital recovery factor = 0.1005

Annual cost = Mill. US \$29.087

B / C = 1.53 (Benefit-cost ratio)

B - C = Mill. US \$153.686

Unit energy cost = 2.9 US¢/kWh

Exchange rate: US \$1 = F.CFA270.6

Discount rate: 10.0%

MVL-1: Memvé Elé 1, MVL-2: Memvé Elé 2

Hydro's 95% dependable power = 201.2 MW (4.3 hours/day basis)

Alternative thermal capacity = 201.2 MW for MVL-1 and MVL-2

Alternative thermal cost = Mill. US \$113.779

Alternative thermal O&M cost = US \$22.60 /kW/year

Primary energy value = US \$0.0769/kWh for Gas-turbine

Secondary energy value = US \$0.0340/kWh for Oil-fired

表 8.3 財務キャッシュフロー

Unit: Mill. US\$

Year in order	Const- ruction Cost	Replace- ment Cost	O&M Cost	Total Cost	Benefit	B - C	Present Value	
							Cost	Benefit
1	9.137	0.000	0.000	9.137	0.000	-9.137	8.307	0.000
2	45.686	0.000	0.000	45.686	0.000	-45.686	37.757	0.000
3	91.372	0.000	0.000	91.372	0.000	-91.372	68.649	0.000
4	121.829	0.000	0.000	121.829	0.000	-121.829	83.211	0.000
5	36.549	0.000	0.000	36.549	0.000	-36.549	22.694	0.000
6	0.000	0.000	42.035	42.035	129.206	87.171	23.727	72.933
7	0.000	0.000	42.035	42.035	129.206	87.171	21.570	66.303
8	0.000	0.000	42.035	42.035	129.206	87.171	19.609	60.275
9	0.000	0.000	42.035	42.035	129.206	87.171	17.827	54.796
10	56.040	0.000	42.035	98.074	129.206	31.131	37.812	49.814
11	56.040	0.000	42.035	98.074	129.206	31.131	34.374	45.286
12	0.000	0.000	43.134	43.134	198.388	155.254	13.744	63.212
13	0.000	0.000	43.134	43.134	198.388	155.254	12.494	57.466
14	0.000	0.000	43.134	43.134	198.388	155.254	11.359	52.242
15	0.000	0.000	43.134	43.134	198.388	155.254	10.326	47.492
16	0.000	0.000	43.134	43.134	198.388	155.254	9.387	43.175
17	0.000	0.000	43.134	43.134	198.388	155.254	8.534	39.250
18	0.000	0.000	43.134	43.134	198.388	155.254	7.758	35.682
19	0.000	0.000	43.134	43.134	198.388	155.254	7.053	32.438
20	0.000	0.000	43.134	43.134	198.388	155.254	6.412	29.489
21	0.000	0.000	43.134	43.134	198.388	155.254	5.829	26.808
22	0.000	0.000	43.134	43.134	198.388	155.254	5.299	24.371
23	0.000	0.000	43.134	43.134	198.388	155.254	4.817	22.156
24	0.000	0.000	43.134	43.134	198.388	155.254	4.379	20.141
25	0.000	0.000	43.134	43.134	198.388	155.254	3.981	18.310
26	0.000	0.000	43.134	43.134	198.388	155.254	3.619	16.646
27	0.000	0.000	43.134	43.134	198.388	155.254	3.290	15.133
28	0.000	0.000	43.134	43.134	198.388	155.254	2.991	13.757
29	0.000	0.000	43.134	43.134	198.388	155.254	2.719	12.506
30	0.000	0.000	43.134	43.134	198.388	155.254	2.472	11.369
31	0.000	0.000	43.134	43.134	198.388	155.254	2.247	10.336
32	0.000	0.000	43.134	43.134	198.388	155.254	2.043	9.396
33	0.000	0.000	43.134	43.134	198.388	155.254	1.857	8.542
34	0.000	0.000	43.134	43.134	198.388	155.254	1.688	7.765
35	0.000	0.000	43.134	43.134	198.388	155.254	1.535	7.059
36	0.000	0.000	43.134	43.134	198.388	155.254	1.395	6.418
37	0.000	0.000	43.134	43.134	198.388	155.254	1.269	5.834
38	0.000	0.000	43.134	43.134	198.388	155.254	1.153	5.304
39	0.000	0.000	43.134	43.134	198.388	155.254	1.048	4.822
40	0.000	116.630	43.134	159.764	198.388	38.624	3.530	4.383
41	0.000	0.000	43.134	43.134	198.388	155.254	0.866	3.985
42	0.000	0.000	43.134	43.134	198.388	155.254	0.788	3.623
43	0.000	0.000	43.134	43.134	198.388	155.254	0.716	3.293
44	0.000	0.000	43.134	43.134	198.388	155.254	0.651	2.994
45	0.000	0.000	43.134	43.134	198.388	155.254	0.592	2.722
46	0.000	0.000	43.134	43.134	198.388	155.254	0.538	2.474
47	0.000	35.971	43.134	79.105	198.388	119.283	0.897	2.249
48	0.000	0.000	43.134	43.134	198.388	155.254	0.445	2.045
49	0.000	0.000	43.134	43.134	198.388	155.254	0.404	1.859
50	0.000	0.000	43.134	43.134	198.388	155.254	0.367	1.690
51	0.000	0.000	43.134	43.134	198.388	155.254	0.334	1.536
52	0.000	0.000	43.134	43.134	198.388	155.254	0.304	1.397
53	0.000	0.000	43.134	43.134	198.388	155.254	0.276	1.270
54	0.000	0.000	43.134	43.134	198.388	155.254	0.251	1.154
55	0.000	93.450	43.134	136.584	198.388	61.803	0.722	1.049
Total							527.917	1,034.252

FIRR = 22.92%

Note: Total financial cost = Mill. US \$416.652

Electricity tariff = 49.5 F.CFA/kWh

US 1\$ = F. CFA270.6

Discount rate = 10.0%

O&M Cost consists of operation, maintenance and sub-transmission cost.

Sub-transmission cost is assumed 30% of annual revenue.

表 8.4 借款返済 (1/4)
(Summary)

Unit: Mill. US\$

Year in order	Repayment Cost	OMR Cost	Sub-transmission Cost	Total Expenditure	Annual Revenue	Balance	Cummulative Surplus
1							
2							
3							
4							
5							
6	51.20	3.27	37.04	91.51	123.48	31.96	31.96
7	49.53	3.27	37.04	89.85	123.48	33.63	65.59
8	47.87	3.27	37.04	88.18	123.48	35.29	100.88
9	46.21	3.27	37.04	86.52	123.48	36.95	137.84
10	44.54	3.27	37.04	84.86	123.48	38.62	176.45
11	42.88	3.27	37.04	83.19	123.48	40.28	216.74
12	41.22	4.37	56.30	101.89	187.68	85.79	302.53
13	39.55	4.37	56.30	100.23	187.68	87.45	389.98
14	37.89	4.37	56.30	98.57	187.68	89.12	479.10
15	36.22	4.37	56.30	96.91	187.68	90.79	569.89
16	34.55	4.37	56.30	95.24	187.68	92.45	662.34
17	32.88	4.37	56.30	93.58	187.68	94.12	757.46
18	31.22	4.37	56.30	91.91	187.68	95.79	855.25
19	29.55	4.37	56.30	90.24	187.68	97.45	955.70
20	27.88	4.37	56.30	88.58	187.68	99.12	1,058.82
21	26.22	4.37	56.30	86.91	187.68	100.79	1,164.61
22	24.55	4.37	56.30	85.24	187.68	102.45	1,273.06
23	22.88	4.37	56.30	83.58	187.68	104.12	1,384.18
24	21.22	4.37	56.30	81.91	187.68	105.79	1,497.97
25	19.55	4.37	56.30	80.24	187.68	107.45	1,614.42
26	17.88	4.37	56.30	78.58	187.68	109.12	1,733.54
27	16.22	4.37	56.30	76.91	187.68	110.79	1,855.33
28	14.55	4.37	56.30	75.24	187.68	112.45	1,979.78
29	12.88	4.37	56.30	73.58	187.68	114.12	2,106.90
30	11.22	4.37	56.30	71.91	187.68	115.79	2,236.69
31	9.55	4.37	56.30	70.24	187.68	117.45	2,369.14
32	7.88	4.37	56.30	68.58	187.68	119.12	2,504.26
33	6.22	4.37	56.30	66.91	187.68	120.79	2,642.05
34	4.55	4.37	56.30	65.24	187.68	122.45	2,782.50
35	2.88	4.37	56.30	63.58	187.68	124.12	2,925.62
36	1.22	4.37	56.30	61.91	187.68	125.79	3,071.41
37		4.37	56.30	60.24	187.68	127.45	3,219.86
38		4.37	56.30	58.58	187.68	129.12	3,370.98
39		4.37	56.30	56.91	187.68	130.79	3,524.77
40		121.00	56.30	179.67	187.68	8.01	3,000.71
41		4.37	56.30	62.96	187.68	124.72	3,125.43
42		4.37	56.30	62.88	187.68	124.80	3,250.23
43		4.37	56.30	62.81	187.68	124.88	3,375.11
44		4.37	56.30	62.73	187.68	124.96	3,500.07
45		4.37	56.30	60.68	187.68	127.01	3,627.07
46		4.37	56.30	60.68	187.68	127.01	3,754.08
47		40.34	56.30	96.65	187.68	91.03	3,845.11
48		4.37	56.30	60.68	187.68	127.01	3,972.12
49		4.37	56.30	60.68	187.68	127.01	4,099.13
50		4.37	56.30	60.68	187.68	127.01	4,226.13
51		4.37	56.30	60.68	187.68	127.01	4,353.14
52		4.37	56.30	60.68	187.68	127.01	4,480.14
53		4.37	56.30	60.68	187.68	127.01	4,607.15
54		4.37	56.30	60.68	187.68	127.01	4,734.15
55		97.82	56.30	154.13	187.68	33.56	4,767.71
56		4.37	56.30	60.67	187.68	127.01	4,894.72
57		4.37	56.30	60.67	187.68	127.01	5,021.73
58		4.37	56.30	60.67	187.68	127.01	5,148.73
59		4.37	56.30	60.67	187.68	127.01	5,275.74
60		4.37	56.30	60.67	187.68	127.01	5,402.75

Note: Exchange Rate: US \$1.00 = F. CFA270.6

OMR: Operation, maintenance and replacement

Sub-transmission cost is assumed 30% of annual revenue.

表 8.4 借款返済 (2/4)
(Repayment for International Financing Agency)

Unit: Mill. US\$

Year In order	Memve Ele 1						Memve Ele 2						Repay- ment Total
	Loan Disbursement			Repayment			Loan Disbursement			Repayment			
	Capital Cost	IDC Cost	Cumm. Debt	Interest	rincipal	Total	Capital Cost	IDC Cost	Cumm. Debt	Interest	rincipal	Total	
1	3.88	0.39	4.27										
2	19.42	2.37	26.06										
3	38.83	6.49	71.38										
4	51.78	12.32	135.47										
5	15.53	15.10	166.11										
6		16.61	182.72	18.27	9.14	27.41							27.41
7			173.58	17.36	9.14	26.49							26.49
8			164.44	16.44	9.14	25.58							25.58
9			155.31	15.53	9.14	24.67							24.67
10			146.17	14.62	9.14	23.75	23.82	2.38	26.20				23.75
11			137.04	13.70	9.14	22.84	23.82	5.00	55.02				22.84
12			127.90	12.79	9.14	21.93	0.00	5.50	60.52				21.93
13			118.77	11.88	9.14	21.01	0.00	6.05	66.57				21.01
14			109.63	10.96	9.14	20.10	0.00	6.66	73.23				20.10
15			100.49	10.05	9.14	19.19	0.00	7.32	80.55	8.06	4.03	12.08	31.27
16			91.36	9.14	9.14	18.27			76.52	7.65	4.03	11.68	29.95
17			82.22	8.22	9.14	17.36			72.50	7.25	4.03	11.28	28.64
18			73.09	7.31	9.14	16.44			68.47	6.85	4.03	10.87	27.32
19			63.95	6.40	9.14	15.53			64.44	6.44	4.03	10.47	26.00
20			54.81	5.48	9.14	14.62			60.41	6.04	4.03	10.07	24.69
21			45.68	4.57	9.14	13.70			56.39	5.64	4.03	9.67	23.37
22			36.54	3.65	9.14	12.79			52.36	5.24	4.03	9.26	22.05
23			27.41	2.74	9.14	11.88			48.33	4.83	4.03	8.86	20.74
24			18.27	1.83	9.14	10.96			44.30	4.43	4.03	8.46	19.42
25			9.14	0.91	9.14	10.05			40.28	4.03	4.03	8.06	18.10
26			0.00						36.25	3.62	4.03	7.65	7.65
27									32.22	3.22	4.03	7.25	7.25
28									28.19	2.82	4.03	6.85	6.85
29									24.17	2.42	4.03	6.44	6.44
30									20.14	2.01	4.03	6.04	6.04
31									16.11	1.61	4.03	5.64	5.64
32									12.08	1.21	4.03	5.24	5.24
33									8.06	0.81	4.03	4.83	4.83
34									4.03	0.40	4.03	4.43	4.43
35									0.00				0.00
36													
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

Note: Interest Rate: 10.00%

Loan Amount: Mill. US \$177.1

Repayment Years: 20 years

Repayment starts 5 years after construction.

表 8.4 借款返済 (3/4)
(Repayment for Bylateral Aid)

Unit: Mill. US\$

Year in order	Memve Ele 1						Memve Ele 2						Repay- ment Total
	Loan Disbursement			Repayment			Loan Disbursement			Repayment			
	Capital Cost	IDC Cost	Cumm. Debt	Interest	rincipal	Total	Capital Cost	IDC Cost	Cumm. Debt	Interest	rincipal	Total	
1	3.88	0.16	4.04										
2	19.42	0.94	24.39										
3	38.83	2.53	65.76										
4	51.78	4.70	122.23										
5	15.53	5.51	143.28										
6		5.73	149.01	5.96	4.97	10.93							10.93
7			144.04	5.76	4.97	10.73							10.73
8			139.08	5.56	4.97	10.53							10.53
9			134.11	5.36	4.97	10.33							10.33
10			129.14	5.17	4.97	10.13	23.82	0.95	24.77				10.13
11			124.17	4.97	4.97	9.93	23.82	1.94	50.53				9.93
12			119.21	4.77	4.97	9.74	0.00	2.02	52.55				9.74
13			114.24	4.57	4.97	9.54	0.00	2.10	54.65				9.54
14			109.27	4.37	4.97	9.34	0.00	2.19	56.84				9.34
15			104.31	4.17	4.97	9.14	0.00	2.27	59.11	2.36	1.97	4.33	13.47
16			99.34	3.97	4.97	8.94			57.14	2.29	1.97	4.26	13.20
17			94.37	3.77	4.97	8.74			55.17	2.21	1.97	4.18	12.92
18			89.41	3.58	4.97	8.54			53.20	2.13	1.97	4.10	12.64
19			84.44	3.38	4.97	8.34			51.23	2.05	1.97	4.02	12.36
20			79.47	3.18	4.97	8.15			49.26	1.97	1.97	3.94	12.09
21			74.50	2.98	4.97	7.95			47.29	1.89	1.97	3.86	11.81
22			69.54	2.78	4.97	7.75			45.32	1.81	1.97	3.78	11.53
23			64.57	2.58	4.97	7.55			43.35	1.73	1.97	3.70	11.25
24			59.60	2.38	4.97	7.35			41.38	1.66	1.97	3.63	10.98
25			54.64	2.19	4.97	7.15			39.41	1.58	1.97	3.55	10.70
26			49.67	1.99	4.97	6.95			37.44	1.50	1.97	3.47	10.42
27			44.70	1.79	4.97	6.76			35.47	1.42	1.97	3.39	10.14
28			39.74	1.59	4.97	6.56			33.50	1.34	1.97	3.31	9.87
29			34.77	1.39	4.97	6.36			31.53	1.26	1.97	3.23	9.59
30			29.80	1.19	4.97	6.16			29.56	1.18	1.97	3.15	9.31
31			24.83	0.99	4.97	5.96			27.59	1.10	1.97	3.07	9.03
32			19.87	0.79	4.97	5.76			25.62	1.02	1.97	3.00	8.76
33			14.90	0.60	4.97	5.56			23.65	0.95	1.97	2.92	8.48
34			9.93	0.40	4.97	5.36			21.67	0.87	1.97	2.84	8.20
35			4.97	0.20	4.97	5.17			19.70	0.79	1.97	2.76	7.92
36			0.00						17.73	0.71	1.97	2.68	2.68
37									15.76	0.63	1.97	2.60	2.60
38									13.79	0.55	1.97	2.52	2.52
39									11.82	0.47	1.97	2.44	2.44
40									9.85	0.39	1.97	2.36	2.36
41									7.88	0.32	1.97	2.29	2.29
42									5.91	0.24	1.97	2.21	2.21
43									3.94	0.16	1.97	2.13	2.13
44									1.97	0.08	1.97	2.05	2.05
45									0.00				0.00
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

Note: Interest Rate: 4.00%
 Repayment Years: 30 years
 Repayment starts 5 years after construction.

Loan Amount: Mill. US \$177.1

表 8.4 借款返済 (4/4)
(Total Repayment)

Unit: Mill. US\$

Year in order	Memve Ele 1						Memve Ele 2						Repay- ment Total
	Loan Disbursement			Repayment			Loan Disbursement			Repayment			
	Capital Cost	IDC Cost	Cumm. Debt	Interest	Principal	Total	Capital Cost	IDC Cost	Cumm. Debt	Interest	Principal	Total	
1	9.14	0.71	9.85										
2	45.69	4.31	59.84										
3	91.37	11.79	163.01										
4	121.83	22.31	307.15										
5	36.55	27.20	370.90										
6		29.72	400.63	32.50	18.70	51.20							51.20
7			381.93	30.84	18.70	49.53							49.53
8			363.23	29.17	18.70	47.87							47.87
9			344.54	27.51	18.70	46.21							46.21
10			325.84	25.85	18.70	44.54	56.04	4.34	60.38				44.54
11			307.14	24.18	18.70	42.88	56.04	9.08	125.51				42.88
12			288.45	22.52	18.70	41.22		9.92	135.42				41.22
13			269.75	20.86	18.70	39.55		10.84	146.26				39.55
14			251.06	19.19	18.70	37.89		11.85	158.11				37.89
15			232.36	17.53	18.70	36.22		12.96	171.07	14.19	8.09	22.28	58.50
16			213.66	15.87	18.70	34.56			162.98	13.46	8.09	21.55	56.11
17			194.97	14.20	18.70	32.90			154.89	12.72	8.09	20.81	53.71
18			176.27	12.54	18.70	31.23			146.79	11.99	8.09	20.08	51.32
19			157.58	10.88	18.70	29.57			138.70	11.26	8.09	19.35	48.92
20			138.88	9.21	18.70	27.91			130.61	10.52	8.09	18.62	46.52
21			120.18	7.55	14.10	21.65			122.52	9.79	8.09	17.88	39.53
22			106.08	6.44	14.10	20.54			114.43	9.06	8.09	17.15	37.69
23			91.98	5.32	14.10	19.43			106.34	8.33	8.09	16.42	35.84
24			77.88	4.21	14.10	18.31			98.24	7.59	8.09	15.68	34.00
25			63.77	3.10	14.10	17.20			90.15	6.86	8.09	14.95	32.15
26			49.67	1.99	4.97	6.95			82.06	6.13	8.09	14.22	21.17
27			44.70	1.79	4.97	6.76			73.97	5.39	8.09	13.49	20.24
28			39.74	1.59	4.97	6.56			65.88	4.66	8.09	12.75	19.31
29			34.77	1.39	4.97	6.36			57.79	3.93	8.09	12.02	18.38
30			29.80	1.19	4.97	6.16			49.69	3.20	6.00	9.19	15.35
31			24.83	0.99	4.97	5.96			43.70	2.71	6.00	8.71	14.67
32			19.87	0.79	4.97	5.76			37.70	2.23	6.00	8.23	13.99
33			14.90	0.60	4.97	5.56			31.70	1.75	6.00	7.75	13.31
34			9.93	0.40	4.97	5.36			25.70	1.27	6.00	7.27	12.63
35			4.97	0.20	4.97	5.17			19.70	0.79	1.97	2.76	7.92
36									17.73	0.71	1.97	2.68	2.68
37									15.76	0.63	1.97	2.60	2.60
38									13.79	0.55	1.97	2.52	2.52
39									11.82	0.47	1.97	2.44	2.44
40									9.85	0.39	1.97	2.36	2.36
41									7.88	0.32	1.97	2.29	2.29
42									5.91	0.24	1.97	2.21	2.21
43									3.94	0.16	1.97	2.13	2.13
44									1.97	0.08	1.97	2.05	2.05
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

Note: Loan Amount: Mill. US \$416.7

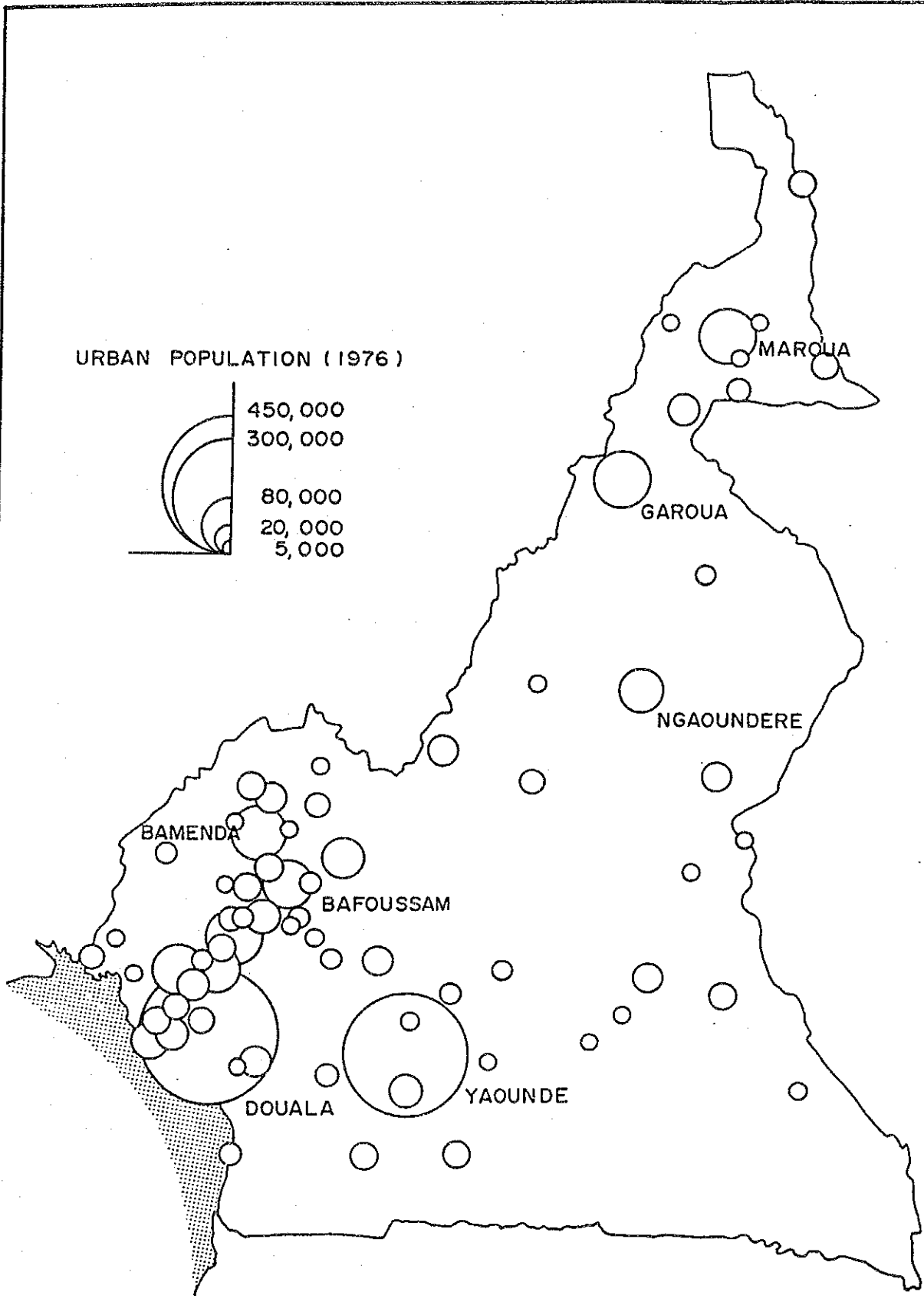


図 8.1 カメルーンの人口密度

JICA