13.2.3 配電系統

第12章にて選定された11kVおよび低圧配電線の拡張・整備計画の建設費概算額は次の通りである。

案件名	電力区	資機材製作輸送費 (日本調達) (¥1,000)	現地工事費 (日本調達) (¥1,000)	現地工事費 (現地調達) (¥1,000)	現地工事費 (合計) (¥1,000)	合計 (日本調達) (¥1,000)	合計 (現地調達) (¥1,000)	合計 (合計) (¥1,000)
Bouddha-Jorpati	(East)	61,900	37,800	7,700	45,500	99,700	7,700	107,400
Godawari-1 and 2	(Lalitpur)	33,400	20,300	4,200	24,500	53,700	4,200	57,900
Sundarijal	(East)	73,100	44,600	9,100	53,700	117,700	9,100	126,800
Thankot	(West)	61,500	37,500	7,700	45,200	99,000	7,700	106,700
Kirtipur	(West)	14,300	8,700	1,800	10,500	23,000	1,800	24,800
Pharping	(Lalitpur)	41,700	25,500	5,200	30,700	67,200	5,200	72,400
Airport (New Chabel)	(East)	22,000	13,400	2,800	16,200	35,400	2,800	38,200
Baneswar	(East)	39,300	24,000	4,900	28,900	63,300	4,900	68,200
Nagarkot	(Bhaktapur)	89,400	54,500	11,200	65,700	143,900	11,200	155,100
Center of Kathmandu Town	(Central)	7,200	4,400	900	5,300	11,600	900	12,500
小 計		443,800	270,700	55,500	326,200	714,500	55,500	770,000
Center of Kathmandu Town	(Central)	46,700	28,500	5,800	34,300	75,200	5,800	81,000
Dharmasthali	(West)	17,600	10,700	2,200	12,900	28,300	2,200	30,500
Baralgau-Gokarneswar	(East)	34,100	20,800	4,300	25,100	54,900	4,300	59,200
Interconnection on Ring Road	(Central)	20,000	7,400	1,500	8,900	27,400	1,500	28,900
Nagarkot-Bramhakhel	(Bhaktapur)	19,600	7,200	1,500	8,700	26,800	1,500	28,300
Additional Materials	(Central)	133,600	49,400	10,100	59,500	183,000	10,100	193,100
Additional Materials	(East)	60,000	22,200	4,500	26,700	82,200	4,500	86,700
Additional Materials	(West)	71,600	26,500	5,400	31,900	98,100	5,400	103,500
Additional Materials	(Lalitpur)	236,700	87,400	17,900	105,300	324,100	17,900	342,000
Thimi	(Bhaktapur)	36,100	13,400	2,700	16,100	49,500	2,700	52,200
Additional Materials	(Bhaktapur)	93,700	34,600	7,100	41,700	128,300	7,100	135,400
小 計		769,700	308,100	63,000	371,100	1,077,800	63,000	1,140,800
Low Tension Materials	(Central)	134,700	24,400	5,000	29,400	159,100	5,000	164,100
Low Tension Materials	(East)	49,400	9,000	1,800	10,800	58,400	1,800	60,200
Low Tension Materials	(West)	52,800	9,500	2,000	11,500	62,300	2,000	64,300
Low Tension Materials	(Lalitpur)	156,200	28,300	5,800	34,100	184,500	5,800	190,300
Low Tension Materials	(Bhaktapur)	120,100	21,700	4,500	26,200	141,800	4,500	146,300
小 計		513,200	92,900	19,100	112,000	606,100	19,100	625,200
工具および車輌		67,700	0	0	0	67,700	0	67,700
合 計		1,794,400	671,700	137,600	809,300	2,466,100	137,600	2,603,700

上表は、表13.1に示す計画実施優先順位に従って作成してある。

13.2.4 事業費総額

送電系統と配電系統の総合事業費は下記の通りである。

案件名	資機材製作輸送費	現地工事費			合計		
	(日本調達) (¥1,000)	(日本調達) (¥1,000)	(現地調達) (¥1,000)	(合計) (¥1,000)	(日本調達) (¥1,000)	(現地調達) (¥1,000)	(合計) (¥1,000)
(1) 送電系統	1,528,200	704,300	190,500	894,800	2,232,500	190,500	2,423,000
計	1,528,200	704,300	190,500	894,800	2,232,500	190,500	2,423,000
(2) 配電系統							
(a) 11kV主要フィーダー	443,800	270,700	55,500	326,200	714,500	55,500	770,000
(b) 11kV一般フィーダー	769,700	308,100	63,000	371,100	1,077,800	63,000	1,140,800
(c) 低圧配電線およびその他	580,900	92,900	19,100	112,000	673,800	19,100	692,900
計	1,794,400	671,700	137,600	809,300	2,466,100	137,600	2,603,700
合 計	3,322,600	1,376,000	328,100	1,704,100	4,698,600	328,000	5,026,700

上記建設費は、NEAの要望案件のうち1995/96年度迄に実施すべき計画として当調査団が推奨する案件全てを含んでいる。

上記建設費の他に、当該計画の設計、工事監理の技術経費および物価上昇分に相当する予備費を含む計画の総事業費は次の通りである。

	日本調達分 (¥1,000)	現地調達分 (¥1,000)	合計 (¥1,000)
(1) 資材供給および工事費	4,698,600	328,100	5,026,700
(2) 技術費	320,000	0	320,000
(3) 予備費	611,500	80,000	691,500
合計	5,630,100	408,100	6,038,200

註： 物価上昇分予備費： 日本調達分：年率5%
現地調達分：年率10%

13.3 計画の分割実施

13.3.1 計画実施期間

両国政府の交換公文の調印、実施設計、入札、契約、製作、輸送、据付、試験に要する期間を考慮すれば当計画を単年度に実施することは不可能である。従って、2年間に亘って実施することとし、第1年度には、設計、入札、製作、出荷を、第2年度に現地据付、試験を実施するものとする。

13.3.2　計画の分割実施

当計画の総事業費は前期の通り60億3千8百万である。当計画の資金枠を考慮に入れ各案件に次の如き実施優先度を付し段階的な計画実施とする。

(1)　案件の優先順位

優先順位を決めるに当たり、下記要点を考慮する。

(a)　発電設備を保有しないカトマンズ盆地に於ては、電力を地方から受電し、盆地内の各電力地域へ送電している。この点から盆地内の主要変電所、主要送電系統は重要な位置を占めている。従って、これ等の設備即ち、当調査団の選定、且つIDAのPSEP計画に含まれていない変電所、開閉所、11kV幹線の整備計画実施を最優先とする。
(b)　第２優先度は、11kV主要配電線の整備計画とする。
(c)　第３優先度案件は、K3変電所の新設、Siuchatar変電所の132/66kV変圧器の増設計画とする。
(d)　上記優先度案件の実施決定後、その他の案件を基金の範囲内で実施する。

(2)　分割実施計画

優先順位に従って、実施案件を２段階に分けた。各段階の案件名および事業費は次の通りである。

案件名	資材・現地工事 (¥1,000)	累積額 (¥1,000)
第１段階計画		
(1)　11kV開閉所	390,100	390,100
(2)　11kV地中線	185,100	575,200
(3)　11kV主要フィーダー	770,000	1,345,200
(4)　技術経費	160,000	1,505,200
(1) - (4)の合計	1,505,200	-
予備費	79,800	-
計	1,585,000	-
第２段階計画		
(1)　K3変電所および66kV送電線	1,453,600	1,453,600
(2)　Siuchatar変電所変圧器	394,200	1,847,800
(3)　11kV一般フィーダー	1,140,800	2,988,600
(4)　低圧配電線	625,200	3,613,800
(5)　運転保守用工具	67,700	3,681,500
(6)　技術経費	160,000	3,841,500
(1) - (6)の合計	3,841,500	-
予備費	611,500	-
計	4,453,000	-
第１、第２段階計画の合計	6,038,000	-

第1段階計画に含まれる11kVフィーダーは下記のもので、それ以外のフィーダーは第2段階計画に含む。

(a) Boudha-Jorpatiフィーダー
(b) Godawari-1および2フィーダー
(c) Sundarijalフィーダー
(d) Thankotフィーダー
(e) Kirtipurフィーダー
(f) Pharpingフィーダー
(g) New Chabel変電所からの引出しAirportフィーダー
(h) Baneswarフィーダー
(i) Nagarkotフィーダー
(j) カトマンズ市中心街のフィーダーの一部

一般経費、工事用工具車輌等の経費、日本人の現地派遣費等は各案件へ配分してあるので、案件の優先順位に変更があった場合には、各案件の現地工事費に若干の変更がある。

13.4 実施スケジュール

図13.1に計画の総合スケジュールを示す。各段階計画とも資機材の供給を第1年度、現地据付工事を第2年度に実施する。

予定期間内に計画を完了させるには下記事項が重要な要素となる。

(1) 交換公文は財政年度の早い時期に調印されることが望ましい。
(2) コンサルタント契約の早期契約および認証
(3) インドのカルカッタ港の荷揚・通関、インド領内の内陸輸送
(4) 資機材のネパール側通関、新設設備の用地の確保、工事許認可、当計画への住民の理解・協力、工事に必要な停電等に対してのNEAの事前手配。

第１４章

経済および財務的評価

第１４章

経済および財務的評価

14.1 序

カトマンズ地区の需要増に対応した送配電系統の最適な整備、拡張計画を経済的、財務的内部収益率（EIRR, FIRR）によって評価する。

本調査が対象としている整備計画はカトマンズ地区のみを受益対象地域としているため、当該地区内の追加電力販売収益をEIRR及びFIRRの計算の便益として採用する。

(1) 投下資本

内部収益率計算のための投下資本に、フィージビリティ調査の対象となった整備拡張計画の他に、第9章で説明した、世銀の資金援助で実施予定のPSEP及びLRP（フェースIII）を考慮した。

尚、LRPはフェースIIで実施したカトマンズ地区の追加分と盆地外の地域の整備を含んでいるので、便宜的に予算の３分の１を計上した。

PSEPおよびLRPを含むプロジェクトの支出計画は以下の通りである。外貨、内貨に分けた詳細は表14.1に示してある。

(Unit: US$1,000)

	HV系統		MV系統	LV系統		
	PSEP	JICA	JICA	LRP	JICA	合計
1991/92	4,600	-	-	1,104	-	5,704
1992/93	4,830	-	7,112	1,190	-	13,132
1993/94	4,830	-	4,170	1,190	-	10,190
1994/95	1,840	10,124	6,359	482	4,312	23,117
1995/96	-	5,862	3,726	-	1,083	10,670
合計	16,100	15,986	21,367	3,966	5,394	62,813

（注）JICA＝本調査対象のプロジェクト

(2) 電力販売価格及び長期限界費用

世銀の資金で実施した“長期限界費用と電力料金調査報告書(案)”（1990年12月）は、NEAの財務状況を分析し、併せて長期限界費用を推定し、理論的電力販売料金を提案している。下表はその結果を示したものである。

	現在の料金	理論的料金	長期限界費用
発電端	—	—	Rs.1.28
HV需要家	Rs.1.13	Rs.1.04	Rs.2.01
MV需要家	Rs.1.47	Rs.1.50	Rs.3.34
LV需要家	Rs.1.40	Rs.3.21	Rs.5.35
平均	Rs.1.40	Rs.2.75	—

上表中、現在の料金は、1988/89年度の総販売収益及び総販売電力量を基に、各電圧レベルの顧客別に、平均販売価格を算出したものである。理論的料金は、NEAの短期の財政的問題を解決するためにはどの程度の価格水準でなければならないかを、現状の財務的状況を分析し、長期限界費用をも考慮して算出したものである。

長期限界費用は、想定した総需要をもとに確立された、アルンNo. 3水力発電所を含む長期の電源拡充計画、送配電系統の拡張計画を考慮して算定している。

(3) 追加販売電力量

便益計算のための追加販売電力量として、第6章で求めたバグマティ地区の販売電力量予測より整備対象地区外のカブレ、トリスリ及びスンコシ地区の予測値を引いた値を使用する。追加販売電力量は、工事の実施工程を考慮して1992/93年より発生すると仮定した。

追加販売電力量（GWh）

	91/92	92/93	93/94	94/95	95/96	96/97
バグマティ地区	308.5	340.3	375.3	413.7	456.0	504.0
カブレ、トリスリ、スンコシ地区	13.5	14.8	16.3	17.9	19.6	21.6
カトマンズ地区	295.0	325.5	359.0	395.8	436.4	482.4
追加電力量	-	30.5	64.0	100.8	141.4	187.4

尚、1995/96年迄の整備、拡張によって1996/97年迄安定して電気の供給が行なわれるので、追加販売電力量として、1996/97年迄を考え、それ以降は1996/97年の追加販電電力量の水準が維持されるものと考えた。

(4) 単位便益

上記（1）で説明したごとく全投下資本の半分がHV（66kVおよび132kV）系統の整備、拡張のためであるが、簡単のため、便益計算用の単位便益として、LV需要家の料金とHV需要家の料金の差を採用する。

尚、カトマンズ地区には、HVで受電している需要家はいない。

14.2 経済的評価

世銀及び本計画で、1995/96年迄の整備、拡張の対象となる計画をカトマンズ地区内の追加電力販売収益の概念及び評価指標としてEIRRを用いて評価する。

評価の手順は他の単独プロジェクト等の手順と概略同じである。但し、本計画は、系統を拡張して新規需要を開拓する事及び既に供給されている需要家への供給能力を高める効果をもったプロジェクトである故、計画対象地区内の追加販売電力量を便益計算の基礎とした。

評価の手順は以下のステップで実施する。

1) 経済的費用の調整
2) 単位便益の推定
3) 便益の計算
4) 検討対象期間の保守用費用を含めた支出計画及び便益の流れ、及びEIRRの計算

経済的費用の調整

経済評価のために、開発計画に含まれる全ての費用を経済的費用、即ち国家経済の見地より受ける実際の資源の費用または機会費用で調整する。商品の経済的費用の調整は、それを、輸入の増加、輸出の減少、国内生産の拡大または他よりの転用等、どれによって調達されるかによる。

通常、商品の各グループ又は必要な作業種別に換算率を決めて、財務的費用を経済的費用に換算している。本調査では換算率として外貨分について1.0、内貨分に0.9を適用する。

単位便益の推定

経済分析のための便益算定には、前節で説明した長期限界費用を使用する。即ちRs.3.34/kWh (=5.35-2.01) を使用する。US$ への換算率は“長期限界費用と電力料金調査報告書(案)”で使用しているRs. 28.6/US$を採用している。

便益の算定

年毎の経済的便益を計算するために、前述の単位便益と前節で説明した追加販売電力量を掛けて求める。

EIRR

送配電設備の経済的耐用年数を考慮して、評価期間を35年に設定した。又、運転・保守 (O/M) 費用を投下資本の2.0%と仮定した。

算定されたEIRRは35.1%であった。計算の詳細を、支出計画、O/Mコスト、便益の流れと共に表14.2に示す。

14.3 財務的評価

整備、拡張計画の財務的建設費は1991年中期の価格水準で見積ってある。人夫及び管理費用を含む送配電設備の運転、保守コストを過去の実績より推定した。

便益算定には第14.1章で説明した理論的料金を適用する。即ち、HV需要家料金とLV需要家料金の差（Rp. 2.17/kWh）に追加販売電力量を掛けて便益を算定する。

世銀の資金援助で実施される整備計画を含めた1995/96年迄実施予定のカトマンズ地区の整備、拡張計画の財務的資金の流れを表14.3 に示す。この場合のFIRRは21.3%である。

14.4 感度分析

カトマンズ地区の送配電網の整備、拡張計画の実行可能性を、不確実性を有する主要な要因に対して検討した。

電力料金

"長期限界費用及び電力料金調査報告書"でも説明しているように、現在の料金体系はLVで受電している家庭用需要家料金がHV、MV、又はLVで供給されている工業需要家の料金より低く、限界費用とかけはなれたものとなっている。

又、現在の電力料金は1988年5月に平均でRs. 1.17からRs. 1.41 Rs./kWh（21%増）に値上げされたが、未だNEAの財務的体質が不十分なものである。事実、1986年度から1990年度の間に、運転経費が年平均40%増加したのに対し、収入の伸びは低く、年平均20%であった。その結果、NEAの運転係数（経費／収入）は悪化して来ている。即ち、運転係数は1986年の63%から1990年の124%に増加している。

調査の結果として、"長期限界費用及び電力料金調査報告書"では：

a) 各電圧レベル毎に季節（渇水期、豊水期）別のピーク時、昼間、夜間料金体系及び平均販売電力料Rs. 2.75/kWhへの値上げを提言している。

b) 上記料金体系の変更が困難な場合には、HV、MVの現在の電力料の据え置き、LV電力料の129%（全需要家平均で96%）の値上げを提言している。

従って、感度分析として、以下の検討を行なった。

(1) EIRR

便益計算のための単位便益が財務的評価で使用した理論的料金（長期限界費用の約65%）及びその中間の料金（-15%及び-30%）の場合のEIRRの変化の様子を計算した。

結果は次の通りである。

	単位便益	EIRR
a) 基準となるケース（長期限界費用）	Rs. 3.34/kWh	35.1%
b) 長期限界費用の-15%	Rs. 2.84/kWh	29.1%
c) 長期限界費用の-30%	Rs. 2.34/kWh	23.4%
d) 理論的料金	Rs. 2.17/kWh	21.5%

(2) FIRR

便益計算のための単位便益が現行料金の水準（理論的料金の約51%）及びその中間の料金（-15%及び-30%）の場合のFIRRの変化の様子を計算した。

但し、上述のように、現行料金体系ではLV需要家料金がHV及びMV需要家の料金より低いため、このままでは、単位便益として高HV需要家料金とLV需要家料金の差を採用するという、前節で設定した仮定を適用出来ないので、理論的料金と同じ比率になるように以下の通り推定した。又、その場合のFIRRも合わせて示す。

(Rs./kWh)

	理論的料金	-15%	-30%	現行料金水準
HV需要家	1.04	0.88	0.74	0.53
MV需要家	1.50	1.28	1.05	0.76
LV需要家	3.21	2.73	2.25	1.63
平均	2.75	2.34	1.93	1.40
単位便益	2.17	1.85	1.51	1.10
FIRR	21.3%	17.7%	13.8%	9.0%

<u>費用</u>

建設費の増加及びO/Mコストの増加に伴うEIRR及びFIRRの変化の様子を検証した。結果は次の通り。

	変化	EIRR	FIRR
a) 基準となるケース	-	35.1%	21.3%
b) 建設費	+10%	31.5%	19.2%
	+20%	28.6%	17.4%
c) O/Mコスト	+25%	34.6%	20.8%
	+50%	34.0%	20.3%

14.5 結論

上述の如く、世銀等の資金援助で現在計画中の整備計画及び本調査で選定された最適な整備、拡張計画を合わせたカトマンズ地区の送配電網整備計画は経済的、財政的見地より妥当なものである。

表

表 2.1　ネパール国内総生産

(million Rs.)

Sector	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90
AT CURRENT PRICE									(*1)	(*2)	(*3)
Agriculture	13,683	15,679	17,903	19,282	22,771	24,171	26,819	30,587	36,032	41,658	46,176
Mining & quarrying	49	68	76	98	128	161	138	151	126	126	128
Manufacturing	1,082	1,225	1,437	1,683	2,091	2,295	3,018	4,059	4,265	4,674	5,017
Electricity, gas & water	69	78	95	146	182	225	394	470	620	615	785
Construction	1,814	2,306	2,707	2,740	2,966	4,115	4,592	5,749	6,986	6,437	6,785
Trade, restaurant & hotels	1,027	1,113	1,234	1,382	1,750	2,110	2,541	3,313	3,889	4,430	4,849
Transport, communication & storage	1,781	2,206	2,302	2,454	2,842	3,174	3,595	4,099	4,997	4,797	5,271
Others	3,846	4,632	5,234	5,976	6,661	8,167	9,331	11,168	12,598	14,678	15,897
GDP in total	23,351	27,307	30,988	33,761	39,390	44,417	50,428	59,596	69,513	77,414	84,907
GDP per capita (Rs.)	1,596	1,818	2,009	2,132	2,423	2,662	2,944	3,394	3,863	4,198	4,492
AT 1974/75 CONSTANT PRICE(*4)											
Agriculture	10,933	12,066	12,616	12,478	13,668	13,990	14,705	16,771	17,993	19,664	21,797
Mining & quarrying	35	44	44	51	63	73	55	52	39	35	33
Manufacturing	688	756	761	792	868	854	1,253	881	959	1,019	968
Electricity, gas & water	42	39	43	56	63	67	107	122	143	122	141
Construction	1,309	1,490	1,548	1,437	1,472	1,863	1,814	1,981	2,152	1,796	1,759
Trade, restaurant & hotels	823	637	635	703	864	976	965	1,090	1,133	1,202	1,268
Transport, communication & storage	1,390	1,434	1,453	1,456	1,604	1,647	1,704	1,709	1,809	1,564	1,523
Others	3,387	3,692	3,821	3,324	3,659	4,161	4,042	6,245	7,592	9,212	10,374
GDP in total	18,606	20,158	20,920	20,297	22,262	23,630	24,645	28,851	31,820	34,613	37,864
GDP per capita (Rs.)	1,271	1,342	1,356	1,282	1,370	1,416	1,439	1,643	1,768	1,877	2,003

Source: Statistic Year Book of Nepal 1989, by Central Bureau of Statistics revised by Economic Survey 1990, by Ministry of Finance.

Note(*1): Revised preliminary estimate.
(*2): Preliminary estimate.
(*3): Tentative estimate.
(*4): Estimation based on the method explained by Central Bureau of Statistics.

表 2.2　絶対最高温度

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max
1976	18.8	24.0	27.8	29.5	29.8	29.2	29.3	28.5	28.0	26.5	25.8	21.2	29.8
1977	19.4	24.3	28.2	29.0	30.8	31.4	29.9	29.8	29.2	26.4	24.7	21.7	31.4
1978	19.4	23.7	24.6	28.2	31.0	29.0	29.5	31.0	29.0	27.0	24.4	23.7	31.0
1979	21.8	22.8	27.3	30.6	33.0	34.0	31.3	30.4	29.0	28.8	25.8	21.0	34.0
1980	19.1	22.8	28.2	32.3	30.6	29.6	30.1	29.4	29.1	26.8	25.3	21.8	32.3
1981	22.0	24.5	24.8	27.0	29.2	31.2	29.2	30.0	29.2	26.9	25.6	22.4	31.2
1982	22.0	22.7	26.4	28.6	32.9	31.0	30.2	30.8	31.2	28.4	25.5	21.5	32.9
1983	20.2	24.4	27.4	28.4	30.2	33.7	30.4	30.6	29.6	29.2	26.4	21.5	33.7
1984	20.8	24.8	28.8	31.8	31.6	32.0	29.8	31.5	29.0	29.8	25.5	22.3	32.0
1985	20.7	23.8	28.6	31.6	31.7	30.6	29.4	30.9	29.9	28.6	26.2	22.2	31.7
1986	21.2	23.4	30.6	29.6	29.4	32.0	30.2	30.8	30.4	27.4	25.2	24.0	32.0
Max.	22.0	24.8	30.6	32.3	33.0	34.0	31.3	31.5	31.2	29.8	26.4	24.0	34.0

Remarks : Kathmandu Airport

表 2.3　最低温度

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Min.
1976	0.2	1.8	3.0	8.2	11.9	16.0	17.8	17.0	14.2	8.2	2.4	-2.0	-2.0
1977	-2.4	-1.2	3.5	7.9	8.9	14.0	18.6	17.6	14.9	6.5	3.0	-2.0	-2.4
1978	-3.5	2.4	0.5	3.7	14.3	16.5	18.5	18.2	16.7	8.6	3.6	0.6	-3.5
1979	-0.8	0.8	1.3	8.9	10.4	14.5	19.1	18.5	14.0	9.0	7.8	0.0	-0.8
1980	-1.0	0.6	3.0	7.8	12.8	17.6	19.0	19.4	16.8	7.2	5.2	-1.0	-1.0
1981	-1.4	0.6	4.0	7.8	12.8	14.2	19.2	18.8	16.0	9.0	2.6	0.0	-1.4
1982	-0.4	0.4	2.2	7.2	10.8	11.1	19.0	17.8	11.8	7.5	3.0	0.0	-0.4
1983	-2.0	-2.2	2.6	6.4	10.8	14.4	19.2	19.2	16.6	6.6	4.2	-0.4	-2.2
1984	-2.6	-0.2	3.6	6.4	11.5	18.2	19.0	13.0	12.6	9.2	3.2	-1.9	-2.6
1985	-1.2	1.0	6.0	8.0	11.5	15.8	18.5	18.6	15.8	8.2	4.5	2.0	-1.2
1986	0.1	0.0	3.0	6.9	9.6	12.8	19.1	18.0	15.8	8.2	5.6	-0.2	-0.2
Min.	-3.5	-2.2	0.5	3.7	8.9	11.1	17.8	13.0	11.8	6.5	2.4	-2.0	-3.5

Remarks : Kathmandu Airport

表 2.4　降雨量

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1976	30	14	0	69	153	387	335	307	170	24	0	0	1489
1977	12	12	17	104	90	266	323	338	79	29	14	14	1298
1978	5	11	69	42	143	299	324	392	160	109	0	2	1556
1979	6	39	1	42	37	258	447	320	99	36	6	65	1356
1980	1	18	46	10	124	349	296	238	184	69	0	0	1335
1981	14	0	60	101	216	141	304	267	225	0	42	0	1370
1982	14	22	36	49	40	200	238	384	155	9	18	3	1168
1983	18	4	30	79	110	81	500	194	288	130	0	15	1449
1984	14	17	14	60	96	275	250	302	260	18	0	7	1313
1985	10	3	4	25	133	161	418	434	376	167	0	55	1786
1986	0	23	16	93	97	316	381	219	221	80	0	49	1495
Average	11	15	27	61	113	248	347	309	202	61	7	19	1420

Remarks : Kathmandu Airport

表 2.5　相対湿度

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	65	52	35	43	61	73	75	80	81	69	72	62
1977	66	50	46	57	58	71	80	80	76	72	75	73
1978	65	59	51	54	67	74	78	70	80	75	77	65
1979	66	61	41	56	46	65	80	82	75	76	72	74
1980	64	52	50	41	58	74	78	77	79	72	72	68
1981	65	55	57	56	66	68	81	78	75	67	78	73
1982	67	62	52	47	44	67	71	81	79	71	77	70
1983	68	65	61	60	73	64	83	81	80	76	72	70
1984	62	52	48	43	68	77	82	79	78	71	64	67
1985	66	58	41	38	58	68	82	79	79	77	72	72
1986	65	58	43	54	58	71	81	78	81	71	72	68

Remarks : Kathmandu Airport

表 2.6　地域別人口及び世帯規模

Development regions, administrative zones & districts	Land area as of 1981 (sq.km)	Population		Number of households in 1981	Household size (persons/household)
		In 1981	In 1990*		
			**		
NEPAL	147,181	15,022,839	18,900,289	2,585,154	5.81
A. Eastern Dev.			***		
Region	28,456	3,708,923	4,707,281	651,795	5.69
-Mechi zone	8,196	932,625	1,262,548	159,152	5.86
-Koshi zone	9,669	1,423,624	1,813,249	248,994	5.72
-Sagarmatha zone	10,591	1,352,674	1,631,484	243,649	5.55
B. Central Dev.			***		
Region	27,410	4,909,357	6,220,404	854,545	5.74
-Janakpur zone	9,669	1,688,115	2,196,060	304,141	5.55
-Bagmati zone	9,428	1,782,439	2,170,131	302,517	5.89
Lalitpur	385	184,341	224,292	29,943	6.16
Bhaktapur	119	159,767	217,434	25,047	6.38
Kathmandu	395	422,237	514,547	67,933	6.22
-Narayani zone	8,313	1,438,803	1,854,213	247,887	5.80
C. Western Dev.			***		
Region	29,398	3,128,859	3,925,612	544,283	5.75
-Gandaki zone	12,275	1,107,569	1,348,736	199,039	5.56
-Dhawalagiri zone	8,148	453,462	550,307	82,761	5.48
-Lumbini zone	8,975	1,567,828	2,026,569	262,483	5.97
D. Mid-Western Dev.			***		
Region	42,378	1,955,611	2,429,768	322,334	6.07
-Rapti zone	10,482	876,723	1,055,966	143,850	6.09
-Bheri zone	10,545	836,402	1,094,182	135,188	6.19
-Karnali zone	21,351	242,486	279,620	43,296	5.60
E. Far-Western Dev.			***		
Region	19,539	1,320,089	1,617,223	212,197	6.22
-Seti zone	12,550	794,911	951,376	131,058	6.07
-Mahakali zone	6,989	525,178	665,847	81,139	6.47

Source: Population Monograph of Nepal, by Central Bureau of Statistics, 1987.

Note(*): Based on population density in 1990 estimated by using annual increase of population density from 1971 to 1981 as shown in Table 3.2.

(**): Based on Statistic Year Book of Nepal 1989, by Central Bureau of Statistics.

(***): Based on Population Projection of Nepal (Total and Sectoral) 1981-2001, by Central Bureau of Statistics.

表 2.7　地帯別人口及び人口密度

Ecological Zones and Development Regions	Area in sq.km (1981)	Population						Population Density		
		1971	1981	Increasing ratio 1971-81	1990*	Increasing ratio 1971-90	Increasing ratio 1981-90	1971	1981	1990*
Mountain	51,817	1,138,610	1,302,896	1.36%	1,361,970	0.95%	0.49%	22.0	25.1	26.3
Eatern Dev. Region	10,438	304,352	338,439	1.07%	351,669	0.76%	0.43%	29.2	32.4	33.7
Central Dev. Region	6,277	353,923	413,143	1.56%	432,128	1.06%	0.50%	56.4	65.8	68.8
Western Dev. Region	5,819	34,380	19,951	-5.30%	20,866	-2.59%	0.50%	5.9	3.4	3.6
Mid-West. Dev. Region	21,351	207,122	242,486	1.59%	254,071	1.08%	0.52%	9.7	11.4	11.9
Far-West. Dev. Region	7,932	238,833	288,877	1.92%	303,236	1.26%	0.54%	30.1	36.4	38.2
Hill	61,345	6,071,407	7,163,115	1.67%	8,682,839	1.90%	2.16%	99.0	116.8	141.5
Eatern Dev. Region	10,749	1,105,590	1,257,042	1.29%	1,514,688	1.67%	2.09%	102.9	116.9	140.9
Central Dev. Region	11,805	1,741,594	2,108,433	1.93%	2,557,357	2.04%	2.17%	147.5	178.6	216.6
Western Dev. Region	18,319	1,816,940	2,150,939	1.70%	2,608,646	1.92%	2.17%	99.2	117.4	142.4
Mid-West. Dev. Region	13,710	885,562	1,042,365	1.64%	1,266,507	1.90%	2.19%	64.6	76.0	92.4
Far-West. Dev. Region	6,762	521,721	604,336	1.48%	735,640	1.82%	2.21%	77.2	89.4	108.8
Terai	34,019	4,345,966	6,556,828	4.20%	8,855,480	3.82%	3.40%	127.8	192.7	260.3
Eatern Dev. Region	7,269	1,387,558	2,113,422	4.30%	2,840,924	3.84%	3.34%	190.9	290.7	390.8
Central Dev. Region	9,328	1,770,236	2,387,781	3.04%	3,230,919	3.22%	3.42%	189.8	256.0	346.4
Western Dev. Region	5,260	595,110	957,969	4.88%	1,296,100	4.18%	3.42%	113.1	182.1	246.4
Mid-West. Dev. Region	7,317	395,322	670,760	5.43%	909,190	4.48%	3.44%	54.0	91.7	124.3
Far-West. Dev. Region	4,845	197,740	426,876	8.00%	578,347	5.81%	3.43%	40.8	88.1	119.4
Nepal	147,181	11,555,983	15,022,839	2.66%	18,900,289	2.62%	2.58%	78.5	102.1	128.4

Source: Population Monograph of Nepal, by Central Bureau of Statistics, 1987.

Note(*): Estimation based on the data of "Population Projection of Nepal (Total and Sectoral), 1981-2001", and "Statistical Year Book of Nepal 1989", by Central Bureau of Statistics.

表 3.1　1981年に於ける地域別、主要工業別労働人口

(persons)

Development regions, administrative zones and districts	Agricult., forestry & fishery	Mining and quarrying	Manufac-turing	Electric-ity, gas & water	Construc-tion	Commerce	Transport, & communi-cation	Finance/ business services	Personal community services	Industry not stated	T o t a l
Nepal	6,244,289	971	33,029	3,013	2,022	109,446	7,424	9,850	313,570	127,272	6,850,886
A. Eastern Development Region	1,447,056	185	11,934	780	684	32,316	2,152	2,343	117,214	35,473	1,650,137
- Mechi Zone	383,056	39	1,672	43	16	9,020	390	749	29,885	7,634	432,504
- Kosi Zone	529,380	65	8,412	478	459	15,228	1,447	1,159	43,264	16,903	616,795
- Sagarmatha Zone	534,620	81	1,850	259	209	8,068	315	435	44,065	10,936	600,838
B. Central Development Region	1,886,258	437	15,043	1,834	907	47,607	3,981	5,839	130,996	41,097	2,133,999
- Janakpur Zone	565,308	75	3,362	76	82	12,182	513	901	51,889	9,669	644,057
- Bagmati Zone	760,023	286	7,151	1,267	624	24,533	2,301	3,720	50,026	20,461	870,392
Lalitpur	61,163	42	1,511	230	114	3,253	328	707	8,198	1,877	77,423
Bhaktapur	56,354	11	1,412	76	40	3,809	257	274	5,374	1,618	69,225
Kathmandu	132,154	147	3,272	541	426	11,910	1,421	2,471	26,243	5,480	184,065
- Narayani Zone	560,927	76	4,530	491	201	10,892	1,167	1,218	29,081	10,967	619,550
C. Western Development Region	1,380,822	176	3,381	316	191	17,046	952	1,006	36,435	26,144	1,466,469
- Gandaki Zone	523,913	96	1,112	39	66	6,021	158	321	11,244	8,824	551,794
- Dhawalagiri Zone	213,639	19	356	12	2	1,322	18	73	4,233	3,422	223,096
- Lumbini Zone	643,270	61	1,913	265	123	9,703	776	612	20,958	13,878	691,559
D. Mid-Western Development Regic	918,826	92	1,602	57	230	8,792	253	338	18,398	14,558	963,146
- Rapti Zone	390,258	32	834	13	32	3,074	46	90	5,917	4,952	405,248
- Bheri Zone	381,631	41	718	23	198	4,984	206	223	10,812	6,845	405,681
- Karnali Zone	146,937	19	50	21	0	734	1	25	1,669	2,761	152,217
E. Far-Western Development Regic	611,327	81	1,069	26	10	3,685	86	324	10,527	10,000	637,135
- Seti Zone	367,998	47	391	5	6	1,584	43	259	5,769	6,037	382,139
- Mahakali Zone	243,329	34	678	21	4	2,101	43	65	4,758	3,963	254,996

Source: Statistic Year Book of Nepal 1989, by Central Bureau of Statistics.

表 3.2　1981/82年に於ける土地利用状況

(sq.km)

Development regions, administrative zones and districts	Total area	Non arable area	Arable area						
			Temporary crops	Temporary fallow & meadow	Permanent crops	Permanent meadow & pasture	Wood and forest	All others	Total
Nepal	147,181.00	122,543.83	22,501.97	372.99	291.54	425.43	149.75	895.49	24,637.17
A. Eastern Development Region	28,456.00	20,746.06	7,111.23	112.06	96.16	58.03	86.55	245.91	7,709.94
- Mechi Zone	8,196.00	5,842.20	2,150.57	33.21	30.82	31.84	59.28	48.08	2,353.80
- Kosi Zone	9,669.00	6,805.05	2,649.07	50.49	21.60	8.87	8.81	125.11	2,863.95
- Sagarmatha Zone	10,591.00	8,098.81	2,311.59	28.36	43.74	17.32	18.46	72.72	2,492.19
B. Central Development Region	27,410.00	19,177.01	7,526.53	103.87	140.45	98.39	35.15	328.60	8,232.99
- Janakpur Zone	9,669.00	6,835.77	2,528.12	41.64	82.45	47.06	11.13	122.83	2,833.23
- Bagmati Zone	9,428.00	7,139.88	2,148.05	20.63	7.82	37.15	19.25	55.22	2,288.12
Lalitpur	385.00	232.04	145.25	1.63	0.29	1.09	1.09	3.61	152.96
Bhaktapur	119.00	25.61	87.78	0.37	0.03	0.11	0.42	4.68	93.39
Kathmandu	395.00	143.48	236.40	4.71	0.13	0.83	0.78	8.67	251.52
- Narayani Zone	8,313.00	5,201.36	2,850.36	41.60	50.18	14.18	4.77	150.55	3,111.64
C. Western Development Region	29,398.00	24,761.59	4,137.20	45.01	39.47	230.87	18.86	165.00	4,636.41
- Gandaki Zone	12,275.00	10,936.63	1,223.04	19.76	4.60	42.27	8.58	40.12	1,338.37
- Dhawalagiri Zone	8,148.00	7,774.14	321.06	4.63	7.31	27.89	2.90	10.07	373.86
- Lumbini Zone	8,975.00	6,050.82	2,593.10	20.62	27.56	160.71	7.38	114.81	2,924.18
D. Mid-Western Development Region	42,378.00	39,796.30	2,427.96	15.53	5.20	28.31	2.48	102.22	2,581.70
- Rapti Zone	10,482.00	9,577.77	840.15	7.02	1.60	24.50	0.75	30.21	904.23
- Bheri Zone	10,545.00	9,077.94	1,390.72	6.52	1.71	2.54	1.51	64.06	1,467.06
- Karnali Zone	21,351.00	21,140.59	197.09	1.99	1.89	1.27	0.22	7.95	210.41
E. Far-Western Development Region	19,539.00	18,062.87	1,299.05	96.52	10.26	9.83	6.71	53.76	1,476.13
- Seti Zone	12,550.00	11,755.51	690.71	62.56	7.71	2.74	2.66	28.11	794.49
- Mahakali Zone	6,989.00	6,307.36	608.34	33.96	2.55	7.09	4.05	25.65	681.64

Source: Statistic Year Book of Nepal 1989, by Central Bureau of Statistics.

表 3.3　主要食料農産物の耕作面積、生産高、収量

Area: Thousand ha.
Production: Thousand M.T.
Yield: M.T./ha.

Food crops		1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	Average annual increasing ratio
Paddy	Area	1,240	1,256	1,262	1,264	1,263	1,254	1,276	1,297	1,265	1,334	1,377	1,391	1,333	1,423	1,450	1,433	0.97%
	Production	2,452	2,605	2,386	2,282	2,339	2,060	2,464	2,560	1,833	2,757	2,709	2,804	2,372	2,982	3,283	3,390	2.18%
	Yield	1.98	2.07	1.89	1.81	1.85	1.64	1.93	1.97	1.45	2.07	1.97	2.02	1.78	2.09	2.26	2.37	1.21%
Maize	Area	458	453	445	445	454	432	457	475	511	504	579	615	627	674	722	751	3.35%
	Production	827	748	797	740	743	576	743	752	718	761	820	874	868	902	1,072	1,201	2.52%
	Yield	1.81	1.65	1.79	1.66	1.64	1.33	1.63	1.58	1.41	1.51	1.42	1.42	1.38	1.34	1.48	1.60	-0.82%
Wheat	Area	291	329	348	367	356	367	392	400	484	472	452	483	536	597	599	604	4.99%
	Production	331	387	362	411	415	440	477	526	657	634	534	598	701	745	830	850	6.49%
	Yield	1.14	1.18	1.04	1.12	1.17	1.20	1.22	1.32	1.36	1.34	1.18	1.24	1.31	1.25	1.39	1.41	1.43%
Barley	Area	28	26	25	26	26	26	27	27	24	25	28	29	29	29	29	30	0.46%
	Production	26	25	21	22	23	23	23	23	21	22	24	23	25	24	27	27	0.25%
	Yield	0.93	0.96	0.84	0.85	0.88	0.88	0.85	0.85	0.88	0.88	0.86	0.79	0.86	0.86	0.93	0.90	-0.22%
Millet	Area	125	126	122	121	123	123	122	122	129	124	134	151	151	165	183	193	2.94%
	Production	142	143	138	130	133	119	122	122	121	115	124	138	138	150	163	225	3.12%
	Yield	1.14	1.14	1.13	1.07	1.08	0.97	1.00	1.00	0.94	0.93	0.93	0.91	0.91	0.91	1.00	1.17	0.17%
									Index of food crops (1974/75=100)									
Whole food crops	Area	100.00%	102.19%	102.95%	103.98%	103.83%	102.90%	106.31%	108.51%	112.44%	114.85%	119.48%	123.11%	123.43%	132.36%	135.59%	136.24%	2.54%
	Production	100.00%	103.44%	98.04%	94.89%	96.69%	85.18%	101.35%	105.43%	88.67%	113.53%	111.46%	117.44%	108.63%	127.13%	142.27%	150.69%	2.91%
	Yield	100.00%	100.00%	95.57%	93.00%	94.57%	86.00%	94.71%	96.00%	86.29%	96.14%	90.86%	91.14%	89.14%	92.14%	100.86%	106.43%	0.35%

Source: Economic Survey 1990, by Ministry of Finance.

表 3.4　主要工業の生産額

Products	Unit	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Annual increasing ratio (%)
Jute Goods	Metric ton	15,502	19,619	21,323	20,026	16,389	18,289	17,198	1.75%
Sugar	Metric ton	20,764	22,357	17,496	11,039	15,190	24,565	30,040	6.35%
Cigarettes	In lakh stick	28,345	32,090	37,407	42,520	47,410	56,000	60,460	12.46%
Leather	1,000 pieces	1,637	2,800	2,770	2,247	2,001	2,877	1,509	−1.35%
Bricks & Tiles	1,000 pieces	20,884	30,689	29,760	25,254	28,451	33,876	34,629	8.79%
Cotton Textiles	1,000 metres	6,862	7,966	10,240	10,533	14,118	17,822	9,914	6.32%
Cement	Metric ton	30,378	36,959	39,225	31,479	96,041	151,631	215,010	38.56%

Source: Statistical Year Book of Nepal 1989, by Central Bureau of Statistics.

表 3.5　全国およびカトマンズ地区製造業の総産出量、総投入量および付加価値

(Million NRs.)

Products	Gross Output		Gross Input		Value Added	
	1981/82	1986/87	1981/82	1986/87	1981/82	1986/87
Nepal	7,098.2	13,537.6	4,736.9	9,048.1	2,361.3	4,489.5
Kathmandu Valley	1,148.1	2,809.6	753.6	1,674.6	394.5	1,135.0
Kathmandu District	724.3	1,911.7	466.1	1,146.7	258.2	765.0
Lalitpur District	142.0	692.8	88.8	395.7	53.2	297.1
Bhaktapur District	281.8	205.1	198.7	132.2	83.1	72.9

Source: Statistical Year Book of Nepal 1989, by Central Bureau of Statistics

表 3.6　地域別工場及び従業員数

Development regions, administrative zones and districts	Number of establishment					Number of persons engaged				
	1964/65	1972/73	1976/77	1981/82	1986/87	1964/65	1972/73	1976/77	1981/82	1986/87
Nepal	1,260	2,434	3,528	4,903	9,359	18,701	47,638	50,120	81,050	152,579
A. Eastern Development Region	278	507	745	977	1,761	8,543	15,538	15,561	27,631	33,498
- Mechi Zone	59	121	210	247	376	710	3,641	5,819	7,153	5,027
- Kosi Zone	120	207	263	407	892	7,013	9,846	6,685	15,552	22,253
- Sagarmatha Zone	99	179	272	323	493	820	2,051	3,057	4,926	6,218
B. Central Development Region	693	1,319	1,787	2,495	4,436	7,972	24,871	22,134	38,686	86,812
- Janakpur Zone	194	341	476	629	1,095	1,748	11,209	5,292	4,559	9,683
- Bagmati Zone	290	495	708	928	1,896	3,014	6,870	8,605	16,998	54,868
Lalitpur	62	95	141	148	423	585	2,039	2,508	3,476	15,673
Bhaktapur	32	39	99	129	262	184	226	1,064	2,257	6,444
Kathmandu	196	307	368	521	819	2,245	4,403	4,506	10,582	30,746
- Narayani Zone	209	483	603	938	1,445	3,210	6,792	8,237	17,129	22,261
C. Western Development Region	195	382	665	974	2,117	1,282	4,682	7,864	8,238	21,273
- Gandaki Zone	0	86	158	305	569	0	841	2,230	2,565	5,023
- Dhawalagiri Zone	0	0	27	43	172	0	0	147	200	613
- Lumbini Zone	195	296	480	626	1,376	1,282	3,841	5,487	5,473	15,637
D. Mid-Western Development Region	52	142	180	265	605	613	1,897	3,186	3,659	6,055
- Rapti Zone	0	46	60	79	180	0	176	403	904	849
- Bheri Zone	52	96	120	186	420	613	1,721	2,783	2,755	5,181
- Karnali Zone	0	0	0	0	5	0	0	0	0	25
E. Far-Western Development Region	42	84	151	192	440	291	650	1,375	2,836	4,941
- Seti Zone	32	56	91	116	277	206	391	653	1,772	3,301
- Mahakali Zone	10	28	60	76	163	85	259	722	1,064	1,640

Source: Statistic Year Book of Nepal 1989, by Central Bureau of Statistics.

表 3.7　観光統計

Item	1981	1982	1982	1984	1985	1986	1987
TOURIST ARRIVALS							
Total number	161,669	175,448	179,405	176,634	180,989	223,331	248,080
Growth rate (%)	(0.8)	8.5	2.3	(1.5)	2.5	23.4	11.1
Number by purpose							
Pleasure	127,709	136,693	132,350	140,592	128,217	163,958	184,979
Trecking	21,668	23,507	24,198	15,010	28,707	33,609	36,164
Business	6,379	7,374	9,801	8,137	10,416	10,863	11,781
Official	5,674	7,166	8,479	9,399	9,230	8,825	8,882
Others	239	708	4,577	3,496	4,419	6,076	6,274
Gross foreign exchange							
Earnings (US$1,000)	44,935	33,441	35,667	41,273	39,185	50,841	60,229
Growth rate (%)	(13.0)	(25.6)	6.7	15.7	(5.1)	29.7	18.5
HOTEL INDUSTRY							
Number of rooms	24,675	26,038	25,033	22,361	21,862	23,784	23,194
Kathmandu Valley	20,152	22,038	20,695	19,092	18,356	19,778	19,097
Other areas	4,163	4,000	4,338	3,269	3,508	4,006	4,097
Number of beds	49,047	50,534	48,607	43,728	42,724	47,266	45,385
Kathmandu Valley	40,343	42,432	40,031	37,228	35,453	38,960	37,221
Other areas	8,704	8,102	8,576	6,440	7,271	8,306	8,164
Guest arrivals	202,268	193,788	179,638	175,044	175,652	231,152	224,835
Guest nights	527,206	528,773	475,314	516,719	452,166	571,769	623,282
Average guest nights/arriv	2.6	2.7	2.6	3.0	2.6	2.5	2.7
Percentage of bed occupancy							
Kathmandu Valley	35.8	35.5	32.9	40.2	35.9	41.8	46.2
Other areas	31.8	29.3	28.9	31.3	28.9	29.4	40.5

Source: Statistical Year Book of Nepal 1989, by Central Bureau of Statistics.

表 3.8　国家収支

(million Rs.)

Head	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89
FINANCE										
Expenditure	3,470.7	4,092.3	5,361.3	6,979.2	7,437.3	8,394.8	9,797.1	11,513.2	14,105.1	18,004.9
Regular (detail:see Table 3.12)	1,162.1	1,361.2	1,634.4	1,997.1	2,273.5	2,906.1	3,584.0	4,135.2	4,677.1	5,676.2
Development	2,308.6	2,731.1	3,726.9	4,962.1	5,163.8	5,488.7	6,213.1	7,378.0	9,428.0	12,328.7
Receipts	2,685.6	3,288.1	3,672.8	3,931.7	4,285.9	4,840.0	5,817.4	7,260.2	9,427.2	9,457.4
Revenue	1,880.0	2,419.2	2,679.5	2,841.6	3,409.3	3,916.6	4,644.5	5,975.1	7,350.4	7,776.8
Foreign grants	805.6	868.9	993.3	1,090.1	876.6	923.4	1,172.9	1,285.1	2,076.8	1,680.6
Over Surplus (+) or Deficit (-)	(785.1)	(804.2)	(1,688.5)	(3,047.5)	(3,151.4)	(3,554.8)	(3,979.7)	(4,253.0)	(4,677.9)	(8,547.5)
SOURCES OF FINANCING DEFICITS										
Foreign Loan	534.9	693.3	729.9	985.8	1,670.9	1,754.9	2,501.1	2,705.8	3,815.8	5,666.4
Internal Loan	180.0	250.0	500.0	1,000.0	1,576.8	1,799.9	1,403.4	1,644.7	1,130.0	1,330.0
a. Banking system	0.0	0.0	0.0	0.0	1,076.8	1,299.9	903.4	1,116.3	790.6	1,320.0
b. Non-banking system	0.0	0.0	0.0	0.0	500.0	500.0	500.0	528.4	339.4	10.0
Cash Balance Surplus (-)	70.2	139.1	458.6	1,061.7	(96.3)	0.0	75.2	(97.5)	(268.0)	1,551.1

Source: Economic Survey 1990, by Ministry of Finance.

表 3.9　第７次５ケ年計画のGDP目標値（1984/85価格）

Sector	GDP(million Rs.)		Annual growth rate (%) from	Composition of GDP(%)	
	1984/85	1989/90	1985 to 1990	1984/85	1989/90
Agricultural sector	22,080	26,220	3.5%	52.4%	49.9%
Non-Agricultural sector	20,060	26,290	5.6%	47.6%	50.1%
GDP in total	42,140	52,510	4.5%	100.0%	100.0%

Source: The Seventh Plan (1985-1990) (A Summary), by National Planning Commission.

表 3.10　第７次５ケ年計画のGDP実績値（1984/85価格）

Sector	GDP(million Rs.)		Annual growth rate (%) from	Composition of GDP(%)	
	1984/85	1989/90*	1985 to 1990	1984/85	1989/90
Agricultural sector	24,170	30,340	4.7%	54.4%	56.2%
Non-Agricultural sector	20,250	23,670	3.2%	45.6%	43.8%
GDP in total	44,420	54,010	4.0%	100.0%	100.0%

Source: Economic Survey 1990, by Ministry of Finance.

Note(*): The current prices have been converted into 1984/85 prices by using GDP price index (Deflator).

表 3.11　第７次５ケ年計画で計画されたGDP、投資、貯蓄予測値（1984/85価格）

Sector	GDP(million Rs.)		Annual growth rate (%) from	Composition of GDP(%)	
	1984/85	1989/90	1985 to 1990	1984/85	1989/90
Consumption	37,741	48,168	5.0%	89.6%	91.7%
Total Investment	7,936	9,350	3.3%	18.8%	17.8%
Fixed Capital Formation	7,448	8,746	3.3%	17.7%	16.7%
Govmt. Sector	3,575	3,467	-0.6%	8.5%	6.6%
Non-Govmt. Sector	3,873	5,279	6.4%	9.2%	10.1%
Change in Balance	488	604	4.4%	1.2%	1.2%
Foreign Balance	(3,539)	(5,006)	7.2%	-8.4%	-9.5%
Import Goods and Services	8,669	11,352	5.5%	20.6%	21.6%
Export Goods and Services	5,130	6,346	4.3%	12.2%	12.1%
GDP	42,138	52,512	4.5%	100.0%	100.0%
Domestic Savings	4,397	4,397	0.0%	10.4%	8.4%

Source: The Seventh Plan (1985-1990) (A Summary), by National Planning Commission.

表 3.12　第７次５ケ年計画で計画されたGDP、投資、貯蓄実績値（1984/85価格）

Sector	GDP(million Rs.)		Annual growth rate (%) from	Composition of GDP(%)	
	1984/85	1988/89*	1985 to 1989	1984/85	1988/89
Consumption	38,178	49,287	6.6%	86.0%	92.8%
Total Investment	10,184	10,343	0.4%	22.9%	19.5%
Fixed Capital Formation	9,386	8,269	-3.1%	21.1%	15.6%
Govmt. Sector	3,629	4,617	6.2%	8.2%	8.7%
Non-Govmt. Sector	5,757	3,652	-10.8%	13.0%	6.9%
Change in Balance	798	2,075	27.0%	1.8%	3.9%
Foreign Balance	(3,945)	(6,504)	13.3%	-8.9%	-12.2%
Import Goods and Services	9,317	13,283	9.3%	21.0%	25.0%
Export Goods and Services	5,372	6,779	6.0%	12.1%	12.8%
GDP	44,417	53,126	4.6%	100.0%	100.0%
Domestic Savings	6,239	3,839	-11.4%	14.0%	7.2%

Source: Economic Survey 1990, by Ministry of Finance.

Note(*): The current prices, revised preliminary estimate in the source, have been converted into 1984/85 price by using GDP price index (Deflator).

表 3.13　貿易先別輸出入状況

(million Rs.)

Exports/Imports	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	Average annual increasing ratio
Exports F.O.B.	890	1,186	1,165	1,046	1,297	1,151	1,608	1,491	1,132	1,704	2,741	3,078	2,992	4,115	4,195	11.71%
India	747	894	780	498	650	521	992	994	843	1,161	1,602	1,241	1,303	1,568	1,035	2.36%
Other countries	143	292	385	548	647	630	616	497	289	543	1,139	1,837	1,689	2,547	3,160	24.75%
Imports C.I.F	1,815	1,982	2,009	2,470	2,885	3,480	4,428	4,930	6,314	6,514	7,742	9,341	10,905	13,870	16,264	16.96%
India	1,476	1,227	1,344	1,534	1,582	1,786	2,179	2,281	2,500	3,058	3,896	3,971	4,262	4,596	4,239	7.83%
Other countries	339	755	665	936	1,303	1,694	2,249	2,649	3,814	3,456	3,846	5,370	6,643	9,274	12,025	29.03%
Trade Balance	(925)	(796)	(844)	(1,424)	(1,588)	(2,329)	(2,820)	(3,439)	(5,182)	(4,810)	(5,001)	(6,263)	(7,913)	(9,755)	(12,069)	20.14%
India	(729)	(333)	(564)	(1,036)	(932)	(1,265)	(1,187)	(1,287)	(1,657)	(1,897)	(2,294)	(2,730)	(2,959)	(3,028)	(3,204)	11.15%
Other countries	(196)	(463)	(280)	(388)	(656)	(1,064)	(1,633)	(2,152)	(3,525)	(2,913)	(2,707)	(3,533)	(4,954)	(6,727)	(8,865)	31.29%
Total Trade Volume	2,705	3,168	3,174	3,516	4,182	4,631	6,036	6,421	7,446	8,218	10,483	12,419	13,897	17,985	20,459	15.55%
India	2,223	2,121	2,124	2,032	2,232	2,307	3,171	3,275	3,343	4,219	5,498	5,212	5,565	6,164	5,274	6.37%
Other countries	482	1,047	1,050	1,484	1,950	2,324	2,865	3,146	4,103	3,999	4,985	7,207	8,332	11,821	15,185	27.95%
Share in Trade (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-
India	82.18%	66.95%	66.92%	57.79%	53.37%	49.82%	52.53%	51.00%	44.90%	51.34%	52.45%	41.97%	40.04%	34.27%	25.78%	-
Other countries	17.82%	33.05%	33.08%	42.21%	46.63%	50.18%	47.47%	49.00%	55.10%	48.66%	47.55%	58.03%	59.96%	65.73%	74.22%	-

Source: Economic Survey 1990, by Ministry of Finance.

表 3.14　月別輸出入の動向（1988-1990）

(million Rs.)

Year Month	Exports	Imports	Balance	Total trade
1987/88 July/Aug.	245.6	697.1	(451.5)	942.7
Aug./Sep.	259.6	747.7	(488.1)	1,007.3
Sep./Oct.	277.7	1,799.9	(1,522.2)	2,077.6
Oct./Nov.	289.3	833.4	(544.1)	1,122.7
Nov./Dec.	327.9	993.4	(665.5)	1,321.3
Dec./Jan.	365.5	910.1	(544.6)	1,275.6
Jan./Feb.	394.8	1,074.2	(679.4)	1,469.0
Feb./Mar.	405.2	1,137.7	(732.5)	1,542.9
Mar./Apr.	393.2	1,179.3	(786.1)	1,572.5
Apr./May	421.3	1,353.1	(931.8)	1,774.4
May/June	391.9	1,516.0	(1,124.1)	1,907.9
June/July	342.6	1,627.7	(1,285.1)	1,970.3
1988/89 July/Aug.	358.4	1,156.6	(798.2)	1,515.0
Aug./Sep.	322.8	1,161.4	(838.6)	1,484.2
Sep./Oct.	355.7	2,308.2	(1,952.5)	2,663.9
Oct./Nov.	275.8	1,248.6	(972.8)	1,524.4
Nov./Dec.	405.9	1,148.1	(742.2)	1,554.0
Dec./Jan.	408.3	1,292.9	(884.6)	1,701.2
Jan./Feb.	431.4	1,406.6	(975.2)	1,838.0
Feb./Mar.	494.9	1,524.8	(1,029.9)	2,019.7
Mar./Apr.	354.7	1,088.8	(734.1)	1,443.5
Apr./May	261.1	1,171.4	(910.3)	1,432.5
May/June	275.9	1,482.2	(1,206.3)	1,758.1
June/july	250.6	1,274.0	(1,023.4)	1,524.6
1989/90 July/Aug.	291.0	1,309.4	(1,018.4)	1,600.4
Aug./Sep.	272.2	1,464.7	(1,192.5)	1,736.9
Sep./Oct.	304.2	1,124.3	(820.1)	1,428.5
Oct./Nov.	394.0	1,240.9	(846.9)	1,634.9
Nov./Dec.	471.5	1,412.1	(940.6)	1,883.6
Dec./Jan.	418.2	1,719.0	(1,300.8)	2,137.2
Jan./Feb.	453.0	1,746.4	(1,293.4)	2,199.4
Feb./Mar.	499.3	1,605.2	(1,105.9)	2,104.5
Mar./Apr.	537.6	1,552.7	(1,015.1)	2,090.3

Source: Monthly Report of Main Economic Indicator (March/April, 1990), by Nepal Rastra Bank (Nepal National Bank).

表 3.15　セクター別エネルギー消費実績

(1,000 TOE)*

Sector		1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Annual increasing ratio (%)
Domestic Sector	Consumption	3,224.56	3,307.03	3,312.69	3,863.53	3,970.42	5,523.19	5,499.40	5,624.30	8.27%
	Percentage(%)	95.62%	94.84%	94.51%	93.98%	94.16%	95.53%	95.21%	94.77%	
Industrial Sector	Consumption	53.46	77.81	80.19	115.61	109.09	129.47	116.00	117.80	11.95%
	Percentage(%)	1.59%	2.23%	2.29%	2.81%	2.59%	2.24%	2.01%	1.98%	
Commercial Sector	Consumption	17.99	27.03	28.63	35.34	36.67	31.42	45.50	51.80	16.31%
	Percentage(%)	0.53%	0.78%	0.82%	0.86%	0.87%	0.54%	0.79%	0.87%	
Transport Sector	Consumption	70.00	69.37	77.49	88.64	92.15	82.57	106.30	129.90	9.23%
	Percentage(%)	2.08%	1.99%	2.21%	2.16%	2.19%	1.43%	1.84%	2.19%	
Agricultural Sector	Consumption	5.48	5.09	5.68	6.58	7.04	14.54	7.60	8.70	6.83%
	Percentage(%)	0.16%	0.15%	0.16%	0.16%	0.17%	0.25%	0.13%	0.15%	
Other	Consumption	0.59	0.75	0.41	1.01	1.10	0.22	1.30	2.20	20.68%
	Percentage(%)	0.02%	0.02%	0.01%	0.02%	0.03%	0.00%	0.02%	0.04%	
Non Energy Use	Consumption	0.03	0.06	0.20	0.21	0.12	0.00	0.00	0.00	-59.38%
	Percentage(%)	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	
Power Generation	Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
	Percentage(%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Total	Consumption	3,372.11	3,487.14	3,505.29	4,110.92	4,216.59	5,781.41	5,776.10	5,934.70	8.41%
	Percentage(%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Source: Energy Balance Sheet of Nepal (Revised and Updated)(1981 - 1988), Report No.4/4/19061989/1/1, Seq.No.321, by Water and Energy Commission, Ministry of Water Resources.

Note(*): TEO - Tons of Oil Equivalent Unit.

表 3.16　エネルギー種別消費実績

(1,000 TOE)*

Kind of Energy			1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Annual increasing ratio (%)
Fuel wood		Consumption	3,141.32	3,256.76	3,260.15	3,432.68	3,523.99	4,414.40	4,374.30	4,477.60	5.19%
		Percentage	93.16%	93.39%	93.01%	83.50%	83.57%	76.36%	75.73%	75.45%	
Agricultural residue		Consumption	55.20	56.70	56.26	383.70	393.90	641.10	636.50	648.60	42.19%
		Percentage	1.64%	1.63%	1.61%	9.33%	9.34%	11.09%	11.02%	10.93%	
Animal dung		Consumption	21.06	21.58	21.30	66.82	68.60	488.28	480.00	490.00	56.76%
		Percentage	0.62%	0.62%	0.61%	1.63%	1.63%	8.45%	8.31%	8.26%	
Coal		Consumption	23.10	24.63	24.90	60.27	48.21	32.04	51.10	52.50	12.44%
		Percentage	0.69%	0.71%	0.71%	1.47%	1.14%	0.55%	0.88%	0.88%	
Petroleum products	LPG	Consumption	0.40	0.62	0.80	0.84	3.21	1.63	2.00	2.00	25.85%
		Percentage	0.01%	0.02%	0.02%	0.02%	0.08%	0.03%	0.03%	0.03%	
	Motor sprit	Consumption	9.04	10.62	12.04	13.40	14.04	16.03	15.60	17.70	10.07%
		Percentage	0.27%	0.30%	0.34%	0.33%	0.33%	0.28%	0.27%	0.30%	
	ATF	Consumption	13.51	15.61	15.50	19.31	18.35	18.92	19.50	22.90	7.83%
		Percentage	0.40%	0.45%	0.44%	0.47%	0.44%	0.33%	0.34%	0.39%	
	Kerosene	Consumption	32.72	29.08	29.94	40.39	42.27	52.97	59.90	69.20	11.29%
		Percentage	0.97%	0.83%	0.85%	0.98%	1.00%	0.92%	1.04%	1.17%	
	H.S.D. oil	Consumption	51.90	47.17	54.84	60.84	64.97	60.69	77.10	96.10	9.20%
		Percentage	1.54%	1.35%	1.56%	1.48%	1.54%	1.05%	1.33%	1.62%	
	L.D. oil	Consumption	6.76	5.10	4.22	4.62	5.02	10.71	4.80	6.40	-0.78%
		Percentage	0.20%	0.15%	0.12%	0.11%	0.12%	0.19%	0.08%	0.11%	
	Fuel oil	Consumption	3.02	3.40	5.86	6.64	9.16	15.52	13.80	9.00	16.88%
		Percentage	0.09%	0.10%	0.17%	0.16%	0.22%	0.27%	0.24%	0.15%	
	Non energy	Consumption	0.03	0.06	0.20	0.21	0.12	0.00	7.90	8.20	122.89%
		Percentage	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.14%	0.14%	
Electricity		Consumption	14.05	15.81	19.28	21.20	24.75	29.12	33.60	34.50	13.69%
		Percentage	0.42%	0.45%	0.55%	0.52%	0.59%	0.50%	0.58%	0.58%	
Total		Consumption	3,372.11	3,487.14	3,505.29	4,110.92	4,216.59	5,781.41	5,776.10	5,934.70	8.41%
		Percentage(%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Source: Energy Balance Sheet of Nepal (Revised and Updated)(1981 - 1988), Report No.4/4/19061989/1/1, Seq.No.321, by Water and Energy Commission, Ministry of Water Resources.

Note(*): TEO - Tons of Oil Equivalent Unit.

表 3.17　セクター別電力消費実績

(GWh)

Sector		1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Annual increasing ratio (%)
Domestic Sector	Consumption	78.57	90.67	119.01	101.41	125.35	167.80	187.88	185.35	13.04%
	Percentage	48.14%	49.31%	51.60%	41.14%	43.55%	49.56%	46.74%	44.84%	
Industrial Sector	Consumption	50.20	61.28	81.95	78.34	92.52	142.70	169.38	166.30	18.66%
	Percentage	30.76%	33.32%	35.53%	31.78%	32.14%	42.15%	42.13%	40.23%	
Commercial Sector	Consumption	23.20	17.83	21.34	48.14	49.80	21.00	22.08	25.04	1.10%
	Percentage	14.21%	9.70%	9.25%	19.53%	17.30%	6.20%	5.49%	6.06%	
Transport Sector	Consumption	1.05	1.05	1.05	1.05	1.05	1.50	1.60	1.60	6.20%
	Percentage	0.64%	0.57%	0.46%	0.43%	0.36%	0.44%	0.40%	0.39%	
Agricultural Sector	Consumption	3.36	4.31	2.40	5.80	6.31	3.00	6.09	8.65	14.46%
	Percentage	2.06%	2.34%	1.04%	2.35%	2.19%	0.89%	1.51%	2.09%	
Others	Consumption	6.83	8.75	4.87	11.77	12.81	2.56	14.97	26.46	21.35%
	Percentage	4.18%	4.76%	2.11%	4.77%	4.45%	0.76%	3.72%	6.40%	
Total	Consumption	163.21	183.89	230.62	246.51	287.84	338.56	402.00	413.40	14.20%
	Percentage(%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

Source: Energy Balance Sheet of Nepal (Revised and Updated)(1981 - 1988), Report No.4/4/19061989/1/1, Seq.No.321, by Water and Energy Commission, Ministry of Water Resources.

表 4.1　連けい系統の既設発電設備

Name	Date in Service	Number of Units and Size MW	Installed Capacity MW	Firm Capacity MW
Hydro Electric:				
Trisuli	1962/70	7 x 3.0	21.0	18.0
Sunkosi	1973	3 x 3.35	10.1	5.8
Gandak	1979	3 x 5.0	15.0	9.4
Kulekhani I	1982	2 x 30.0	60.0	60.0
Devighat	1984	3 x 4.7	14.1	14.1
Kulekhani II	1986	2 x 16.0	32.0	32.0
Marsyangdi	1990	3 x 23.0	69.0	63.0
Subtotal - Hydro			221.2	202.3
Misc. Small Hydro			6.0	6.0
Total Hydro - Interconnected System			227.2	208.3
Diesel:				
Hetauda		4 x 2.5	10.0	10.0
Misc. Diesel			15.0	7.0
Subtotal - Diesel			25.0	17.0
Total Plant Installed			252.2	225.3

(1) Kulekhani I and II share a common hydraulic system and can only be operated in tandem as (30 + 16) = 46 MW units. Similarly, unit outages at Trisuli results in reduction of power output at Devighat.

表 4.2　連けい系統外の既設発電設備

Name	Type	Installed Capacity (MW)	Available Capacity (MW)	In-Service Date	Region
Dhankuta	Hydro	2 x 0.12 - 0.24	0.16	1973	Eastern
Surkhet	Hydro	3 x 0.12 - 0.36	0.12	1978	M & FW 1/
Banglung	Hydro	1 x 0.18 - 0.18	-	1981	Western
Phidim	Hydro	2 x 0.13 - 0.26	-	1981	Eastern
Jomsom	Hydro	2 x 0.13 - 0.26	-	1982	Western
Junla	Hydro	2 x 0.10 - 0.20	-	1982	M & FW
Doti	Hydro	2 x 0.10 - 0.20	-	1982	M & FW
Gorkha	Hydro	2 x 0.03 - 0.06	-	1982	Eastern
Dhading	Hydro	1 x 0.03 - 0.03	-	1982	Central
Syangja	Hydro	2 x 0.04 - 0.08	-	1984	Western
Helambu	Hydro	1 x 0.05 - 0.05	-	1985	Central
Sub-total I		1.92			
Janakpur	Diesel	3 units - 0.83	0.60	1961	Central
Bharatpur	Diesel	2 x 0.26 - 0.52	0.50	1961	Central
Bhairawa	Diesel	2 x 0.26 - 0.52	0.50	1961	Western
Illam	Diesel	2 x 0.10 - 0.20	0.16	91/73	Eastern
Bhadrapur	Diesel	1 x 0.34 - 0.34	0.24	1975	Eastern
Ghorahi	Diesel	2 x 0.05 - 0.10	0.10	56/82	M & FW
Tulsipur	Diesel	2 units - 0.07	0.05	1956	M & FW
Nepalgunj	Diesel	2 x 0.26 - 0.52	0.50	1960	M & FW
Sub-total II		3.10		4.27	
TOTAL I & II		5.02			

1 / M & FW: Mid- and Far-Western Regions.

表 4.3　既設送電線

	From	To	Volt. (kV)	CCT	Length (km)	Conductors Kind	Size	Type	Commis Year	Remarks
I)	Existing 132 kV Line									
1.	Hetauda	Bhratpur	132	1	70.0	ACSR	200	Panther	1979	Tower (SC)
2.	Bhratpur	Burdghat (Dumkibas)	132	1	70.0	ACSR	200	Panther	1979	Tower (SC)
3.	Burdghat	Gandak	132	1	14.0	ACSR	200	Panther	1979	Tower (SC)
4.	Bhratpur	Pokhara	132	1	85.0	ACSR	150	Wolf		Tower (SC)
5.	Hetauda	Dhalkebar (Janakpur)	132	1	137.0	ACSR	250	Bear		Tower (SC)
6.	Dhalkebar	Dubi (Binatnagar)	132	1st (a)	146.0	ACSR	250	Bear	1985	Tower (DC)
7.	Burdghat	Butwal	132	1st	43.0	ACSR	250	Bear		Tower (DC)
8.	Kulikhani-II	Siuchatar	132	1st	34.0	ACSR	250	Bear	1986	Tower (DC)
9.	Kulikhani-II	Hetauda	132	1st	8.0	ACSR	250	Bear	1986	Tower (DC)
10.	Dubi	Anarmani	132	1	76.0	ACSR				Tower (DC)
11.	Marshyangdi	Balaju	132	1	84.0	ACSR	300	DIN (300/50)		Tower (SC)
12.	Marshyangdi	Bharatpur	132	1	25.0	ACSR	300	DIN (300/50)		Tower (SC)
13.	Butwal	Shivpur	132	1st	60.6	ACSR	250	Bear		Tower (DC)
14.	Shivpur	Lamahi	132	1st	51.1	ACSR	250	Bear		Tower (DC)
15.	Lamahi	Kohalpur	132	1st	95.7	ACSR	250	Bear		Tower (DC)
II)	Existing 66 kV Line									
1.	Trisuli	Balaju	66	1	29.0	ACSR	100		1962	Tower (DC)
2.	Balaju	Siuchatar	66	2	4.0	ACSR	150	Wolf		Tower (DC)
3.	Sunkosi	Baneswar	66	1	55.0	ACSR	120		1972	Tower (SC)
4.	Hetauda	Amlekhgunj	66	2	16.0	ACSR	150	Wolf		Tower (DC)
5.	Amlekhgunj	Simra	66	2	10.0	ACSR	150	Wolf		Tower (DC)
6.	Simra	Parmanipur	66	2	9.0	ACSR	150	Wolf		Tower (DC)
7.	Paramanipur	Birgunj	66	2	9.0	ACSR	150	Wolf		Tower (DC)
8.	Kulikhani-I	Siuchatar	66	2	29.0	ACSR	150	Wolf	1982	Tower (DC)
9.	Kulikhani-I	Hetauda	66	2	16.0	ACSR	150	Wolf	1982	Tower (DC)
10.	Patan	Siuchatar	66	1st	7.0	ACSR	150	Wolf	1982	Tower (DC)
11.	Devigat	New Chabel	66	1st	33.0	ACSR	150	Wolf	1983	Tower (DC)
12.	Baneswar	N. Patan	66	1	2.8	ACSR	120	Wolf	1986	Tower (DC)
13.	Balaju	Lainchar	66	1	2.3	ACSR	200		1989	Pole-H (SC)
14.	Balaju	New Chabel	66	1	23.0	ACSR	100/150(b)		1990	

Remarks:
a) "1st" means a single circuit on double-circuit towers.
b) Trisuli-Balaju and Devighat-New Chabel lines have been connected with jumper conductors since 1990.

表 4.4　既設変電所(132kV/66kV)

Name	Voltage (kV)	Unit Capacity (MVA)		No. of Units		Total Capacity (MVA)	Region
Butwal	132/33	10.0		2		20.0	Western
Bardaghat	132/11	5.0		1		5.0	Western
(Dumkibas)							
Chanauta	132/33	5.0		1		5.0	Western
(Shivpur)		5.0					
Lamahi	132/33	5.0		1		5.0	Mid Western
Kohalpur	132/33	5.0		2		10.0	Mid Western
Gandaki	6.6/131	10.0	/b	2		10.0	Western
Bharatpur	132/11	10.0		1		10.0	Central
Pokhara	132/11	6.0		1		6.0	Western
Damauli	132/33	5.0		1		5.0	Western
Dhalkebar	132/33/11	10.0		1		10.0	Central
Dubi	132/33	15.0		2		30.0	Eastern
(Biratnagar)							
Hetauda	132/66	20.0		1		20.0	Central
	132/66	10.0		1		10.0	
	66/11	6.0		2		12.0	
Marsyangdi	11/132	30.0	/b	3	/a	90.0	Western
	33/11	6.0	/b	1		6.0	
Kulekhani II	6.6/132	37.8	/b	1	/a	37.8	Central
Kulekhani I	66/11	3.0	/b	1		3.0	Central
	11/66	35.0	/b	2		70.0	
Siuchatar	132/66	37.8		1	/a	37.8	Central
	66/11	18.0		2		36.0	
Baneswar	66/11	18.0		1	/a	18.0	Central
Birgunj	66/11	6.0		1		6.0	Central
	66/11	3.15		2		6.3	
Trisuli	6.6/66	11.25	/b	2	/a	22.5	Central
Balaju	66/11	10.0		2		20.0	Central
	132/66	45.0		1	/a	45.0	
Phachkhal	66/11	1.5		1	/c	1.5	Central
Sunkosi	6.6/66	5.6	/b	2		11.2	Central
Parwanipur	66/11	1.5		2		3.0	Central
N. Patan	66/11	18.0		2	/a	36.0	Central
Devighat	6.6/66	6.3	/b	3		18.9	Central
N. Chabel	66/11	6.3		3		18.9	Central
Amlekhgunj	66/11	1.5		1		1.5	Central
Simra	66/11	1.5		1		1.5	Central
Lainchaur	66/11	10.0		2		20.0	Central

Notes:
/a Bank of single phase transformers.
/b Transformers at power station
/c Out of order

表4.5　発電に関する日報

Daily Generation Data　　KULEKHANI Water level_____(metre)

Name of the Powr Station	Kulekhani 1	Kulekhani 2	Trishuli	Devighat	Gandak	Marsyangdi	Sunkoshi	HET.DIS	Total
Generation (MWH)									
Maximum Load (MW)									
System Peak (MW)									
Load Factor									
Generation upto date (MWH)									

Peak time: _____ hrs　Max load to Dhalkebar _____ (MW)　Frequency: Max _____ HZ　Temp: Max _____ c
Max load to Bharatpur _____ (MW)　Min _____ HZ　Min _____ c
Max load to Birguni _____ (MW)

Morning Peak _____ (MW); at _____ hrs.

Copy to:

1) Managing Director, NEA
2) Chief Director, Operation and Maintenance Directorate
3) Chief Director, Planning Directorate
4) Chief Director, Construction Directorate
5) Director, System Control Department
6) Director, Generation Department
7) Director, Transmission Department
8) Chief Director, Distribution & Consumer Services

_____
Shift incharge

_____
Deputy Manager
(Buddha Harayan Manandhar)

204 / / (/ /19),

表 4.6　既設11kVリングメインシステム

S. No.	From	To	Circuit	Voltage (kv)	Length (KM)	Conductor Type
1	Balaju	Maharajgunj	SC	11	4.5	0.2 sq. in
2	Balaju	Old Chabel	SC	11	9.0	0.2 sq. in
3	Teku	Thapathali	DC (UGC)	11	1.7	200 sq. mm
4	Balaju	Teku	DC	11	3.8	0.2 sq. in
5	Teku	Siuchatar	DC	11	2.5	0.2 sq. in
6	Teku	N. Patan	DC	11	4.5	0.2 sq. in
7	New Patan	K-2	DC	11	4.8	0.2 sq. in
8	K-2	R. Palace	SC (UGC)	11	1.0	240 sq. mm
9	K-2	Lainchaur	SC (UGC)	11	1.7	240 sq. mm
10	Lainchaur	R. Palace	SC (UGC)	11	0.7	240 sq. mm
11	Maharajgunj	Old Chabel	SC	11	2.7	0.2 sq. in
12	Old Chabel	N. Chabel	DC	11	1.0	0.2 sq. in
13	N. Chabel	Bhaktapur	DC	11	9.6	0.2 sq. in
14	Bhaktapur	Thimi	DC	11	3.2	0.2 sq. in
15	Thimi	New Patan	DC	11	7.9	0.2 sq. in
16	Old Patan	N. Patan	DC (Cable)	11	0.05	0.1 sq. in

Source : NEA

Note : UGC = under ground power cables

表4.7　既設11kV配電線

Substation/ Switching Station	Nos of Feeder	Feeder Name		Length (km)
SIUCHATAR SUBSTATION	6	ROPEWAY (KIRTIPUR)		17.5
		KALIMATI		4.7
		KALANKI		1.2
		SWAYAMBHU		14.5
		THANKOT		31.5
		TAHACHAL		2.3
			SUBTOTAL	71.7
BALAJU SUBSTATION	4	DHARMASTHALI		27.6
		SWAYAMBHU		8.9
		B.I.D.		1.3
		NAYABAZAR		9.2
			SUBTOTAL	46.9
NEW CHABEL SUBSTATION	4	MAHARAJGUNJ		8.1
		AIRPORT		2.9
		SUNDARIJAL		34.6
		BOUDHA JORPATI		13.0
			SUBTOTAL	57.9
NEW PATAN SUBSTATION	2	OLD PATAN-2		0.0
		OLD PATAN-1		0.0
			SUBTOTAL	0.1
OLD PATAN SWITCHING STATION	6	RING ROAD		7.0
		RADIO NEPAL		3.5
		PATAN		3.1
		JAWALAKHEL		3.7
		PHARPING		34.4
		MANGAL BAZAR		1.5
			SUBTOTAL	53.3
BANESWAR SUBSTATION	6	BANESWAR		4.3
		AIRPORT		12.6
		GODAWARI-2		40.4
		GODAWARI-1		35.4
		BHADOL		10.0
		SHANKHAMUL		4.1
			SUBTOTAL	106.8
LAINCHAUR SUBSTATION	4	SPARE (NAYA BAZAR)		9.2
		LAZIMPAT		3.3
		KING'S WAY		4.8
		GAIRI-DHARA		5.9
			SUBTOTAL	23.1
OLD CHABEL SWITCHING STATION	4	BANESWOR		3.5
		NAXAL		7.0
		SUNDARIJAL *(not used)*		6.9
		TANGAL		3.5
			SUBTOTAL	20.9
TEKU SWITCHING STATION	8	PULCHOWK		8.5
		KALIMATI		0.5
		KIRTIPUR		4.7
		MINT		2.3
		TAHACHAL		4.0
		THANKOT		3.5
		BHIMSENTHAN		4.9
		TRIPURESWOR		1.2
			SUBTOTAL	29.6
K2 SWITCHING STATION	7	KING'S WAY		4.2
		KAMALADI		3.0
		SINGHA DURBAR		0.3
		MAHABOUDHA		2.0
		CITY-1		2.5
		TANGAL		4.7
		BABAR MAHAL		1.4
			SUBTOTAL	18.2
BHAKTAPUR SWITCHING STATION	6	BYASI		11.6
		KATUNJE		7.0
		NALIN CHOWK		14.7
		KHOPASI		13.7
		BRICK FACTORY		3.6
		NAGARKOT		27.2
			SUBTOTAL	77.8
MAHARAJGUNJ SWITCHING STATION	3	KING'S WAY		1.0
		BUDHANILKANTHA		19.6
		BALUWATAR		1.0
			SUBTOTAL	21.5
THIMI SWITCHING STATION	2	THIMI		12.3
		TROLLEY BUS		0.9
			SUBTOTAL	13.2
THAPATHALI SWITCHING STATION	6	TEKU		1.8
		PATAN		3.8
		THAPATHALI		1.2
		SINGHDARBAR		9.3
		SANEPA		2.8
			SUBTOTAL	18.9
TOTAL	68			559.9
AVERAGE	4.9			8.2

表 4.8　既設配電用変圧器

(UNIT: Nos.)

Unit Capacity (KVA)	Number of Units					Total
	Kathmandu West	Kathmandu East	Kathmandu Central	Bhaktapur	Lalitpur	
10	0	4	1	0	2	7
15	5	7	4	1	0	17
25	44	18	2	19	18	101
30	6	1	0	0	0	7
45	2	0	0	0	1	3
50	39	37	19	53	38	186
63	2	0	1	0	2	5
75	0	2	1	1	1	5
100	132	109	188	65	156	650
125	2	1	6	1	2	12
150	14	5	10	1	8	38
200	16	9	26	3	12	66
250	24	22	137	4	28	215
300	0	0	0	3	1	4
315	0	0	3	0	1	4
350	1	0	0	0	0	1
400	2	0	0	0	1	3
500	1	4	6	0	2	13
600	0	0	0	0	1	1
650	0	0	1	0	0	1
750	1	0	2	0	3	6
1000	0	1	1	0	1	3
1300	0	0	1	0	0	1
2250	1	0	0	0	0	1
* 7265	21	0	0	0	0	21
Total Nos.	313	220	409	151	278	1371
Total kVA	40186	24700	70103	12490	34931	182410

Note: 1) This table is prepared based on the route map of distribution lines
2) This table includes private transformers.
3) Transformer capacity of 7265kVA marked with (*) is total capacity of 21 nos. of transformers.

表 4.9　11kV配電線に於ける過負荷、電圧降下検討結果（1989/90）（1/3）

FEEDER NAME	MAX. LOAD CURRENT (A)	SECTION-1					SECTION-2					SECTION-3					SECTION-4					VOLTAGE AT 11KV D/L END (P.U.)	JUDGEMENT
		R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CURRENT (A)	PASSING CURRENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CURRENT (A)	PASSING CURRENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CURRENT (A)	PASSING CURRENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CURRENT (A)	PASSING CURRENT (A)		
SIUCHATAR S/S																							
ROPEWAY (KIRTIPUR)	95	0.3504	0.3268	2.6	345	95	0.6957	0.3483	3.4	223	66.279	0.6957	0.3483	2.6	223	28.721						0.957	O
KALIMATI	67	0.3504	0.3268	2	345	67	0.6957	0.3483	2	223	33.5											0.987	O
KALANKI	15	0.6957	0.3483	1	223	15	0.3504	0.3268	1	345	7.5											0.999	O
SWAYAMBHU	30	0.159	0.0856	0.5	375	30	0.3504	0.3268	5.7	345	28.421	0.6957	0.3483	3	223	10.421	1.1638	0.3645	0.3	161	0.9474	0.988	O
THANKOT	105	0.3504	0.3268	6.5	345	105	0.6957	0.3483	1.8	223	38.738	1.1638	0.3645	2	161	20.388						0.945	O
TAHACHAL	60	0.6957	0.3483	2	223	60	0.3504	0.3268	0.5	223	12											0.992	O
BALAJU S/S																							
DHARMASTHALI	90	0.6957	0.3483	2	223	90	0.3504	0.3268	4.5	345	62.308											0.975	O
SWAYAMBHU	50	0.3504	0.3268	1.5	345	50																0.997	O
B.I.D.	100	0.6957	0.3483	1	223	100																0.994	O
NAYABAZAR	120	0.3504	0.3268	0.5	345	120	0.159	0.0856	2.9	375	102.35											0.993	O
NEW CHABEL S/S																							
MAHARAJGUNJ	65	0.3504	0.3268	3.2	345	65																0.993	O
AIRPORT	NA	0.6957	0.3483	2.6	223	NA																NA	NA
SUNDARIJAL	35	1.4013	0.3703	8	158	35																0.968	O
BOUDHA JORPATI	200	0.6620	0.3481	3.7	223	200																0.957	O
CHABEL S/S																							
BANESWOR	100	0.6957	0.3483	3.6	223	100																0.978	O
NAXAL	125	0.3504	0.3268	3.2	345	125																0.986	O
SUNDARIJAL	90	1.4013	0.3703	8.2	158	90																0.916	X
TANGAL	52	0.3504	0.3268	2.3	345	52																0.996	O
NEW PATAN S/S																							
OLD PATAN-2	180	0.3504	0.3268	0.05	345	180																1.000	O
OLD PATAN-1	225	0.3504	0.3268	0.05	345	225																1.000	O
OLD PATAN S/S																							
RING ROAD	50	0.5046	0.3277	2	287	50																0.991	O
RADIO NEPAL	60	1.1638	0.3645	2	161	60																0.984	O
PATAN	105	0.5046	0.3277	1.5	287	105																0.989	O
JAWALAKHEL	80	0.5046	0.3277	2	287	80																0.988	O
PHARPING	90	0.3504	0.3268	6	345	90	0.6957	0.3483	4.2	223	37.059											0.955	O
MANGAL BAZAR	48	0.5046	0.3277	0.5	287	48	0.1278	0.0833	1	420	32											0.994	O

表 4.9　11kV配電線に於ける過負荷、電圧降下検討結果（1989/90）（2/3）

FEEDER NAME	MAX. LOAD CUR-RENT (A)	SECTION-1					SECTION-2					SECTION-3					SECTION-4					VOLTAGE AT 11KV D/L END (P.U.)	JUDGE-MENT
		R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CUR-RENT (A)	PASSING CUR-RENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CUR-RENT (A)	PASSING CUR-RENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CUR-RENT (A)	PASSING CUR-RENT (A)	R (OHM/KM)	X (OHM/KM)	TRUNK LINE LENGTH (KM)	MAX. ALLOW CUR-RENT (A)	PASSING CUR-RENT (A)		
NEW BANEWOR S/S																							
BANESWOR	130	0.3504	0.3268	1.5	345	130	0.0979	0.0795	0.3	480	21.667											0.993	O
AIRPORT	180	0.3504	0.3268	6.7	345	180	0.6957	0.3483	1.1	223	25.385											0.947	O
GODAWARI-2	165	0.3504	0.3268	4	345	165	0.3504	0.3268	1	345	121	0.3504	0.3268	10	345	110						0.915	X
GODAWARI-1	130	0.3504	0.3268	4	345	130	0.1748	0.302	3	546	92.857	0.3504	0.3268	7	345	65						0.943	O
* IMADOL	80	0.3504	0.3268	4	345	80																0.989	O
SHANKHAMUL	138	0.3504	0.3268	2	345	138																0.991	O
TEKU S/S																							
PULCHOWK	115	0.3504	0.3268	3.5	345	115																0.986	O
KALIMATI	23	0.3504	0.3268	1.6	345	23																0.999	O
KIRTIPUR	30	0.3504	0.3268	2.4	345	30																0.998	O
MINT	130	0.3504	0.3268	1.2	345	130	0.159	0.0856	0.4	375	32.5											0.994	O
TAHACHAL	47	0.3504	0.3268	2.6	345	47																0.996	O
THANKOT	21	0.3504	0.3268	0.75	345	21																0.999	O
BHIMSENTHAN	135	0.159	0.0856	1.5	375	135	0.3504	0.3268	0.3	345	22.5											0.996	O
TRIPURESWOR	35	0.159	0.0856	0.5	375	35	0.3504	0.3268	0.8	345	21.538											0.999	O
K2 S/S																							
KING'S WAY	150	0.3504	0.3268	1.2	345	150	0.1218	0.0833	0.8	368	60											0.993	O
KAMALADI	95	0.1218	0.0833	0.7	368	95	0.3504	0.3268	1.1	345	58.056											0.996	O
SINGHA DURBAR	50	0.118	0.0817	0.3	439	50	0.3504	0.3268	1.6	345	43.478	0.6957	0.3483	0.4	223	8.6957						0.996	O
MAHABOUDHA	80	0.1218	0.0833	0.5	368	80	0.118	0.0817	0.6	439	51.429	0.3504	0.3268	0.3	345	17.143						0.998	O
CITY-1	110	0.118	0.0817	1.2	439	110																0.999	O
TANGAL	160	0.159	0.0856	0.7	375	160	0.3504	0.3268	2.7	345	127.06											0.984	O
BABAR MAHAL	70	0.159	0.0856	0.5	375	70	0.3504	0.3268	1	345	46.667											0.997	O
LAINCHAUR S/S																							
SPARE (NAYA BAZAR)	52	0.3504	0.3268	4	345	52																0.993	O
LAZIMPAT	100	0.159	0.0856	0.1	375	100	0.3504	0.3268	2.3	345	95.833											0.992	O
KING'S WAY	132	0.159	0.0856	0.3	375	132	0.3504	0.3268	1.5	345	110											0.993	O
GAIRI-DHARA	100	0.159	0.0856	0.15	375	100	0.3504	0.3268	2.5	345	94.34											0.991	O

表 4.9　11kV配電線に於ける過負荷、電圧降下検討結果（1989/90）（3/3）

FEEDER NAME	MAX. LOAD CURRENT (A)	SECTION-1 R (OHM/KM)	SECTION-1 X (OHM/KM)	SECTION-1 TRUNK LINE LENGTH (KM)	SECTION-1 MAX. ALLOW CURRENT (A)	SECTION-1 PASSING CURRENT (A)	SECTION-2 R (OHM/KM)	SECTION-2 X (OHM/KM)	SECTION-2 TRUNK LINE LENGTH (KM)	SECTION-2 MAX. ALLOW CURRENT (A)	SECTION-2 PASSING CURRENT (A)	SECTION-3 R (OHM/KM)	SECTION-3 X (OHM/KM)	SECTION-3 TRUNK LINE LENGTH (KM)	SECTION-3 MAX. ALLOW CURRENT (A)	SECTION-3 PASSING CURRENT (A)	SECTION-4 R (OHM/KM)	SECTION-4 X (OHM/KM)	SECTION-4 TRUNK LINE LENGTH (KM)	SECTION-4 MAX. ALLOW CURRENT (A)	SECTION-4 PASSING CURRENT (A)	VOLTAGE AT 11KV D/L END (P.U.)	JUDGEMENT
BHAKTAPUR S/S																							
BYASI	108	0.3504	0.3268	2	345	108																0.993	O
KATUNJE	42	0.159	0.0856	0.8	375	42	0.3504	0.3268	0.9	345	36.985	0.6957	0.3268	5	223	31.343						0.986	O
NALIN CHOWK	20	0.159	0.0856	0.7	375	20	0.3504	0.3268	2.6	345	18.028	0.6957	0.3483	3.8	223	10.704						0.993	O
BANEPA (KHOPASI)	*58*	*0.1748*	*0.302*	*13*	*546*	*58*																0.985	O
BRICK FACTORY	115	0.3504	0.3268	1.8	345	115																0.993	O
NAGARKOT	44	1.1638	0.3645	2.6	161	44	0.6957	0.3483	11	223	35.588											0.960	O
MAHARAJGUNJ S/S																							
KING'S WAY	NA	0.159	0.0856	1	375	NA																NA	NA
BUDHANILKANTHA	*70*	*0.6957*	*0.3483*	*3.8*	*223*	*70*																0.984	O
BALUWATAR	45	0.3504	0.3268	1.2	345	45																0.998	O
THIMI S/S																							
THIMI	95	0.3504	0.3268	2.3	345	95	0.6957	0.3483	3	223	53.774											0.975	O
TROLLEY BUS	30	0.3504	0.3268	0.9	345	30																0.999	O
THAPATHALI S/S																							
TEKU	54	0.3504	0.3268	1.1	345	54																0.998	O
PATAN	124	0.3504	0.3268	1.5	345	124																0.994	O
THAPATHALI	33	0.3504	0.3268	1.1	345	33																0.999	O
SINGHDARBAR	46	0.3504	0.3268	2.5	345	46																0.996	O
SANEPA	48	1.4013	0.3703	0.7	158	48	0.6957	0.3483	0.3	223	22.154	0.1278	0.0833	0.2	420	11.077	0.6957	0.3483	0.1	223	3.6923	0.995	O

Note:
1) "NA" means "Not Available" or "Not Applicable".
2) Max. load current is data measured on January 5,1990 except the feeder marked with * of which data was measured on October 10, 1990.
3) *Voltage at D/L end for OLD PATAN S/S is calculated taking into account volatage drop between NEW PATAN S/S and OLD PATAN S/S.*

表 4.10　11kV配電線用遮断器の動作回数（1/4）

SUBSTATIONS	FEEDER	FREQUENCY OF TRIPPING PER MONTH (NOS. / MONTH) 2046(1989)-2047(1990)																																					FREQUENCY OF TRIP/YEAR			LENGTH (KM)	FREQ/ YEAR/ KM	JUDGE
		APR-MAY			MAY-JUN			JUN-JUL			JUL-AUG			AUG-SEP			SEP-OCT			OCT-NOV			NOV-DEC			DEC-JAN			JAN-FEB			FEB-MAR			MAR-APR								
		BAISAKHA			JESTHA			ASADHA			SHARAWAN			BHADRA			ASHWIN			KARTIK			MARGA			POUSH			MARGA			FALGUN			CHAITRA								
		OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT			
SIUCHATAR	TEKU-2	1	0	1	1	5	6	2	3	5	7	1	8	2	3	5	0	3	3	0	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	13	18	31	2.50	12.40	O
	TR NO.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.00	NA	
	BUS-COUPLER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	NA	
	TR NO.1	0	1	1	3	0	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0.00	NA	
	TEKU-1	0	1	1	1	6	7	2	2	4	1	5	6	3	5	8	1	2	3	0	2	2	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	8	26	34	2.50	13.60	O
	THANKOT	5	13	18	1	6	7	3	16	19	5	5	10	5	15	20	1	13	14	4	1	5	0	2	2	0	5	5	0	10	10	2	1	3	5	1	6	31	88	119	31.50	3.78	X
	TAHACHAL	1	1	2	0	0	0	12	2	14	0	1	1	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	14	5	19	2.30	8.26	O
	SWOYAMBHU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	6	6	0	1	1	2	0	2	2	2	4	3	1	4	3	1	4	11	12	23	14.50	1.59	O
	KALANKI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	2	4	6	1.20	5.00	O
	KALIMATI	0	0	0	0	0	0	0	0	0	0	3	3	0	1	1	2	2	4	4	0	4	0	1	1	0	0	0	0	4	4	0	0	0	1	0	1	7	11	18	4.70	3.83	O
	KIRTIPUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3	3	6	0	0	0	5	0	5	4	0	4	13	4	17	17.50	0.97	O
BALAJU	DHARMASTHALI	1	6	7	2	7	9	4	19	23	2	9	11	0	4	4	1	3	4	0	4	4	0	0	0	0	0	0	0	1	1	0	0	0	0	8	8	10	61	71	27.60	2.57	O
	SWOYAMBHU	1	10	11	0	7	7	7	8	15	1	8	9	5	6	11	1	0	1	1	1	2	1	3	4	0	0	0	0	8	8	0	0	0	0	1	1	17	52	69	8.90	7.75	O
	MAHARAJGUNJ	4	0	4	0	0	0	1	0	1	5	1	6	4	3	7	2	1	3	2	1	3	3	3	6	3	3	6	0	2	2	0	0	0	0	2	2	24	16	40	4.43	9.03	O
	LAINCHOUR-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.20	0.00	O
	KALIMATI-1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	NA	NA	
	TEKU-1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4.00	0.50	O
	TR NO.1	0	0	0	2	0	2	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	6	0.00	NA	
	BUS-COUPLER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	NA	
	TR NO.2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0.00	NA	
	LAINCHOUR-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.20	0.00	O
	KALIMATI-2	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	NA	NA	
	B. I. D	5	0	5	3	3	6	6	3	9	1	3	4	0	0	0	2	0	2	1	0	3	0	1	1	0	0	0	0	1	1	1	2	3	0	0	0	13	19	34	1.30	26.15	O
	TEKU-2	0	0	0	0	0	0	0	0	0	1	1	2	2	3	5	0	0	0	0	2	1	0	2	2	0	1	1	0	0	0	0	1	1	0	0	0	3	10	13	4.00	3.00	O
	CHABEL	5	0	5	6	0	6	3	0	3	4	0	4	7	4	11	2	2	4	1	1	1	2	2	4	2	3	5	0	0	0	2	0	2	0	1	1	34	13	46	9.00	5.11	O
	NAYABAZAR	2	4	6	0	6	6	0	11	11	1	2	3	0	2	2	2	2	4	0	0	5	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	5	28	38	9.20	4.13	O
NEW-CHABEL	SUNDARIJAL	1	7	8	5	3	8	4	10	14	2	1	3	1	5	6	0	0	0	2	3	5	0	0	0	1	0	1	0	0	0	6	1	7	9	3	12	31	35	61	34.00	1.79	O
	INCOMER-3	0	0	0	0	4	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6	6	0.00	NA	
	BHAKTAPUR-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	6	6	0	2	2	0	2	2	0	10	13	9.60	1.35	O
	CHABEL-2	0	0	0	6	6	1	3	4	1	6	7	0	0	0	0	1	1	0	3	3	0	0	0	0	2	0	2	5	0	5	1	1	2	4	4	8	15	24	39	1.00	39.00	O
	CHABEL-1	0	0	0	0	0	0	1	3	4	1	6	7	0	2	2	0	1	1	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	15	14	1.00	14.00	O
	BHAKTAPUR-1	1	0	1	1	5	6	0	0	0	0	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	5	5	0	2	2	0	2	2	2	18	20	9.60	2.08	O
	INCOMER-2	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	1	3	0	0	0	0	0	0	2	7	9	0.00	NA	
	INCOMER-1	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4	6	0.00	NA	
	MAHARAJGUNJ	0	0	0	1	1	2	1	3	4	1	1	2	6	1	9	1	2	3	0	2	11	0	0	0	1	2	3	2	1	3	0	4	4	6	3	9	21	20	40	8.10	4.94	O
NEW-PATAN	THIMI-2	0	0	0	0	3	3	0	0	0	0	2	2	1	0	1	1	1	2	0	1	1	0	0	0	0	0	0	6	5	11	0	1	1	1	5	6	11	8	22	30	7.90	3.80	O
	PATAN-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	3	0.05	60.00	O
	KATHMANDU-2	0	0	0	0	1	1	0	1	1	0	2	2	0	0	0	1	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	7	11	4.20	2.62	O
	THAPATHALI-2	0	0	0	0	0	0	0	0	0	0	3	3	1	0	1	0	0	0	0	2	1	0	0	0	1	2	3	0	1	1	0	0	0	0	0	0	2	8	9	4.20	2.14	O
	TR NO.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.00	NA	
	BUS-COUPLER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	NA	
	TR NO.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.00	NA	
	THAPTHALI-1	0	0	0	0	0	0	0	0	0	0	4	4	5	1	6	1	2	3	0	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	6	10	14	4.20	3.33	O
	KATHMANDU-1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	4.20	0.71	O
	PATAN-1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0.05	40.00	O
	THIMI-1	0	0	0	0	0	0	0	1	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	1	3	3	6	7.90	0.76	O

Remarks:
OC: Overcurrent relay
EF: Earth fault relay
TT: Total

表 4.10　11kV配電線用遮断器の動作回数（2/4）

SUBSTATIONS	FEEDER	FREQUENCY OF TRIPPING PER MONTH (NOS. / MONTH) 2046(1989)-2047(1990)																																		FREQUENCY OF TRIP/YEAR			LENGTH (KM)	FREQ/ YEAR/ KM	JUDGE
		APR-MAY BAISAKHA			MAY-JUN JESTHA			JUN-JUL ASADHA			JUL-AUG SHARAWAN			AUG-SEP BHADRA			SEP-OCT ASHWIN			OCT-NOV KARTIK			NOV-DEC MARGA			DEC-JAN POUSH			JAN-FEB MAGHA			FEB-MAR FALGUN			MAR-APR CHITRA								
		OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT					
NEW-BANESWAR	MAIN TR.	4	0	4	0	2	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	0	1	7	4	11	0.00	NA	
	BANESWAR	3	9	12	1	8	9	3	3	6	1	4	5	0	1	1	1	3	4	1	5	6	1	0	1	6	3	9	2	0	2	4	0	4	1	2	3	24	38	62	4.30	14.42	O
	AIR PORT	2	8	10	5	9	14	1	3	4	0	3	3	0	11	11	0	10	10	0	3	3	1	8	9	2	1	3	1	1	2	1	8	9	4	15	19	17	80	97	12.60	7.70	O
	SANKHA-MUL	1	2	3	6	7	13	0	7	7	0	11	11	0	17	17	4	8	12	0	4	4	0	5	5	1	4	5	1	1	2	2	2	4	1	1	2	16	69	85	4.10	20.73	O
	GODAWARI-1	0	0	0	0	0	0	0	0	0	0	5	5	1	26	27	5	28	33	1	17	18	1	5	6	0	4	4	0	11	11	0	14	14	0	8	8	8	118	126	35.40	3.56	X
	GODAWARI-2	0	0	0	0	0	0	0	0	0	0	16	16	2	26	28	0	15	15	4	24	28	1	8	9	3	16	19	0	6	6	0	2	2	10	38	48	20	151	171	40.40	4.23	X
	IMBDOL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.00	0.00	O
PATAN	RING ROAD	4	0	4	2	0	2	0	1	1	9	10	19	1	3	4	0	0	0	0	2	2	2	2	4	0	0	0	0	0	0	8	6	14	0	4	4	26	28	54	7.00	7.71	O
	RADIP-NEPAL	0	2	2	0	0	0	1	1	2	0	1	1	3	3	6	2	5	7	0	3	3	6	6	12	0	0	0	0	0	0	1	2	3	1	7	8	14	30	44	3.50	12.57	O
	NEW-PATAN-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.00	O
	NEW-PATAN-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.02	0.00	O
	JAWALAKHEL	1	0	1	1	0	1	4	3	7	8	8	16	6	5	11	5	2	7	0	1	1	0	0	0	0	0	0	3	3	6	2	0	2	1	1	2	31	23	54	3.70	14.59	O
	PATAN	3	2	5	1	0	1	1	1	2	5	5	10	4	4	8	7	5	12	2	3	5	0	0	0	7	5	12	1	0	1	1	1	2	5	0	5	37	26	63	3.10	20.32	O
	PHARPING	6	11	17	5	7	12	3	18	21	13	8	21	12	5	17	2	4	6	0	0	0	3	2	5	1	3	4	2	3	5	0	0	0	4	8	12	51	69	120	34.40	3.49	X
	MANGAL BAZAR	0	0	0	0	0	0	1	2	3	3	3	6	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	6	6	13	19	1.50	12.67	O
TEKU	PULCHOK	6	12	18	2	3	5	0	0	0	3	5	8	8	7	15	4	1	5	6	5	11	1	3	4	0	0	0	0	0	0	1	1	2	2	4	6	33	41	74	8.50	8.71	O
	KALIMATI	0	0	0	0	0	0	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	0.50	8.00	O
	KIRTIPUR	8	6	14	9	15	24	3	13	16	4	5	9	6	7	13	6	4	10	6	6	12	5	2	7	7	4	11	0	1	1	2	2	4	1	0	1	57	65	122	4.70	25.96	X
	BHIMSENSTHAN	5	5	10	3	2	5	5	3	8	9	2	11	7	4	11	2	1	3	1	1	2	4	4	8	2	1	3	0	0	0	0	0	0	1	0	1	39	23	62	4.90	12.65	O
	TEKU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	NA	
	THANKOT	2	3	5	2	0	2	1	3	4	5	5	10	0	0	0	1	1	2	0	0	0	0	1	1	0	1	1	1	1	2	0	1	1	4	2	6	16	18	34	3.50	9.71	O
	PATAN-1	0	0	0	1	0	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	4.51	0.67	O
	PATAN-2	0	0	0	1	0	1	1	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	4.51	0.67	O
	SIUCHATAR-1	0	0	0	1	4	5	1	4	5	0	6	6	1	3	4	1	3	4	0	4	4	0	3	3	0	1	1	0	0	0	0	0	0	0	0	0	4	28	32	3.00	10.67	O
	SIUCHATAR-2	0	0	0	2	1	3	1	1	2	1	1	2	3	1	4	1	1	2	0	2	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	8	9	17	3.00	5.67	O
	BALAJU-1	0	0	0	1	3	4	1	0	1	2	7	9	2	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	13	19	4.00	4.75	O
	BALAJU-2	0	0	0	1	1	2	0	0	0	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	5	6	4.00	1.50	O
	TRIPURESHOR	0	0	0	1	1	2	0	2	2	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	10	1.20	8.33	O
	MINT	4	6	10	6	10	16	3	3	6	5	8	13	1	15	16	5	8	13	2	2	4	1	1	2	1	4	5	1	1	2	2	2	4	1	1	2	32	61	93	2.30	40.43	O
	TAHACHAT	2	3	5	3	3	6	9	11	20	3	3	6	10	8	18	3	4	7	6	5	11	2	4	6	2	3	5	2	2	4	2	2	4	12	12	24	56	60	116	4.00	29.00	X
K-2	PATAN-1	0	1	1	0	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	7	7	4.83	1.45	O
	PATAN-2	0	2	2	0	3	3	0	0	0	0	1	1	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	8	4.83	1.66	O
	LAINCHOUR	0	2	2	0	0	0	0	1	1	0	0	0	0	0	0	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	2.00	3.00	O
	RAJDURBAR	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	5	5	1.00	5.00	O
	TANGAL	1	0	1	0	2	2	0	2	2	0	2	2	0	3	3	0	4	4	1	0	1	0	1	1	0	0	0	0	3	3	0	0	0	0	0	0	2	17	19	4.70	4.04	O
	KAMALADI	1	1	2	0	0	0	1	2	3	0	1	1	0	0	0	0	2	2	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	3	7	10	3.00	3.33	O
	CITY-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2.20	0.45	O
	CITY-1	0	0	0	0	0	0	0	2	2	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	2.50	1.60	O
	MAHABOUDHA	7	0	7	0	0	0	0	0	0	0	0	0	0	1	1	1	2	3	1	0	1	0	0	0	2	0	2	1	1	2	0	0	0	1	0	1	12	4	16	2.00	8.00	O
	BABARMAHAL	1	4	5	0	2	2	0	1	1	1	0	1	0	0	0	0	0	0	2	1	3	3	1	4	0	0	0	0	0	0	2	2	4	0	0	0	9	11	20	1.40	14.29	O
	SINGH-DURBAR	0	1	1	1	3	4	0	1	1	1	0	1	0	0	0	1	0	1	1	0	1	0	1	1	0	0	0	0	2	2	0	1	1	0	2	2	4	11	15	0.30	50.00	O
	KING'S WAY	0	2	2	1	2	3	2	1	3	0	1	1	1	4	5	0	0	0	0	1	1	0	1	1	0	0	0	2	2	4	0	2	2	0	0	0	6	16	22	4.20	5.24	O

Remarks:
OC: Overcurrent relay
EF: Earth fault relay
TT: Total

表 4.10　11kV配電線用遮断器の動作回数（3/4）

SUBSTATIONS	FEEDER	FREQUENCY OF TRIPPING PER MONTH (NOS. / MONTH) 2046(1989)-2047(1990)																																		FREQUENCY OF TRIP/YEAR			LENGTH (KM)	FREQ/ YEAR/ KM	JUDGE
		APR-MAY BAISAKHA			MAY-JUN JESTHA			JUN-JUL ASADHA			JUL-AUG SHARAWAN			AUG-SEP BHADRA			SEP-OCT ASHWIN			OCT-NOV KARTIK			NOV-DEC MARGA			DEC-JAN POUSH			JAN-FEB MAGHA			FEB-MAR FALGUN			MAR-APR CHITRA								
		OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT				
LAINCHOUR	BALAJU-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	3	1.2	2.5	O
	BALAJU-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1.2	1.667	O
	KATHMANDU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	*	NA	
	RAJDURBAR	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0.7	2.857	O
	NAYA BAZAR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2	3	5	2	2	4	0	0	0	0	0	0	2	2	4	5	3	8	12	11	23	9.2	2.5	O
	LAZIMPAT	8	5	13	0	0	0	1	1	2	0	5	5	4	3	7	0	0	0	4	4	8	6	6	12	1	1	2	0	3	3	4	2	6	34	0	34	62	30	92	3.3	27.88	O
	GAIRIDHARA	7	3	10	3	4	7	4	2	6	0	5	5	0	3	3	3	2	5	1	1	2	9	10	19	2	2	4	0	1	1	3	1	4	3	3	6	35	37	72	5.9	12.2	O
	KING'S WAY	7	4	11	1	1	2	1	1	2	0	1	1	0	0	0	4	3	7	1	1	2	2	1	3	1	1	2	0	3	3	1	1	2	4	0	4	22	17	39	4.8	8.125	O
	LAINCHOUR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	NA	
CHABEL	MAHARAJGUNJ	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3.8	0.263	O
	BALAJU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	O
	BANESWAR	1	1	2	1	1	2	5	3	8	0	1	1	0	2	2	0	0	0	0	0	0	0	2	2	0	3	3	2	2	4	3	2	5	4	2	6	16	19	35	3.5	10	O
	NAXAL	1	0	1	0	0	0	2	4	6	1	4	5	0	9	9	6	6	12	0	0	0	0	2	2	0	0	0	0	3	3	0	0	0	1	2	3	11	30	41	7	5.857	O
	BOUDHA-JORPATI	4	0	4	0	11	11	7	11	18	0	19	19	4	10	14	8	8	16	1	5	6	1	8	9	1	5	6	3	7	10	11	9	20	9	11	20	49	104	153	5	30.6	X
	NEW-CHABEL-1	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0.5	6	O
	NEW-CHABEL-2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0.5	2	O
	AIR PORT	2	2	4	0	3	3	4	2	6	1	1	2	2	2	4	3	2	5	1	1	2	1	3	4	0	1	1	0	4	4	0	2	2	4	0	4	18	23	41	4.5	9.111	O
	TANGAL	0	0	0	0	2	2	7	7	14	2	1	3	11	7	18	3	3	6	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	1	1	24	22	46	3.5	13.14	O
BHAKTAPUR	CHABEL-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9.6	0	O
	NAGARKOT	1	3	4	1	7	8	5	8	13	1	9	10	2	8	10	1	3	4	2	2	4	0	1	1	2	4	6	4	2	6	2	4	6	3	2	5	24	53	77	27.2	2.831	O
	THIMI-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.2	0	O
	BRICK	0	14	14	1	8	9	0	0	0	0	3	3	1	6	7	0	3	3	2	1	3	1	2	3	0	1	1	0	0	0	0	1	1	0	1	1	5	40	45	3.6	12.5	O
	KATUNJE	0	0	0	0	0	0	4	28	32	0	5	5	2	0	2	4	2	6	2	3	5	1	0	1	0	4	4	0	2	2	1	2	3	14	47	61	7	8.714	O
	BUS-COUPLER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	NA	
	KHOPASI	0	0	0	1	8	9	7	7	14	5	20	25	5	12	17	1	7	8	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	21	54	75	13.7	5.474	O
	THIMI-1	6	10	16	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	8	11	19	3.2	5.938	O
	BYASI	0	1	1	1	3	4	1	1	2	0	1	1	2	0	2	3	1	4	0	2	2	0	0	0	1	0	1	0	2	2	0	5	5	0	3	3	6	19	27	11.6	2.328	O
	CHABEL-1	0	1	1	0	6	6	2	8	10	1	6	7	5	3	8	2	4	6	1	3	4	6	1	7	1	0	1	1	0	1	0	2	2	1	0	1	19	32	51	9.6	5.313	O
	NALINCHOUK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	3	4	9	0	13	1	14	14.7	0.952	O
MAHARAJGUNJ	BALAJU	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	4	1	5	4.5	1.111	O
	CHABEL	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2.66	0.376	O
	KING'S WAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	O
	BALUWATAR	6	0	6	0	1	1	0	0	0	1	1	2	3	1	4	0	0	0	0	2	2	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	10	7	17	1	17	O
	BUDHANILKANTH	3	6	9	2	3	5	0	3	3	1	1	2	2	7	9	0	0	0	0	3	3	2	4	6	1	0	1	0	1	1	0	2	2	3	6	9	14	36	50	19.6	2.551	O
THIMI	PATAN-1	1	1	2	2	4	6	0	0	0	3	6	9	9	3	12	1	5	6	1	0	1	2	5	7	3	1	4	0	2	2	1	1	2	0	6	6	23	34	57	7.9	7.215	O
	PATAN-2	1	1	2	2	7	9	0	0	0	3	6	9	2	8	10	1	6	7	1	0	1	1	5	6	4	1	5	0	2	2	1	1	2	0	6	6	16	43	59	7.9	7.468	O
	THIMI	4	4	8	1	17	18	0	0	0	6	15	21	2	8	10	2	3	5	0	2	2	1	6	7	1	1	2	2	9	11	3	3	6	1	6	7	23	74	97	12.3	7.886	O
	TROLLEY-BUS	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0.9	2.222	O
	BHAKTAPUR-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.2	0	O
	BHAKTAPUR-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	3.2	0.313	O

Remarks:
OC: Overcurrent relay
EF: Earth fault relay
TT: Total

表 4.10　11kV配電線用遮断器の動作回数（4/4）

SUBSTATIONS	FEEDER	FREQUENCY OF TRIPPING PER MONTH (NOS. / MONTH) 2046(1989)-2047(1990)																																		FREQUENCY OF TRIP/YEAR			LENGTH (KM)	FREQ./ YEAR/ KM	JUDGE
		APR-MAY BAISAKHA			MAY-JUN JESTHA			JUN-JUL ASADHA			JUL-AUG SHARAWAN			AUG-SEP BHADRA			SEP-OCT ASHWIN			OCT-NOV KARTIK			NOV-DEC MARGA			DEC-JAN POUSH			JAN-FEB MAGHA			FEB-MAR FALGUN			MAR-APR CHITRA								
		OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT	OC	EF	TT			
THAPATHALI	INCOMER-1	1	0	1	3	0	3	11	0	11	3	0	3	4	0	4	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	2	2	0	0	0	23	3	26	1.7	15.29	O
	TEKU	1	0	1	2	1	3	3	0	3	1	1	2	1	0	1	0	0	0	1	1	2	0	0	0	1	1	2	2	0	2	2	1	3	0	0	0	14	5	19	1.8	10.56	O
	PATAN	4	2	6	4	2	6	5	3	8	3	0	3	6	0	6	0	0	0	1	0	1	1	1	2	4	0	4	3	1	4	2	2	4	4	2	6	37	13	50	3.8	13.16	O
	THAPATHALI	0	0	0	1	2	3	3	0	3	3	0	3	1	0	1	0	0	0	2	1	3	0	0	0	0	0	0	0	1	1	0	1	1	0	2	2	10	7	17	1.2	14.17	O
	SINGH-DURBAR	1	0	1	1	4	5	8	1	9	9	0	9	4	0	4	0	0	0	0	1	1	0	0	0	1	1	2	2	0	2	1	1	2	0	1	1	27	9	36	9.3	3.871	O
	SANEPA	1	1	2	3	4	7	1	6	1	1	0	1	2	0	2	0	0	0	6	1	7	2	1	3	0	0	0	0	1	1	0	0	0	2	1	3	18	9	27	2.8	9.643	O
	INCOMER-2	2	0	2	3	0	3	11	0	11	3	0	3	4	0	4	0	0	0	0	0	0	1	1	2	1	1	2	0	0	0	0	2	2	0	0	0	25	4	29	1.7	17.06	O
TOTAL		150	184	334	115	261	376	180	277	457	162	314	476	192	309	501	119	222	341	78	175	253	84	145	229	81	107	188	50	134	184	88	115	203	189	211	391	1479	2454	3933	742.6	5.296	

Remarks:
OC: Overcurrent relay
EF: Earth fault relay
T T: Total

表 4.11　Lalitpur地区に於ける配電用変圧器の利用率（1989/90）（1/3）

Name of Transformer			Peak Load Current				Utilization Factor
Tr.No.	KVA	Location	R	Y	B	Date	
11	100	Sat Dobato	100	98	75	Nov.15, 1989	0.693
12	100	" Ringroad	128	130	138	"	0.956
15	100	" Godawaryway	87	61	98	Nov.13, 1989	0.679
16	100	Batuki Bhairab	54	24	30	Mar.19, 1990	0.374
701	100	Talchikhel	106	111	93	Nov.16, 1989	0.769
702	100	Jwarkunj Ringroad	152	187	158	Dec.05, 1989	1.296
703	100	Kusunti	153	121	131	"	1.060
704	100	Tikhederal	140	130	125	Nov.16, 1989	0.970
706	100	Bagdol-Nakhu	112	66	93	Dec.16, 1989	0.776
707	25	Bagdol	162	-	-	Dec.11, 1989	4.489
708	100	Pattiba	146	137	185	Mar.19, 1990	1.282
704A	50	Nakhipot(Tikhedeva)	30	14	60	Nov.15, 1989	0.831
801	100	Lagankhel	135	158	128	Dec.09, 1989	1.095
-	100	Thasikhel	250	105	230	Dec.05, 1989	1.732
601A	100	Eebahal	80	75	85	Dec.19, 1989	0.589
602	250	Ekhalakhu	276	248	253	Nov.26, 1989	0.765
603	100	Balakha	126	106	129	Dec.01, 1989	0.894
604	100	Purnachandi	108	119	118	Nov.28, 1989	0.824
605	200	Gabahal	174	187	183	Dec.15, 1989	0.648
617	250	Mangal Bazar	150	135	115	Jan.06, 1990	0.416
617A	100	Mahapal	50	45	30	Sept.18,1989	0.346
618	200	Tangal	173	161	146	Dec.24, 1989	0.599
201	100	Naradera	130	85	77	Oct.04, 1989	0.901
202	100	Man Bhawan	150	195	140	Nov.24, 1988	1.351
205	100	Taphaloo	170	177	140	Nov.17, 1989	1.226
204	100	Kumaripati	110	124	115	Nov.27, 1989	0.859
205	100	Agnisala	102	152	109	Nov.23, 1989	1.053
206	200	Tadhoka	160	168	180	Nov.18, 1989	0.624
211	100	Jwarkunja	60	55	90	Aug.30, 1989	0.624
204B	100	Kumaripati	135	100	116	Nov.11, 1989	0.935
-	100	Patan Hospital	105	92	100	Nov.20, 1989	0.727
-	100	Bigi Iron	120	100	168	Nov.23, 1989	1.164
-	100	Dakhinkali	154	104	176	Mar.01, 1990	1.219
501	200	Lagankhel Bus Stop	242	205	284	Feb.18, 1990	0.984
502	100	Lagankhel Wood Depo	70	45	90	Jan.04, 1989	0.624
503	100	Lagankhel Podetole	137	117	92	Nov.14, 1989	0.949
-	100	Kani Bahal	75	54	103	Nov.06, 1989	0.714
507	100	Sincha-biry	80	75	50	Nov.17, 1988	0.554
506	150	Okubahal	100	195	155	Dec.14, 1989	0.901
508	100	Lukhusi	160	150	200	26-May-89	1.386
509	250	Dhalachhe	136	137	151	Nov.29, 1989	0.418
510	250	Tyagal	312	259	239	Dec.01, 1989	0.865
510A	100	Pillachhe	136	137	151	Nov.29, 1989	1.046
511	250	Pinchhe	334	357	306	Dec.01, 1989	0.989
512	250	Guitole	242	205	276	Dec.03, 1989	0.765

表 4.11　Lalitpur地区に於ける配電用変圧器の利用率（1989/90）（2/3）

Name of Transformer			Peak Load Current				Utilization
Tr.No.	KVA	Location	R	Y	B	Date	Factor
513	100	Bhul-dhoka	137	119	147	Dec.03, 1989	1.018
514	100	Chapat Ganesh	90	95	60	Oct.26, 1988	0.658
-	100	Gwarko	113	106	146	Dec.20, 1989	1.012
616	100	Bailachhe	102	95	115	Dec.20, 1989	0.797
616A	100	Bailachhe	110	101	110	Dec.20, 1989	0.762
615	250	Kobahal Tole	187	214	250	Nov.29, 1989	0.693
614	100	Kumbheswore	140	114	168	Nov.29, 1989	1.164
613	250	Kwalakhu	275	425	250	Dec.02, 1988	1.178
612	100	Dhapagal	110	100	115	Aug.25, 1989	0.797
609	200	Ekhachhe Tole	100	96	107	Dec.15, 1989	0.371
608	100	Tapahity	143	140	154	Dec.15, 1989	1.067
610	100	Nagabahal	106	93	121	Dec.07, 1989	0.838
606	250	Nakabahil	251	186	240	Dec.15, 1989	0.696
611	250	Dhallayacha	177	229	210	Dec.07, 1989	0.635
607	100	Ashok Hall	185	162	152	Dec.07, 1989	1.282
504	150	Thaina	210	138	182	Dec.24, 1989	0.970
517	250	Walkhu	60	135	150	Oct.03, 1987	0.416
505	100	Saugal Tole	125	150	120	Dec.23, 1988	1.039
-	100	Khhapinchhe	104	105	138	Nov.26, 1989	0.956
516A	100	Chyasal Tole	127	40	51	Nov.28, 1989	0.880
515	250	Neuta	228	258	210	Nov.28, 1989	0.715
516	250	Chyasal Tole	298	286	288	Nov.28, 1989	0.826
101	250	Kupandole	335	240	300	Dec.13, 1988	0.928
101A	100	Hotel Himalaya	114	78	133	Oct.20, 1989	0.921
104	100	Jwagal	119	157	163	Dec.12, 1989	1.129
105	250	Chakupat Bread	230	247	201	Nov.30. 1989	0.685
108	125	Sajha Bus	158	80	117	Feb.14, 1990	0.876
-	100	Jwagal	100	167	140	Dec.12, 1989	1.157
215	100	Chhyabahal	100	100	146	Dec.01, 1989	1.012
218	150	Pulchowk Police	167	150	155	Dec.04, 1989	0.771
219	100	Natole	110	195	135	Dec.01, 1989	1.351
102	100	Kandevtasthan	159	158	177	Dec.12, 1989	1.226
316	100	Tanginchauk	76	85	50	Nov.20, 1989	0.589
103	250	Kupandole(Aurbed)	365	360	330	Dec.12, 1989	1.012
309	100	Sanepa Amarabati	152	120	150	Nov.17, 1989	1.053
310	100	Gusingal	83	21	75	Nov.18, 1989	0.575
313	100	Nanicha Shop	79	87	98	Dec.12, 1989	0.679
314	100	Bakhundole Greenwich	95	116	129	Nov.20, 1989	0.894
315	100	"	100	109	75	Nov.24, 1989	0.755
-	100	"	141	151	140	Nov.21, 1989	1.046
212	150	Panchayat Training	161	143	156	Dec.13, 1989	0.744
213	100	Jawalakhel Busn Stop	103	78	141	Jan.23, 1990	0.977
214	100	Machagal	200	142	220	Oct.16, 1989	1.524
216	100	Damkal West	150	125	125	Sept.21,1987	1.039
217	100	Damkal East	210	195	236	Dec.19, 1989	1.635

表 4.11　Lalitpur地区に於ける配電用変圧器の利用率（1989/90）（3/3）

Name of Transformer			Peak Load Current				Utilization
Tr.No.	KVA	Location	R	Y	B	Date	Factor
307	100	Sanepa	108	91	84	Nov.28, 1989	0.748
308	100	"	135	113	158	Nov.24, 1989	1.095
709	100	Bhanimandal	238	167	232	Sept.03,1989	1.649
710	100	Gainda Goath	129	143	145	Dec.10, 1989	1.005
311	100	Sanchal	158	75	190	Nov.26, 1989	1.316
312	100	Sanepa Kalolpul	99	65	86	Nov.27, 1989	0.686
711A	150	Dhobighat	243	175	225	Dec.10, 1989	1.122
712	100	Dhobighat Chaur	155	139	175	Dec.07, 1989	1.212
713	100	Hari Shop	112	120	170	Dec.11, 1989	1.178
317	100	Ex.Military Organisatior	115	125	135	Apr.06, 1990	0.935
716	100	Jawalakhel Wood	40	55	70	Dec.31, 1988	0.485
-	100	Kharibot	140	118	121	Nov.18, 1989	0.970
-	100	Sanepa Sanchal	79	77	118	Nov.26, 1989	0.818
717	150	Tibetan Gumpa	128	170	60	Dec.13, 1989	0.785
708C	100	Pashupati Textile	107	93	82	Nov.26, 1989	0.741
909	100	Lubhu Police	120	135	150	Dec.10, 1989	1.039
910	250	Lubhu Bazar	350	350	400	Jan.13, 1989	1.109
911	250	Sanugaun Bazar	500	450	425	Jan.06, 1989	1.386
913	200	Sanugaun Purba	325	350	350	Jan.13, 1989	1.212
907A	50	Lamatar No.1	35	25	15	Jan.10, 1989	0.485
907B	50	Lamatar No.2	65	40	30	Jan.10, 1989	0.901
401D	200	Tuttepani	158	134	146	Feb.23, 1989	0.547
209	250	Chhayabahal	363	337	388	Nov.27, 1988	1.075
-	100	Nirbhawan	102	150	129	Dec.08, 1988	1.039
-	250	Sundhara	200	135	150	Oct.26, 1988	0.554
444	100	Thecho	120	85	90	Nov.16, 1987	0.831
444A	200	Thecho Bazar	105	150	170	Nov.16, 1987	0.589
419	200	Badegaun	120	150	135	Oct.14, 1987	0.520
417A	100	Thaiba Road	25	55	80	Nov.30, 1988	0.554
417	100	Thaiba City	150	95	135	Oct.16, 1987	1.039
414	250	Harisiddhi Chaur	385	430	475	Oct.16, 1987	1.316
414A	100	Harisiddhi Main Road	60	60	120	Nov.04, 1987	0.831
415	150	Harisiddhi City	200	200	200	Nov.04, 1987	0.924
Average	134.1		150.9	143.1	154.3		0.935

表 4.12　132kV及び66kV遮断器の定格

Substation	Rated Voltage	Rated Current	Breaking Current	B/L	Type
1. 132 kV Circuit Breakers					
Balaju	145 kV	1,250 A	20 kA	650 kV	GIS
Siuchatar	145 kV	800 A	25 kA	650 kV	SF6
2. 66 kV Circuit Breakers					
Balaju: Bus Tie	72.5 kV	1,250 A	20 kA	325 kV	GIS
Others	72.5 kV	630 A	20 kA	325 kV	GIS
Siuchatar	66 kV (Nominal)	800 A	13.1kA	350 kV	MINI OIL
New Patan	66 kV (Nominal)	800 A	13.1 kA	350 kV	MINI OIL
Sunkosi-Patan	*1	1,000 A	20 kA	*1	*1
New Baneswar	72 kV	600 A	12.5 kA	350 kV	SF6
New Chabel	66 kV (Nominal)	1,600 A	21.9 kA	325 kV	MINI OIL
Lainchaur *2	72.5 kV	630 A	20 kA	325 kV	GIS

*1: Information is not available
*2: Data for original CB before fire accident

表 4.13　11kV遮断器

Substation or Switching Station	Breaking Capacity	Type	Q'ty	Remarks
Balaju	20.0 kA	MINI OIL	16 nos.	AEG
Siuchatar	26.3 kA	MINI OIL	12 nos.	India. Mf.
New Patan	26.3kA	MINI OIL	11 nos.	India. Mf.
New Baneswar	25.0 kA	VC	10 nos.	Japanese Mf.
New Chabel	18.4 kA	BULK OIL	14 nos.	India. Mf.
Lainchaur (*1)	20.0 kA	V C	8 nos.	Chines. Mf.
Teku - A	7.88 kA	BULK OIL	11 nos.	English Elec.
- B	20.0 kA	BULK OIL	6 nos.	Yorkshire
K-2	25.0 kA	VC	18 nos.	Japanese Mf.
Royal Palace	7.88 kA	BULK OIL	5 nos.	English Elec.
Bhaktapur	20.0 kA	BULK OIL	11 nos.	Yorkshire
Old Chabel	7.88 kA	BULK OIL	10 nos.	English Elec.
Old Patan				
- Gen. Circuit	13.1 kA	BULK OIL	1 no.	English Elec.
- Mangal Line	20.0 kA	BULK OIL	1 no.	Yorkshire
- Others	7.88 kA	BULK OIL	11 nos.	English Elec.
Thimi	7.88 kA	BULK OIL	6 nos.	English Elec.
Maharajgunj	7.88 kA	BULK OIL	5 nos.	English Elec.
Thapathali	40.0 kA	MINI OIL	8 nos.	Japanese Mf.

(*1) Tempolary use.

表 5.1　発電所別発生電力量（1/2）

Unit: MWh

Description	Shrawan 7/8	Bhadra 8/9	Ashwin 9/10	Kartik 10/11	Marga 11/12	Poush 12/1	Magha 1/2	Falgun 2/3	Chitra 3/4	Baishak 4/5	Jestha 5/6	Asadha 6/7	Total
2040/41(83/84)	21572.8	23993.4	22649.4	22553.1	25182.2	28694.4	27761.2	25437.7	22694.1	21983.0	23876.7	23686.5	290084.5
Trishuli	7582.3	8744.7	8402.0	7999.2	8425.9	8496.8	8314.8	8349.0	7929.9	8092.8	8396.1	9403.3	100136.6
Devighat	2159.4	3825.0	2818.3	3677.4	2075.7	3073.8	3376.2	3280.7	2887.3	2859.6	4085.5	3423.5	37542.1
Sunkoshi	5304.0	5396.2	5236.3	5680.8	4897.0	3782.9	2880.0	2556.0	1152.5	3169.0	4533.1	4704.0	49291.7
Gandak	1582.2	3059.6	2674.9	2747.7	2422.7	1881.0	2146.2	2150.1	726.2	974.7	1714.0	1508.7	23588.0
Kulekhani I	4945.0	2968.0	3518.0	2448.0	7361.0	11460.0	11044.0	9102.0	9998.3	6887.0	5148.0	4647.0	79526.3
2041/42(84/85)	24680.5	23551.8	22896.8	24807.6	27225.0	32150.8	30173.6	28170.1	26202.0	25987.4	27607.2	28547.6	322000.4
Trishuli	9216.8	8305.9	6699.2	6024.0	7226.8	7958.2	7616.4	7999.1	8279.2	7154.8	6683.9	5950.0	89114.2
Devighat	107.8	3946.5	4213.6	3925.7	4389.6	5082.9	4884.3	4950.2	4566.8	4299.0	4145.9	3607.5	48119.8
Sunkoshi	3964.3	3734.2	5901.1	4005.1	2582.4	2561.8	2800.8	2684.2	2415.4	2656.3	4262.8	5155.2	42723.6
Gandak	2344.6	319.3	1367.9	4698.9	5270.2	2969.9	4271.1	4261.6	1684.7	1269.2	4198.6	3722.9	36378.8
Kulekhani I	9047.0	7246.0	4715.0	6154.0	7756.0	13578.0	10601.0	8275.0	9256.0	10608.0	8316.0	10112.0	105664.0
2042/43(85/86)	29217.6	29926.6	29940.1	28521.2	32923.9	37489.2	39494.9	35850.9	35704.2	36339.0	38832.1	39954.0	414193.5
Trishuli	5033.7	5883.8	7551.8	6398.2	7829.7	8011.1	8501.5	6351.2	6508.2	8735.3	8319.5	8704.7	87828.5
Devighat	3144.5	3495.7	3294.6	2982.1	4841.3	5546.3	4653.8	3358.2	4245.3	5549.6	5085.0	5308.1	51504.4
Sunkoshi	5566.9	5209.0	6385.4	6718.6	5788.8	4486.8	3343.2	3063.8	3093.1	4057.1	4991.1	4594.7	57298.5
Gandak	2532.4	2116.1	3688.3	3985.3	4444.2	4383.0	4484.4	4078.7	1404.6	2149.0	4570.6	5314.5	43151.1
Kulekhani I	12940.0	13222.0	9020.0	8437.0	10020.0	15062.0	18512.0	18999.0	20453.0	15848.0	15866.0	16032.0	174411.0
2043/44(86/87)	41763.5	38410.1	37645.5	37648.2	43316.3	49747.1	45620.6	45321.9	43143.5	44686.5	43303.2	44781.1	515387.4
Trishuli	8974.1	9247.2	9411.3	8720.2	8074.2	8155.3	8230.9	6262.3	6761.5	9114.8	9107.9	9373.6	101433.1
Devighat	5385.2	5271.9	5816.1	5619.7	5715.2	5661.4	3565.5	3500.2	2795.8	6077.8	6054.6	6138.7	61601.9
Sunkoshi	4802.4	4178.4	5940.5	4899.1	4607.5	4153.0	3003.4	2534.4	3288.0	3272.2	2863.7	1592.8	45135.2
Gandak	5029.9	4368.6	4501.6	5090.2	5631.5	5760.9	4774.8	4207.4	1911.0	2081.7	5790.3	3124.9	52272.7
Kulekhani I	17572.0	15344.0	11976.0	13319.0	14078.0	17260.0	17440.0	19250.0	18980.0	15952.0	12914.0	15511.0	189596.0
Kulekhani II					5209.9	8756.5	8606.1	9567.6	9407.3	8188.2	6572.8	9040.1	65348.5
2044/45(87/88)	43176.4	46214.6	43286.1	43239.0	46937.6	49758.6	48027.7	44239.0	41711.5	42923.1	44910.1	44855.5	539279.1
Trishuli	8898.6	8867.8	9580.5	9336.5	8991.6	8955.2	8250.3	8660.7	8805.3	8126.3	9219.8	9145.2	106837.8
Devighat	5214.5	5131.5	6442.4	6728.6	6505.8	6591.9	6038.7	6247.8	6414.6	5805.6	6435.8	5887.1	73444.1
Sunkoshi						845.3	2242.6	1168.3	696.3	1750.6	2185.4	1751.0	10639.5
Gandak	2297.1	3116.0	4415.8	5192.1	4991.2	5638.8	3280.4	3061.0	1480.6	2967.3	6254.9	3856.6	46551.8
Kulekhani I	15831.0	17780.0	14987.0	14478.0	17825.0	18740.0	19192.0	17068.0	16487.0	16402.0	14037.0	15340.0	198167.0
Kulekhani II	10935.2	11319.3	7860.4	7503.9	8624.0	8987.4	9023.8	8033.2	7827.6	7871.4	6777.2	8875.5	103638.9

表 5.1　発電所別発生電力量 (2/2)

Unit: MWh

Description	Shrawan 7/8	Bhadra 8/9	Ashwin 9/10	Kartik 10/11	Marga 11/12	Poush 12/1	Magha 1/2	Falgun 2/3	Chitra 3/4	Baishak 4/5	Jestha 5/6	Asadha 6/7	Total
2045/46(88/89)	48501.0	46299.5	46705.7	42392.7	43974.6	50762.3	47490.6	46996.8	37978.1	35398.4	37205.0	41221.2	524925.9
Trishuli	9682.1	9220.5	9305.3	9276.3	8893.2	8545.9	8501.7	9101.5	9260.0	9202.4	9184.5	8879.3	109052.5
Devighat	6217.5	5993.5	6496.5	6711.3	6569.8	6509.4	6532.7	6914.7	7122.6	6969.0	6855.8	6156.2	79048.8
Sunkoshi	2858.9	3875.5	3535.2	4270.1	4057.4	4196.2	4058.9	3545.3	4022.9	4653.1	4733.8	4770.7	48577.9
Gandak	2823.3	1122.8	1354.9	4878.7	5336.5	5555.4	5953.4	5137.8					32162.8
Kulekhani I	16808.0	15482.0	17011.0	12135.0	13273.0	17985.0	15563.0	15431.0	12139.0	10018.0	11209.0	13818.0	170872.0
Kulekhani II	10111.2	10605.3	9002.9	5121.3	5844.7	7970.4	6880.9	6866.6	5433.6	4555.9	5222.0	7597.0	85211.8
2046/47(89/90)	50442.5	51107.5	49042.8	53864.3	63746.3	66448.5	60992.6	56351.9	54349.4	59735.4	60525.3	60028.5	686634.8
Trishuli	8455.4	8584.1	8450.9	9006.4	8203.5	6938.5	7462.8	7660.6	7977.8	6348.6	8421.5	8670.4	96180.4
Devighat	6074.7	6157.6	6253.8	6880.6	6114.6	5264.1	5819.4	5933.5	6111.8	4727.5	6250.4	6233.2	71821.2
Sunkoshi	4269.1	4410.2	4446.2	5513.9	4380.0	3034.6	2960.2	3038.4	3255.4	3776.3	774.2	2503.7	42362.2
Gandak	4059.4	3248.6	4968.8	4983.4	5319.2	4215.3	3822.3	3654.4	2938.4	1388.9	5221.1	4970.3	48790.1
Kulekhani I	17250.0	18641.0	16134.0	10800.0	12007.0	13251.0	10828.0	8331.0	5902.0	6573.0	7262.0	5611.0	132590.0
Kulekhani II	10334.0	10066.0	8789.0	4783.0	5211.0	5628.0	4592.0	3603.0	2497.0	2694.0	3013.0	1690.0	62900.0
Marsyangdi				11897.0	22511.0	28117.0	25508.0	24131.0	25667.0	34227.0	29583.0	30350.0	231991.0

表 5.2　地域別、電力料金別販売電力量（1989/90）

Unit: MWh

	Central			East-	Western		Mid&Far	Total	(Share
	Bagmati	Jnakpur	Narayani	ern	Gandaki	Lumbini	Western		in %)
Domestic	150,883	5,767	23,154	16,455	10,863	15,565	7,796	230,483	42.2
Non-commercial	27,586	1,539	3,479	4,267	5,252	1,831	3,001	46,955	8.6
Commercial	27,148	749	1,992	1,289	1,038	497	1,090	33,803	6.2
Industrial	43,082	10,952	60,286	38,884	4,491	14,617	5,908	178,220	32.6
Water Supply	7,464	318	505	1,345		1,910	387	11,929	2.2
Irrigation	207	1,701	8,147	100		1,661	149	11,965	2.2
Street Right	2,962	277	668	837	85	1,146	1,272	7,247	1.3
Temporary Supply	116		112	43	39	20	65	395	0.1
Transportation	1,882		160				18	2,060	0.4
Temples	115	17		96		25	12	265	0.0
Bulk Supply(Expo)			3,978	1,631		17,677		23,286	4.3
Total	261,445	21,320	102,481	64,947	21,768	54,949	19,698	546,608	100.0
(Share in %)	47.8	3.9	18.7	11.9	4.0	10.1	3.6	100.0	

Source: NEA Commercial Department, Revenue Division
Statement of units sold, revenue analisys no. of consumers and collection

表 5.3　過去5年間の需要家数の推移

	1985/86	1986/87	1987/88	1988/89	1989/90
Domestic	175,860	208,870	230,178	251,753	274,921
Industrial	4,575	5,464	6,181	6,769	7,482
Commercial	527	315	641	1,678	1,758
Non-commercial	1,881	1,768	2,403	3,477	4,506
Transportation	8	8	8	9	9
Irrigation			311	343	382
Water Supply	277	351	77	105	112
Temples			59	152	205
Street Light	318	675	1,474	385	517
Temporary Supply	113	275	145	104	123
Total	183,559	217,726	241,477	264,775	290,015

Source : Commercial Department, Policy Division

表 5.4　電化率の推移

Year	Whole Nepal			Bagmati Zone		
	Populat. (1000)	Customer	E.Ratio (%)	Populat. (1000)	Customer	E.Ratio (%)
1981/82	15,020	119,435	4.77	1,780	86,051	29.01
1982/83	15,421	131,651	5.12	1,828	83,392	27.37
1983/84	15,833	139,418	5.28	1,876	86,218	27.58
1984/85	16,256	162,040	5.98	1,926	100,171	31.21
1985/86	16,690	182,938	6.58	1,978	111,343	33.77
1986/87	17,123	208,870	7.32	2,029	119,460	35.33
1987/88	17,581	230,178	7.86	2,083	131,096	37.76
1988/89	18,050	215,753	7.17	2,139	142,886	40.08
1989/90	18,532	274,921	8.90	2,196	155,599	42.51

Source : NEA Commercial Department, Policy Division

(Remarks) (1) Base of population : 1981 Census
(2) Growth rate of population : 2.67%
(3) Averaged household size : 6 persons

表 5.5　1990年1月5日の時間別発電所出力

UNIT:MW

Time	MRS	KL-1	KL-2	TRL	DEV	SNK	GDK	PAN	SUN	BUT	STI	FEW	TOTAL
24.00	44.00			11.00	8.50	4.20	7.60	0.50	0.60	0.29	1.32	0.75	78.76
1.00	42.90			9.20	8.50	4.20	7.60		0.30	0.23	1.22	0.76	74.91
2.00	43.20			9.20	7.50	3.90	7.40		0.30	0.23	1.22	0.76	73.71
3.00	42.20			9.20	7.00	3.90	7.50		0.30	0.23	1.22	0.76	72.31
4.00	41.40			9.20	7.00	4.00	7.50		0.60	0.23	1.22	0.76	71.91
5.00	49.00			9.20	7.00	4.00	4.20	0.60	0.60	0.26	1.20	0.77	76.83
6.00	53.30	11.20	2.60	11.00	7.00	4.60	7.10	0.60	0.60	0.31	1.20	0.76	100.27
7.00	50.30	28.00	13.50	11.00	9.00	6.00	7.30	0.60	0.60	0.37	1.20	0.76	128.63
8.00	54.00	31.20	16.30	11.00	9.00	5.80	6.40	0.60	0.60	0.30	1.20	0.72	137.12
9.00	42.80	31.40	15.10	11.00	9.00	5.00	7.30	0.60	0.60	0.29	1.20	0.72	125.01
10.00	40.80	27.80	9.60	11.00	9.00	4.30	7.70	0.60	0.60	0.26	1.20	0.72	113.58
11.00	38.70	23.80	14.70	11.00	8.50	3.90	4.10	0.60	0.34	0.23	1.20	0.75	107.82
12.00	35.90	17.50	9.30	11.00	8.50	3.90	6.40	0.60	0.34	0.20	1.20	0.75	95.59
13.00	34.00	14.10	7.80	11.00	8.50	3.90	8.10		0.34	0.14	1.20	0.61	89.69
14.00	41.00	12.10	4.80	11.00	8.50	2.80	8.10		0.34	0.11	1.20	0.42	90.37
15.00	40.20	16.20	7.30	11.00	8.00	2.70	7.90		0.34	0.26	1.20	0.40	95.50
16.00	41.50	17.20	7.70	11.00	8.00	2.80	7.80		0.34	0.26	1.22	0.59	98.41
17.00	56.50	16.40	7.60	11.00	8.00	3.20	7.60	0.50	0.60	0.26	1.22	0.76	113.64
18.00	54.60	53.10	24.60	11.00	8.50	4.50	7.60	1.00	0.60	0.40	1.22	0.78	167.90
19.00	52.10	56.10	26.40	11.00	8.50	6.00	7.50	1.00	0.60	0.46	1.22	0.77	171.65
20.00	42.30	54.20	25.70	11.00	8.50	6.00	7.40	1.00	0.60	0.46	1.11	0.76	159.03
21.00	47.50	36.70	14.60	11.00	8.50	5.80	7.10	1.00	0.60	0.41	1.11	0.75	135.07
22.00	41.20	25.30	5.30	11.00	8.50	4.30	5.90	0.50	0.60	0.37	1.11	0.75	104.83
23.00	46.00	4.70	4.60	11.00	8.50	4.00	5.00	0.50	0.60	0.34	1.11	0.75	87.10
24.00	39.70			11.00	8.50	3.80	5.50	0.50	0.60	0.31	1.11	0.75	71.77
Total	1115.10	477.00	217.50	266.00	206.00	107.50	173.60	11.30	12.54	7.21	29.83	17.83	2641.41

1) Daily load factor of the day: 62.2%
2) Maximum peak demand of 176.2 MW of the year was recorded at 18:30 p.m. of the day.

Note:

MRS: Marsyangdi
KL-1: Kulekhani-1
KL-2: Kulekhani-2
TRL: Trishuli
DEV: Devigat
SNK: Sunkoshi
GDK: Gandak
PAN: Panauti
SUN: Sundarijal
BUT: Butwal
STI: Seti
FEW: Fewa

表 5.6　カトマンズ盆地内の支店別、電力料金別の月別販売電力量（1/3）

KATHMANDU CENTRAL

Unit: MWh

Months	DOM	NCOM	COM	IND	WSPL	IRR	SLGT	TSPL	TRNS	TMPL	BLK	TOTAL
Sharwan	4,965.2	1,002.0	1,231.4	487.6	167.8	0.0	82.6	0.0	0.3	0.0	0.0	7,936.9
Bhadra	5,113.9	981.1	1,345.9	497.9	230.9	0.0	83.8	0.0	0.7	0.0	0.0	8,254.2
Ashwin	4,988.8	805.3	1,213.7	617.5	129.6	0.0	140.8	0.0	0.7	0.0	0.0	7,896.4
Kartik	5,706.9	953.3	1,593.2	491.9	348.3	0.0	134.3	0.0	0.6	0.0	0.0	9,228.5
Marga	6,760.8	1,039.6	1,535.6	594.1	170.6	0.0	142.0	0.0	0.5	0.0	0.0	10,243.2
Poush	7,231.4	1,438.1	1,749.1	741.1	190.4	0.0	164.7	0.0	0.9	0.0	0.0	11,515.7
Magha	7,031.8	1,274.1	1,524.1	704.9	168.6	0.0	155.5	0.0	0.9	0.0	0.0	10,859.9
Falgun	6,520.0	1,409.6	1,537.8	774.5	243.5	0.0	158.1	0.0	1.2	0.0	0.0	10,644.7
Chaitra	6,103.2	1,143.6	1,434.5	687.2	202.0	0.0	293.5	0.0	0.7	0.0	0.0	9,864.7
Baishak	5,635.9	839.6	1,319.7	580.4	172.4	0.0	269.6	0.0	0.3	0.0	0.0	8,817.9
Jestha	5,484.1	927.0	1,130.7	606.0	219.3	0.0	279.8	0.0	0.5	0.0	0.0	8,647.4
Asadha	5,486.2	983.6	1,457.5	606.2	174.0	0.0	277.3	0.0	0.4	0.0	0.0	8,985.2
Total	71,028.2	12,796.9	17,073.2	7,389.3	2,417.4	0.0	2,182.0	0.0	7.7	0.0	0.0	112,894.7

KATHMANDU EAST

Unit: MWh

Months	DOM	NCOM	COM	IND	WSPL	IRR	SLGT	TSPL	TRNS	TMPL	BLK	TOTAL
Sharwan	1,457.6	303.8	182.2	253.7	127.1	0.7	0.3	0.1	87.3	3.4	0.0	2,416.2
Bhadra	1,616.3	279.0	221.2	239.6	265.3	0.7	0.3	0.1	95.9	4.2	0.0	2,722.6
Ashwin	1,672.0	448.9	319.5	245.3	142.5	0.1	0.6	0.2	92.0	4.0	0.0	2,925.1
Kartik	1,729.7	157.6	76.6	245.7	203.0	0.3	0.7	0.1	84.3	5.1	0.0	2,503.1
Marga	1,953.3	393.2	182.3	294.0	176.1	1.0	0.6	0.1	84.9	4.8	0.0	3,090.3
Poush	2,147.7	308.1	193.6	330.7	123.6	0.7	0.9	0.2	66.0	13.6	0.0	3,185.1
Magha	2,039.9	341.0	169.9	334.5	161.8	1.0	0.0	0.2	101.2	13.5	0.0	3,163.0
Falgun	1,970.8	357.2	169.2	367.8	166.1	0.4	0.0	0.3	90.2	13.9	0.0	3,135.9
Chaitra	1,888.0	325.1	158.8	368.2	185.9	0.3	3.6	0.2	92.4	14.6	0.0	3,037.1
Baishak	1,754.5	282.5	197.8	315.5	167.6	0.3	0.0	0.2	81.4	13.9	0.0	2,813.7
Jestha	1,725.7	238.7	158.8	343.5	174.0	0.1	2.7	0.1	88.0	10.8	0.0	2,742.4
Asadha	1,730.9	282.7	236.3	294.9	167.3	0.4	2.5	0.1	88.0	10.7	0.0	2,813.8
Total	21,686.4	3,717.8	2,266.2	3,633.4	2,060.3	6.0	12.2	1.9	1,051.6	112.5	0.0	34,548.3

NOTES :

DOM	:	Domestic	WSPL	:	Water supply	TRNS	:	Transportation
NCOM	:	Non-commercial	IRR	:	Irrigation	TMPL	:	Temple
COM	:	Commercial	SLGT	:	Street light	BLK	:	Bulk supply
IND	:	Industrial	TSPL	:	Temporary			

表 5.6　カトマンズ盆地内の支店別、電力料金別の月別販売電力量（2/3）

KATHMANDU WEST

Unit: MWh

Months	DOM	NCOM	COM	IND	WSPL	IRR	SLGT	TSPL	TRNS	TMPL	BLK	TOTAL
Sharwan	1,254.7	220.2	456.2	1,290.5	176.7	0.0	13.2	0.1	0.0	0.0	0.0	3,411.6
Bhadra	1,347.4	240.3	564.1	1,085.6	167.4	0.0	13.2	0.1	0.0	0.0	0.0	3,418.1
Ashwin	1,349.5	246.9	523.6	1,115.7	216.5	0.0	13.2	0.1	0.0	0.0	0.0	3,465.5
Kartik	1,435.8	197.1	470.7	874.8	169.5	0.0	13.2	0.0	0.0	0.0	0.0	3,161.1
Marga	1,678.9	486.3	409.5	1,191.1	165.8	0.0	13.2	1.3	0.0	0.0	0.0	3,946.1
Poush	1,827.6	331.1	441.9	1,279.7	165.6	0.0	13.2	0.1	0.0	0.0	0.0	4,059.2
Magha	1,700.6	350.2	389.1	1,233.2	174.4	0.0	13.2	0.7	0.0	0.0	0.0	3,861.4
Falgun	1,567.6	299.7	387.7	1,165.4	183.3	0.0	13.2	0.1	0.0	0.0	0.0	3,617.0
Chaitra	1,620.2	260.8	418.5	1,181.8	197.5	0.0	13.2	0.1	0.0	0.0	0.0	3,692.1
Baishak	1,458.7	216.9	423.8	895.6	134.9	0.0	13.2	0.8	0.0	0.0	0.0	3,143.9
Jestha	1,383.0	237.6	407.4	1,231.4	113.9	0.0	13.2	0.7	0.0	0.0	0.0	3,387.2
Asadha	1,404.9	241.7	564.7	1,613.2	233.4	0.0	13.2	0.6	0.0	0.0	0.0	4,071.7
Total	18,028.9	3,328.8	5,457.2	14,158.0	2,098.9	0.0	158.4	4.7	0.0	0.0	0.0	43,234.9

LALITPUR

Unit: MWh

Months	DOM	NCOM	COM	IND	WSPL	IRR	SLGT	TSPL	TRNS	TMPL	BLK	TOTAL
Sharwan	1,860.5	299.4	187.7	871.8	20.3	0.0	21.5	2.8	3.0	0.0	0.0	3,267.0
Bhadra	1,992.0	373.3	160.5	893.4	26.7	0.0	21.5	2.4	14.8	0.0	0.0	3,484.6
Ashwin	1,935.2	928.1	228.7	343.7	29.7	0.0	21.5	5.0	2.8	0.0	0.0	3,494.7
Kartik	1,982.2	221.1	114.3	685.1	24.8	0.0	21.5	2.2	5.7	0.0	0.0	3,056.9
Marga	2,285.7	603.9	258.9	1,116.8	20.4	0.0	21.5	8.8	22.3	0.0	0.0	4,338.3
Poush	2,565.2	363.2	245.2	882.1	21.5	0.0	21.5	4.3	0.0	0.0	0.0	4,103.0
Magha	2,428.6	430.9	196.3	1,014.6	32.5	0.0	21.5	4.3	0.0	0.0	0.0	4,128.7
Falgun	2,308.1	454.5	218.1	1,074.2	20.2	0.0	21.5	6.6	0.0	0.0	0.0	4,103.2
Chaitra	2,240.0	434.6	211.8	1,072.3	20.6	0.0	21.5	11.4	0.0	0.0	0.0	4,012.2
Baishak	1,943.7	306.1	181.9	932.8	21.1	0.0	21.5	6.7	0.0	0.0	0.0	3,413.8
Jestha	1,990.9	290.4	123.7	890.6	18.8	0.0	21.5	4.7	0.0	0.0	0.0	3,340.6
Asadha	2,035.0	285.3	154.8	958.8	23.5	0.0	21.5	5.8	0.0	0.0	0.0	3,484.7
Total	25,567.1	4,990.8	2,281.9	10,736.2	280.1	0.0	258.0	65.0	48.6	0.0	0.0	44,227.7

NOTES :

DOM	:	Domestic	WSPL	:	Water supply	TRNS	: Transportation
NCOM	:	Non-commercial	IRR	:	Irrigation	TMPL	: Temple
COM	:	Commercial	SLGT	:	Street light	BLK	: Bulk supply
IND	:	Industrial	TSPL	:	Temporary		

表 5.6　カトマンズ盆地内の支店別、電力料金別の月別販売電力量（3/3）

BHAKTAPUR

Unit: MWh

Months	DOM	NCOM	COM	IND	WSPL	IRR	SLGT	TSPL	TRNS	TMPL	BLK	TOTAL
Sharwan	534.9	124.3	3.0	236.4	44.8	0.2	24.0	0.9	60.1	0.0	0.0	1,028.6
Bhadra	547.4	143.3	4.1	267.5	46.4	0.5	24.0	1.3	70.6	0.0	0.0	1,105.1
Ashwin	545.7	120.9	3.9	260.1	48.1	0.0	0.0	1.6	56.5	0.0	0.0	1,036.8
Kartik	582.2	141.9	3.6	309.5	48.9	0.0	24.0	1.8	58.0	0.0	0.0	1,169.9
Marga	583.9	179.8	3.6	303.5	48.9	0.0	24.0	1.1	79.0	0.0	0.0	1,223.8
Poush	624.8	231.2	5.0	343.7	47.3	0.0	24.0	1.5	74.5	0.0	0.0	1,352.0
Magha	672.4	208.2	5.0	391.5	44.1	0.0	24.0	1.7	76.3	0.0	0.0	1,423.2
Falgun	585.7	171.3	4.0	345.1	43.8	0.0	24.0	1.4	54.8	0.0	0.0	1,230.1
Chaitra	634.8	150.4	3.8	366.3	47.1	0.0	24.0	1.1	62.2	0.0	0.0	1,289.7
Baishak	694.5	126.4	2.3	303.8	54.4	0.0	24.0	1.1	57.7	0.0	0.0	1,264.2
Jestha	654.1	117.0	2.1	320.1	63.0	0.0	24.0	1.4	58.0	0.0	0.0	1,239.7
Asadha	623.8	111.6	2.7	297.0	59.2	0.0	24.0	1.1	66.1	0.0	0.0	1,185.5
Total	7,284.2	1,826.3	43.1	3,744.5	596.0	0.7	264.0	16.0	773.8	0.0	0.0	14,548.6

NOTES :
DOM : Domestic
NCOM : Non-commercial
COM : Commercial
IND : Industrial
WSPL : Water supply
IRR : Irrigation
SLGT : Street light
TSPL : Temporary
TRNS : Transportation
TMPL : Temple
BLK : Bulk supply

表 5.7　1990年1月5日午後5時に於ける各変電所の最大負荷

Name	Max. Demand (MW)
Siuchatar Substation	6.34
Balaju Substation	5.37
New Chabel Substation	1.74
Baneswar Substation	13.50
Lainchaur Substation	6.89
Patan Substation	- (*1)
K-2 Switching Station	12.40
Teku Switching Station	9.03
Old Patan Switching Station	7.22
Thapathali Switching Station	5.30
Old Chabel Switching Station	8.08
Maharajgunj Switching Station	1.97
Thimi Switching Station	1.78
Bhaktapur Switching Station	5.61
Total	85.23 MW

(Note) *1: No feeder line is fed.

表 5.8　現行の電力料金体系

(Since May 14, 1989)

Category	Minimum/demand charges		Consumption charges		Charge for metering	
Domestic	Upto 2.5 Ampere for minimum allowance of 25 KWh:	NRs. 9.0/month	1 KWh upto 75 KWh:	NRs.1.20/KWh	Upto 2.5 Ampere meter capacity:	NRs. 2/month
	2.5 A upto 15 A for minimum allowance of 25 KWh:	NRs. 30.0/month	Thereafter:		Above 2.5 A upto 30 A meter capacity:	NRs. 5/month
	15 A upto 30 A for minimum allowance of 50 KWh:	NRs. 60.0/month	76 KWh upto 200 kWh:	NRs.1.30/KWh	All above 30 A meter capacity:	NRs. 10/month
	31 A upto 60 A for minimum allowance of 75 KWh:	NRs. 90.0/month	over 201 KWh:	NRs.1.60/KWh		
	61 A upto 100 A for minimum allowance of 100 KWh	NRs. 122.5/month				
	101 A over for minimum allowance of 300 KWh:	NRs. 412.5/month				
Commercial	Supply at 400/200 V:	NRs. 108.0/Kw/month		NRs.1.60/KWh		
	Supply at 11 KV and above:	NRs. 100.0/Kw/month		NRs.1.50/KWh	--	
	Others upto 25 Kh:	NRs. 80.0/Kw/month		NRs.1.65/KWh		
Non-commercial		NRs. 100.0/month		NRs.1.80/KWh		
Temple		NRs.10.0/month and KWh allowance		NRs.1.10/KWh		
Industrial	(A) Rural/cottage upto 12 Kw/15Hp capacty	NRs. 20.0/month		NRs.1.20/KWh		
	(B) By voltage: - 400/220 V above 12 upt 50 KW	NRs. 75.0/Kw/month		NRs.1.25/KWh	--	
	- 11 Kv	NRs. 70.0/Kw/month		NRs.1.20/KWh		
	- 33 Kv	NRs. 65.0/Kw/month		NRs.1.10/KWh		
	- 66 Kv	NRs. 60.0/Kw/month		NRs.0.95/KWh		
	- 132 Kv	NRs. 50.0/Kw/month		NRs.0.85/KWh		
Irrigation	(A) Small scale (10 KVA and 400/220 V supply)	NRs. 20.0/Kw/month		NRs.0.80/KWh		
	(B) By voltage: - 400 V above 10 upto 25 KVA	NRs. 45.0/Kw/month		NRs.0.80/KWh	--	
	- 11 Kv	NRs. 40.0/Kw/month		NRs.0.70/KWh		
	- 33 Kv	NRs. 35.0/Kw/month		NRs.0.65/KWh		
Water supply at 400 V supply		NRs. 57.0/Kw/month		NRs.0.70/KWh	--	
Supply at 11 Kv and above		NRs. 50.0/Kw/month		NRs.0.65/KWh		
Transportation		NRs. 66.0/Kw/month		NRs.0.70/KWh	--	
Street light	(A) Supply through meter	-		NRs.1.25/KWh	--	
	(B) Supply without meter	-		NRs.0.50/KWh		
Temporary supply	(A) Supply through meter	-		NRs.3.70/KWh	--	
	(B) Supply without meter	-		NRs.1.75/KWh		

Source: Nepal Electricity Authority

表 6.1　NEAの1986年の需要予測結果（全国）

Year	Generation (GWh)		Peak Load (MW)
	National	Inter-connected	Inter-connected
2040/41 : 1983/84	381.15	324.96	76.0
2041/42 : 1984/85	421.05	351.91	79.7
2042/43 : 1985/86	498.55	473.27 (1)	107.1
2043/44 : 1986/87	589.32	557.46	124.0
2044/45 : 1987/88	675.76	635.49	141.1
2045/46 : 1988/89	757.57	709.67	157.7
2046/47 : 1989/90	817.49	786.97 (2)	177.4
2047/48 : 1990/91	881.50	869.84 (3)	196.3
2048/49 : 1991/92	958.76	946.01	213.3
2049/50 : 1992/93	1038.10	1038.10 (4)	233.8
2050/51 : 1993/94	1121.54	1121.54	251.8
2051/52 : 1994/95	1204.24	1204.24	269.5
2052/53 : 1995/96	1281.28	1281.28	286.5
2053/54 : 1996/97	1357.80	1357.80	303.6
2054/55 : 1997/98	1439.65	1439.65	321.7
2055/56 : 1998/99	1524.85	1524.85	340.7
2056/57 : 1999/00	1613.31	1613.31	360.5
2057/58 : 2000/01	1705.41	1705.41	381.2
2058/59 : 2001/02	1801.27	1801.27	402.9
2059/60 : 2002/03	1901.37	1901.37	425.8
2060/61 : 2003/04	2005.32	2005.32	449.8
2061/62 : 2004/05	2113.59	2113.59	475.0
2062/63 : 2005/06	2225.75	2225.75	501.3

Remarks:

(i) 1983/84 and 1984/85 values are actual.
(ii) 1985/86 values are estimated.

(1) Interconnection of Koshi and Janakapur.
(2) Interconnection of Mechi and Rapti-Bheri
(3) Interconnection of Sagarmatha
(4) Interconnection of Seti-Mahakali

Source : Electricity Load Forecast -1986, Main Report Vol.1 Table 10.4, NEA

表 6.2　EDFの需要予測結果（連けい系統）

	Medium			High			Low		
	Consum (GWh)	Produ. (GWh)	Peak (MW)	Consum (GWh)	Produ. (GWh)	Peak (MW)	Consum (GWh)	Produ. (GWh)	Peak (MW)
1987/88	442.0	611.0	141.0	442.0	611.0	141.0	442.0	611.0	141.0
1988/89	482.0	656.0	150.0	482.0	656.0	150.0	482.0	656.0	150.0
1989/90	510.0	691.0	160.0	523.0	709.0	164.0	502.0	681.0	157.0
1990/91	556.0	739.0	169.0	585.0	778.0	178.0	537.0	714.0	165.0
1991/92	616.5	810.9	185.5	663.6	872.8	199.8	583.2	767.0	176.9
1992/93	683.6	889.8	203.5	752.8	979.9	224.2	633.3	824.3	189.8
1993/94	758.0	976.6	223.4	854.0	1100.3	251.7	687.7	886.0	203.5
1994/95	840.5	1072.0	245.1	968.8	1235.6	282.4	746.8	952.5	218.2
1995/96	932.0	1176.8	269.0	1099.0	1388.0	317.0	811.0	1024.0	234.0
1996/97	1029.4	1296.5	296.3	1224.0	1541.6	352.1	882.5	1111.4	253.9
1997/98	1137.0	1428.4	326.3	1363.1	1712.6	391.1	960.2	1206.3	275.5
1998/99	1255.8	1573.8	359.4	1518.1	1902.6	434.4	1044.8	1309.4	299.0
1999/00	1387.0	1734.0	395.9	1690.8	2113.7	482.6	1136.8	1421.2	324.4
2000/01	1532.0	1910.0	436.0	1883.0	2348.0	536.0	1237.0	1543.0	352.0
2001/02	1658.5	2965.6	469.6	2045.5	2547.6	579.3	1341.8	1671.2	379.9
2002/03	1795.3	2233.3	505.8	2222.0	2764.0	626.0	1455.5	1810.6	410.0
2003/04	1943.5	2414.7	544.8	2413.7	2998.8	676.6	1578.9	1961.6	442.6
2004/05	2103.9	2610.8	586.8	2621.9	3253.6	731.2	1712.6	2125.2	477.6
2005/06	2277.6	2822.8	632.0	2848.2	3530.0	790.2	1857.8	2302.5	515.5
2006/07	2465.6	3052.0	680.7	3093.9	3829.8	854.0	2015.2	2494.5	556.4
2007/08	2669.1	3299.9	733.1	3360.8	4155.2	923.0	2185.9	2702.6	600.5
2008/09	2889.4	3567.9	789.6	3650.8	4508.2	997.5	2371.1	2928.0	648.1
2009/10	3127.8	3857.7	850.5	3965.8	4891.2	1078.0	2572.1	3172.3	699.5
2010/11	3386.0	4171.0	916.0	4308.0	5307.0	1165.0	2790.0	3437.0	755.0

Sourse : Ten Year Transmission and Distribution Plan, Load Forecast Study, EDF Dec. 1989

表 6.3　経済成長率（1974/75価格）

	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	81-89	85-89
National	20920	20297	22262	23630	24645	25617	27624	28263	28831		
Increse(%)		-2.98	9.68	6.15	4.30	3.94	7.83	2.31	2.01	4.091	4.000
Agriculture	12616	12478	13668	13990	14705	14789	15993	17013	17563		
Share (%)	60.31	61.48	61.40	59.20	59.67	57.73	57.90	60.20	60.92		
Increse(%)		-1.09	9.54	2.36	5.11	0.57	8.14	6.38	3.23	4.222	4.540
Non-agriculture	8304	7819	8594	9640	9940	10828	11631	11250	11268		
Share (%)	39.69	38.52	38.60	40.80	40.33	42.27	42.10	39.80	39.08		
Increse(%)		-5.84	9.91	12.17	3.11	8.93	7.42	-3.28	0.16	3.889	3.185

Remarks :

1) 1987/88:Revised preliminary estimates.
2) 1988/89:Preliminary estimates.
3) 1989/90:Tentative estimates.

表 6.4　1989/90～2010/11の経済成長率の予測値

Year	GDP	Non-agriculture	Agriculture
1989/90	0.40	1.00	0.00
1990/91	2.30	0.96	3.20
1991/92	4.30	4.45	4.20
1992/93	4.30	4.45	4.20
1993/94	4.30	4.45	4.20
1994/95	4.30	4.45	4.20
1995/96	4.30	4.45	4.20
1996/97	5.20	6.70	4.20
1997/98	5.20	6.66	4.20
1998/99	5.20	6.63	4.20
1999/00	5.20	6.60	4.20
2000/01	5.20	6.57	4.20
2001/02	5.20	6.54	4.20
2002/03	5.20	6.51	4.20
2003/04	5.20	6.48	4.20
2004/05	5.20	6.45	4.20
2005/06	5.20	6.42	4.20
2006/07	5.20	6.40	4.20
2007/08	5.20	6.37	4.20
2008/09	5.20	6.35	4.20
2009/10	5.20	6.33	4.20
2010/11	5.20	6.30	4.20

Note: Growth rate of non-agriculture GDP is worked out from that of total GDP and agriculture GDP which are previously assumed, taking into account of change in composition of non-agriculture and agriculture GDP.

表 6.5　確定している工場開発計画（200kW以上）

S. No.	Name	Power Request > 200 kW
Region : Central Development		
Zone : Bagmati	Branch : Kathmandu	
1.	Everest Milk Food Industries	250 kW
2.	Swastik Textile Products	72,000 units
3.	Maskay Pole Industries, Naikab	200 kW
4.	Nepal Metal Company, Ganesh Himal	2,000 kW
Zone : Bagmati	Branch : Bhaktapur	
1.	Heem Elctronics	450 kW
2.	Nepal Orind Magnesite Pvt. Ltd., Lamosangu	2,000 kW
Zone : Narayani		
1.	Birgunj Brick Tile Factory, Parsa	300 kVA
2.	Nepal Bitmen and Barrel Industries, Bara	500 kVA
3.	Tam Lakhan Khandsari, Rasua	275 KVA
Zone : Gandaki		
1.	Gorkhali Rubber Udyog Ltd., Tanahu	2,500 kW
Region : Eastern Development		
Zone : Koshi / Janakapur / Sagarmatha		
1.	Pashupati Brick Factory, Duhabi, Sunsari	450 kW
2.	A.M. Jute Mills, Katahari, Morang	800 kW
3.	Pashupati Gas Udyog, Tanki, Morang	250 kW
4.	Golden Battery Industry, Tanki Morang	290 kW
5.	Arun Banaspati Limited, Duhabi, Sunsari	500 kW
6.	Udayapur Cement Factory, Udayapur, Sagarmatha	10,000 kW
Region : Mid-western Development		
Zone : Bheri	Distrct : Nepalganji / Banke	
1.	Nepal Paper Udyog Ltd.	2,000 kW
2.	Binayak Bicuit Pvt. Ltd.	480 kW
3.	Gaja Nand Textile Industries	200 kVA

Source : Ten Year Transmission and Distribution Plan
Load Forecast Study, Annex 1,

表 6.6　既設及び確定している大規模工場

Name of Industries	Location	Capacity	1987/88		1990/91		1995/96		2000/01		2010/11	
		kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW	MWh	kW
Committed Industries												
Nepal Orind Magnesite	Bagmati	3,000			2,160	900	4,320	1,800	5,520	2,300	8,640	3,600
Nepal Metal Company	Kathmandu	2,000					2,880	1,200	3,680	1,530	5,760	2,400
Nepal Paper Udyog	Nepalgunj	3,000					10,400	1,800	13,270	2,300	20,800	3,600
Gorkhli Rubber	Gandaki	2,500			2,200	750	8,700	1,500	11,100	1,900	17,400	3,000
Udayapur Cement	Sagarmatha	10,000					29,700	6,000	48,130	8,320	78,400	13,500
Ashok Steel	Narayani	5,000			3,800	2,000	6,900	2,000	29,500	5,100	59,000	10,200
Total		25,500			8,160	3,650	62,900	14,300	111,200	21,450	190,000	36,300
Existing Industries												
Himal Cement		4,000	7,660	1,800	13,900	2,400	13,900	2,400	13,900	2,400	13,900	2,400
Hetauda Cement		8,500	23,200	5,100	29,500	5,100	29,500	5,100	29,500	5,100	59,000	10,200
Total		12,500	30,860	6,900	43,400	7,500	43,400	7,500	43,400	7,500	72,900	12,600

Source : Ten Year Transmission and Distribution Plan
Load Forecast Study, Table 5.3

表 6.7　灌漑用電力需要

(Unit : GWh)

District	Type	Ultimate 1986 Forecast Demand	FY 2000 7th Power Project Demand	M.W.R. FY 2000 Potential Estimate
Jhapa	STW		2.4	6.0
Morang	STW+DTW			14.0
Sunsari	STW+DTW		2.3	23.0
Saptari	STW+DTW+LIFT	9.1		35.0
Siraha	STW	9.8	2.3	4.0
Dhanusha	STW+DTW	10.5		13.0
Mahottari	STW+DTW			14.0
Sarlahi	STW+DTW		1.9	22.0
Rautahat	STW+DTW		1.3	26.0
Bara	STW+DTW	2.6		36.0
Parsa	STW+DTW			23.0
Chitwan	STW+LIFT	13.8	0.3	44.0
Nawal Parasi	STW		0.3	1.0
Kapilvasatu	STW+DTW	7.0		34.0
Rupandehi	STW+DTW+LIFT	1.7		7.0
Nuwakot	LIFT			3.0
Banke	STW+DTW		1.4	4.0
Bardiya	STW+DTW			22.0
Kailaki	STW+DTW	6.0		4.0
Kanchanpur	STW+DTW			4.0
Total		60.5	12.2	339.0

Note : STW : Shallow tubewells
DTW : Deep tubewells
LIFT : Lift irrigation

Source : Ten Year Transmission and Distribution Plan, Load Forecast, Table A4-2

表 6.8　電力損失の推移

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90
Generation	234.7	275.2	347.0	382.4	420.8	488.5	571.0	627.0	672.3	769.7
Export	3.8	5.2	6.0	10.3	10.6	21.5	20.5	16.1	17.6	23.3
Gen-Expot	230.9	270	341	372.1	410.2	467.1	550.6	610.9	654.7	746.4
Sales	160.6	181.2	227.8	242.0	282.4	320.0	382.1	449.1	478.5	524.8
Energy loss	70.3	88.8	113.2	130.1	127.8	147.1	168.4	161.8	176.1	221.6
% Loss	30.46	32.89	33.19	34.97	31.16	31.50	30.59	26.49	26.91	29.69

Souses : NEA Commercial Department, Policy Division
Generation : including import from India.
E. Loss : including self consumption.

表 6.9　年負荷率の推移

	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90
Generation	234.7	275.2	347.0	382.4	420.8	488.5	571.0	627.0	672.3	769.7
Export	3.8	5.2	6.0	10.3	10.6	21.5	20.5	16.1	17.6	23.29
Gen.-Export	231.0	270.0	341.0	372.1	410.2	467.1	550.6	610.9	654.7	746.4
Peak demand	59.5	75.1	83.7	96.8	104.5	113.7	123.0	135.2	149.5	176.2
Load factor	44.31	41.05	46.5	43.88	44.81	46.89	51.1	51.58	49.99	48.36

Souses : NEA Commercial Department, Policy Division
Generation : including import from India.

表 6.10　全国の需要予測：1989/90～2010/11

	46/47 89/90	47/48 90/91	48/49 91/92	49/50 92/93	50/51 93/94	51/52 94/95	52/53 95/96	53/54 96/97	54/55 97/98	55/56 98/99	56/57 99/00	57/58 00/01	58/59 01/02	59/60 02/03	60/61 03/04	61/62 04/05	62/63 05/06	63/64 06/07	64/65 07/08	65/66 08/09	66/67 09/10	67/68 10/11
BAGMATI																						
Domestic	150.88	161.09	178.22	196.93	217.39	239.73	264.14	292.10	322.78	356.43	393.34	433.80	472.51	514.42	559.77	608.84	661.95	710.80	762.98	818.72	878.26	941.85
H.holds	366.00	372.56	379.20	385.92	392.74	399.63	406.61	413.68	420.83	428.06	435.38	442.78	450.26	457.83	465.82	473.21	481.03	488.92	496.89	504.95	513.08	521.29
Customer	155.60	169.08	182.80	196.72	210.77	224.93	239.13	253.37	267.59	281.77	295.90	309.95	323.90	337.74	351.46	365.06	378.52	391.85	405.03	418.08	430.99	443.76
E.Ratio	42.51	45.38	48.21	50.97	53.67	56.28	58.81	61.25	63.59	65.83	67.96	70.00	71.94	73.77	75.46	77.14	78.69	80.15	81.51	82.80	84.00	85.13
Unit	970	953	975	1001	1031	1066	1105	1153	1206	1265	1329	1400	1459	1523	1593	1668	1749	1814	1884	1958	2038	2122
Industrial	43.08	46.53	53.05	59.39	66.57	74.69	83.91	94.55	106.52	119.99	135.15	152.18	166.62	182.39	199.60	218.37	238.86	261.21	285.59	312.17	341.15	372.74
Commercial	27.15	28.78	31.87	35.30	39.09	43.29	47.95	52.93	58.44	64.52	71.23	78.63	84.77	91.38	98.51	106.19	114.47	123.40	133.03	143.40	154.59	166.65
Irrigation	0.21	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.30	0.31	0.32	0.34	0.35	0.36	0.38	0.40	0.41	0.43	0.45	0.47	0.49
Others	40.13	42.03	45.15	48.47	52.00	55.74	59.71	64.13	68.85	73.87	79.23	84.93	90.24	95.84	101.76	108.00	114.59	120.51	126.71	133.19	139.97	147.06
Total Sale	261.45	278.64	308.51	340.33	375.28	413.70	455.96	503.99	556.88	615.11	679.25	749.87	814.48	884.38	959.99	1041.79	1130.27	1216.34	1308.73	1407.92	1514.42	1628.78
Losses	29.7	29	28	27	26	25	24	23	22	21	20	19	18	18	18	18	18	18	18	18	18	18
Generation	371.90	392.45	428.49	466.20	507.14	551.61	599.95	654.53	713.95	778.63	849.06	925.77	993.27	1078.51	1170.72	1270.47	1378.38	1483.34	1596.02	1716.98	1846.86	1986.31
L.Factor	44.2	44.4	44.6	44.8	45	45.2	45.4	45.6	45.8	46	46.2	46.4	46.6	46.8	47	47.2	47.4	47.6	47.8	48	48.2	48.4
Peak Load	96.05	100.90	109.67	118.79	128.65	139.31	150.85	163.86	177.95	193.23	209.79	227.76	243.32	263.07	284.35	307.27	331.96	355.74	381.16	408.34	437.40	468.49
OTHER AREA																						
Domestic	80.52	87.55	98.60	110.93	124.65	139.91	156.86	176.45	198.26	222.53	249.50	279.46	309.09	341.53	377.03	415.87	458.34	498.78	542.37	589.35	639.95	694.44
H.holds	2722.67	2797.90	2874.82	2953.43	3033.75	3115.77	3199.51	3284.96	3372.12	3460.99	3551.56	3643.84	3737.79	3833.43	3930.72	4029.65	4130.20	4232.34	4336.04	4441.28	4548.02	4656.21
Customer	119.32	139.05	161.42	186.61	214.77	246.07	280.66	318.68	360.25	405.49	454.50	507.39	564.22	625.07	689.98	759.02	832.20	909.54	991.06	1076.75	1166.60	1260.57
E.Ratio	4.38	4.97	5.61	6.32	7.08	7.90	8.77	9.70	10.68	11.72	12.80	13.92	15.09	16.31	17.55	18.84	20.15	21.49	22.86	24.24	25.65	27.07
Unit	675	630	611	594	580	569	559	554	550	549	549	551	548	546	546	548	551	548	547	547	549	551
Industrial	135.24	145.30	167.27	190.10	217.84	252.37	296.50	335.93	380.41	430.57	487.12	550.84	600.54	654.66	713.57	777.71	847.52	923.50	1006.17	1096.13	1194.00	1300.46
Commercial	6.56	6.96	7.71	8.53	9.45	10.47	11.59	12.80	14.13	15.60	17.22	19.01	20.50	22.09	23.82	25.68	27.68	29.84	32.16	34.67	37.38	40.29
Irrigation	11.76	17.13	19.43	22.38	26.22	31.25	37.90	42.29	47.31	53.07	59.69	67.31	70.13	73.08	76.15	79.35	82.68	86.15	89.77	93.54	97.47	101.56
Others	29.26	30.65	32.93	35.35	37.92	40.65	43.55	46.77	50.21	53.88	57.78	61.94	65.81	69.90	74.21	78.77	83.58	87.89	92.41	97.14	102.08	107.25
Total Sale	263.34	287.59	325.93	367.29	416.08	474.65	546.41	614.24	690.32	775.64	871.31	978.57	1066.07	1161.26	1264.79	1377.37	1499.79	1626.16	1762.89	1910.83	2070.88	2244.01
Losses	29.7	29	28	27	26	25	24	23	22	21	20	19	18	18	18	18	18	18	18	18	18	18
Generation	374.60	405.05	452.69	503.14	562.28	632.87	718.96	797.71	885.03	981.83	1089.14	1208.11	1300.09	1416.17	1542.42	1679.72	1829.01	1983.12	2149.86	2330.28	2525.46	2736.60
L.Factor	56.8	56.8	57	57.2	57.4	57.6	57.8	58	58.2	58.4	58.6	58.8	59	59.2	59.4	59.6	59.8	60	60	60	60	60
Peak Load	75.55	81.41	90.66	100.41	111.82	125.43	141.99	157.00	173.59	191.92	212.17	234.54	251.55	273.08	296.42	321.73	349.15	377.31	409.03	443.36	480.49	520.66
WHOLE NEPAL																						
Domestic	231.40	248.64	276.82	307.86	342.04	379.65	421.00	468.55	521.04	578.96	642.84	713.26	781.60	855.95	936.80	1024.72	1120.28	1209.58	1305.36	1408.07	1518.21	1636.29
H.holds	3088.67	3170.46	3254.02	3339.36	3426.48	3515.40	3606.12	3698.63	3792.94	3889.05	3986.94	4086.61	4188.06	4291.26	4429.53	4502.86	4611.22	4721.26	4832.94	4946.23	5061.10	5177.50
Customer	274.92	308.12	344.22	383.32	425.54	471.00	519.80	572.04	627.83	687.28	750.40	817.33	888.12	962.81	1041.45	1124.08	1210.72	1301.39	1396.10	1494.83	1597.58	1704.33
E.Ratio	8.90	9.72	10.58	11.48	12.42	13.40	14.41	15.47	16.55	17.67	18.82	20.00	21.21	22.44	23.51	24.96	26.26	27.56	28.89	30.22	31.57	32.92
Unit	842	807	804	803	804	806	810	819	830	842	857	873	880	889	900	912	925	929	935	942	950	960
Industrial	178.32	191.83	220.32	249.50	284.41	327.06	380.41	430.48	486.93	550.56	622.27	703.03	767.17	837.05	913.17	996.08	1086.38	1184.71	1291.76	1408.29	1535.15	1673.20
Commercial	33.71	35.73	39.58	43.83	48.54	53.76	59.54	65.73	72.57	80.12	88.45	97.65	105.26	113.47	122.32	131.86	142.15	153.24	165.19	178.08	191.97	206.94
Irrigation	11.97	17.35	19.65	22.61	26.46	31.51	38.17	42.56	47.59	53.37	60.00	67.63	70.47	73.43	76.51	79.73	83.08	86.56	90.20	93.99	97.94	102.05
Others	69.39	72.68	78.08	83.82	89.92	96.39	103.26	110.91	119.06	127.75	137.01	146.88	156.05	165.74	175.97	186.77	198.17	208.41	219.12	230.32	242.05	254.31
Total Sale	524.79	566.23	634.45	707.62	791.37	888.36	1002.37	1118.23	1247.20	1390.78	1550.58	1728.44	1880.55	2045.64	2224.78	2419.16	2630.06	2842.50	3071.62	3318.75	3585.30	3872.79
Losses	29.70	29.00	28.00	27.00	26.00	25.00	24.00	23.00	22.00	21.00	20.00	19.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Generation	746.50	797.51	881.17	969.35	1069.42	1184.47	1318.91	1452.25	1598.97	1760.45	1938.20	2133.88	2293.36	2494.68	2713.14	2950.19	3207.39	3466.46	3745.88	4047.26	4372.32	4722.91
L.Factor	49.7	49.9	50.2	50.5	50.8	51.1	51.4	51.7	51.9	52.2	52.4	52.7	52.9	53.1	53.3	53.5	53.8	54.0	54.1	54.2	54.4	54.5
Peak Load	171.60	182.31	200.33	219.21	240.47	264.74	292.85	320.86	351.54	385.15	421.96	462.31	494.87	536.15	580.77	629.00	681.11	733.04	790.19	851.69	917.90	989.15

表 6.11　地域別需要予測

(A) Share od Demand by Study Area (%)

Area Name	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
KTM Central	45.19	43.88	42.62	41.40	40.23	39.10	38.02	36.98	35.97	35.01	34.08	33.19
KTM Eastern	12.77	13.29	13.80	14.30	14.78	15.24	15.69	16.13	16.55	16.96	17.36	17.75
KTM Western	16.00	16.59	17.17	17.72	18.25	18.77	19.26	19.74	20.21	20.66	21.09	21.50
Lalitpur	16.05	16.07	16.08	16.08	16.08	16.07	16.05	16.03	16.01	15.98	15.95	15.92
Bhaktapur	5.61	5.79	5.98	6.15	6.33	6.50	6.66	6.82	6.98	7.14	7.29	7.43
Kavre	1.73	1.73	1.72	1.72	1.72	1.71	1.70	1.70	1.69	1.68	1.68	1.67
Trisuri	1.36	1.36	1.35	1.35	1.35	1.34	1.34	1.33	1.33	1.32	1.32	1.31
Sunkosi	1.28	1.28	1.28	1.28	1.27	1.27	1.26	1.26	1.25	1.25	1.24	1.24
Total	100	100	100	100	100	100	100	100	100	100	100	100

(B) Energy Sales (GWh)

Area Name	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
KTM Central	118.16	122.27	131.47	140.89	150.97	161.76	173.35	186.36	200.33	215.35	231.50	248.87
KTM Eastern	33.38	37.04	42.58	48.66	55.46	63.06	71.56	81.30	92.19	104.35	117.93	133.07
KTM Western	41.84	46.24	52.96	60.30	68.50	77.64	87.84	99.51	112.54	127.05	143.23	161.24
Lalitpur	41.97	44.78	49.61	54.74	60.34	66.48	73.20	80.81	89.15	98.30	108.34	119.35
Bhaktapur	14.66	16.14	18.44	20.94	23.75	26.88	30.38	34.39	38.88	43.89	49.49	55.73
Kavre	4.53	4.82	5.32	5.86	6.44	7.07	7.77	8.55	9.41	10.35	11.38	12.50
Trisuri	3.56	3.78	4.18	4.60	5.06	5.56	6.10	6.72	7.39	8.13	8.94	9.82
Sunkosi	3.36	3.57	3.95	4.34	4.78	5.25	5.76	6.35	6.98	7.68	8.44	9.28
Total	261.45	278.64	308.51	340.33	375.28	413.70	455.96	503.99	556.88	615.11	679.25	749.87

表 6.12　変電所別需要予測

Unit:MW

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Kathmandu-2	12.40	13.05	13.74	14.46	15.22	16.02	16.86	17.74	18.67	19.65	20.68	21.77
Teku	9.03	9.61	10.23	10.89	11.59	12.34	13.13	13.98	14.88	15.84	16.86	17.94
Lainchour	6.89	7.25	7.63	8.03	8.45	8.90	9.37	9.86	10.38	10.92	11.49	12.10
Thapathali	5.30	5.58	5.87	6.18	6.50	6.85	7.20	7.58	7.98	8.40	8.84	9.31
Maharajganj	1.97	2.07	2.18	2.30	2.42	2.54	2.68	2.82	2.97	3.12	3.29	3.46
Chabel	8.08	8.71	9.38	10.11	10.90	11.74	12.66	13.64	14.70	15.84	17.07	18.40
New Chabel	1.74	1.94	2.16	2.41	2.69	3.00	3.35	3.74	4.17	4.65	5.19	5.78
Baneswar	13.50	14.81	16.24	17.81	19.54	21.43	23.51	25.78	28.28	31.02	34.03	37.32
Siuchatar	6.34	7.05	7.84	8.72	9.69	10.78	11.99	13.33	14.82	16.48	18.33	20.38
Balaju	5.37	5.97	6.64	7.38	8.21	9.13	10.15	11.29	12.55	13.96	15.52	17.26
Old Patan	7.22	7.81	8.45	9.14	9.88	10.69	11.57	12.51	13.53	14.64	15.83	17.13
Bhaktapur	5.61	6.18	6.80	7.49	8.25	9.08	10.00	11.01	12.12	13.34	14.69	16.18
Thimi	1.78	1.98	2.20	2.44	2.71	3.01	3.34	3.71	4.12	4.58	5.08	5.64
Trisuli	1.20	1.29	1.40	1.51	1.63	1.75	1.89	2.04	2.20	2.37	2.56	2.76
Sunkosi	1.56	1.68	1.82	1.96	2.11	2.28	2.46	2.65	2.86	3.09	3.33	3.59
Total	87.99	94.98	102.58	110.83	119.80	129.54	140.14	151.68	164.23	177.90	192.80	209.02

Remarks:

Kathmandu-2 : 100% Central
Teku : 80% Central + 20% Western
Lainchour : 100% Central
Thapathali : 100% Central
Maharajganj : 100% Central
Chabel : 60% Central + 40% Eastern
New Chabel : 100% Eastern

Baneswar : 50% Eastern + 50% Lalitpur
Siuchatar : 100% Western
Balaju : 100% Western
Old Patan : 100% Lalitpur
Bhaktapur : 70% Bhaktapur + 30% Kavre
Thimi : 100% Bhaktapur
Trisuri : 100% Trisuli
Sunkosi : 100% Sunkosi

表 7.1　既存系統における発電機定数

Station Name	Capacity (MW)	Power Factor
MARSYANGDI	69.0	0.90
KULEKHANI-1	60.0	0.85
KULEKHANI-2	32.0	0.85
TRISULI	18.0	0.80
DEVIGHAT	14.1	0.80
SUNKOSI	10.0	0.85
HETAUDA	10.0	0.85

表 7.2　既存系統における変圧器定数

Station Name	Nominal Voltage (higher side) [kV]	Reactance [pu ; 100MVA Base]
MARSYANGDI	132	0.1156
KULEKHANI-2	132	0.2910
HETAUDA	132	0.2450
SIUCHATAR	132	0.2471
BALAJU	132	0.2489
DEVIGHAT	66	0.3688
TRISULI	66	0.3693
KULEKHANI-1	66	0.1036
HETAUDA	66	0.6250
SUNKOSI	66	0.7116
PATAN	66	0.1813
SIUCHATAR	66	0.1853
BALAJU	66	0.3990
N.CHABEL	66	0.3503
LAINCHAUR	66	0.4390
BANESWAR	66	0.3685

表 7.3　既存系統における送電線およびリングメイン配電線定数

Unit :100MVA Base pu

Station Name	Station Name	Nominal Voltage [kv]	impedance R	impedance j X	admittance j b
MARSYANGDI	BALAJU	132	0.063310	0.190998	0.042185
MARSYANGDI	BHARATPUR	132	0.018842	0.056845	0.012555
KULEKHANI-2	SIUCHATAR	132	0.025626	0.077309	0.017075
KULEKHANI-2	HETAUDA	132	0.006030	0.018190	0.004018
HETAUDA	BHARATPUR	132	0.065792	0.161950	0.034525
KULEKHANI-1	SIUCHATAR	66	0.073111	0.129801	0.007403
KULEKHANI-1	HETAUDA	66	0.040160	0.071570	0.004087
DEVIGHAT	N.CHABEL	66	0.166390	0.295410	0.004212
TRISULI	BALAJU	66	0.218612	0.269970	0.003554
SUNKOSI	BANESWAR	66	0.353472	0.501770	0.006883
PATAN	SIUCHATAR	66	0.020168	0.035807	0.000511
PATAN	BANESWAR	66	0.017995	0.025545	0.000350
SIUCHATAR	BALAJU	66	0.017647	0.031331	0.001787
BALAJU	JUMPER-1	66	0.052768	0.065165	0.000858
BALAJU	LAINCHAUR	66	0.008647	0.020102	0.000301
N.CHABEL	JUMPER-1	66	0.080674	0.143229	0.002042
PATAN	THIMI	11	0.534603	1.128020	0.000064
PATAN	K-2	11	0.324822	0.685380	0.000039
SIUCHATAR	TEKU	11	0.169178	0.356969	0.000020
BALAJU	TEKU	11	0.257151	0.542592	0.000031
BALAJU	MAHARAJGUNJ	11	0.609041	1.285087	0.000018
BALAJU	CHABEL	11	1.218083	2.570173	0.000036
N.CHABEL	BHAKTAPUR	11	0.649644	1.370759	0.000077
N.CHABEL	CHABEL	11	0.067671	0.142787	0.000008
CHABEL	MAHARAJGUNJ	11	0.365425	0.771052	0.000011
LAINCHAUR	R.PALACE	11	0.060744	0.045645	0.000114
R.PALACE	K-2	11	0.086777	0.065207	0.000163
K-2	LAINCHAUR	11	0.147934	0.110744	0.000278
TEKU	THAPATHALI	11	0.095041	0.057438	0.000453

表 7.4　拡張整備計画案

Year	Sub-project of Scenario A	Sub-project of Scenario B	Sub-project of Scenario C
1990/91	(1) 2nd circuit of 66kV Siuchatar - Patan line includ. 66kV T/L bay at Patan and Siuchatar		
1991/92	(2) Creation of 66/11kV New Bhaktapur S/S,1x10MVA includ. connection of Sunkosi line and 11kV line (3) 66kV 1cct New Bhaktapur - New Chabel line includ. 66kV switchgear at New Chabel	(1) Creation of 132/66kV New Bhaktapur S/S, 132/66kV 45MVA and 132/11kV 1x18MVA includ. connection of Sunkosi line and 11kV line (2) 132kV Siuchatar-New Bhaktapur line, 1st cct includ. 132kV switchgear at Siuchatar	(1) Creation of 132kV switching station near Thankot (2) Creation of New Bhaktapur S/S, 132/66kV 1x45MVA and 132/11kV 1x18MVA, includ. includ. connection of Sunkosi line and 11kV line (3) 132kV Siuchatar-New Bhaktapur line (1st cct) includ. 132kV switchgear at Siuchatar
1992/93	(4) Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat (5) Connection of Marsyangdi line to Siuchatar S/S includ. 132kV switchgear(2 T/L bays) (6) Addition of 66/11kV transformer at Baneswar includ. 66kV switchgear,2x18MVA in total	(3) Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat (4) Connection of Marsyangdi line to Siuchatar includ. 132kV switchgear (5) Augmentation of 66/11kV transformer at Baneswar includ. 66kV switchgear	(4) Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat (5) Augmentation of 66/11kV transformer at Baneswar includ. 66kV switchgear
1993/94	(7) Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuit (8) 66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar	(6) Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuit (7) 66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar	(6) Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuits (7) 66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar
1994/95	(9) Addition of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear		
1995/96	(10) Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line (11) Addition of 66/11kV transformer at New Bhaktapur, 2x10MVA in total	(8) Augmentation of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear (9) Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line	(8) Augmentation of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear (9) Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line
1996/97	(12) Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA	(10) Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA	(10) Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA
1997/98	(13) Replacement of 66/11kV transformers at Lainchaur from 2x10MVA to 2x18MVA (14) Creation of 66/11kV Banepa S/S includ. connection of Sunkosi line and 11kV cubicles	(11) Replacement of 66/11kV transformers at Lainchaur from 2x10MVA to 2x18MVA (12) Creation of 66/11kV Banepa S/S, 1x10MVA includ. connection of Sunkosi line and 11kV cubicles	(11) Replacement of 66/11kV transformers at Lainchaur S/S from 2x10MVA to 2x18MVA (12) Creation of 66/11kV Banepa S/S includ. connection of Sunkosi line and 11kV cubicles
1998/99	(15) 132kV Siuchatar-New Bhaktapur 2cct line (16) Upgrading of New Bhaktapur S/S to 132kV includ. 132kV switchgear at Siuchatar (17) Creation of 132/11kV Chapagaon S/S, 1x18MVA (18) Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total (19) Replacement of 66/11kV transformers at Balaju S/S from 2x10MVA to 2x18MVA	(13) 2nd circuit of 132kV Siuchatar - New Bhaktapur line includ. 132kV switchgears (14) Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total (15) Creation of 132/11kV Chapagaon S/S, 1x18MVA (16) Replacement of 66/11kV transformers at Balaju from 2x10MVA to 2x18MVA (17) Augmentation of 132/11kV transformer at New Bhaktapur, 2x18MVA in total	(13) 2nd circuit of 132kV SW/S - New Bhaktapur line includ. 132kV switchgears (14) Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total (15) Creation of 132/11kV Chapagaon S/S, 1x18MVA (16) Replacement of 66/11kV transformers at Balaju from 2x10MVA to 2x18MVA
1999/00	(20) Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA	(18) Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA	(17) Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA
2000/01	(21) Augmentation of 132/11kV transformers at New Bhaktapur, 1x18MVA		(18) Augmentation of 132/11kV transformer at New Bhaktapur, 2x18MVA in total

表 7.5　既存11kV遮断機の定格遮断電流および短絡計算結果

UNIT : kA

STATION NAME	RATED BREAKING CURRENT (Existing CB)	3 PHASE SHORT CIRCUIT CURRENT						
			SCENARIO - A		SCENARIO - B		SCENARIO - C	
		1989/90	1995/96	2000/01	1995/96	2000/01	1995/96	2000/01
PATAN	26.30 20.00 13.10 / 1 7.88 / 2	12.55	13.50	16.10	12.69	15.19	12.44	15.19
SIUCHATAR	26.30	12.95	14.91	18.98	15.00	18.76	14.73	18.75
BALAJU	20.00	10.59	14.85	18.94	15.04	18.60	14.81	18.60
LAINCHAUR	20.00 / 3	9.54	14.34	17.77	14.49	17.58	14.27	17.57
NEW CHABEL	18.40	8.70	13.33	17.09	12.45	14.62	12.31	14.62
BANESWAR	25.00	7.65	12.31	14.41	11.71	13.73	8.07	13.73
BHAKTAPUR	20.00	4.45	8.60	12.16	8.80	11.94	8.62	11.94
TEKU	20.00 7.88	9.09	13.86	20.14	13.93	19.88	13.70	19.88
THAPATHALI	40.00	7.86	11.24	14.95	11.29	14.87	11.13	14.87
R.PALACE	7.88	9.09	13.29	16.17	13.42	16.04	13.22	16.03
MAHARAJGUNJ	7.88	5.16	6.13	6.67	6.05	6.48	6.01	6.48
CHABEL	7.88 / 2	7.76	10.79	13.03	10.31	11.75	10.21	11.75
THIMI	7.88 / 2	4.69	6.92	8.41	6.91	8.29	6.81	8.29
K-2	25.00	9.26	13.46	16.39	13.57	16.25	13.37	16.25
K-3	-	-	12.88	15.45	12.95	15.35	12.76	15.34
N.BHAKTAPUR	-	-	10.10	16.29	10.27	15.50	9.99	15.51
CHAPAGAON	-	-	-	8.65	-	8.74		8.75

/ 1 : For diesel generator

/ 2 : No rating plate, but assumed to be 7.88 kA.

/ 3 : No information about breaking current, but assumed to be 20.0 kA.

表 7.6　11kV遮断器の取り替えおよび新設計画

	Substation		Replace	Addition	Shift	New S/S	Total
Urgent Works							
1)	Old Patan	*1	14				14
2)	Royal Palace		5				5
Upto 1995/96							
3)	Teku	*2	17	2			19
4)	New Bhaktapur	*3				12	12
5)	Lainchaur	*4	8	2			10
6)	K3					10	10
7)	Chabel	*5			6		6
Upto 2000/01							
8)	Thimi		6				6
9)	Banepa					5	5
10)	Chapagaon					5	5
	Total		50	4	6	32	92

Remarks :

*1 : Existing building is considered to be used.

*2 : Replace is recommended to be done when the station is upgraded.

*3 : Including cubicles for connection of 11kV Thimi-Bhaktapur line.

*4 : Existing ones are temporally use.

*5 : Dismantled cubicles at Old Patan and Teku will be used.

表 7.7　送電システムの建設費（シナリオ-A）

Year		Sub-project	Const. Cost (US$1000)
1990/91	(1)	2nd circuit of 66kV Siuchatar - Patan line includ. 66kV T/L bay at Patan and Siuchatar	860.7
1991/92	(2)	Creation of 66/11kV New Bhaktapur S/S,1x10MVA includ. connection of Sunkosi line and 11kV line	1,760.7
	(3)	66kV 1cct New Bhaktapur - New Chabel line includ. 66kV switchgear at New Chabel	1,036.4
1992/93	(4)	Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat	642.9
	(5)	Connection of Marsyangdi line to Siuchatar S/S includ. 132kV switchgear(2 T/L bays)	907.1
	(6)	Addition of 66/11kV transformer at Baneswar includ. 66kV switchgear,2x18MVA in total	1,232.9
1993/94	(7)	Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuit	6,596.7
	(8)	66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar	3,206.4
1994/95	(9)	Addition of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear	2,815.3
1995/96	(10)	Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line	3,176.5
	(11)	Addition of 66/11kV transformer at New Bhaktapur, 2x10MVA in total	1,164.3
1996/97	(12)	Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA	1,784.6
1997/98	(13)	Replacement of 66/11kV transformers at Lainchaur from 2x10MVA to 2x18MVA	1,708.9
	(14)	Creation of 66/11kV Banepa S/S includ. connection of Sunkosi line and 11kV cubicles	1,414.3
1998/99	(15)	132kV Siuchatar-New Bhaktapur 2cct line	3,664.3
	(16)	Upgrading of New Bhaktapur S/S to 132kV includ. 132kV switchgear at Siuchatar	3,837.1
	(17)	Creation of 132/11kV Chapagaon S/S, 1x18MVA	1,692.3
	(18)	Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total	1,433.5
	(19)	Replacement of 66/11kV transformers at Balaju S/S from 2x10MVA to 2x18MVA	1,708.9
1999/00	(20)	Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA	642.9
2000/01	(21)	Augmentation of 132/11kV transformers at New Bhaktapur, 1x18MVA	1,247.8
Total			42,534.5

表 7.8　送電システムの建設費（シナリオ-B）

Year			Const. Cost (US$1000)
1991/92	(1)	Creation of 132/66kV New Bhaktapur S/S, 132/66kV 45MVA and 132/11kV 1x18MVA includ. connection of Sunkosi line and 11kV line	5,328.1
	(2)	132kV Siuchatar-New Bhaktapur line, 1st cct includ. 132kV switchgear at Siuchatar	3,008.6
1992/93	(3)	Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat	642.9
	(4)	Connection of Marsyangdi line to Siuchatar includ. 132kV switchgear	907.1
	(5)	Augmentation of 66/11kV transformer at Baneswar includ. 66kV switchgear	1,232.9
1993/94	(6)	Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuit	6,596.7
	(7)	66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar	3,206.4
1995/96	(8)	Augmentation of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear	2,815.3
	(9)	Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line	3,176.5
1996/97	(10)	Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA	1,784.6
1997/98	(11)	Replacement of 66/11kV transformers at Lainchaur from 2x10MVA to 2x18MVA	1,708.9
	(12)	Creation of 66/11kV Banepa S/S, 1x10MVA includ. connection of Sunkosi line and 11kV cubicles	1,414.3
1998/99	(13)	2nd circuit of 132kV Siuchatar - New Bhaktapur line includ. 132kV switchgears	2,005.7
	(14)	Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total	1,433.5
	(15)	Creation of 132/11kV Chapagaon S/S, 1x18MVA	1,692.3
	(16)	Replacement of 66/11kV transformers at Balaju from 2x10MVA to 2x18MVA	1,708.9
	(17)	Augmentation of 132/11kV transformer at New Bhaktapur, 2x18MVA in total	1,247.8
1999/00	(18)	Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA	642.9
Total			40,553.4

表 7.9　送電システムの建設費（シナリオ-C）

Year		Sub-project	Const. Cost (US$1000)
1991/92	(1)	Creation of 132kV switching station near Thankot	3,480.0
	(2)	Creation of New Bhaktapur S/S, 132/66kV 1x45MVA and 132/11kV 1x18MVA, includ. includ. connection of Sunkosi line and 11kV line	5,328.1
	(3)	132kV Siuchatar-New Bhaktapur line (1st cct) includ. 132kV switchgear at Siuchatar	3,008.6
1992/93	(4)	Modification of 66kV switchgear at Trisuli P/S and jumper connection between Trisuli and Devighat	642.9
	(5)	Augmentation of 66/11kV transformer at Baneswar includ. 66kV switchgear	1,232.9
1993/94	(6)	Creation of 66kV K3 S/S, 2x18MVA includ. 11kV switchgear for transformer circuits	6,596.7
	(7)	66kV Siuchatar-K3 2cct line includ. switchgear at Siuchatar	3,206.4
1995/96	(8)	Augmentation of 132/66kV transformer at Siuchatar includ. 132kV and 66kV switchgear	2,815.3
	(9)	Upgrading of Teku SW/S to 66kV 1x18MVA S/S includ. incoming lines from Siuchatar-K3 line	3,176.5
1996/97	(10)	Replacement of 66/11kV transformers at New Chabel S/S from 3x6.3MVA to 2x18MVA	1,784.6
1997/98	(11)	Replacement of 66/11kV transformers at Lainchaur S/S from 2x10MVA to 2x18MVA	1,708.9
	(12)	Creation of 66/11kV Banepa S/S includ. connection of Sunkosi line and 11kV cubicles	1,414.3
1998/99	(13)	2nd circuit of 132kV SW/S - New Bhaktapur line includ. 132kV switchgears	2,005.7
	(14)	Addition of 66/11kV transformer at Teku S/S, 2x18MVA in total	1,433.5
	(15)	Creation of 132/11kV Chapagaon S/S, 1x18MVA	1,692.3
	(16)	Replacement of 66/11kV transformers at Balaju from 2x10MVA to 2x18MVA	1,708.9
1999/00	(17)	Installation of static condenser at New Bhaktapur 66kV bus, 2x10MVA	642.9
	(18)	Augmentation of 132/11kV transformer at New Bhaktapur, 2x18MVA in total	1,247.8
Total			43,126.3

表 7.10　kWおよびkWh価値

Power and energy losses in the system is assessed by the following KW and KWh values.

KW Value

A basis of the value is obtained from the estimated construction cost of the undermentioned medium-speed diesel power plant (26MW) under construction in the Eastern region.

The construction cost is as below:

Foreign Currency (US$ 1,000)		18,145
(a)	Equipment and material costs	12,186
(b)	Site installation cost	5,256
(c)	Others (for Engineering, etc.)	703
Local currency (Nrs. 1,000)		11,000

Note: US$ 1.00 = NRs.28

The above estimate results in the unit rate of US$713/KW.
While, an equivalent fixed cost for the station including operation and maintenance costs is estimated at US$130/kW/year under the following conditions.

- Construction period	2 years
- Disbursement of construction cost	40% and 60%
- Discount rate	10%
- Life time of the plant	20 years
- Operation and maintenance costs	3% of total construction cost

KWh Value

Fuel cost is applied with that in 1990 price level.

- Fuel cost	US$ 0.3/l
- Calorific value of fuel	10,800 Kcal/kg
- Plant efficiency	37%
- Operation and maintenance cost	UScent 0.6/kWh

The kWh value is computed as UScent 7.5/kWh from the above assumptions.

表 8.1　11kV配電線、電圧降下と電流容量（1/3）

NAME OF FEEDER	1989/90 Voltage Regul. at End V.R(%)	1989/90 Extent of V.R	1989/90 Cond. Cable Capa.	1990/91 Voltage Regul. at End V.R(%)	1990/91 Extent of V.R	1990/91 Cond. Cable Capa.	1991/92 Voltage Regul. at End V.R(%)	1991/92 Extent of V.R	1991/92 Cond. Cable Capa.	1992/93 Voltage Regul. at End V.R(%)	1992/93 Extent of V.R	1992/93 Cond. Cable Capa.	1993/94 Voltage Regul. at End V.R(%)	1993/94 Extent of V.R	1993/94 Cond. Cable Capa.
SUCHATAR S/S															
Ropeway/Kirtipur	95.78	O	O	95.21	O	O	94.59	O	O	93.88	O	O	93.12	O	O
Kalimati	98.74	O	O	98.65	O	O	98.56	O	O	98.46	O	O	98.35	O	O
Kalanki	99.86	O	O	99.85	O	O	99.83	O	O	99.81	O	O	99.79	O	O
Swayambhu	98.77	O	O	98.49	O	O	98.20	O	O	97.84	O	O	97.47	O	O
Thankot	94.80	O	O	93.98	O	O	93.26	O	O	92.49	X	O	91.62	X	O
Tahachal	99.19	O	O	99.41	O	O	99.07	O	O	99.00	O	O	98.93	O	O
BALAJU S/S															
Dharmasthali	97.53	O	O	97.12	O	O	96.65	O	O	96.13	O	O	95.53	O	O
Swayambhu	99.74	O	O	99.70	O	O	99.65	O	O	99.60	O	O	99.53	O	O
B.I.D	99.41	O	O	99.22	O	O	99.00	O	O	98.75	O	X	98.47	O	X
Naya Bazar	99.37	O	O	99.31	O	O	99.26	O	O	99.19	O	O	99.12	O	O
NEW CHABEL S/S															
Maharajgunj	99.28	O	O	99.21	O	O	99.15	O	O	99.06	O	O	98.97	O	O
Airport	n.a	n.a	n.a	98.16	O	O	97.84	O	O	97.45	O	O	97.05	O	O
Sundarijal	96.84	O	O	96.57	O	O	96.20	O	O	95.84	O	O	95.39	O	O
Boudha-Jorpati	95.75	O	O	95.08	O	X	94.32	O	X	93.45	O	X	92.44	X	X
CHABEL Sw/S															
Baneswar	97.86	O	O	97.47	O	O	97.02	O	O	96.50	O	O	95.90	O	O
Naxal	98.61	O	O	98.51	O	O	98.39	O	O	98.28	O	O	98.16	O	O
Sundarijal	91.66	X	O	91.66	X	O	90.83	X	O	89.90	X	O	88.88	X	O
Tangal	99.58	O	O	99.55	O	O	99.52	O	O	99.40	O	O	99.45	O	O
NEW PATAN S/S															
Old Patan-1	99.98	O	O	99.96	O	O	99.95	O	O	99.95	O	O	99.94	O	X
Old Patan-2	99.76	O	O	99.97	O	O	99.96	O	O	99.96	O	O	99.96	O	O
OLD PATAN P/S															
Ring Road	99.57	O	O	99.54	O	O	99.49	O	O	99.45	O	O	99.40	O	O
Radio Nepal	98.91	O	O	98.80	O	O	98.69	O	O	98.56	O	O	98.44	O	O

NAME OF FEEDER	1994/95 Voltage Regul. at End V.R(%)	1994/95 Extent of V.R	1994/95 Cond. Cable Capa.	1995/96 Voltage Regul. at End V.R(%)	1995/96 Extent of V.R	1995/96 Cond. Cable Capa.	1996/97 Voltage Regul. at End V.R(%)	1996/97 Extent of V.R	1996/97 Cond. Cable Capa.	1997/98 Voltage Regul. at End V.R(%)	1997/98 Extent of V.R	1997/98 Cond. Cable Capa.	1998/99 Voltage Regul. at End V.R(%)	1998/99 Extent of V.R	1998/99 Cond. Cable Capa.	1999/00 Voltage Regul. at End V.R(%)	1999/00 Extent of V.R	1999/00 Cond. Cable Capa.	2000/01 Voltage Regul. at End V.R(%)	2000/01 Extent of V.R	2000/01 Cond. Cable Capa.
SUCHATAR S/S																					
Ropeway/Kirtipur	92.24	X	O	91.21	X	O	90.11	X	O	88.91	X	O	87.49	X	O	85.96	X	O	84.25	X	X
Kalimati	98.24	O	O	98.11	O	O	97.98	O	O	97.81	O	O	97.66	O	O	97.47	O	O	97.26	O	O
Kalanki	99.76	O	O	99.76	O	O	99.74	O	O	99.71	O	O	99.68	O	O	99.65	O	O	99.62	O	O
Swayambhu	97.02	O	O	96.49	O	O	95.92	O	O	95.26	O	O	94.53	O	O	93.71	O	O	92.77	O	O
Thankot	90.69	X	O	89.61	X	O	88.43	X	O	87.09	X	O	85.60	X	O	83.95	X	O	82.15	X	X
Tahachal	98.85	O	O	98.77	O	O	98.69	O	O	98.58	O	O	98.49	O	O	98.37	O	O	98.24	O	O
BALAJU S/S																					
Dharmasthali	94.84	O	O	94.10	O	O	93.25	O	X	92.29	X	X	91.24	X	X	90.04	X	X	88.69	X	X
Swayambhu	99.70	O	O	99.39	O	O	99.31	O	O	99.22	O	O	99.11	O	O	99.00	O	O	98.87	O	O
B.I.D	98.15	O	X	97.78	O	X	97.37	O	X	96.91	O	X	96.39	O	X	95.80	O	X	95.14	O	X
Naya Bazar	99.05	O	O	98.96	O	O	98.87	O	O	98.77	O	O	98.65	O	O	98.52	O	O	98.39	O	O
NEW CHABEL S/S																					
Maharajgunj	98.90	O	O	98.81	O	O	98.70	O	O	98.58	O	O	98.46	O	O	98.33	O	O	98.16	O	O
Airport	96.56	O	X	96.01	O	X	95.39	O	X	94.68	O	X	93.89	O	O	92.99	O	X	91.98	X	X
Sundarijal	94.94	O	O	94.40	O	O	93.76	O	O	93.13	O	O	92.32	X	O	91.50	X	O	90.60	X	O
Boudha-Jorpati	91.33	X	X	90.05	X	X	87.98	X	X	87.02	X	X	85.19	X	X	83.15	X	X	80.87	X	X
CHABEL Sw/S																					
Baneswar	95.24	O	X	94.49	O	X	93.63	O	X	92.68	O	X	91.57	X	X	90.33	X	X	88.91	X	X
Naxal	98.03	O	O	97.89	O	O	97.73	O	O	97.55	O	O	97.37	O	O	97.16	O	O	96.95	O	O
Sundarijal	87.77	X	O	86.48	X	O	85.18	X	X	83.70	X	X	82.12	X	X	80.36	X	X	78.42	X	X
Tangal	99.41	O	O	99.36	O	O	99.31	O	O	99.25	O	O	99.20	O	O	99.13	O	O	99.07	O	O
NEW PATAN S/S																					
Old Patan-1	99.94	O	X	99.93	O	X	99.93	O	X	99.92	O	X	99.91	O	X	99.90	O	X	99.89	O	X
Old Patan-2	99.95	O	O	99.95	O	O	99.94	O	X	99.94	O	X	99.93	O	X	99.92	O	X	99.91	O	X
OLD PATAN P/S																					
Ring Road	99.35	O	O	99.30	O	O	99.23	O	O	99.16	O	O	99.06	O	O	98.99	O	O	98.90	O	O
Radio Nepal	98.29	O	O	98.13	O	O	97.94	O	O	97.74	O	O	97.53	O	O	97.29	O	O	97.07	O	X

表 8.1　11kV配電線、電圧降下と電流容量（2/3）

NAME OF FEEDER	1989/90 Voltage Regul. at End V.R(%)	1989/90 Extent of V.R	1989/90 Cond. Cable Capa.	1990/91 Voltage Regul. at End V.R(%)	1990/91 Extent of V.R	1990/91 Cond. Cable Capa.	1991/92 Voltage Regul. at End V.R(%)	1991/92 Extent of V.R	1991/92 Cond. Cable Capa.	1992/93 Voltage Regul. at End V.R(%)	1992/93 Extent of V.R	1992/93 Cond. Cable Capa.
OLD PATAN P/S												
Patan	99.32	O	O	99.27	O	O	99.22	O	O	99.16	O	O
Jawalakhel	99.31	O	O	99.25	O	O	99.19	O	O	99.11	O	O
Pharping	95.89	O	O	95.39	O	O	94.84	O	O	94.21	O	O
Mangal Bazar	99.84	O	O	99.83	O	O	99.82	O	O	99.80	O	O
NEW BANESWAR S/S												
Baneswar	99.29	O	O	99.22	O	O	99.14	O	O	99.08	O	O
Airport	94.83	O	O	94.04	O	O	93.41	O	O	92.67	O	O
Godawari-1	94.15	O	O	93.71	O	O	93.21	O	O	92.67	O	O
Godawari-2	91.30	X	O	90.75	X	O	90.02	X	O	89.29	X	O
Imadol	98.89	O	O	98.77	O	O	98.66	O	O	98.54	O	O
Shankhamul	99.04	O	O	98.96	O	O	98.88	O	O	98.79	O	O
TEKU S/S												
Pulchowk	98.60	O	O	98.50	O	O	98.39	O	O	98.28	O	O
Kalimati	99.93	O	O	99.93	O	O	99.93	O	O	99.93	O	O
Kirtipur	99.75	O	O	99.72	O	O	99.71	O	O	99.68	O	O
Mint	99.00	O	O	98.98	O	O	98.95	O	O	98.93	O	O
Tahachal	99.57	O	O	99.55	O	O	99.52	O	O	99.49	O	O
Thankot	99.95	O	O	99.94	O	O	99.94	O	O	99.93	O	O
Bhimsenthan	99.62	O	O	99.60	O	O	99.59	O	O	99.58	O	O
Tripureswar	99.88	O	O	99.88	O	O	99.88	O	O	99.88	O	O
K2 S/S												
King's Way	99.24	O	O	99.20	O	O	99.16	O	O	99.12	O	O
Kamaladi	99.54	O	O	99.53	O	O	99.51	O	O	99.48	O	O
Singha Durbar	99.59	O	O	99.59	O	O	99.58	O	O	99.50	O	O
Mahabouddha	99.82	O	O	99.81	O	O	99.81	O	O	99.80	O	O
City-1	99.85	O	O	99.85	O	O	99.84	O	O	99.84	O	O
Tangal	98.38	O	O	98.26	O	O	98.16	O	O	98.04	O	O
Baber Mahal	99.71	O	O	99.71	O	O	99.71	O	O	99.71	O	O

NAME OF FEEDER	1993/94 Voltage Regul. at End V.R(%)	1993/94 Extent of V.R	1993/94 Cond. Cable Capa.	1994/95 Voltage Regul. at End V.R(%)	1994/95 Extent of V.R	1994/95 Cond. Cable Capa.	1995/96 Voltage Regul. at End V.R(%)	1995/96 Extent of V.R	1995/96 Cond. Cable Capa.	1996/97 Voltage Regul. at End V.R(%)	1996/97 Extent of V.R	1996/97 Cond. Cable Capa.
OLD PATAN P/S												
Patan	99.10	O	O	99.04	O	O	98.97	O	O	98.88	O	O
Jawalakhel	99.05	O	O	98.96	O	O	98.87	O	O	98.77	O	O
Pharping	93.48	O	O	92.66	O	O	91.79	X	O	90.74	X	O
Mangal Bazar	99.74	O	O	99.77	O	O	99.75	O	O	99.73	O	O
NEW BANESWAR S/S												
Baneswar	98.97	O	O	98.88	O	O	98.77	O	O	98.66	O	O
Airport	91.89	X	O	91.00	X	O	90.01	X	X	88.91	X	X
Godawari-1	92.13	X	O	91.50	X	O	90.83	X	O	90.06	X	O
Godawari-2	88.45	X	O	87.56	X	O	86.57	X	O	85.47	X	O
Imadol	98.40	O	O	98.23	O	O	98.06	O	O	97.87	O	O
Shankhamul	98.69	O	O	98.58	O	O	98.47	O	O	98.33	O	O
TEKU S/S												
Pulchowk	98.16	O	O	98.02	O	O	97.80	O	O	97.72	O	O
Kalimati	99.93	O	O	99.93	O	O	99.93	O	O	99.93	O	O
Kirtipur	99.65	O	O	99.62	O	O	99.58	O	O	99.56	O	O
Mint	98.90	O	O	98.86	O	O	98.83	O	O	98.79	O	O
Tahachal	99.46	O	O	99.43	O	O	99.38	O	O	99.35	O	O
Thankot	99.95	O	O	99.93	O	O	99.92	O	O	99.92	O	O
Bhimsenthan	99.56	O	O	99.54	O	O	99.53	O	O	99.51	O	O
Tripureswar	99.88	O	O	99.87	O	O	99.87	O	O	99.87	O	O
K2 S/S												
King's Way	99.08	O	O	99.04	O	O	99.00	O	O	98.93	O	O
Kamaladi	99.45	O	O	99.42	O	O	99.38	O	O	99.35	O	O
Singha Durbar	99.57	O	O	99.57	O	O	99.58	O	O	99.55	O	O
Mahabouddha	99.79	O	O	99.78	O	O	99.78	O	O	99.77	O	O
City-1	99.83	O	O	99.83	O	O	99.82	O	O	99.81	O	O
Tangal	97.92	O	O	97.80	O	O	97.66	O	O	97.50	O	O
Baber Mahal	99.71	O	O	99.70	O	O	99.70	O	O	99.69	O	O

NAME OF FEEDER	1997/98 Voltage Regul. at End V.R(%)	1997/98 Extent of V.R	1997/98 Cond. Cable Capa.	1998/99 Voltage Regul. at End V.R(%)	1998/99 Extent of V.R	1998/99 Cond. Cable Capa.	1999/00 Voltage Regul. at End V.R(%)	1999/00 Extent of V.R	1999/00 Cond. Cable Capa.	2000/01 Voltage Regul. at End V.R(%)	2000/01 Extent of V.R	2000/01 Cond. Cable Capa.
OLD PATAN P/S												
Patan	98.79	O	O	98.70	O	O	98.59	O	O	98.49	O	O
Jawalakhel	98.66	O	O	98.53	O	O	98.40	O	O	98.26	O	O
Pharping	89.60	X	O	88.32	X	O	86.86	X	O	85.26	X	X
Mangal Bazar	99.71	O	O	99.69	O	O	99.67	O	O	99.64	O	X
NEW BANESWAR S/S												
Baneswar	98.53	O	O	98.39	O	O	98.24	O	O	98.07	O	X
Airport	87.72	X	X	86.38	X	X	84.86	X	X	83.21	X	X
Godawari-1	89.21	X	O	88.26	X	O	87.28	X	O	86.70	X	O
Godawari-2	84.27	X	O	82.91	X	X	81.50	X	X	79.93	X	X
Imadol	97.66	O	O	97.42	O	O	97.18	O	O	96.88	O	O
Shankhamul	98.20	O	O	98.04	O	O	97.87	O	O	97.70	O	X
TEKU S/S												
Pulchowk	97.55	O	O	97.35	O	O	97.15	O	O	96.93	O	O
Kalimati	99.93	O	O	99.93	O	O	99.93	O	O	99.93	O	O
Kirtipur	99.52	O	O	99.47	O	O	99.43	O	O	99.38	O	O
Mint	98.74	O	O	98.70	O	O	98.65	O	O	98.60	O	O
Tahachal	99.30	O	O	99.26	O	O	99.20	O	O	99.15	O	O
Thankot	99.91	O	O	99.90	O	O	99.90	O	O	99.89	O	O
Bhimsenthan	99.49	O	O	99.47	O	O	99.44	O	O	99.42	O	O
Tripureswar	99.87	O	O	99.86	O	O	99.86	O	O	99.86	O	O
K2 S/S												
King's Way	98.87	O	O	98.81	O	O	98.74	O	O	98.67	O	O
Kamaladi	99.30	O	O	99.26	O	O	99.22	O	O	99.17	O	O
Singha Durbar	99.55	O	O	99.54	O	O	99.52	O	O	99.51	O	O
Mahabouddha	99.76	O	O	99.75	O	O	99.74	O	O	99.73	O	O
City-1	99.80	O	O	99.79	O	O	99.74	O	O	99.76	O	O
Tangal	97.34	O	O	97.15	O	O	96.96	O	O	96.75	O	O
Baber Mahal	99.69	O	O	99.68	O	O	99.67	O	O	99.66	O	O