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Bhutan Country Economic Memorandum

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ABBREVIATIONS AND ACRONYMS

AAC	-	Annual Allowable Cut
ARI	-	Acute Respiratory Infection
BBPL	-	Bhutan Board Products Limited
BCCL	-	Bhutan Calcium Carbide Limited
BFAL	-	Bhutan Ferro-Alloys Limited
BHU	-	Basic Health Unit
BLC	-	Bhutan Logging Corporation
BOB	-	Bank of Bhutan
BPC	-	Bhutan Polythene Company
BTF	-	Bhutan Trust Fund for Environmental Conservation
CHPC	-	Chukha Hydropower Corporation
DANIDA	-	Danish International Development Agency
EDP	-	Essential Drug Program
EIA	-	Environmental Impact Assessment
EPI	-	Expanded Program on Immunization
FAO	-	Food and Agriculture Organization
FMU	-	Forest Management Unit
FSD	-	Forest Services Division, Ministry of Agriculture
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GOI	-	Government of India
GWMC	-	Gedu Wood Manufacturing Corporation
IFDP	-	Integrated Forestry Development Program
IUCN	-	International Union for the Conservation of Nature
MPFD	-	Master Plan for Forestry Development
NEC	-	National Environmental Commission
NES	-	National Environmental Strategy
PCA	-	Penden Cement Authority
PPD	-	Policy Planning Division, Ministry of Agriculture
PSMP	-	Power System Master Plan
RGOB	-	Royal Government of Bhutan
RMA	-	Royal Monetary Authority
RSPN	-	Royal Society for the Protection of Nature
RTM	-	Round Table Meeting
UNDP	-	United Nations Development Programme
WWF	-	World Wildlife Fund

Table of Contents

Page No.

Country Data Sheet

Abstract

Summary and Recommendations i

CHAPTER I: RECENT ECONOMIC DEVELOPMENTS 1

A. Country Background 1

B. Structure of the Economy 3

C. Development Strategy and Fiscal Concerns 6

D. Other Economic Developments 13

E. Options/Recommendations 16

CHAPTER II: EXPLOITATION OF THE HYDROPOWER POTENTIAL AND INDUSTRIAL DEVELOPMENT 19

A. Power Sector Background 19

B. Power Sector Development Strategy 21

C. Power Pricing 25

D. Future Revenue Contribution of the Power Sector 30

CHAPTER III: ENVIRONMENT AND FOREST RESOURCES MANAGEMENT

A. Environment and Development in Bhutan 33

B. The Forestry Sector 40

Annex: Bhutan's Forest Management Units 49

Statistical Appendix 50

Text Tables

1.1 Grant Aid 1988/89 - 1994/95 3

1.2 Current Government Expenditures 1989/90 - 1994/95 8

1.3 Current Expenditures under the 7th Plan 9

1.4 Government Budget Summary 1986/87 - 1994/95 12

1.5 RGOB Holdings in Public Corporations 15

1.6 Contribution of Public Corporations to Government Revenues 16

2.1 Revision of Domestic Power Tariff and Revenue Impacts 29

3.1 Bhutan's Protected Area System 37

3.2 Annual Logging Volume 41

Figures

1.1 Composition of GDP	4
1.2 Sectoral Composition of Capital Expenditures 1989/90-1994/95	9
1.3 1994/95 Budget Allocations for Capital and Current Expenditures	10
1.4 Revenue and Expenditure Trends 1987/88-1994/95	11
1.5 Projected Fiscal Deficit 1994/95-99/00	13
2.1 Capacity of New Hydropower Projects	30
2.2 Medium-Term Power Export Revenues	31
3.1 Subsidized Non-Industrial Wood Price	46

Boxes

2.1 Hydropower Projects under Implementation	20
2.2 Power System Master Plan and Projects under Study	21
2.3 Donor Assistance in Rural Electrification	24
3.1 Local Institutions for Pasture Management in Bhutan	35
3.2 Bhutan Trust Fund for Environmental Conservation	36
3.3 Transaction Costs of Lumber Acquisition	45

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BHUTAN: COUNTRY DATA SHEET

AREA: 46.50 (thous sq. km.) POPULATION: 675,000 (1994) DENSITY: 14.5 per km²
 RATE OF GROWTH: 3.1

POPULATION CHARACTERISTICS

Crude birth rate (per 1000, 1980-85): 39
 Crude death rate (per 1000, 1980-85): 17
 Infant mortality (per 1000 live births, 1994): 70
 Life expectancy at birth (1994): 66

HEALTH (1990)

Population per physician: 3,822
 Population per hospital bed: 635

INCOME DISTRIBUTION

% of National income - highest quintile: ..
 - lowest quintile: ..

ACCESS TO ELECTRICITY (1993)

% of Population: 20

ACCESS TO SAFE WATER (1990)

% of Population - urban: 50
 - rural: 25

EDUCATION

Adult literacy rate (% , 1990): 38
 Primary school enrollment
 (% of relevant age group, 1994): 70
 Secondary school enrollment
 (% of relevant age group): ..

NUTRITION

Calorie intake as % of requirements: ..
 Daily caloric supply per capita: ..

GDP PER CAPITA (US\$ 1992) : 396.5

GROSS DOMESTIC PRODUCT

	1991/92		SHARE IN GROSS DOMESTIC PRODUCT		
	US\$ Million	%	1985-89	1990	1991
GDP at market prices	265.8	100.0	100.0	100.0	100.0
Gross domestic investment	72.8	27.3	36.7	32.6	31.1
Gross national saving	45.9	16.2	11.4	17.5	18.5
Current account balance	-26.9	10.1			
Exports of goods & NFS	63.1	23.7			
Import of goods & NFS	83.1	31.3			

OUTPUT (1993)

	Value Added	
	US\$ Million	%
Agriculture	101.8	40.6
Manufacturing & mining	31.7	12.7
Construction	22.7	9.0
Electricity	19.6	7.8
Services	75.1	29.9
Total	251.0	100.0

CENTRAL GOVERNMENT FINANCE

	Nu Million			% of GDP 1992/93
	1991/92	1992/93	1993/94 (Prel.)	
Current receipts	1,128	1,519	1,589	22.3
Current expenditures	1,152	1,212	1,527	17.8
Current surplus	-24	307	62	4.5
Capital expenditures	1,037	1,292	1,922	18.9
External assistance (grant)	791	967	1,851	14.2
Overall balance	-271	-18	-9	-0.3

BHUTAN: COUNTRY DATA SHEET

MONEY, CREDIT AND PRICES

	1990	1991	1992	1993	1994
	(Nu Million outstanding, end of June)				
Money and quasi-money	979.2	1,189.8	1,366.3	1,588.1	1,930.0
Bank credit to public sector	-111.9	-308.6	36.1	578.2	409.1
Bank credit to private sector	241.4	261.6	364.1	481.6	415.9

(Percentages, or Index Numbers)

Money as % of GDP	19.7	21.6	21.5	21.8	..
General price index (1979 = 100)	246.0	273.7	317.5	360.6	..
Annual percentage changes in:					
General price index	10.7	11.3	16.0	13.6	..
Bank credit to public sector	76.8	-175.8	111.7	1601.7	-29.2
Bank credit to private sector	80.3	8.4	39.2	32.3	-13.6

BALANCE OF PAYMENTS

(US\$ Million)

	1990/91	1991/92	1992/93
Exports of goods, f.o.b.	69.8	63.1	66.2
Imports of goods, c.i.f.	81.4	83.1	125.0
Trade Balance	-11.6	-20.0	-58.8
Non-Factor Services, net	-8.2	-7.0	-13.3
Current Account Balance	-19.8	-26.9	-72.1
Official transfers/grants	52.6	37.9	61.4
Other capital	-1.4	7.8	12.5
Capital account	51.2	45.7	73.9
Errors and Omission a/	-16.9	3.1	10.1
Overall Balance	14.5	21.8	11.9
Gross International Reserves (end of period)	90.5	99.7	94.5

EXCHANGE RATES

	Annual Averages				
	1990	1991	1992	1993	1994
US\$1.00 = Nu	17.0	18.7	25.9	27.8	31.4
Nu1.00 = US\$	0.06	0.05	0.04	0.04	0.03

MERCHANDISE EXPORTS

1993

	US\$ Million	%
Electricity	19.3	25.9
Wood & wood products	11.5	15.5
Cement	7.0	9.4
Fruits & fruits products	4.7	6.3
Cardamom	1.7	2.3
Potato	1.4	1.9
Others	28.8	38.7
TOTAL	74.4	100.0

EXTERNAL DEBT, June 30, 1994 c/ (US\$ Million)

Public debt	134.0
Non-guaranteed private debt	..
Total outstanding & disbursed	134.0

DEBT SERVICE RATIO FOR FY94 b/c/d/ %

Public debt	20.6
Non-guaranteed private debt	..
Total outstanding & disbursed,	20.6

IBRD/IDA LENDING, June 1994 (US\$ Million)

	IBRD	IDA
Outstanding & disbursed	18.2
Undisbursed	8.4
Outstanding incl. undisbursed	26.6

a/ The negative errors and omissions are partly attributable to an underestimation of border trade with India, especially in the period until 1991/92.

b/ Debt services as percentage of exports of goods, services and private transfers.

c/ Excluding short-term debt.

d/ Scheduled payments.

Abstract

This Country Economic Memorandum was prepared as a background document for the UNDP Roundtable Meeting, which is scheduled for January 1995. It is intended to complement a parallel document prepared by UNDP for the same meeting which focuses on human resources development. Given the focus of the UNDP report, this report focuses on the growth, fiscal, and environmental issues that will be essential for Bhutan to resolve in promoting sustainable poverty reduction.

The starting point for the report is Bhutan's broad strategy for poverty reduction. With little surplus to redistribute, progress in reducing poverty will depend on the rate of human resources development and economic growth. Bhutan has started an impressive program of basic education and health services and needs to position itself to finance continued expansion and coverage of these services. Meanwhile, in the medium-term the majority of people living in rural areas will continue to depend for their livelihoods on subsistence agriculture, for which careful management of forestry resources is a prerequisite.

Bhutan has made significant economic and social progress since it opened up to the rest of the world in the early 1960s. Generous donor supports from the international community as well as revenues from electric power exports to India have enabled the Royal Government of Bhutan to build basic infrastructure and rapidly expand the coverage of social services. However, increases in current expenditure have outpaced domestic revenues and placed strains on the budget. Solving the fiscal problem -- through enhanced revenue mobilization -- is thus a central challenge. It will largely determine the pace at which human resources development can proceed. In this context, the report looks at two sectors -- power and forestry -- which offer significant potential for financing social programs and the economy's broader growth requirements.

The Royal Government of Bhutan has an outstanding record of environmental management and attaches great importance to ensuring that Bhutan's natural resource-based industries are developed in an environmentally sustainable manner. As modern sector development progresses, it is particularly important that this careful balance be maintained. To this end, the report suggests that expenditures on developing forest management plans may be one of the best investments Bhutan can make, and that deregulation of domestic forestry pricing may increase the efficiency of the forestry sector and make a significant contribution to budget revenues. Sustainable management of forests will support and complement subsistence agriculture.

The report also discusses the scope for increased fiscal revenues from additional power exports, which the Government sees as a primary focus of its strategy for financing development. However, the report cautions that the scope for increased power revenues will be limited until some of the long-gestation power investments currently being studied come on stream. The report suggests strategies for fiscal management in the interim. It also urges that careful thought be given to the selection of the next round of hydropower projects for environmental soundness and economic viability. Consideration needs to be given to different modalities for financing these investments, including mobilizing private financing. The tariff structure needs to be revised, both to increase revenues and to open up the range of financing options for future projects.

Summary and Recommendations

1. Bhutan began its process of modernization as recently as the 1960s. Prior to that, Bhutan remained largely untouched by events in the outside world. In the 1960s, a road network was built, which connected the country to major trading routes in India. In 1987, the country's first major hydropower project (Chukha) went into production, permitting power exports to India as well as the establishment of energy-intensive industries. The revenue from these sectors -- along with generous donor support -- provided the financing for establishing basic social services in the country. Although per capita income is estimated at \$425, urban areas and major river valleys have an air of greater prosperity, partly due to the impressive size and quality of housing. However, life for people living in more isolated areas is much more arduous. Income earning opportunities are constrained by low farm productivity and limited trading opportunities. These people may be several days from the nearest road.

2. Although it is clear that Bhutan has managed to avoid the extreme manifestations of poverty found elsewhere in South Asia, there is very little data on incomes or poverty on which to base hard analysis. Bhutan has, however, made considerable progress in providing primary education and basic health services to its citizens. Recent household surveys confirm that literacy levels are rising, and that as a result of better health coverage life expectancy is increasing. There appears to be relatively little scope for reducing poverty through redistributive measures. This suggests the solution to poverty has to come through economic growth and development of the human capital base. The latter will require prudent fiscal policies to ensure that resources are available to properly fund social services for the poor.

3. In an economy with few sources of domestic tax revenue, the resource-based sectors such as hydropower and forestry are particularly important as sources of financing for growth and for the Government's development program, especially basic health and education services which require substantial recurrent financing. RGOB is currently pursuing a human resources development strategy based appropriately on the rapid spread of education to lay the basis for longer-term growth, and on improving health status through preventative health care. If it cannot capture additional surpluses from the resource-based sectors, it appears unlikely that Bhutan will be able to continue to expand basic social services on a scale that can improve the quality of life of the poor at existing income levels.

4. Over the past decade the development of hydropower has served both to accelerate domestic economic activity, as well as the source of revenues that have allowed the Government to expand social services. There is substantial scope for further development of power for export to India, and the Government sees this as central to its development strategy -- both to finance investment for longer-term growth and to generate off-farm employment in power-consuming sectors.

5. Forestry management issues are an important part of Bhutan's poverty alleviation strategy in their own right, because the majority of the rural population depend on subsistence agriculture, and will continue to do so in the medium-term. Maintaining their incomes depends on sustaining the food-fuel-fodder cycle that is supported by forest resources in proximity to populated areas. The report explores ways in which forests can be managed better to protect the subsistence base.

6. The Government has invested great effort in protecting Bhutan's unique Himalayan environment, ecology, and culture. As the process of modern sector development proceeds, however, it will be increasingly important that this balance be carefully managed, especially since two of the key development sectors -- forestry and hydropower -- are inextricably linked with the natural environment.

7. Bhutan has developed its country through a series of five year plans. It is now at the midway point in its Seventh Five Year Plan (7th Plan). As expected, the rapid growth resulting from hydropower development and energy-intensive industries in the late 1980s has slowed, to a reported 4 percent. This figure may somewhat overstate actual performance, because official estimates of the growth rate of the agricultural sector, which accounts for two-fifths of the economy, seem to be high. The balance of payments has remained in surplus and foreign exchange reserves have climbed to well over 13 months of imports. Public sector investment, which is largely financed by grants, has averaged around one-third of Gross Domestic Product (GDP).

Fiscal Issues

8. Bhutan's fiscal prospects changed significantly in the mid-1980s with the commissioning of the Chukha hydropower plant -- the first large hydropower export scheme. Revenues from Chukha made it possible to accelerate spending on social programs and public services. Export prices are contractually fixed for four years at a time. Hydropower projects currently under construction will not add significantly to revenue growth. While there is scope to develop additional power export projects, financing has yet to be arranged and subsequent construction is likely to take between eight to ten years.

9. Consequently, the Royal Government of Bhutan (RGOB) faces a structural problem in that only half of total revenues are generated domestically, with power exports accounting for the bulk of receipts. The other half is accounted for by grants. This situation leaves Bhutan extremely vulnerable to external shocks. For example, in the event that foreign aid flows decline unexpectedly, Bhutan would have little room for maneuvering since the recurrent budget, which is covered for the most part by domestic revenues, consists largely of salaries and interest payments that cannot be adjusted in the short term. The solution requires broadening the domestic revenue base. This report explores ways in which this can be done, especially in the power and forestry sectors.

10. When the 7th Plan was discussed at the Round Table Meeting (RTM) held in March 1992, donors expressed concern that the Plan did not earmark sufficient resources to meet the recurrent expenditure requirements associated with planned investment. Developments since then seem to have borne this out. Despite a public sector wage freeze, which led to a significant erosion in real wages, and a vigorous effort to avoid wasteful expenditures, recurrent spending has been about 15 percent greater than planned. This year the Government granted a wage increase to civil servants. It expects that part of this increase will be offset by savings in other areas. However, once the increased staffing requirements and other operating costs associated with the current wave of capital spending are taken into account, recurrent expenditures are likely to be 30 percent greater than originally envisaged for the remainder of the 7th Plan.

11. Excluding grants, total government revenues have hovered around 20 percent of GDP. However, revenues have not kept pace with recurrent expenditures. Although the budget does not include any significant new revenue measures, the Government expects that there will be some improvement in the fiscal situation this year as a result of continuing efforts to contain non-wage recurrent expenditures. However, there is a limit to Bhutan's ability to reduce the deficit through such cost savings. Over the medium term, it is clear that the RGOB will need to increase revenues significantly in order to provide adequate funding for recurrent spending. Otherwise there is a risk that government agencies will be understaffed, infrastructure will not be adequately maintained and the quality of services will suffer. There are three potentially promising and timely actions for increasing government revenues in the short-to-medium term: adopting a more commercial approach to financial sector management policy, increasing domestic power prices and changing domestic wood pricing.

Interest Rate Liberalization

12. Interest rates in Bhutan are administratively determined and maintained at relatively high levels, which have encouraged domestic financial savings but have led to weak credit demand on the part of the private sector. This has resulted in the build-up of the Bank of Bhutan's (BOB) excess reserves with the Royal Monetary Authority (RMA), which stands at half of RMA's total liabilities. Since RMA invests these excess reserves in convertible currencies at a rate less than the domestic deposit rate, there is a net loss to the financial sector. The elimination of interest rate controls on deposits would eventually lead to rates that reflect those prevailing in India. This together with a shift in the composition of reserves from non-rupee to rupee holdings would restore the profitability of RMA and permit it to make a greater contribution to the budget in the form of higher profits.

The Power Sector

13. Bhutan has substantial hydropower potential, which, with careful management, can be developed in a way that is compatible with sound environmental principals, and with a large market for this power in neighboring India. At the moment two mid-sized hydropower plants are being developed largely to supply domestic power needs. A series of studies is underway to identify the next major export project. However, careful thought needs to be given to how the next export scheme(s) will be financed and developed. The Chukha hydropower plant was financed by Indian aid in exchange for guaranteed exports at a low fixed price. This financing model assured Bhutan of steady revenue flows without the financial and technical risk. However, this financing arrangement may not be feasible given the level of financing required for the next project. While the option of another Chukha-style development should not be dismissed, Bhutan should move towards commercializing its power sector and consider mobilizing private sector financing. This would open up more options and increase the probability that the next project would be financed in a timely manner.

14. So far the Government has managed the hydropower development very carefully to ensure that the environmental and socioeconomic impacts of these investments are handled with particular care. Continued attention to assessing and managing the potential environmental and socioeconomic risks associated with further development of the sector -- both in the construction phase to limit the environmental pressures associated with the presence of large number of construction workers, and subsequently to ensure that the water storage requirements of such schemes do not result in the loss of critical habitats and any associated resettlement of local people is properly handled.

15. The power sector's contribution to the budget should be increased by raising tariffs. At present, the power sector is an underutilized source of revenue, as domestic consumers pay only one-fifth of the rates that low income consumers pay in neighboring countries. Furthermore, the cost of providing electricity to domestic consumers is more expensive than currently charged (US1.2 cents) because electricity tariffs do not include distribution costs. It is estimated that the marginal cost of supplying power to domestic consumers in Bhutan is around US 5 cents per kWh. Since household demand is relatively inelastic, the Government may well be able to charge considerably more than this. In Nepal, for example, household consumers pay US 6-7 cents per kWh. A higher domestic tariff in Bhutan would make the real cost of producing power in Bhutan more transparent. The current pricing structure for electricity, which developed out of the financing agreements for Chukha, has undermined the financial viability of new hydropower schemes that would be financed on commercial terms. This pricing structure also runs the risk of encouraging inefficient power-intensive industries.

Environment and Forestry

16. Bhutan has a well-deserved reputation for careful environmental stewardship and has attached great importance to ensuring that its natural resource-based industries are environmentally sustainable. Almost 67 percent of the country is under forest cover.¹ However, approximately one tenth of this area is degraded as a result of heavy utilization in areas close to population centers. Because of its extraordinary rich flora and fauna, Bhutan is considered one of the ten most important global diversity "hot spots". In order to guard against the threat of further encroachment, almost one quarter of the country is covered by a system of national parks, reserves and other protected areas. Bhutan has made impressive efforts to preserve its environment and has now put in place the beginnings of a policy framework for environmental management. The next steps are to ensure that the institutions are established and well staffed to administer these policies, and that effective strategies -- for example in forestry pricing and administration -- are developed to implement them.

17. Estimates of Bhutan's forest resources suggest that there may be scope for additional commercial development of its timber resources on an environmentally sustainable basis. Investing in the preparation of forest management plans and monitoring industrial forest concessions more closely will enable the RGOB to determine what level of extraction is environmentally sustainable. Lifting domestic price controls on wood that currently encourage excessive use and improving the regulatory environment would increase the efficiency of the local industry, free up administrative resources for forest protection and increase the contribution of the sector to the government budget. These are examples of "win-win" economic policies that would make a positive contribution to Bhutan's goal of environmentally sustainable growth.

18. Some of these changes are clearly difficult. However, the Government can draw comfort from the knowledge that they will largely affect relatively higher income households, which consume electricity, hold savings accounts and are building homes. Unless the Government raises additional revenues to fund recurrent expenditures, its ability to manage its infrastructure and social programs will be jeopardized. Even with increased revenues, however, Bhutan may need to scale back the pace of capital spending and program expansion to avoid further pressures on the recurrent budget.

¹ Sixty four percent is comprised of wooded forest while three percent is sparse forest.

Consequently, the Government is reviewing the feasibility of its development targets in key areas, such as education and health. The initial results of this review are expected to be available in time for the next RTM in January 1995. Donors can assist in this process by helping the authorities identify the recurrent cost implications of ongoing investments more precisely. There is also a case for shifting some donor financing from new capital investments to critical recurrent expenditure needs in the social sectors -- at least in the interim until the next major power project comes on stream.

Chapter I

Recent Economic Developments

1.1. Chapter I describes the broad trends in Bhutan's economic development and then goes on to explore in more depth the current fiscal situation. In particular, this chapter examines the emerging squeeze on expenditures in the face of a fairly stagnant non-aid revenue outlook -- at least in the medium term until another major power project is developed. This has potentially serious implications for Bhutan's capacity to carry out its development objectives. This chapter suggests some possible steps that the Royal Government and donors can take to manage the fiscal transition and concludes by reviewing other recent developments in the economy, including progress on the Government's privatization program.

A. Country Background

1.2. Bhutan is a small Buddhist kingdom nestled in the remote eastern Himalayas. It is bordered by India in the south and southwest and by the Tibet region of China in the north and northwest. Bhutan is almost entirely mountainous, and the terrain is among the most rugged in the world -- rising in elevation from 160 meters above sea level to more than 7,000 meters -- which makes travel and communication within the country very difficult. Because of its location on the steep southern watershed of the Himalayan range, Bhutan is endowed with enormous hydropower potential, estimated at about 12,000 MW. Bhutan's mountains contain deposits of limestone, gypsum, dolomite and graphite.

1.3. As a result of formidable natural barriers, Bhutan remained inaccessible by road and air and largely untouched by developments of the outside world until the 1950s. In the early 1960s, Bhutan began the process of modernization through a series of Five Year Plans. A road network was built, which connected Bhutan to major trade routes in India. In 1987, the country's first major hydropower project (Chukha) came on stream, permitting power exports to India as well as the establishment of energy-intensive industries including cement, calcium carbide, and wood products. The development of the power sector and associated industries has led to faster economic growth, and the growth in these sectors along with generous donor assistance has provided the financing required to expand the coverage of basic social services in the country.

1.4. Of the 675,00² people who live in Bhutan, the majority live in rural areas and are subsistence farmers. Per capita income is US\$425, which surpasses many of its South Asian neighbors.³ Bhutan has made considerable progress in recent years in providing primary education and basic health services to its citizens. Infant mortality has fallen from 134 per 1,000 live births in 1989 to 70 in 1994. Primary school enrollment has more than doubled,

² The population figure is estimated for 1994 and is based on the 1990 census, assuming a 3.1 percent population growth rate. The population was recently thought to be 1.4 million inhabitants. In 1990, preliminary census results indicated a much smaller population of about 600,000 Bhutanese nationals.

³ This figure was estimated for 1994 and differs from the figure of US\$180 reported in the 1994 World Bank Atlas which is based on higher population estimates. Comparable per capita income in Nepal, Bangladesh and India was US\$170, US\$220 and US\$310, respectively.

rising from 30 percent 15 years ago to about 70 percent in 1994. Maternal mortality has declined sharply from 7.7 per 1,000 in 1984 to 3.7. Bhutan also leads South Asia in the use of oral rehydration therapy for preventing deaths from diarrhea. Furthermore, Bhutan is the first country in the region to iodize its entire salt supply, which has resulted in the virtual elimination of iodine deficiency. There are no reported cases of polio, neo-natal tetanus or diphtheria. As a result of better health care coverage, Bhutanese can now expect to live longer. Life expectancy in Bhutan has risen from 48 years to 66 in less than a decade, an indication that demographic pressures are building up. Thus, Bhutan faces a major challenge in reducing the growth of its population, which is currently increasing at a rate of 3.1 percent annually.

1.5. There is little hard data on incomes or poverty in Bhutan. However, in a country with Bhutan's development profile -- that is, still largely dependent on subsistence agriculture -- incomes are at a low uniform level and spread fairly evenly among the population. Under these conditions, there is little scope for redistributive or targeted poverty alleviation measures. The solution to poverty has to come from achieving broad economic growth. For these reasons, the present report focuses on those sectors (power and forestry) with potential to raise aggregate incomes in the long term. However, maintaining the income base of the rural poor in the medium term will also require ensuring that the subsistence land base on which they depend is well protected.

1.6. The fact there is not significant overpopulation means that Bhutan has been able to avoid the more extreme manifestations of poverty that are evident elsewhere in South Asia. Nonetheless, accelerating population growth can quickly erode this advantage. Therefore, population programs need to be an integral part of the poverty strategy.

1.7. The Government's emphasis on social services has contributed to a better quality of life than would be expected from such low levels of income. However, in order to sustain these services and expand coverage of these services will be costly. Therefore, it is important that the RGOB pursue a program of careful fiscal management and consider eliminating or redirecting subsidies that do not have a clear poverty justification.

1.8. An important feature of Bhutan's economy is its strong economic ties to India. India is Bhutan's most important trading partner, as evidenced by the fact that the vast majority of Bhutanese exports (86 percent in 1992) go to India. Trade between India and Bhutan is essentially free of restrictions or tariffs. Until 1974, the Indian Rupee (Rs) was the only medium of exchange in Bhutan and continues to circulate freely as legal tender in Bhutan. The Bhutanese Ngultrum (Nu) is pegged at par with the Indian Rupee. Consequently, Bhutan has limited monetary autonomy from India, and price trends closely reflect inflationary movements in India.

1.9. In the early 1970s, India accounted for a major share of foreign aid contributions to Bhutan. In recent years, the share of aid from India has been declining as assistance from other donors has increased. India also provides non-budgetary assistance. In 1993/94, India provided Nu 320 million in off-budgetary financing, which is primarily used for defense services.

Table 1.1: Grant Aid, 1988/89 - 1994/95

(Nu millions)

	88/89	89/90	90/91	91/92	92/93	93/94 estimate	94/95 budget
from India	564	290	453	232	363	642	934
other	227	233	300	559	604	1208	1829
Total	791	523	753	791	967	1850	2763
<u>Memorandum Item:</u>							
Share of Aid from India	71%	55%	60%	29%	38%	35%	34%
Non-budgetary grants from India (Nu millions)	262	260	280	300	320	320	350

Source: National Budget and Aid Coordination Division.

B. Structure of the Economy

Composition of GDP

1.10. The Bhutanese economy has undergone significant structural changes over the last decade. As depicted in Figure 1.1, electricity generation and energy-intensive industries have grown significantly, with their share in GDP increasing from 3 percent in 1980 to 17 percent in 1993. Important shifts also occurred in transport, financial services and real estate sectors. Together these sectors almost doubled their share in GDP between 1980 and 1993. The growth in these sectors along with financial support from donors has provided the financing for expanding government and social services.

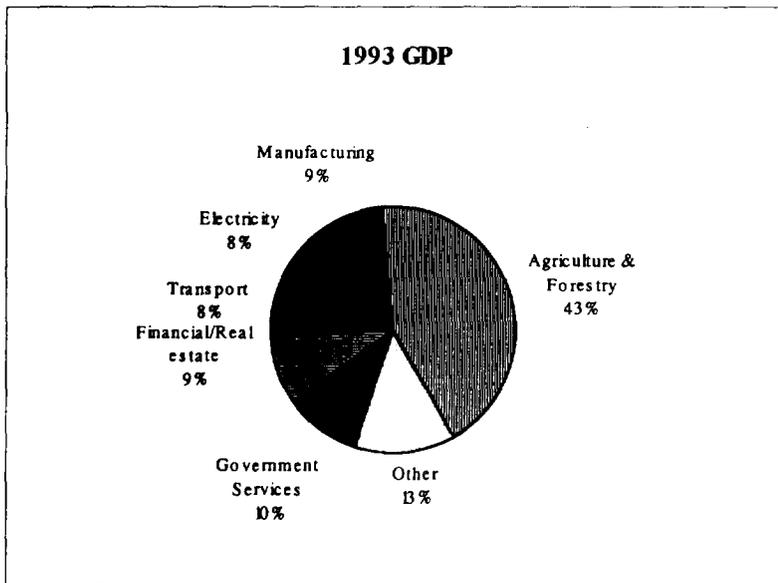
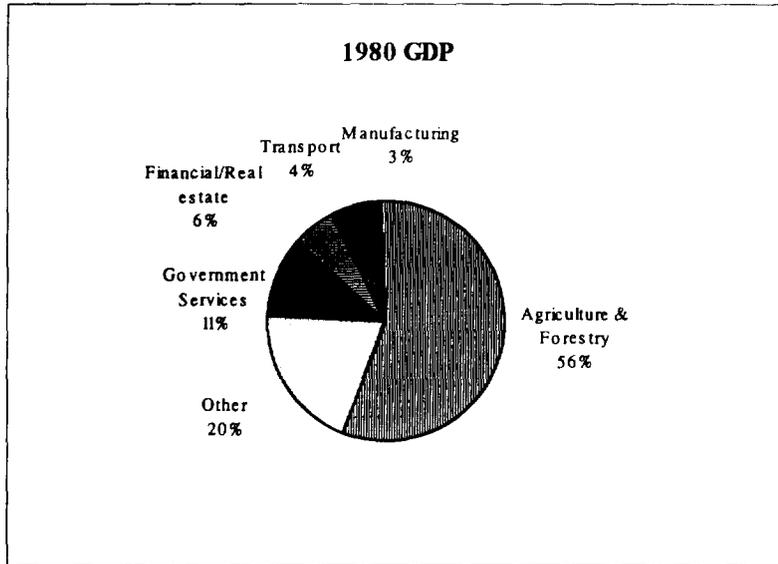
1.11. Agriculture, livestock and forestry -- the more traditional sectors in the economy -- have exhibited more modest growth rates. Agriculture's share in GDP⁴ fell from 56 percent in 1980 to 43 percent in 1993. Agricultural statistics are weak, and existing GDP estimates do not capture the full extent of activities in the important forestry sector.⁵ Therefore, it is difficult to draw precise conclusions on the contribution of agriculture to economic growth over the past decade. However, the reported decline gives a sense of the diminishing relative importance of the sector.

1.12. Maize is the largest crop, dominating rainfed and tsheri (shifting cultivation) main season cropping. Maize accounts for 55 percent of foodgrain production, while paddy accounts for 33 percent. Recently, potatoes have become an increasingly important food crop, both in terms of domestic consumption and export. Export earnings from potato

⁴ Includes livestock and forestry.

⁵ Current GDP figures for forestry only reflect the activities of the Bhutan Logging Corporation and a small portion of individual rural use. These activities account for about half of total annual timber extraction.

Figure 1.1: Composition of GDP
(in 1980 prices)



production in 1993/94 amounted to Nu 50 million from virtually nothing just a few years ago. In areas near the Indian border and some of the inner valleys, cash crops are grown, notably oranges, cardamom and apples. Livestock is an integral part of the farming system, providing draught power and manure to maintain the fertility of the land, and supplementing the diet with meat and dairy products.

1.13. Because of the mountainous terrain, only a small proportion of the land is farmed, and there is reportedly little scope for expansion. Recent estimates of land area under cultivation vary from 3 percent to 16 percent of total land, but the higher estimate probably includes pasture lands.⁶ An agronomic survey conducted in 1990 concluded that farm size has been steadily declining as farms become sub-divided between children. The declining average farm size has forced many farmers to become sharecroppers in addition to farming their own land.

1.14. The contribution of tourism to the economy is very modest. Total tourism receipts amounted to US\$3.2 million, of which one-third was collected as government royalties. While there is no official limit on the number of tourists allowed in the country, there were only 3,000 visitors in 1993 because of capacity constraints during the spring and fall when the weather is at its best and the Thimphu and Paro festivals take place. As part of a strategy to capture more revenues from tourism, the RGOB would like to spread tourist arrivals more evenly throughout the year in order to make better use of available capacity, which is grossly underutilized during the off-season. The RGOB would like to encourage longer visits. On average, tourists spend about a week in the country.

Overall Growth

1.15. Bhutan experienced impressive growth in the 1980s. The average real growth rate for the first half of the 1980s was almost 6.0 percent. In the second half of the eighties, the surge in hydropower development and establishment of associated industries boosted the average growth rate to 7.7 percent. Given that no new hydropower or industrial projects have come on stream since 1990, growth has slowed to about 4 percent p.a.. The growth outlook in the medium term appears to be quite favorable. The Government has projected an average growth rate of over 5 percent p.a. over the next five years. Most of the increase is expected to come from energy-intensive industries: a ferro-silicon plant which was put into trial production in October 1994; the construction of two new hydropower plants (Basachu and Kurichu); expansion of an existing cement plant (Penden); and construction of a new cement plant (Dungsum).

Sectoral Developments

1.16. Agriculture. Agriculture in Bhutan has not experienced the dynamic growth of other sectors of the economy. The average rate of agricultural growth is reported to have been about 4-5 percent. However, the actual growth is likely to have been less than reported. The last agricultural survey conducted in 1990 concluded that production levels had been overestimated for several crops and that there had been very little increase in yields since the

⁶ The 3 percent figure was estimated from an Agronomic Survey while the 16 percent figures is based on a satellite image.

previous survey in 1983. Improved agricultural performance could make a substantial contribution to reducing poverty in Bhutan since the majority of the poor live in rural areas. The potential scope for raising agricultural productivity and incomes is considerable, given that irrigation and mechanization are not widely used at present and that the use of high-yielding crop varieties is limited.

1.17. Forestry. Forests cover 67 percent of the land area in Bhutan and represent an abundant natural resource. During the first half of the eighties, growth in the sector was close to 8 percent. In the last few years, this has dropped to less than one percent. However, the accuracy of these figures is questionable given the deficiencies in the statistical database for forestry activities. The existing GDP figures only reflect the activities of the Bhutan Logging Corporation (BLC) and a small share of individual use, accounting in aggregate for only about half of total forestry activity. Chapter 3 provides a review of the main development issues in the forestry sector.

1.18. Power and Industry. As pointed out earlier, the power sector is very important in the Bhutanese economy, and accounted for a significant share of growth in the 1980s. The commissioning of Chukha -- Bhutan's first major hydropower plant -- led to a once-off increase in GDP of 18 percent in 1987 and enabled further growth to take place in energy-intensive industries. Development of the industrial sector has contributed significantly to aggregate GDP growth over the past decade. The manufacturing sector has grown at an average of 18 percent p.a. since 1985 -- albeit from a small base -- and is the result of a large discrete increase in industrial output from three industrial plants (Penden Cement Authority, Bhutan Calcium Carbide Ltd., and Bhutan Board Products Ltd.). The most significant effect of development of the power sector has been its impact on government revenues, and hence its capacity to finance a broad-based development program.

C. Development Strategy and Fiscal Concerns

1.19. Bhutan's development efforts started in the 1960s with an appropriate emphasis on establishing basic infrastructure -- particularly the road network. The focus then shifted to establishing an administrative superstructure and rudimentary health and education services. By the 1980s, the development focus shifted to the power and industrial sectors as a means of boosting growth further.

1.20. The combination of high levels of foreign aid and rising revenues, primarily from hydropower development during the 1980s allowed the RGOB to embark on an ambitious program to expand the existing infrastructure and to increase the coverage of basic social services. As a result, the RGOB made considerable progress in strengthening and expanding its health infrastructure, especially in the area of primary health care. The Government also made significant strides in modernizing the education system and increasing primary school enrollment, which is part of a long-term goal to develop the country's human resources and reduce its dependence on expatriate workers. The next stage of Bhutan's development plan involves expanding the coverage of social services into more isolated areas, which is likely to be expensive for the Government, especially in terms of recurrent cost financing. Bhutan is now half way through its 7th Plan. The 7th Plan continues to pursue the goals of the Sixth Plan (6th Plan), which emphasized self-reliance, human development, and

improved rural conditions. In addition the 7th Plan stresses the importance of health and education, and development of the private sector.

1.21. Bhutan faces serious structural problems in mobilizing resources to fund programs. First, the tax base is limited as a result of a narrow productive base, low incomes and a widely dispersed population. Second, revenues generated from the country's major natural resources, particularly forestry and hydropower, have been inelastic with respect to overall economic growth. For example, revenues from the power sector are essentially determined by the fixed capacity of Chukha and by the contractual agreement for the export of power. Third, development programs are highly dependent on donor assistance, particularly with respect to capital expenditures, which are entirely financed by grants and concessional loans. Overall, the Government has limited control over key fiscal variables, thus reducing its capacity to respond to changing domestic needs.

Expenditure Trends

1.22. Although the total recurrent expenditures have been growing at about 10.2 percent p.a. over the past five years, the rate of increase, net of interest payments, is about 8.0 percent p.a. -- less than two-thirds the rate of nominal GDP growth. RGOB faces increasing pressure on recurrent expenditure both in the short and longer term. In the short term, the recent wage increase granted to civil servants needs to be funded out of the current year's budget.⁷ In the longer term, the infrastructure currently being constructed with aid financing will require increased operating and maintenance allocations.

1.23. As shown in Table 1.2, recurrent spending levels grew relatively slowly between 1989/90 and 1992/93, but have risen sharply during the last two years. Most of the growth has occurred in interest payments. Even allowing for the 25 percent increase in civil service salaries in this year's budget, spending on wages and salaries has been declining in real terms over the last five years. Similarly, expenditures on goods and services have risen by only 2.3 percent (in real terms) annually during this period. Given the scale of investment that has occurred during this period, it would be surprising if recurrent expenditures have risen sufficiently to cover the full cost of operating and maintaining these programs. Clearly, as more new projects and programs come on stream, the recurrent expenditure requirements will need to rise in order to meet the cost requirements for operating and maintaining these projects and programs. Unless Bhutan can mobilize additional resources to meet these rising costs, it is clear that problems of underfunding, which have surfaced in recent years, will intensify.

⁷ A wage increase of Nu 150 million was awarded in July 1994, which would only compensate for half the erosion in real wages since 1988.

Table 1.2: Current Government Expenditures, 1989/90-1994/95
(Nu millions)

	89/90	90/91	91/92	92/93	93/94	94/95 budget	real change % p.a.
Wages and Salaries	489	513	491	496	540	680	-0.9
Goods and Services	411	410	509	523	595	677	2.3
Subsidies and Transfers	128	126	92	130	165	154	-1.5
Interest Payments	41	33	59	62	227	210	39.6
TOTAL	1069	1082	1151	1211	1527	1721	10.2

Source: National Budget and Aid Coordination Division.

1.24. These problems are clearest in the education and health systems. Spending in the health sector over the past two years has amounted to 41 percent of the 7th Plan allocation. While health spending is on track, it has been reported that 25 percent of the 79 Basic Health Units in the country are understaffed. Budget allocations will need to be increased to accommodate the recent civil service pay increase and to meet the needs for additional staff so that the facilities can be effectively utilized. The recurrent budget does not cover all routine non-salary costs of existing services. The incremental recurrent costs of expanding health coverage during the rest of the 7th Plan period will generate additional spending needs.

1.25. Donors are already playing a helpful role in assisting the Government with these problems.⁸ For example, UNICEF provides all of the vaccines and some equipment for the government's Expanded Program on Immunization (EPI), as well as about 20 percent of the cost for drugs distributed through the Essential Drugs Program (EDP). In addition to the EPI and EDP programs, donors also fund a significant share of hospital operating costs.⁹ However, this situation means that Bhutan's health programs are vulnerable to shifts in donors' priorities.

1.26. The education sector, in which salaries represent a much larger proportion of recurrent spending, is underfunded. The cumulative recurrent expenditures in the first two years of the 7th Plan have been less than planned, amounting to only 33 percent of 7th Plan targets. As a result, student/teacher ratios are below desired levels. Bhutan's goal of achieving universal access to primary education by the year 2000 would require hiring an additional 500 teachers by the end of the 7th Plan period in order to meet the desired teacher/student ratios. Since Bhutan will only produce 450 teachers during this period, hiring is more likely to fall short of the target unless additional and more expensive expatriate teachers are employed. In any case, hiring an additional 500 teachers would still imply a substantial increase in spending. In response, the Government is already in the process of adopting cost-cutting measures such as requiring teachers to teach multiple subjects and grade levels. In addition, the Government has been requesting greater participation of communities in the maintenance of schools.

⁸ See Financial Study of Thimphu General Hospital: Recurrent Cost Analysis and Selected Options for Privatization and User Fees and Dzongkhag Costing Study for Tashigang Dzongkhag, DANIDA, 1992.

⁹ Donors financed more than 10 percent of the operating costs of Thimphu General Hospital in 1992. In the case of the Tashigang Hospital and Riserboo Hospital in Tashigang Dzongkhag, donor financing represented 13 percent and 68 percent of total operating costs in 1990/91, respectively.

1.27. The overall recurrent costs for the remaining three years of the 7th Plan are likely to be significantly greater than originally anticipated by the RGOB. Estimates of recurrent expenditures have been recalculated below (Table 1.3) and are compared to the original 7th Plan projections. If the Government meets its existing commitments to improve social service delivery, recurrent costs are likely to exceed projections by 27 percent in 1994/95, 30 percent in 1995/96 and 32 percent in 1996/97.

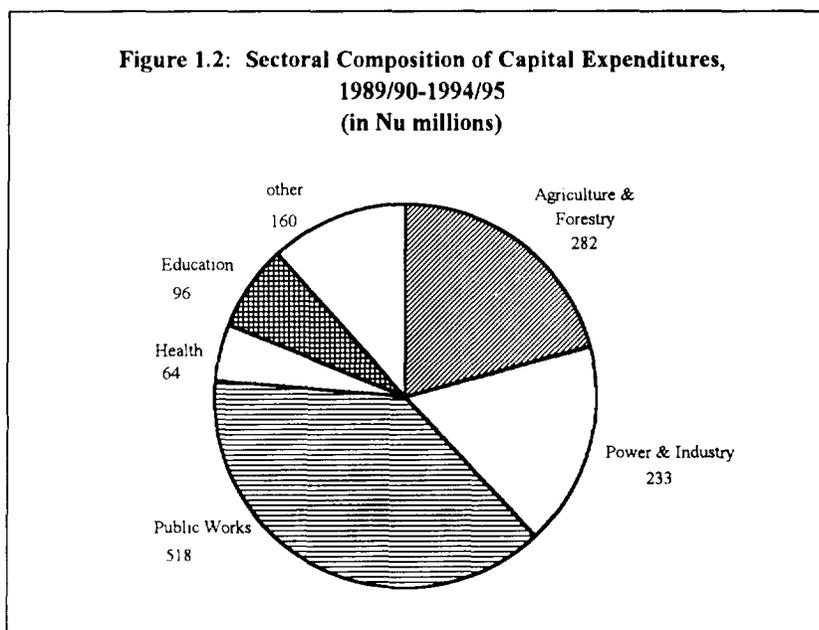
Table 1.3: Current Expenditures under the 7th Plan
(Nu millions)

	92/93	93/94	94/95	95/96	96/97	Total
World Bank Staff Estimates 1/	1212 actual	1527 actual	1962	2279	2624	9605
Original Plan Expenditures 1/	1153	1332	1549	1753	1992	7779
Ratio of WB Estimates/Plan	1.05	1.15	1.27	1.30	1.32	1.23

1/ Includes interest payments, but excludes power projects.

Note: World Bank estimates assumes that the wage costs associated with hiring 500 additional teachers are divided equally among the three remaining years of the 7th Plan.

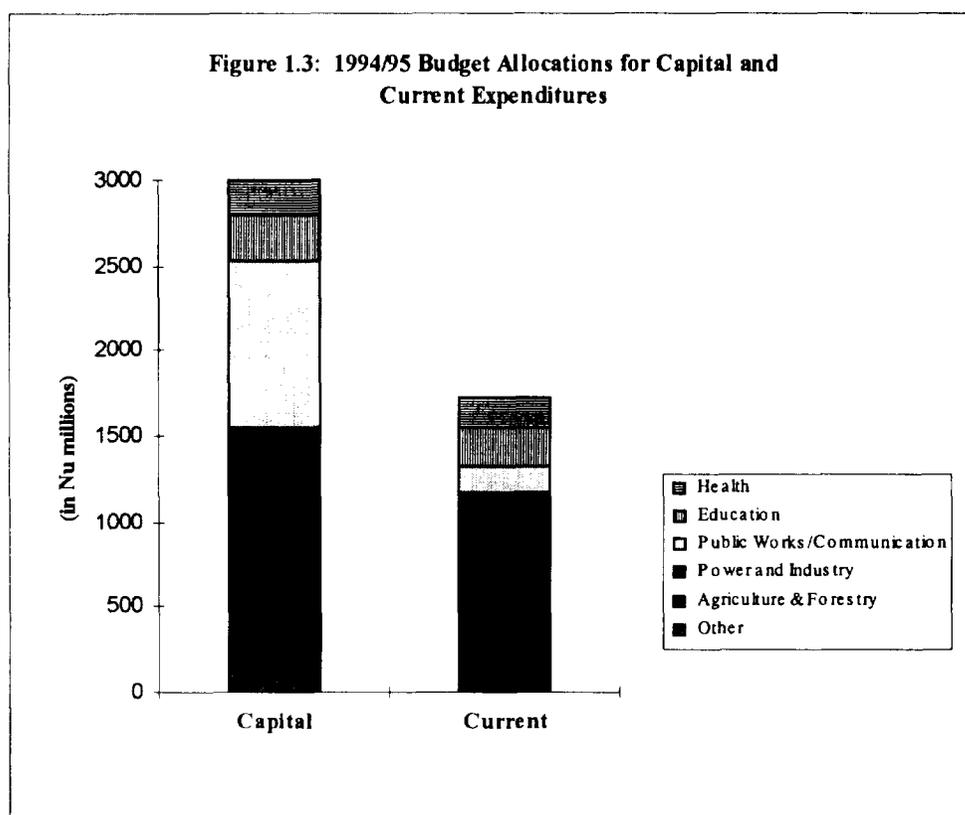
1.28. The sectoral composition of capital expenditure allocations over the past six years is shown in Figure 1.2 below. In current prices, capital expenditures have more than quadrupled since 1989/90 and are projected to reach one-third of GDP. The level of capital expenditures in Bhutan is mainly a function of donor-funded projects, most of which are on a grant-basis, and is therefore not a cause for immediate fiscal concern. However, given the magnitude of capital investments in Bhutan -- which, relative to the size of the economy is more than three times the levels of Nepal and -- it will be extremely difficult for the RGOB to meet the associated recurrent costs.



1.29. Donors can help Bhutan manage this problem. As Figure 1.3 shows, capital expenditures proposed in the current budget year (1994/95) are almost twice the level of recurrent spending in the same sectors. Since investment in these sectors is almost totally financed by donors, Bhutan does not have the flexibility of shifting its spending patterns towards recurrent expenditures associated with high rates of return. Small shifts in the composition of external assistance -- from new projects towards recurrent expenditure requirements -- would help maximize the development impact of projects. It would provide Bhutan with some breathing space to mobilize resources in order to meet the operating costs of new projects.

Revenue Constraints

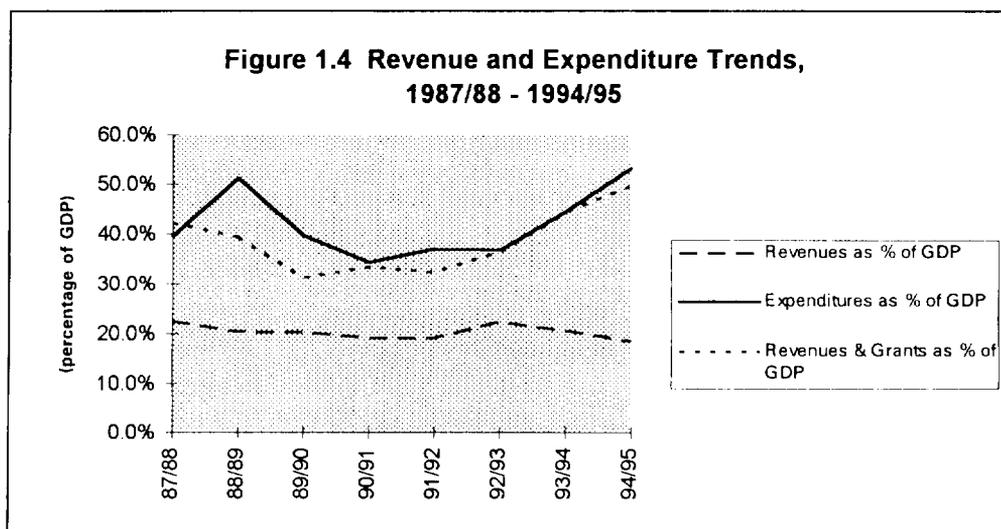
1.30. The short term outlook for revenues is not very favorable. The Government faces a very narrow revenue base, partly as a consequence of the low incomes and widely dispersed population, which makes it difficult to tax individuals and small enterprises directly. In 1993/94, only one-third of revenues were derived from direct taxation, the remaining two-thirds were generated from non-tax sources. While revenues generated from the Chukha Hydropower plant are quite substantial, the net contribution from Chukha is declining when debt service payments are taken into account.



1.31. Despite the efforts to enhance revenue mobilization through various initiatives in recent years -- including strengthening tax administration, rationalizing the tax structure, expanding the tax base and simplifying administrative procedures -- domestic revenues have exceeded 20 percent of GDP only in extraordinary years and have tended to fall as a percentage of GDP since the commissioning of the Chukha Hydropower plant in 1987. Government revenues as a percentage of GDP are projected to decline over the next ten years, assuming that no new large power projects come on stream. A baseline revenue forecast is shown in Figure 1.5. Commissioning of power and industrial projects under construction (Chukha tailrace, Basachu and Kurichu hydropower projects and a ferro-silicon plant) are incorporated in these projections as well as other expected tax increases.

The Fiscal Balance

1.32. Between 1987/88 and 1989/90, immediately following the completion of Chukha, current expenditures nearly doubled, with almost 40 percent of the increase accounted for by a civil service wage increase in 1988. This rapid increase in spending outpaced the growth in revenues and resulted in large fiscal deficits in 1988/89 and 1989/90. Although the RGOB was able to reduce the fiscal deficit in 1990/91, this trend was only temporary. Expenditures regained momentum and outpaced revenue growth ever since as depicted in Figure 1.4. The budget registered a fiscal deficit in both 1991/92 and 1992/93. While the 1993/94 budget envisaged a surplus of 1.9 percent of GDP, there was a slight deficit that year due to overruns in current expenditures.



1.33. The current budget (1994/95) allows for a fiscal deficit of 3.5 percent of GDP. It will be difficult to contain the deficit at this level. Recurrent expenditures are projected to increase by about 13 percent or Nu 193 million. Given that a civil service salary increase of Nu 150 million (9 percent of recurrent expenditures) was awarded in July 1994, recurrent obligations in 94/95 are likely to be underestimated. Capital expenditures are already high and will add to the pressure on recurrent spending. More fundamentally, recurrent budgets are

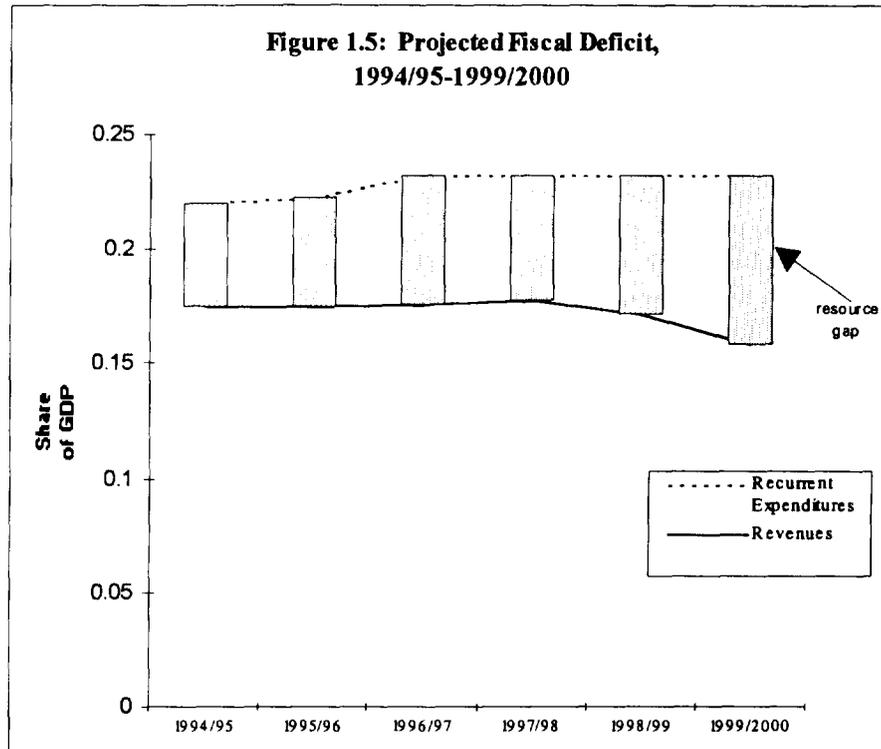
based primarily on the previous year's level (plus an increment) and do not necessarily reflect quantitative estimates of current obligations or a realistic assessment of what would be required to operate public services adequately.

1.34. The fiscal crisis is likely to continue throughout the remainder of the 7th Plan and at least until the next major hydropower project is completed. Figure 1.5 illustrates the magnitude of the resource gap for current expenditures until the year 2000. The projections of recurrent expenditures are from Table 1.3. Tax revenues are assumed to remain as a constant share of non-power GDP (7 percent). Non-tax revenues (excluding power revenues) are assumed to grow at half the rate of GDP. In order to fund the recurrent expenditure requirements in 1994/95, it is estimated that the RGOB would have to borrow Nu 375 million, which would exhaust the excess liquidity in the banking system (Nu 1,200 million) in about four years.

Table 1.4: Government Budget Summary, 1986/87 - 1994/95
(Nu millions)

	87/88	91/92	92/93	93/94	94/95
			prov.	est.	proj.
Revenues and Grants	1,586	1,919	2,486	3,440	4,396
Revenues	842	1,128	1,519	1,589	1,633
Tax Revenue	233	328	447	569	611
Non-Tax Revenue	609	800	1,071	1,020	1,022
(of which is Chukha)	(297)	(260)	(248)	(389)	(340)
Grants	744	791	967	1,851	2,763
from India	567	232	363	643	934
Other	177	559	604	1,208	1,829
Expenditures	1,484	2,190	2,503	3,449	4,708
Current Expenditures	619	1,152	1,212	1,527	1,720
Capital	678	919	1,126	1,691	2,997
Net lending	187	118	166	231	-9
Overall Balance	102	-271	-18	-9	-312
(after grants)					
Financing	-102	271	18	9	312
foreign	261	113	-23	-11	72
domestic	-363	158	40	19	240
Memorandum Item:					
Budget Deficit as % of Expenditures	6.9%	-12.4%	-0.7%	-0.2%	-6.6%
Budget Deficit as % of GDP	2.7%	-4.6%	-0.3%	-0.1%	-3.5%
Revenues as % of GDP	22.4%	19.0%	22.3%	20.4%	18.4%

Source: National Budget and Aid Coordination Division



D. Other Economic Developments

Balance of Payments

1.35. The current account deficit, which decreased during the late 1980s, widened substantially in 1992/93 to nearly 30 percent of GDP. This surge was largely due to the purchase of a second aircraft by Druk Air Corporation and equipment for the construction of a ferro-silicon plant. In 1993/94, there was a decline in current account deficit to about 20 percent of GDP. As a result of continued high levels of aid inflows, the overall balance of payments position remained strong in 1993/94, recording a surplus of more than Nu 600 million. At the end of 1993/94, total gross international reserves climbed well over 13 months of imports.

1.36. Despite a projected decline in foreign aid disbursements and the repayment of the rupee line of credit to the State Bank of India, the overall balance of payments is expected to register another surplus in 1994/95. It is expected that the trade balance will improve, reflecting increases in exports from the newly completed ferro-silicon plant. About half of the output from the ferro-silicon plant will be exported to India, which will help reduce the trade imbalance with India slightly. However, the impact of ferro-silicon exports on the balance of trade with India is likely to be diluted by the effects of the trade liberalization reforms underway in India. The lowering of tariffs in India will result in cheaper imports from third

countries, which will ultimately exert downward pressure on the price of exports from Bhutan that enter India duty-free

External Debt and Reserve Management

1.37. Bhutan's external debt was almost negligible until 1984/85 when the authorities began to borrow abroad to finance economic development projects. By the end of 1993/94, the total outstanding debt had reached US\$133 million, of which US\$78 million is in convertible currencies. The remainder is owed to India. As a result, the overall external debt service ratio rose sharply to about 20 percent of exports of goods and services in the past two years (from less than 7 percent in previous years). One factor for the increase was the start of debt-service payments on Kuwait Fund loans for the calcium carbide plant and particle board factory. The level of debt service is expected to be exceptionally high in the current year (1994/95), rising to more than 40 percent of current expenditures. This reflects loan payments for the ferro-silicon plant, interest rescheduling of the debt for Chukha and repayment of rupee lines of credit. The level of debt service payments is expected to drop by half by the end of the 7th Plan period.

1.38. Until last year, the management of hard currency reserves was handled by the RMA, while rupee reserves were managed by the BOB. The authorities have unified the management of reserves under the RMA, however, in practice the management of hard currency and rupee reserves is still separate. As a result of Bhutan's trade imbalance with India, the RMA borrowed on commercial terms to maintain the level of its rupee reserves. The Royal Government recently activated two lines of credit -- one with the State Bank of India and one with the Government of India at a rate of interest of 14 and 7 percent, respectively -- despite the fact that hard currency reserves remained at well over 13 months of imports.¹⁰ In 1993/94, the cost of servicing these overdraft facilities was reported at over Rs 100 million (US\$3.2 million), which could have been avoided if the RMA had drawn down its own hard currency reserves to compensate for the external imbalance with India. Moreover, the RMA would have saved Rs 50 million.¹¹ As a result, the RMA barely broke even in 1993/94.

1.39. The relatively high real interest rate levels have encouraged domestic financial savings, but have led to relatively weak credit demand on the part of the private sector. Since the Government has refrained from significant domestic borrowing, the result has been a rapid increase in the BOB's excess reserves with the RMA. The value of these excess reserves now stands at half of RMA's total liabilities. Since the RMA invests the BOB's excess reserves in "convertible currencies" at a rate of 6 percent compared to an average deposit rate of 10 percent, the BOB's resource mobilization efforts have led to a net loss to the banking sector. Although the RMA's preference for holding its reserves in convertible currencies led to a substantial gain in 1991 when the Indian rupee was devalued, the policy of aligning domestic interest rates with rupee interest rates and holding reserves in other currencies means that the Bank of Bhutan and the RMA incur substantial losses during periods when the rupee is more

¹⁰ These lines of credit have steadily been reduced. The outstanding balance at the end of October 1994 was Rs 250 million (Government of India) and Rs 220 million (State Bank of India).

¹¹ This assumes an average interest rate of 10% on rupee lines of credit and 5% on hard currency reserves.

stable. The RMA's desire to maintain reserves in fully convertible currencies was understandable when strict exchange rate controls between the rupee and third currencies were in place. However, the rationale is less clear now that the rupee has moved to convertibility.

Privatization

1.40. In contrast to most public enterprises in the region, public manufacturing and service corporations in Bhutan have generally been profitable. All but two public corporations made a profit in 1993/94.¹² In 1991/92, the Government embarked on an ambitious program of privatization as part of a broader strategy to generate an efficient, dynamic commercial and industrial sector in Bhutan. All agro-industries have been privatized, and the RGOB is seriously considering privatizing the postal and telecommunication services. As of 1992/93, the cumulative sale of government shares of public corporations was equal to Nu 163 million. The Government continues to own shares in six major public corporations, which have a book value of about Nu 300 million.¹³

Table 1.5: RGOB Holdings in Public Corporations

	Present Holdings ^{1/}	(Nu millions) Asset Value of Corporation ^{2/}
Bhutan Polythene Company	40%	19.12
Penden Cement Authority	69%	268.13
Bhutan Ferro Alloys Ltd.	25%	--
Gedu Wood Manufacturing Corporation	48%	161.85
Bhutan Tourism Corporation Ltd.	7%	--
Bhutan Board Products Ltd.	24%	345.00

1/ As of June 1994.

2/ End of Calendar Year 1993.

Source: Ministry of Trade and Industry

1.41. The Government has privatized many of the key public enterprises and intends to sell remaining enterprises once absorptive capacity in the private sector permits. There is concern among some government officials that the sale of profitable public enterprises has resulted in the loss of a potentially lucrative source of revenue, and there is also a perception that public corporations have been sold at a loss. An examination of the data suggests that these concerns may not be as significant as perceived.

¹² The two loss makers were Gedu Wood Manufacturing Company (GWMC) and the Bhutan Polythene Company (BPC). The performance of GWMC involves a separate set of issues related to the forestry sector which are distinct from those affecting other public manufacturing enterprises, which are discussed in detail in Chapter 3.

¹³ Only BPC, GWMC, Penden Cement Authority (PCA) and Bhutan Board Products Ltd (BBPL).

Table 1.6 The Contribution of Public Corporations to Government Revenues
(Nu millions)

	87/88	88/89	89/90	90/91	91/92	92/93	93/94
Transfer of Profits	17.5	9.8	7.9	0.5	0.0	0.0	0.0
Corporate Taxes	25.5	1.7	15.9	18.5	26.6	65.6	56.0
<u>Memorandum Item:</u>							
Total Government Revenue	842	847	946	996	1128	1519	1589
Corporate taxes as % of revenues	3.0%	0.2%	1.7%	1.9%	2.4%	4.3%	3.5%
profits as a % of revenues	2.1%	1.2%	0.8%	0.1%	0.0%	0.0%	0.0%

Note: Includes PCA, BLC, GWMC, BTC, BCCI, BBPL, and BPC.

Source: Division of Revenue and Customs.

1.42. Up until 1990/91, the transfer of profits from public manufacturing and service enterprises, excluding Chukha Hydropower Corporation, represented about one percent of revenues. This share dropped to less than one percent following the privatization program initiated in 1991/92. On the other hand, the contribution from corporate taxes is more significant with respect to the budget. The share of domestic revenues from public enterprises in the form of corporate taxes increased from 2.4 percent in 1991/92 to 3.5 percent 1993/94, which would seem to suggest that privatization and corporatization has resulted in some efficiency gains.

1.43. To the extent there is concern that the public enterprises have been sold at a loss, the solution is probably to invest more effort in the preparation and valuation of firms before selling off shares. While public corporations appear to be operating relatively efficiently in the public sector and are not yet causing a drain on the budget as in other countries, it would seem appropriate for the RGOB to accelerate its withdrawal from commercial activities in order to focus its energy on critical areas, such as the provision of infrastructure and social services.

E. Options/Recommendations

1.44. The Government plans to deal with the current fiscal crisis by borrowing Nu 240 million in 1994/95. However, according to our estimates, domestic borrowing would have to reach Nu 375 million in order to fund current programs adequately. While domestic borrowing may be a short-term solution, it is not sustainable in the medium or long term.

1.45. Short-to-Medium Term. There are three options the Government may like to consider.

- Increase revenues from the power sector. Measures are suggested in Chapter 2 for adjusting domestic power tariffs, which would yield an estimated Nu 67 million in revenue from low voltage consumers, (aside from high voltage users). Furthermore, given that the power sector represents the single largest source of revenue for Bhutan and no new major projects are scheduled for completion in the

near future, to a large extent, the outcome of current tariff negotiations will determine whether Bhutan will be able to achieve its social development objectives.

- Capture additional revenues from the forestry sector by eliminating subsidies on wood products. The current system favors the allocation of wood for construction of housing, which costs the Government between Nu 37 million and Nu 51 million. If the Government wishes to continue its assistance for housing construction, it could do so in a more transparent manner (see Chapter 3).
- Reduce the losses in the monetary system by liberalizing interest rates. Due to the administered high deposit rates, the excess savings amount to more than Nu 1,200 million, or more than 70 percent of deposits. Most of the assets of the central bank, RMA, are held in US dollars. This imbalance between assets and liabilities has resulted in a loss of more than Nu 100 million. (See discussion in para 1.39)

1.46. Longer Term. The Government should adopt measures to increase revenues over the long term.

- Acceleration of power development. The RGOB should accelerate the preparatory work needed, including a financing strategy and environmental impact assessments, to bring the next power export project on stream as soon as possible. Since commissioning of the next major hydropower project is so important for the long-term fiscal management, the Government may wish to consider seriously the option of private sector involvement discussed in Chapter 2.
- Forestry development. Utilization of forest resources is currently constrained by the limited number of forest management units (FMUs) completed each year. These FMUs must precede commercial logging activities as a means to ensure sustainable use of forest resources. The Government needs to allocate more resources to the preparation of FMUs in order to increase the potential revenue contribution from the forestry sector.
- Privatization. Privatization is a desirable course of action in the long run. Development of the private sector -- one of the objectives of the 7th Plan--will increase the potential for capturing greater corporate taxes if privatization is accompanied by efficiency gains.

1.47. While the RGOB makes an effort to increase revenues, it also needs to make sure that public services are adequately funded. The Government may wish to:

- Review the level of expenditures and develop more realistic estimates of expenditures. The RGOB needs to review its proposed programs and get a better sense of what is affordable. The RGOB has already made a first step in the right direction by reviewing its health and education targets under the 7th Plan. Cost studies like the ones recently conducted by DANIDA for the Tashigang and Thimphu hospitals can serve as useful building blocks and should be used as a tool

for projecting the recurrent cost implications of building new hospitals and BHUs and expanding the health delivery infrastructure. These projected costs could then be used for long-term planning. The RGOB should also commission cost studies for other sectors.

- Introduce a more systematic process for budget planning in which likely revenues are projected for several years ahead, so that the RGOB can program spending within a realistic resource envelope.
- Encourage donor financing of key recurrent activities -- at least in the interim until revenue from the next major hydropower project comes on stream. The RGOB and donors need to evaluate carefully the pace of investment in new social services to manage the recurrent cost-burden.

Chapter II

Exploitation of Hydropower Potential and Industrial Development

2.1. Bhutan's untapped hydropower capacity is one of the obvious major sources of potential economic growth and government revenues. However, the revenues from new projects currently under implementation are not likely to be large enough to reverse the fiscal trend in the near term, and the next generation of large projects are still many years away. There are three important power sector issues facing Bhutan, and this chapter covers each of them.

- First, the RGOB needs to determine what strategy should be followed for further development of the power system, including the choice of the next large project(s) to take advantage of Bhutan's hydropower capacity for export to India, how these will be financed, and also how development of supply and distribution for domestic use should be managed.
- Second, the RGOB needs to consider whether to move the sector to a more commercial footing by revising power pricing arrangements.
- Third, the Government needs to explore ways of increasing revenue flows from the power sector, given the fiscal pressures facing Bhutan described in the previous chapter.

A. Power Sector Background

2.2. Prior to the commissioning of the Chukha hydropower plant in 1986, Bhutan's massive hydropower potential (12,000 MW) remained untapped. Chukha is Bhutan's first and only major hydropower project in the country. Total power generation capacity in 1994 is 344 MW, of which 325 MW is accounted for by Chukha. The RGOB has recently started construction of two new mid-sized projects, Kurichu (45 MW) and Basachu (61 MW), while expanding the capacity of Chukha through an additional tailrace.

2.3. The commissioning of Chukha permitted a rapid increase in domestic electrification for industrial and household use. In 1992/93, electricity consumption was 174 million kWh. Industrial use accounted for about 80 percent of domestic consumption in 1992/93. Most of the industrial power is consumed by a few large (formerly public) manufacturing corporations. The largest electricity consumer is Bhutan Calcium Carbide Limited (BCCL), which accounted for 80 percent of industrial consumption in 1992/93. Household use of electricity in Bhutan compares favorably with other South Asian countries. Twenty percent of the population has access to electricity, compared to only ten percent of households in Nepal. The RGOB has also been promoting rural electrification in isolated areas. Construction of a 1.1 MW scheme is underway in the Tashigang District. Another 1.0 MW project is currently under study at Yongla/Wangla -- in one of the remotest areas of Bhutan -- with assistance from the GOI. Financing for this project is currently being sought.

2.4. Under an energy buy-back arrangement for 99 years with the Government of India (GOI), the electricity generated by Chukha but not consumed within Bhutan is exported to India. In 1993, about 90 percent of the electricity (1,465 million kWh) generated by Chukha was exported to India. The balance was sold for domestic consumption. Electricity exports have had a significant impact on Bhutan's balance of trade with India and on government revenues. The value of exports to India increased by 84.9 percent in 1987. Government revenues doubled between 1985/86 and 1987/88.

2.5. Chukha was developed on a unique basis. Since Bhutan was unable to finance the massive costs of a large hydropower scheme (and since at the time external commercial financing was effectively ruled out -- because revenue flows were in Indian rupees -- then a non-convertible currency), India developed Chukha on a grant/loan basis and agreed on a tariff that is effectively a royalty on the power generated. This has a number of complex implications which are explored in this chapter, including the approach to financing future power export projects, the appropriate pricing of power for exports and domestic use, and the choice of future projects.

Box 2.1: Hydropower Projects under Implementation

Basachu. Basachu is a run-of-the-river project situated in the Sankosh basin, 22 kilometers south of the town of Wangdi Phodrang. The total capacity of 61 MW will be commissioned in two stages. The total project cost is estimated at Nu 1,515 million (US\$ 49 million equivalent). The Government of Austria is financing 53 percent of the project cost through a grant and concessional loan. Eleven percent is being funded out of the government budget, and the remaining 36 percent is still unfunded. Nevertheless, a transmission line that will supply power to the project site has already been installed. The construction of the project will begin following the monsoon season in 1994. Commissioning of the first stage (22.2 MW) is expected in 1997. The second stage (38.6 MW) is expected to be completed by the year 2000.

Kurichu. Kurichu is a reservoir-type hydropower project located near Mongar in eastern Bhutan. The RGOB has been promoting this project since the 6th Five Year Plan as a means for developing industrial activities in the eastern part of the country. The initial generation capacity will be 45 MW. The capacity could be increased at a later stage by 15 MW. The cost is estimated at about Nu 2,560 million (US\$83 million equivalent) and is fully financed by the GOI through a grant (60%) and a loan (40%). The rate of interest of the loan is 10.75 percent.

While construction of Kurichu began in May 1994, the project is not expected to be commissioned until 1999. The reservoir will provide seasonal storage and will thus allow 45 MW of generation at peak and at least 25 MW at other times throughout the lean season. Upon completion, Kurichu will supply the proposed Dungsum cement project with 25 MW. Kurichu will also be connected to small hydropower networks through an eastern grid, which will almost eliminate the need for the eastern region of the country to import electricity from India

Chukha tailrace. Due to insufficient capacity of the tailrace tunnel, the effective capacity of the Chukha hydropower station has been 325 MW compared to the design capacity of 336 MW. The construction of a tailrace tunnel will permit full capacity utilization. The cost of construction is estimated at Nu 35 million. Completion of the project is expected by the mid-1995.

B. Power Sector Development Strategy

2.6. The Government has started construction of two mid-sized projects, Kurichu and Basachu. In addition, it is expanding the capacity of Chukha through the construction of a tailrace tunnel (see Box 2.1). Kurichu is intended to supply the eastern parts of the country. Basachu will provide power to areas surrounding Thimphu, Paro, Punakha, Chirang, Dagana, Sarpang and Wangdi Phodrang, which are currently supplied by Chukha. This will allow greater exports from Chukha.

2.7. The next major power project is likely to be chosen from among the four large export projects described in Box 2.2. A detailed feasibility study has been completed for Chukha II. Feasibility studies for Chukha III and Bunakha are expected to be completed by the end of 1994, and a detailed feasibility study of Mangde Chu is expected in 1997.

Box 2.2: Power System Master Plan and Projects under Study

The Bhutan Power System Master Plan (PSMP) is a project cofinanced by the UNDP and the Royal Government of Norway and executed by the World Bank. The principal objective of the PSMP is to improve the RGOB's capacity to develop environmentally-sound hydropower projects that make the best use of the country's hydropower potential. The elements of the PSMP include: (i) strengthening of the hydrological and data processing procedures in Bhutan; (ii) preparation of a twenty-year master plan for hydropower development; (iii) preparation of pre-feasibility study reports for the four hydropower projects; and (iv) production of the detailed feasibility study of the project chosen by the RGOB out of four pre-feasibility study sites.

The PSMP selected 25 promising projects with a total capacity of 10,988 MW, following an initial desk study. From this final list, the five most cost-effective projects were selected for construction. They include two projects each on the Wang and Sankosh rivers and a project on the Bumthang River. Their combined capacity would be 2,500 MW.

Pre-feasibility studies for four sites (two on the Sankosh River, one on the Mangde River and another on the Kholong River) were conducted during Phase II of the PSMP. The four schemes were all run-of-the-river projects. Two projects on the Wang River, which were the most promising during the Phase I evaluation, were not included since feasibility studies were already being conducted. Mangde Chu and Kholong were not among the five projects in the Phase I tentative selection. The main reason appears to have been the desire of the RGOB to have a major hydropower plant situated in each of the main river basins in order to achieve regionally balanced development.

Chukha II (Tala) and Chukha III. Proposals have been made by the GOI for two more large hydropower projects downstream of the Chukha project. One is Chukha II (Tala) and the other is Chukha III. A detailed feasibility study of Chukha II (1,020 MW run-of-the-river project) has now been submitted to the Bhutanese authorities by the GOI. The estimated cost is Nu 15,000 million (about US\$484 million equivalent). Chukha III is a storage dam project near the border with India. The site for Chukha III (262 MW) was studied under the PSMP and was ranked at the bottom of the 25 potential projects. The project has now been redesigned with a capacity of 900 MW. The project report will be completed by the end of 1994. In 1992, the cost of the project was estimated at US\$ 548 million. Design and construction of either project would take at least 8 years.

Mangde Chu. The Government has decided to conduct a detailed feasibility study (under the PSMP Phase III) for this 265 MW run-of-the-river scheme to be located in the central part of the country

Bunakha Reservoir scheme. This reservoir project upstream of the Chukha plant would have 120 MW capacity. It is also designed to increase the output of Chukha itself by controlling the Wang River flow during peak periods. A project report will be ready by the end of 1994.

2.8. Since Bhutan lacks the capacity to finance the development of major hydropower projects, it faces two options:

- (i) to rely on Indian and/or other donor public financing
- (ii) to seek private sector financing.

Concerning the first option, Bhutan would continue to benefit from a guaranteed income stream -- as it has with Chukha -- while bearing none of the financial or technical risk. However, it is uncertain whether India or other donors will be able to finance such large investments, given that resources in donor countries are likely to become more scarce over the next decade. If Bhutan decides to pursue this strategy, there is a risk that no projects would materialize in the next ten years and rising domestic consumption would reduce exports from Chukha, slowly eroding the export revenue base.

2.9. While it is not definite that it will succeed, the second option of seeking financing from the private sector has a number of attractive features: (i) it allows development of the sector without reliance on public sector finance; (ii) it facilitates commercialization of the sector more generally, which is discussed in further detail in para. 2.31 - 2.32; it can solve a number of problems, including distorted pricing signals; and (iii) it ensures selection of the most cost-effective project. However, for private sector financing to proceed, Bhutan would need a firm agreement with the purchaser -- in this case India -- regarding the intention to purchase power at a pre-determined price.¹⁴ With this agreement Bhutan can then go ahead and call for proposals from investors to study and develop environmentally-acceptable sites for the next major project. Before proceeding, it would be useful to have an inventory of sites developed to the pre-feasibility level on which prospective developers can bid. This flows naturally from the current PSMP exercise, but is a costly process that may require further donor assistance.

2.10. Project Selection. While the development of hydropower can potentially improve Bhutan's economic and fiscal situation considerably, the selection of uneconomic projects can lead to considerable losses and possible financial drain. There are two concerns: (i) that projects are not chosen systematically on economic grounds, and (ii) that mid-sized plants may not be financially viable at current tariff rates.

2.11. The objective of the selection process for power export projects should be to maximize the joint benefits to Bhutan and India. Maximizing the present worth of expected benefits over costs is the appropriate criterion to be used by project planners in optimizing dam height, tunnel diameter and transmission length, the choice of equipment types and sizes and so on in comparing one project with another. This requires a full analysis of patterns of demand, costs, expansion plans and operating conditions in India and Bhutan. This type of analysis has been undertaken in the course of the PSMP, and it is important that its conclusions be given an adequate weight in the final decision process.

¹⁴ While not trivial, this is not an insurmountable difficulty and has been resolved successfully in the case of other bilateral power agreements -- most notably, in the case of Laos and Thailand.

2.12. Conditions in the consuming market are important in selecting export projects. For example, it may be more profitable for Bhutan to tailor its supply to a particular niche or to peak niches in Indian demand. This, as much as financing and technical considerations, will affect the value-added of Bhutanese power, and thus, the rent that can be captured.

2.13. Regional balance should not be a consideration in export project selection. While the desire of the RGOB to promote regionally balanced development is understandable, it may not be compatible with economic assessments of projects. Projects should be evaluated strictly on economic terms, especially for large projects that require external financing. It is recommended that RGOB undertake a careful examination of the costs and benefits of each proposed scheme. It is recommended that this analysis be completed as soon as possible, in order to capture the revenue benefits of additional exports.

2.14. It is also recommended that RGOB seriously examine the options for private sector involvement in the next major power project. A move to private sector financing should reduce the project selection problems outlined above, as private investors would have incentives to select the most cost-effective project. At a minimum, pursuing private sector participation would provide additional options for future development of the sector and introduce competition into the process.

2.15. Environmental Issues. In considering the next hydropower export project, it is very important for RGOB to evaluate the environmental implications very carefully. Although hydropower projects are considered to be relatively "environmentally friendly" by the RGOB, they inevitably have some impact on the surrounding environment and communities. For example, when land is evacuated for construction purposes, communities are often displaced and agricultural land is taken out of production.

2.16. Environmental considerations play a particularly important role when comparing run-of-the-river (Chukha II and Mangde Chu) and reservoir project sites (Chukha III and Bunakha). Reservoir schemes tend to create greater economic benefits than run-of-the-river plants through their more steady, controllable generation of power. Despite this favorable economic feature, environmental issues have to be examined with respect to storage schemes. For example, large reservoirs flood natural habitats and agricultural land, typically requiring resettlement of displaced communities. In addition, earthquake risks are much more serious in the case of large dams. Since the construction of large seasonal reservoir dams usually takes longer than smaller diversion dams, the environmental damage caused by temporary settlements of construction workers tends to be greater.

2.17. Although the RGOB requires Environmental Impact Assessments (EIA) for all projects, the Government is still limited in carrying out these assessments. Given the importance placed on the environment, continued financial and technical assistance from donors to Bhutan in conducting EIAs will be helpful.

Rural Electrification

2.18. The RGOB is planning to promote rural electrification. So far, the Government has been expanding the areas with access to electricity by extending the grid network.

2.19. A program of smaller schemes can supplement development of large and medium projects and grid extensions based on them. This is especially the case in isolated areas that are not practically served with grid extensions, where the rugged terrain makes it extremely expensive to establish a high voltage grid network. Such smaller schemes take two forms: mini and small hydropower plants (say in the 1-10 MW range) supplying localized grids and micro-hydropower projects serving individual villages in remote areas. Experience with micro-stations financed by Japan is presented in Box 2.3.

2.20. A number of smaller schemes with the capacity of up to 10 MW might be possible for satisfying Bhutan's needs especially in the eastern and central regions. The number of potential sites for these schemes is considered very large. Such plants could be sized according to dry season river flows, thus providing continuous firm power.

2.21. Smaller schemes could have several advantages over large plants: (i) they could be connected at different points to a regional medium voltage network, thus reducing the need for major transmission investments and providing security; (ii) the disturbance caused by construction and worker camps would be minimized; and (iii) Bhutanese contractors could be employed (as is the case, for example, at Rangjung), providing them with the chance to acquire expertise. However, the unit costs of smaller hydropower projects tend to be higher than for large ones. Careful choices have to be made as to whether it is more cost-effective to develop large export plants which would also supply electricity for the domestic market -- rather than investing RGOB's own (or aid) resources in small to mid-sized domestic projects.

Box 2.3: Donor Assistance in Rural Electrification

Since 1987, Japan has provided the hardware for 13 micro hydropower plants (total capacity of 980 kW) located in remote areas, some of which have little prospect of ever being connected to a national grid. These plants vary in capacity from 20 to 200 kW. Service connections were provided at the time of installation to all dwellings in the villages where power was supplied. Villagers provided the labor for the installation and bore the cost of wiring within their homes. Lighting is the main use of electricity. Radio/tape-recorders and sometimes rice cookers or electric irons are also used, but power points are discouraged, except in the largest systems.

Responsibility for running and maintaining the plant is borne by the villagers. The smaller systems are looked after by a part-time caretaker who may be paid about Nu 2 per month by each consumer. His tasks include closing down the plant in the morning and starting it in the evening. The larger systems, on the other hand, retain one or two technicians, and charge consumers according to their metered consumption. Poor maintenance in smaller systems can cause problems. For example, four of the 13 turbines were down in July 1994.

Since the size of the plants was designed to meet initial demand, rising demand over time can create overload problems. In the case of the smaller systems, connections may have to be refused to newly built houses. In the larger systems, a gradual proliferation of power points may require action by the Power Division to limit demand.

2.22. The Power Division of the RGOB is proposing to prepare a Power Distribution Master Plan, for which financing is currently being sought. This exercise is timely and useful. The relative benefits of supplying electricity for domestic consumption should be compared to alternative scenarios (such as large/medium and small/mini plants) and grid extension (national and localized).

2.23. The RGOB also needs to review the benefits of further rural electrification. The level of domestic electrification so far achieved is relatively high at about 20 percent. Since major population centers have been already electrified, the benefits of providing electricity to remote villages may not be large enough to justify potentially high costs, especially under the current budget constraints.

Institutional Strengthening

2.24. It is important for the RGOB to build up a reliable hydro-meteorological data base and the expertise to evaluate hydropower projects. An effort to improve data collection was launched under the PSMP and needs to be maintained.

2.25. There is also a need to formulate a manpower development plan for future hydropower projects. When the construction of Kurichu and Basachu is completed, there will be a shortage of skilled engineers and power plant operators. The same is true for longer-term projects that are still in the planning stages. The shortages in skilled manpower may pose a serious bottleneck in the long-term development of the power sector. Given the priority the RGOB attaches to self-reliance, it will need to place more emphasis on training civil and power engineers in preparation for these requirements. The Power and Education Divisions need to play an important role in this exercise to ensure the design of the manpower strategy is appropriate.

C. Power Pricing

2.26. The consumers of Chukha electricity have benefited from very low prices. The GOI financed construction of Chukha on highly concessional terms (60 percent grant, 40 percent loan at 5 percent p.a. interest). In turn, these favorable terms were passed on to consumers by the Government, which does not fully recover the capital cost from its customers. This has a number of consequences. The price charged for power from Chukha does not correspond to commercial power tariffs. The operations of the Chukha Hydropower Corporation (CHPC) are profitable despite a very low tariff level. The export price paid by India should not be regarded as a power tariff in the usual sense, but rather represents a resource-rent being paid to Bhutan for use of its power.

2.27. Export Pricing. The current export price is a flat rate of Nu 0.37/kWh. This is equivalent to about US1.2 cents per unit, compared to about US4.0 cents per unit paid by India to Nepal. The price is adjusted every four years for Indian inflation. The most recent adjustment took place in January 1993.

2.28. There are two immediate concerns with respect to the export price. First, the current tariff rate has eroded in real terms because it is only adjusted every four years. Therefore, it is recommended that the tariff be adjusted annually to account for inflation. Second, the tariff structure is uniform and does not distinguish between peak and off-peak demand. A shift from a uniform rate to peak-load pricing will increase allocative efficiency and potentially benefit consumers in both India and Bhutan.

2.29. In the longer term, the tariff structure needs to be re-examined in order to ensure the viability of the power sector. The current price of electricity was based on the financing arrangement of Chukha and is much lower than the long-run marginal cost of producing and distributing electricity. This tariff structure may not be appropriate for future power projects that do not receive the same level of concessional financing as Chukha. In the case of Basachu and Kurichu, the financing arrangements differ considerably from Chukha. Therefore, the tariff rates should be revised to reflect the real cost of financing.

2.30. If the performance of CHPC were evaluated from a commercial point of view, the overall profits of this corporation would have been less than actually recorded. If CHPC had to cover the true financial costs of the project, it would need to provision approximately Nu 260 million annually in interest payments.¹⁵ In addition, depreciation costs would have to reflect the value of fixed assets in use. In 1992, fixed assets were valued at Nu 4,730 million. Therefore, the depreciation allowance would have been more than Nu 140 million per year. These costs would have eliminated Chukha's surplus in 1992/93. This clearly illustrates that at the current electricity tariff CHPC is not commercially viable.

2.31. A move towards more commercial pricing of exports would have important implications beyond establishing the financial viability of CHPC as a commercial entity. First, the concessional aid flows invested in the power sector by donors will not be dissipated among power consumers in both India and Bhutan. If the power sector can meet the costs of its investments out of its sales revenues, assistance extended to the power sector will benefit the whole economy as additional resources become available to RGOB.

2.32. Furthermore, hydropower projects that are commercially financed would become feasible. Since the current power price does not reflect the full financial costs of power generated by Chukha, only projects financed on highly concessional terms will be viable. As noted later (in para. 2.50), even Kurichu -- with 60 percent grant financing--will not break even under the existing pricing regime.

2.33. For any new project designed for export, the value of the rent to be gained from exploitation of the Bhutanese hydropower resource is the difference between:(i) the present value of India's avoided costs -- whether in the form of building and operating fewer thermal plants or in the form of reduced load shedding, and (ii) the cost of construction and operation of a new hydropower plant. This rent has to be divided between the two countries, and the export tariff applied would form part of the sharing arrangement.

¹⁵ Assuming CHPC was to be charged a 10 percent rate of interest on the funds made available by India.

2.34. The amount of the rent is naturally subject to risk, because construction and operating costs, construction time, river flows, and operating performance of a hydropower project cannot be predicted with certainty, nor can the future pattern of demand of electricity consumption in both countries and development of the power system in India. Hence negotiations will have to cover the division of risk, with the solution lying somewhere between two extremes. India would minimize its risk if it did not contribute any capital and paid a tariff agreed in advance. Bhutan's risk would be minimized if India paid a fixed sum for exploitation of the resource, subject to Bhutan taking the energy it required.

2.35. The actual outcome will be a negotiated price that reflects the concerns of both sides and will depend very much on how additional generating capacity is financed -- especially the extent of Indian financing for construction. As described earlier, one possibility would be to incorporate some form of private sector involvement in financing, ownership, and/or operations. This would reduce the requirement for public sector financing for both sides, as well as facilitate commercialization of power transactions.

2.36. It is recommended that a detailed analysis of the options for a financial framework for developing power for export be undertaken, along with an assessment of the costs and benefits of each approach before deciding how to proceed with the next generation of export projects. This analysis could also provide a basis for discussion of adjustments to the current pricing regime.

2.37. Domestic Tariffs. Low voltage domestic consumers pay Nu 0.40/kWh, while high voltage domestic users pay Nu 0.37/kWh. These rates are very low, being the equivalent of about US 1.2 cents per kWh, compared, for example, with domestic power tariff of US 6-7 cents in Nepal.

2.38. Domestic tariffs are currently based on the export price to India. Since whatever amount of power is not taken domestically can be exported to India, the export price serves as a benchmark for the opportunity cost of electricity consumed within Bhutan.

2.39. At present, the difference between the export price and domestic tariff does not cover distribution costs. Furthermore, domestic tariffs do not reflect capital costs invested in Chukha or by aid donors and Government in newer schemes. They represent a significant subsidy to power consumers by the RGOB (in the case of distribution and transmission costs), and by India (in the case of capital costs).

2.40. In the PSMP documents, the long-run marginal cost of supplying electricity to domestic users were estimated on the basis of export pricing plus distribution and transmission costs.¹⁶ The long-run marginal cost represents a lower bound, and the actual cost will be higher to the extent that the marginal cost of generation is higher than the Chukha export price. For low voltage users, PSMP arrived at an estimate of Nu 1.42/kWh in the western region and

¹⁶ Using the forecast growth of peak demand and the costs of planned investments in transmission and distribution over a period of years, a marginal cost per MW of peak demand is calculated, converted into marginal cost per MWh on the basis of an assumed load factor, and added to the export price of Nu 0.37/kWh, grossed up to allow for transmission and distribution losses.

Nu 5.09/kWh in the central and eastern regions. The difference between these estimates and the current domestic tariff of Nu 0.40/kWh implies a domestic subsidy of Nu 1.02/kWh in the western region and Nu 4.69/kWh in the central and eastern regions. The implicit subsidy similarly calculated for high voltage users in the western region, such as BCCL and Bhutan Ferro-Alloys Limited (BFAL), is relatively small.

2.41. This implicit subsidy diverts part of Bhutan's share of the rent away from government revenues to low voltage electricity consumers. Based on the estimates above, the subsidy for 1992/93 was Nu 91 million. This amount is considerable when compared to total government revenues of Nu 1,589 million in 1993/94.

2.42. Since the average incomes of electricity users are probably higher than those of the rest of the population, this subsidy may run counter to the Government's desire to assist poorer groups within the population. It would be better for the RGOB to set appropriate power prices and use the additional revenues generated to finance development and social programs that benefit the entire population.

2.43. The PSMP recommended that domestic tariffs should be differentiated on the basis of voltage levels and should be raised to cover the marginal costs of supply at least in the western region. The PSMP proposed the following rates: Nu 0.40/kWh for high voltage and Nu 1.40/kWh for low voltage supply. Such a tariff increase of Nu 1.0/kWh for low voltage users would raise Nu 67 million in additional revenue.¹⁷ These estimates should serve as a minimum basis for adjusting domestic tariffs. Given that the marginal cost of additional power is greater than that of exports plus distribution and that the Government desires to raise revenues from domestic sources, RGOB should seriously consider revising tariffs to a higher level than that proposed in the PSMP.

2.44. Note, that the low voltage tariff of Nu 1.40/kWh proposed in the PSMP can be compared with the old domestic tariff that existed prior to commissioning of Chukha in 1988, which was about Nu 0.75/kWh. When adjusted for inflation, this would be equivalent to about Nu 1.0/kWh by now, and the proposed tariff increase thus represents in a large part a re-establishment of the earlier status quo. The impact of such a tariff increase on smaller consumers could be attenuated by a two-block tariff for households, with an initial block of, for example, 20 kWh continuing to be charged Nu 40/kWh (lifeline rate), the higher price being charged only on consumption in excess of this first block.¹⁸

2.45. Under the proposed higher tariff structure, consumers would pay the same price for electricity as India pays but would now have to pay for what they have hitherto obtained free, namely the services of transmission and distribution. In addition, with the new plants coming on stream, tariffs would need further adjustments to reflect the different cost

¹⁷ This is based on the electricity consumption level in 1992/93 with the assumption that there is no decrease in electricity consumption as a result of the higher price.

¹⁸ The revenue loss from this lifeline rate is relatively small. On the average Bhutan's residential consumers use about 120 kWh of electricity per month (1992/93). Charging the existing tariff of Nu 0.40 for the first 20 kWh would result in a revenue loss of only Nu 3.6 million.

structure -- especially as long as the two grid sections remain unconnected. It is recommended that RGOB undertake a quick analysis for setting new tariffs. RGOB should also consider how contributions to capital costs can be incorporated into the tariff structure.

2.46. While the PSMP only considered raising low voltage tariffs substantially to cover the costs of distribution, RGOB should also consider moving to more commercial pricing for all domestic consumers, because (i) low-voltage consumers account for only 38% of domestic consumption; (ii) there is a need to broaden the revenue base; and (iii) current tariffs are exceedingly low by international standards and may encourage inefficient use of power and/or uneconomic choice of technologies. Table 2.1 illustrates the likely revenue impact of increasing both low and high voltage tariffs.

Table 2.1: Revision of Domestic Power Tariff and Revenue Impacts

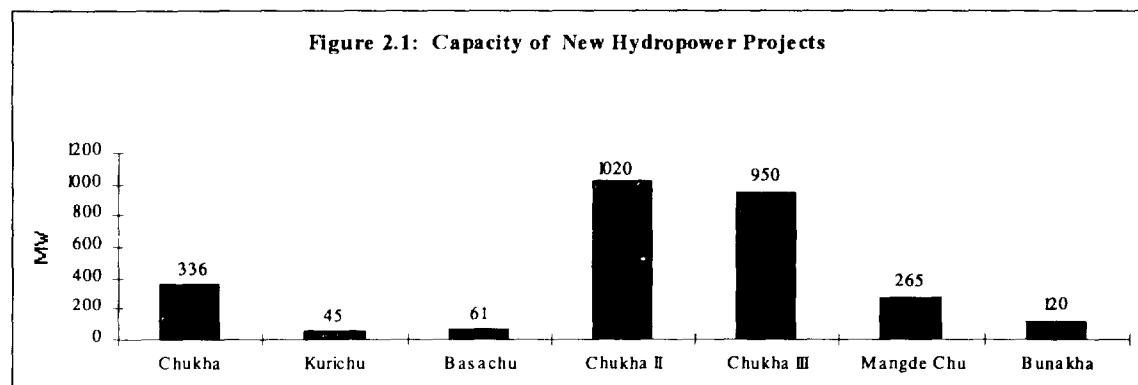
	Low Voltage (LV)	High Voltage (HV)	Total Revenue from Domestic Sale
Current tariff (Nu/kWh)	0.4	0.37	Nu 66 million
PSMP proposal (Nu/kWh)	1.4	0.4	Nu 136 million
Illustrative higher tariff (US 6 cents for LV US 4 cents for HV)	1.86	1.24	Nu 256 million
memo item current consumption (million kWh)	66	108	

2.47. Fuelwood Conservation. There may be a temptation to justify subsidized electricity prices as a means of encouraging the substitution of electricity for fuelwood, especially given the high priority assigned to protecting the country's forests. However, experience from other countries casts serious doubt over the connection between fuelwood use and availability of power.¹⁹ Most households that gain access to electricity use it for lighting and a few small appliances such as radio and fans. Household use does not extend to cooking, the main source of demand for fuelwood. Thus, the impact on deforestation is very limited. Promotion of efficient wood stoves may be more effective in reducing fuelwood consumption (see Para. 3.18).

¹⁹ See, for example, World Bank, Zambia: Urban Household Energy Strategy, Energy Sector Management Assistance Program Report No. 121/90, August 1990, and Nepal: Issues and Options in the Energy Sector, (4474-NEP), August 1983.

D. Future Revenue Contributions of the Power Sector

2.48. The power sector's contribution to government revenues takes the form of transfer of CHPC's net surplus to the RGOB. Revenue contributions of CHPC were Nu 248 million and 389 million, respectively in 1992/93 and 1993/94. This amounts to 16.3 percent and 24.5 percent of the total RGOB revenue, respectively. (The increase is accounted for by the export price increase from Nu 0.27/kWh to Nu 0.37, which became effective from January 1993.)



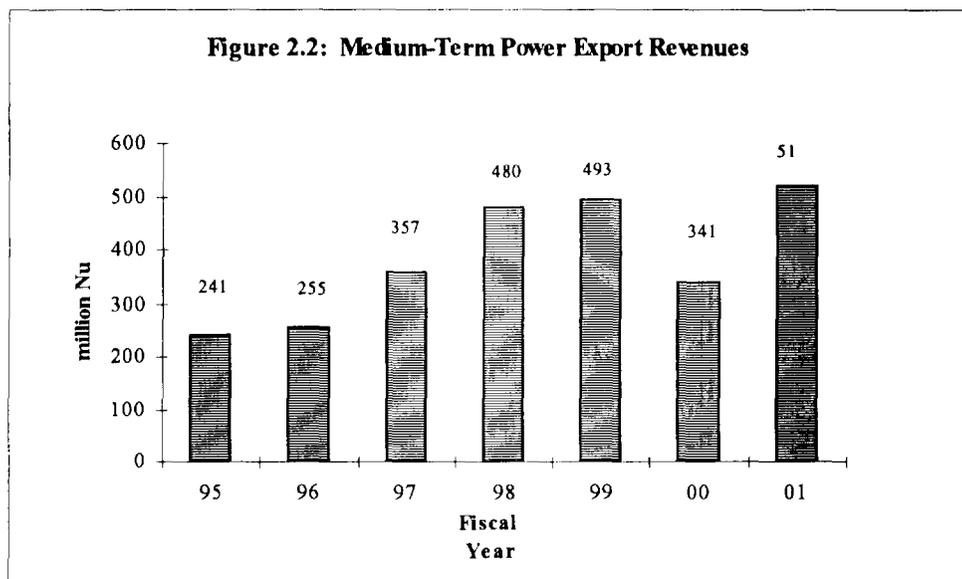
2.49. Revenue Potential of Kurichu and Basachu. In light of the Government's tight fiscal condition, it is important to evaluate the potential revenue contribution of the two projects under construction. The capacity of these two projects is shown in Fig. 2.1, together with capacity of other proposed projects. Together with the Chukha tailrace project, Kurichu and Basachu will increase the country's total installed generation capacity by 117 MW (an increase of 36 percent).

2.50. Despite the substantial increase in power generation, the revenue contribution from these projects will be modest once debt service and operating expenses are taken into account. Revenue projections from power exports are shown in Figure 2.2.²⁰ The increase in 1996/97 reflects an upward revision in export prices, which is scheduled for January 1997. The increase in 1997/98 reflects the commissioning of the first phase of Basachu. Kurichu is expected to make a loss due to a high level of debt servicing, which is reflected in the 1999/00 revenue projections.²¹

²⁰ Assumptions for projections are as follows: (i) the export price is revised every four years; (ii) high-voltage sales to new industries (BFAL and Dungsum Cement) are treated as exports; and (iii) all additional output from Basachu and Kurichu is exported.

²¹ The impact of Kurichu on the budget could be even greater. Following the commissioning of Kurichu, it is likely that power consumption will increase in the eastern region of the country, thus reducing total exports. Furthermore, the Government will also have to bear the distribution costs associated with the project.

2.51. This indicates that the mid-sized hydropower projects currently under construction cannot play a significant role in reversing the fiscal situation of the RGOB. It is estimated that the gap between recurrent expenditures and domestic resources will be about Nu 375 million for the current fiscal year (1994/95), and Basachu will only start generating revenues in 1997/98. Therefore, the result of export price discussions currently underway with India will be extremely important for the government's medium-term fiscal situation.



2.52. The revision of electricity tariffs (adjusted for inflation) would have a substantial impact on RGOB's revenues from the power sector. For example, if the recent upward revision from Nu 0.27 to 0.37/kWh had been spread evenly over the previous three years, export receipts would have been about 14 percent greater for the three interim years combined, or about Nu 180 million.²² Unless the price is revised annually, real revenues from Chukha will continue to decline by the inflation rate. Under the current system, this revenue loss is projected to be about Nu 278 million by the next price revision.²³

2.53. Any real increase that can be negotiated in the absolute level of export tariffs from Chukha would of course have an even more dramatic effect on revenues. For example, an increase of Nu 0.25/kWh, which raises the price to Nu 0.62/kWh (equivalent to US 2 cents), would generate additional revenue of Nu 366 million to the RGOB annually.

²² Since the increase was 37 percent after four years, annual revisions would have increased the price by 8.2 percent annually, with resulting prices of Nu 0.29/kWh in 1990, 0.31 in 1991 and 0.34 in 1992.

²³ Based on projected inflation in India of 7.3 percent, 9.5 percent, 8.0 percent and 7.0 percent between 1993 and 1996, the export price would rise to Nu 0.50/kWh in 1997.

2.54. Export revenues and hence the fiscal impact of new large hydropower projects are potentially enormous. For example, if Chukha II were chosen, it would almost triple the country's power export capacity. Actual revenues will depend very much on financial conditions and tariffs. If the current export price is applied to the next export project commissioned, a highly concessional financing arrangement will be necessary to derive a sizable budgetary contribution from the project. If, however, the export price is revised to reflect the financial cost of Chukha, then it should be possible to generate substantial revenues.

Chapter III

Environment and Development

3.1. This chapter provides an overview of the range of environmental issues which Bhutan faces and aims to assess the RGOB's policy objectives in managing forestry resources in the context of environmental conservation, commercial production and poverty reduction. The first half of the chapter sets the broad context of Bhutan's environment, including a discussion of the range of natural resource management and pollution challenges and their underlying causes. The second half of the chapter focuses specifically on forestry sector issues since this sector is one of the most significant off-farm economic activities in Bhutan.

A. Environment and Development in Bhutan

3.2. The RGOB has adopted an approach to development that places a priority on environmental and cultural conservation. Bhutan is fortunate in that it has not experienced the kind of environmental degradation that has affected many developing countries. Nonetheless, there are areas where population pressure is straining the traditional subsistence base.

3.3. Bhutan's environmental problems have resulted largely from geophysical peculiarities accompanied by underdevelopment, despite Bhutan's traditionally cautious approach to development and careful attention to environmental protection. Six main factors have contributed to these problems:

- (i) Bhutan is located in a geologically young, naturally erosion-prone region, and low sloping land in river valleys is quite limited.
- (ii) Bhutan's population is unevenly distributed throughout the country. Moreover the population is growing at a rate of 3.1 percent p.a.
- (iii) A large portion of the population depends on subsistence activities involving natural resources--agriculture, animal husbandry and forestry. Increases in productivity in these sectors have been slow, and those subsisting from natural resource sectors often lack resources to make necessary investments or shoulder the opportunity costs to avoid degrading these environments. The dependence on subsistence activities is likely to remain for the foreseeable future.
- (iv) There is a complex relationship among forest, crop and pasture lands in the agricultural system, with forests and pastures supplying essential inputs into the farming system.
- (v) Bhutan is at a stage of development in which its management and administrative systems are still being established.
- (vi) Slow but steady theft of fuelwood is leading to degradation in the foothills.

3.4. Land Uses. The wide altitudinal and climatic range in Bhutan have significantly influenced the concentration of population and the types of predominant land use - pasture, agriculture crops, and forest. While the overall population of Bhutan is relatively small and the average population density of 14 persons per square kilometer is relatively low, the population is very unevenly distributed. The highest population densities tend to be in the lower-altitude, warmer south, with much lighter population densities towards the higher-altitude and colder north. About 95 percent of the population live in the southern sub-tropical zone or in the central mid-montane zone. Additionally, within the south to north gradient, the population is concentrated in relatively low-sloping areas in river valleys, including Paro, Thimphu, Punakha, Bumthang and Tashigang, between the major mountain ranges.

3.5. Predominance of Rural Subsistence Economy. There is a strong relationship between the rural subsistence economy, population growth and the environment in Bhutan. The country's population is growing at a rate of about 3.1 percent per year, thus doubling every 23 years. Given the low utilization of family planning methods and declining mortality as a result of improved health care, population growth may accelerate further. With the limited land base, it is becoming more difficult to absorb this increased population. As mentioned in Chapter I (para 1.13), there is limited scope for expansion of arable area, and the average farm size has been declining. There is still tremendous pressure to expand onto other rural lands which tend to be more steeply sloped, erosion-prone, or otherwise marginal for agricultural production. This may exacerbate the problem of poverty in the long run. In addition, tsheri cultivation (shifting cultivation) which is commonly practiced on steeply sloping land is widely observed in the east and south of the country and is spreading west in response to economic pressures. Due to the growing scarcity of unoccupied arable land, the rotational period of tsheri has been shortened, resulting in soil degradation and significant erosion.

3.6. There is a complex relationship among forest, crop and pasture lands in the traditional agricultural system in Bhutan. The sustainability of the farming system requires a delicate balance between these lands and human and livestock populations (see Box 3.1). Wood and non-wood forest products, such as leaf mulch, fodder for cattle feed and firewood, are essential inputs into the farming system. Without nutrient transfer from off-farm activities, primarily from forest land, soil fertility cannot be maintained. Cattle dung, composted with leaf mulch, is virtually the only locally available fertilizer.

3.7. The balance between the components of the farming system is being upset through overcutting of forests or overgrazing of pastures and forests. Problems including land degradation, decreasing crop productivity and erosion are beginning to emerge, although still localized. Therefore, increased efforts must be made to manage these lands with appropriate recognition of their multiple uses for crop, livestock and forestry production, as well as their role as natural habitats for wildlife.

Box 3.1: Local Institutions for Pasture Management in Bhutan

Modern law is very recent to Bhutan and religious and customary rights still play a very significant role. Similarly, traditional institutions for distribution of pasture lands still exist and are widely used in some areas of Bhutan. These customary allocation regimes have extremely important implications for the allocation and use of pastures by herders.

Pastoral communities of Gechukha, Chumpa and Chempa in Haa District exhibit distinct methods for distributing pastures equitably. In upper Haa, three villages have collective user rights over pasture land used for yak grazing. Herders determine through consensus which pasture areas will be combined for summer and winter grazing. Once these combinations are agreed upon, the yak population is divided into five equal groups. There is no limit on the size of the herd. A herder from each of these groups then casts dice to decide what pasture his group will be assigned to. The herder who rolls the highest number out of three turns has first choice for the pasture area. The second highest roll has second choice and so on.

In contrast, communal pastures in Ura are used for cow grazing. There are limits on the herd size. For the most part, communal pastures in Ura are allocated by consensus except for the best pastures which are allocated by lottery. Each year, the names of pastures are written on pieces of paper which are drawn at random by individual herders. Thus, each herder has an equal probability of drawing the preferred pastures. The lottery gives a herder the right to a pasture for the season. The herder also has an obligation to maintain the productivity of the grazing land while in his possession, although it is not enforced by explicit sanctions.

The role of these local institutions in resource management is often discounted by government policy makers. For example, the Land Act of 1979 codified specific use rights on government land. These formal use rights resembled what were customary rights for fuelwood collection and livestock grazing. However, there were major differences contributing to inefficient use of resources.

Per the Land Act, people have registered their grazing rights over one million acres of the Government-owned "native pasture" at a royalty rate of Nu 30/acre/year. However, many of them do not actually hold livestock, and they rent out the grazing rights to others who do have livestock. This creates a distinct disincentive for pasture improvement and a perverse incentive to overgraze the area.

(Source: Karma Ura, "The Nomads' Gamble: Pastoralists of Northern Bhutan," South Asia Research, Vol. 13, No. 2, November 1993, pp. 81-100)

Scope and Relative Severity of Environmental Problems

3.8. Bhutan has a well-deserved reputation for its environmental stewardship. In comparison to other Asian countries, Bhutan has been more successful in protecting its natural environment because of a strong political directive that restricts commercial extraction of forest and wood products. However, despite government's intention to protect its natural environment from the damage wrought in other countries, environmental problems do exist.

3.9. One set of environmental problems stems from the extent of underdevelopment in the country. Environmental degradation has negative consequences on economic activities. Inadequate access to water and sanitation and the heavy dependence on wood fuels, which leads to indoor air pollution, have adversely affected the health of the majority of the population. The other set of problems relates to programs designed to protect the environment, some of which have contributed to inefficient and excessive use of natural resources.

3.10. Impact on Economic Activity. One serious concern is the potential impact of environmental degradation on agricultural productivity including forestry. Since Bhutan's

economy is extremely dependent on natural resources, natural resources must be managed in a sustainable manner. The two main concerns are deforestation/forest degradation and soil erosion. Although deforestation and forest degradation are localized problems, they still have a widespread effect on the overall productivity of the forestry sector. For example, excessive fuelwood and fodder collection, uncontrolled livestock grazing and subsidized fuelwood and lumber prices serve to reduce the yield of non-timber forest products such as fuelwood, fodder, edible fruits and oils, and medicinal plants. These issues are discussed in more detail in the next section. Soil erosion is caused by inappropriate agricultural practices, overgrazing and construction of roads.²⁴

3.11. Loss of Natural Habitats and Ecosystems, Including Biodiversity. Bhutan encompasses two biogeographical zones -- Palearctic and Indo-Malayan--and contains diverse and unique habitats and a high level of biological diversity. Recognized as one of the 10 global hot spots for biodiversity, Bhutan has a wide assortment of flora and fauna including an unknown number of unique plant species, 750 avifauna species, and large fauna ranging from elephants and tigers and the rare golden langur in the tropical jungles of the south, to the snow leopard, the blue sheep and takin in alpine forests and meadows of the north.

3.12. The major threats to Bhutan's natural habitats and ecosystems include encroachment by people as well as livestock, poor land management and illegal hunting and poaching (mainly in areas adjacent to the southern border with India). The RGOB has responded to these threats by establishing parks, reserves and other protected areas. The international donor community is assisting the Government's efforts through the Trust Fund for Environmental Conservation (Box 3.2). In 1993, the RGOB revised its system of protected

Box 3.2: Bhutan Trust Fund for Environmental Conservation

The Bhutan Trust Fund (BTF) for Environmental Conservation was established in 1991 to assist the RGOB with its conservation efforts. BTF is managed by a board consisting of representatives from the RGOB, the World Wildlife Fund (WWF) and the United Nations Development Programme (UNDP). BTF's current endowment totals US\$ 10 million, which was contributed by the Global Environment Facility (GEF), WWF, Netherlands and Norway. A second GEF tranche of US\$ 3 million will be disbursed when RGOB meets several conditions, including upgrading the Wildlife Division of the former Department of Forestry (now known as FSD) to the joint director level, and upgrading two existing protected areas. Other donors are being encouraged to contribute to the BTF. The target is US\$ 20 million for full endowment.

UNDP's Trust Department has invested the BTF to produce investment income to support environmental conservation programs. RGOB contributes 10 percent of the costs of all BTF-funded projects. The BTF has been held entirely in US dollars, with interest rates that have resulted thus far in a modest investment income of approximately US\$ 350,000 per year.

Since its initiation, the BTF has supported work in four main areas, including: (i) development of priority protected areas (Jigme Dorji National Park, Manas National Park, Royal and Black Mountains National Park) and planning for protected areas systems; and (ii) support to the Forest Service Division. When fully endowed, the BTF will expand its support to also cover National Environmental Commission (NEC), and the Royal Society for the Protection of Nature (RSPN) which is a local environmental NGO.

²⁴ Soil erosion from overgrazing is reported to be most serious in alpine areas which serve as summer pasture for cattle and as winter pasture for yaks.

areas, according to International Union for the Conservation of Nature (IUCN) criteria, to make it more comprehensive and representative of all the main ecosystems. Currently Bhutan has four national parks, four wildlife sanctuaries and one nature reserve that cover one quarter of the country's land area (see Table 3.1). While the RGOB has devised a Five Year plan for the protected area system, individual management plans for parks, sanctuaries, reserve and conservation areas are still being developed.

3.13. Bhutan has made tremendous efforts to protect its natural habitats and ecosystems. However, protected areas alone are insufficient for sustainable management of natural habitats and ecosystems. Strategies and methods for strengthening management of agriculture, forest and other rural landscapes are also needed. It is hoped that these management issues will be addressed by the National Environmental Strategy, which is currently being developed (see para. 3.20).

Table 3.1: Bhutan's Protected Area System

Protected Area	Dzongkhag	Area (km ²)
<i>(National Parks)</i>		
Jigme Dorji National Park	Paro/Thimpu/Gasa/Punakha	4,200
Black Mountain National Park	Wangdu/Tongsa/Zhemgang/Bumthang	1,400
Trumshingla	Zhemgang/Bumthang/Mongar	768
Royal Manas National Park	Sarpang/Zhemgang/S. Jongkhar	1,000
<i>(Wildlife Sanctuaries)</i>		
Sakteng Wildlife Reserve	Trashigang	650
Kulong Chu Wildlife Reserve	Lhunsi/Trashiyangtse	1,300
Phibsoo Wildlife Reserve	Sarpang	278
Khaling/Neoli Wildlife Reserve	S. Jongkhar	273
<i>(Nature Reserve)</i>		
Torsa Strict Nature Reserve	Haa/Samtse	644
Total		10,513

3.14. Health Effects. There are two major environmentally-related health concerns. These are water pollution from sewage and indoor air pollution from wood stoves and open fires. Exposure to air and water pollution is the top cause of morbidity, together constituting more than 28 percent of treated health cases in the country. Of the total cases treated in hospitals and basic health units (BHUs), diarrhea/dysentery represented 12.7 percent and acute respiratory infections (ARI) represented 15.5 percent -- representing a significant burden on the health care system.

3.15. Enteric and diarrheal diseases are primarily transmitted through contaminated drinking water, which typically results from inadequate treatment and disposal of human sewage. Ingestion of contaminated foodstuffs and poor hygienic practices, such as infrequent hand washing, also play a major role in transmission. In 1992, 54 percent of the population had access to safe drinking water, and 60 percent was served by sanitary facilities. However, these figures are misleading, because many public water systems are contaminated by leakage from public sewage.

3.16. Indoor air pollution is a major cause of ARI, which results from using fuelwood in unventilated houses. Fuelwood is a major source of domestic energy in Bhutan and is used for cooking, heating and insect fumigation. Fuelwood releases large amounts of air pollutants, including respirable particulates, carbon monoxide, nitrogen oxides and formaldehyde.

3.17. These environmentally-related health effects are a major concern, particularly given that health care resources are limited. Therefore, prevention of health problems through investments in improved water supply and smokeless stoves may be more cost effective than treatment of illnesses. In light of this, the RGOB may want to consider emphasizing programs aimed at reducing water and air pollution. Such expenditures for preventive measures would help to reduce morbidity (and possibly mortality) and related costs of illness.

3.18. Some work is already being done in these areas. An ongoing DANIDA-funded project focuses on water supply in six of Bhutan's major towns and partial sewerage coverage in two towns. The RGOB has also been implementing programs to promote the use of smokeless stoves. Unfortunately, stove programs thus far have not been very successful in Bhutan. Some problems have resulted from faulty stove designs, such as tin chimney stacks which rusted away and could not be easily replaced. Furthermore, some resistance to smokeless stoves may result from people's perception that household smoke helps to prevent insect infestations.²⁵

Environmental Management

3.19. Conservation of the environment is one of the objectives of Bhutan's 7th Plan. To meet this objective, Bhutan is in the process of balancing environmental concerns with development objectives, identifying key environmental problems, determining priority policy interventions, and selecting appropriate instruments to implement these policies. The National Environmental Commission (NEC)²⁶ is responsible for coordinating this work on both "brown"

²⁵ It has been shown that improved stoves with chimneys or other means to reduce smoke can make an important contribution to health. Cross-sectional and longitudinal studies confirm a three-fold decrease in exposure to smoke through the use of so-called improved stoves. In reviewing the experience of stove programs in other countries, several characteristics of successful programs emerge: (i) stoves are designed to include features that are desirable to the local market; (ii) stoves are produced locally; (iii) stoves are not heavily subsidized to ensure the program is self-sustaining; and (iv) the programs concentrate on groups which have difficulty collecting fuelwood or spend a substantial portion of their income on fuelwood. See, for example, Kirk R. Smith, *Biofuels, Air Pollution and Health: A Global Review*, New York, Plenum Press, 1987.

²⁶ Formerly the National Environmental Committee. In 1990, the National Environmental Committee established the National Environmental Secretariat under the National Planning Commission. In November 1992 National

and "green" environmental issues. The NEC is comprised of key government ministers and secretaries.

3.20. National Environmental Strategy. The principal task of NEC is to develop a National Environmental Strategy (NES). For this purpose, an intersectoral task force, consisting of members nominated by sectoral ministries, has been formed to draft background papers on key topics such as population, urban and industrial development, hydropower, watershed management, biodiversity conservation and land management.

3.21. The terms of reference for the task force are very broad: to formulate a strategy that will ensure that all aspects of utilization of natural resources and possible pollution of the environment are taken into consideration in development policies as well as in concrete development projects. A series of meetings to discuss the draft strategy will be attended by representatives from ministries, dzongkhags, the private sector, the Monk Body and the general public. The NES is scheduled to be completed and submitted for cabinet approval by June 1995, in time for it to be incorporated into the 8th Plan.

3.22. A NES would be useful for Bhutan, and the process being pursued -- encouraging broad participation of relevant ministries and trying to create constituencies within the relevant ministries through the NES process -- is good. If the sectoral background papers treat the issues with sufficient depth, a well balanced and comprehensive NES is possible.

3.23. Environmental Impact Assessments. The NEC is also charged with implementing the requirement of Environmental Impact Assessments (EIA) for development projects in Bhutan. EIA guidelines have been drafted and endorsed by NEC, but the task of establishing EIA procedures remains. A matter of some internal discussion is the role of NEC in the EIA process. NEC rightly asserts that EIAs should be undertaken by project proponents as a regular part of project planning and feasibility analysis. NEC's role will be to assess the terms of reference for the EIAs, review and evaluate the EIA reports, make recommendations for mitigation measures, approval or rejection of the project. Although NEC is taking steps to obtain the necessary in-house skills (for example, a senior EIA officer was recently recruited), it still has limited capacity for reviewing EIAs.

3.24. Environmental Quality Standards. The NEC is also involved in drafting umbrella environmental legislation that would authorize the development of specific regulations. NEC is charged with establishing a framework for environmental quality standards appropriate for the socioeconomic conditions of Bhutan. NEC is being careful not to import environmental quality standards from elsewhere, which may not be financially or technically feasible to implement.

3.25. NEC's approach to environmental management, especially for impact assessment and quality standards, seems very sensible; that is: (i) working on umbrella environmental legislation which would authorize specific regulations; (ii) establishing a framework for "appropriate" environmental standards; and (iii) creating capability for EIA

Environmental Secretariat was renamed the National Environment Commission and was made independent of the Planning Commission.

review. However, the agency staff will need to be strengthened beyond the existing three professional staff members in order to fulfill its mandate.

B. The Forestry Sector

3.26. Three major issues arise in the forestry sector. The first is whether the level of commercial utilization of forestry resources can be increased beyond the present level, without significant environmental cost. The second issue has to do with the mechanisms for the management of non-industrial forest utilization -- by communities and by the state -- to ensure sustainable support for subsistence farming. The third is related to the pricing of forestry resources and products -- to ensure that an appropriate rent is captured, and that the right signals are given for optimal utilization and conservation.

3.27. Forests currently cover approximately 67 percent or 2.3 million hectares of the country's total land area.²⁷ The upper limit of forest area is 3,500 meters (11,500 ft), with conifers replacing hardwoods at about 2,500 meters (8,000 ft). These forests provide essential inputs into the farming system as well as timber, fuelwood and numerous non-wood forest products such as medicinal plants. Foliage is used as livestock fodder. Leaves mixed with animal dung are used to produce compost, the major source of fertilizer for agricultural crops. Firewood is virtually the sole source of energy for cooking and heating. Timber is used for construction of housing.

3.28. While the total forest area is quite large relative to the size of the country, much of the forest is concentrated in large contiguous areas some distance from the main population centers and from permanently cultivated areas. Thus, the vast majority of forests are relatively inaccessible except to people living on the periphery. The scrub area is typically located closer to populated areas, since they result from grazing, fuelwood collection and timber harvest.

3.29. There has been decline in forest area over the last 30 years. Approximately 10 percent of the current total forest area is degraded. Forests have been degraded from grazing, collection of fodder, firewood, building materials and non-wood forest products, as well as over-maturity of forest stands in more remote areas.

Rate of Commercial Exploitation

3.30. Currently there are two main forms of commercial logging in Bhutan, one is undertaken by BLC accounting for about one-third of commercial extraction, and the other is undertaken by various industrial users (such as a particle board plant, and a plywood manufacturing company), accounting for the remaining two-thirds. BLC operates in forested areas approved by the RGOB, many of which are covered by detailed management plans. These areas are called Forest Management Units (FMUs). Industrial users, on the other hand, are granted concessions and operate in areas not covered by FMUs. Therefore, it is important

²⁷ This figure includes alpine pasture, meadows and alpine scrub which are not technically forest (in the sense that the areas actually or potentially have trees as the dominant vegetation), but are legally included as Royal Government forest because the land is not registered as private land.

for the RGOB to monitor their operations properly in order to ensure sustainability of these resources.²⁸

3.31. Estimated Current Logging Volume. Bhutan does not have solid logging volume statistics. Formerly, the Forest Services Division (FSD) was responsible for maintaining forest statistics, but at the end of the 6th Plan this task was turned over to the Policy Planning Division (PPD) of the Ministry of Agriculture. PPD is, however, not up-to-date in compiling the data base. As a result, available annual cut statistics are based on best guesses and are not necessarily reliable, particularly for individual logging. Best guesses of the annual cut in 1992/93 are shown in Table 3.2.

Table 3.2: Annual Logging Volume

Bhutan Logging Corporation	40,000 m ³ /yr
Industrial Concessions	
Gedu Wood Manufacturing Corporation	40,000 m ³ /yr
Bhutan Carbide and Chemical Limited	10,000 m ³ /yr
Bhutan Board Products Limited	30,000 m ³ /yr
IFDP	10,000 m ³ /yr
Village (own cut)	80,000 m ³ /yr
Total	210,000 m³/y

3.32. Major Logging Operations. BLC, which cuts about 40,000 m³ p.a., mostly operates in accordance with forest management plans in the areas where FMUs have been established.²⁹ BLC was established in 1984 as an autonomous, fully government-owned corporation under a royal charter. BLC took over the logging operations from the Department of Forestry's Logging Division, which had assumed the task of commercial logging when the RGOB banned all logging by private operators in 1979. It is estimated about 30 percent of BLC's output is sold in domestic markets. The balance is exported.

3.33. Industrial concessions account for another 80,000 m³/yr. Wood from the concession areas is used for the manufacturing of wood products such as plywood and particle board, and as a direct input such as fuel for firing up plants. Forestry concessions are granted

²⁸ There is also a Swiss-funded forestry project in Bumthang District, called Integrated Forestry Development Project (IFDP). This project operates within the FMU.

²⁹ BLC currently operates in 4 districts--Haa, Paro, Thimphu and Wangdi--where FMUs are available. However, BLC is also operating ad hoc (without management plans) in other districts, principally through the territorial operations of the FSD. Sometimes exploitation is concurrent with plan development. In such cases, ex post volume adjustment is made for volume cut prior to FMUs completion.

in forested areas not covered by FMUs. Concessionaires are permitted to clear-cut at a specified rate (annual coupe) and required to replant. Clear felling is justified because selective felling can damage surrounding trees, and natural regeneration of desired species may not be fast enough to sustain the operation.³⁰

3.34. Sustainable Logging. The Bhutan Master Plan for Forestry Development (MPFD) estimated the Annual Allowable Cut (AAC) at 1.2 million m³ of stemwood or roundwood (portion utilized for commercial timber production), of which 560,000 m³ was estimated to be economically accessible.³¹ Since the annual cut in 1992/93 is estimated to have been 210,000 m³ (excluding fuelwood), there may be some scope for expansion of economic activities based on forest resources. However, these estimates must be treated with caution.

3.35. The global estimate of AAC from Bhutan's forests is highly uncertain, and not particularly useful for management purposes, mostly because the calculations were based on outdated statistics, with limited reliability. The original comprehensive forest survey was done in 1980-81 with Indian assistance, but was based on aerial photos from 1956-58. The more recent Master Plan for Forest Development was compiled using 1989 satellite images with limited ground truthing.³²

3.36. Rather than refining these global estimates, the RGOB has appropriately focused its efforts on expanding individual FMUs. Management plans for FMUs are based on detailed inventories using aerial surveys and ground truthing, which make the estimate of a local AAC more reliable. Currently, 9 FMUs totaling about 90,000 ha have been completed, and at least an additional 7 FMUs covering about 73,000 ha (7 percent of forest area) are being prepared (see Annex).

3.37. For sustainable logging activity, it is important to accelerate the formulation of FMUs. This serves two purposes. First, through this exercise policy-makers can gain a better sense of maximum annual logging activity that forests in Bhutan can sustain. Second, extending the coverage of FMUs will allow BLC to expand its operations safely and sustainably. Although it is estimated that BLC has a capacity to log approximately 46,000 m³

³⁰ Clear felling is also practiced by BLC under some of FMUs for broadleaf forests, which are then replanted with commercially valuable species.

³¹ Economically accessible is defined as on land with a slope less than 45 degrees, an elevation of less than 3,500 meters and within 10 km of a major road.

³² The global AAC does not take into account two factors affecting allowable cut: grazing and bark beetle infestation. Overgrazing by livestock and wildlife in forest areas can adversely affect forest regeneration. Currently there is a problem with over-population of wild boar. To reduce livestock predation, farmers poisoned large predators such as cats and wolves. As the number of large predators diminished, there has been a resulting explosion in the wild boar population. An FAO-assisted study concluded that out-of-balance wildlife may be a bigger problem than livestock with respect to forest overgrazing. There is also a severe ongoing bark beetle epidemic in the country resulting in defoliation of firs in higher altitudes. First recognized as a serious problem in Bhutan in the 1980s, thus far the pest has damaged or killed a large area of forests, although data on the exact magnitude of the problem is not available. The pest may be encouraged by poor logging practices, such as leaving remnants of logged wood to rot on the forest floor, as is common with small-scale local cutting. Pest management and salvage of dead trees have controlled the epidemic, but the causes of pest attack have not yet been eliminated.

annually, BLC only cuts about 40,000 m³.³³ BLC's operations have been reportedly constrained by slow progress of FMU formulation. Acceleration of FMUs will create opportunities for BLC to be more financially viable, which will bring fiscal benefits to the Government.

3.38. If, for example, more rapid development of FMUs would allow the doubling of commercial logging activities over the next 10 years (from the current level of 50,000 m³ to 100,000 m³, which is currently expected to be possible) this would generate about Nu 18 million at the current royalty rate.³⁴ Since BLC is currently operating below profitable levels, this increased production may make it feasible to raise the royalty rate.³⁵

3.39. Detailed inventories of forest areas have been compiled in developing FMUs and will be useful in determining areas for industrial concessions. These inventories are crucial in deciding the location of wood-related industries.

3.40. The areas that have been designated for industrial concessions should be governed by forest management plans in order to ensure resource sustainability. In the case of the Gedu Wood Manufacturing Corporation (GWMC), the availability of species suitable for plywood was overestimated,³⁶ and now the corporation may no longer be viable.

Non-Commercial Uses and Forest Management

3.41. There are two institutional issues regarding non-commercial use of forests. The first is that a mechanism is needed for effective community management of local forests, given that the FSD cannot hope to monitor and micro-manage subsistence use of forests effectively. Experience elsewhere suggests that community forestry user-groups are generally the most effective form of resource management. The second issue is that the current process for regulating and allocating wood for subsistence purposes is excessively cumbersome.

3.42. Forest Management by User Groups. The Government needs to look into the potential of forestry management by user groups. Even with the accelerated efforts of the FSD, it is unlikely that the entire forest area in the country will be covered by FMUs in the medium term. Furthermore, there are forests that are simply too costly for RGOB officials to reach and manage effectively. Therefore, some form of local forestry management is desirable in these areas.

³³ Presented here is the actual achievable logging volume estimated by BLC officials, while the maximum theoretical capacity based on the current equipment of BLC is far greater, about 76,000 m³.

³⁴ Matching the breakdown in the MPFD of Bhutan's forest cover by types of trees with the list of royalties on forest products by class of trees, the average royalty rate for trees in Bhutan is estimated as about Nu 10/cft.

³⁵ Currently BLC is operating at a loss partly due to a low level of logging volume. If the volume of logging is increased, BLC will be able to spread its fixed costs and reduce its unit cost of operation, thereby providing a larger profit margin from which higher royalty can be extracted.

³⁶ Moreover, replanting by GWMC is reported to be unsuccessful.

3.43. Because the Government has a strong desire to regulate the use of forest resources, management of forests by user groups has not been widely tested in Bhutan.³⁷ Experience elsewhere suggests that villagers recognize benefits from efficient use of forest resources, which may in turn lead to the discontinuation of both inefficient logging practices and wasteful wood consumption. The transfer of management responsibility to user groups can also potentially help the Government by relieving pressure on expenditures required for forest management, which is particularly useful under the current tight fiscal conditions. Village forestry management will be introduced under the Third Forestry Development Project.

3.44. Non-Commercial Logging and Timber Allocation for Household Use. Non-commercial logging by individuals is estimated to account for 80,000 m³, almost 40 percent of the total logging volume. The RGOB has a system of allocating timber for household use, which allows each Bhutanese household to obtain timber to build a new house every 25 years. Consumers who do not reside close to roads and hence do not have easy access to sawmills are allotted standing trees to be felled and are allowed to cut trees by themselves. These trees typically fall outside FMU areas. Although the allotment is supposed to be made through marking trees by forest officers, there seems to be no reliable mechanism to ensure that only allotted trees are felled, which may lead to excessive logging. This operation is often conducted without proper safeguards in cutting practices, which contribute to the risk of bark beetle infestation.

3.45. In the case of households in urban and accessible rural areas, wood allocation is achieved through a subsidized scheme implemented by the BLC. The system is unnecessarily complex and consumes a substantial amount of time on the part of officials, households and sawmills (Box 3.3). In addition it involves subsidy elements that undermine the financial viability of BLC (see para. 3.48). The RGOB should explore alternative mechanisms for managing household consumption of wood for building purposes.

Pricing and Royalties

3.46. Subsidized Domestic Wood Prices. The RGOB has a policy of fixing domestic prices of wood and wood products. Wood prices for household subsistence use are set far below the industrial rates, which are equal to the weighted average of export auction price of the reference year.³⁸ On average, government-determined prices for rural and urban wood consumers were 24 percent and 39 percent of the equivalent export prices, respectively in 1991 and 1992. Two examples are shown in Figure 3.1.

³⁷ In the late 1980s, there was a pilot project implemented by FAO, which was later discontinued.

³⁸ Auctions which Bhutanese and non-Bhutanese alike can attend are held monthly in Phuntsholing. Both logs and sawn timber of all wood types except walnut and juniper are sold by auction.

Box 3.3: Transaction Costs of Lumber Acquisition

In order to allocate subsidized wood for subsistence purposes, lumber use in Bhutan is heavily regulated. This makes the transaction costs of lumber acquisition extremely high, especially in terms of non-pecuniary items such as paper work and queuing time. For both rural and urban consumers, the process of acquiring lumber, whether one plank or enough to build a house, is a long and complicated one. The average elapsed time for the total acquisition process is about 2 to 4 months. Described here is the process one has to go through to acquire lumber for housing construction.

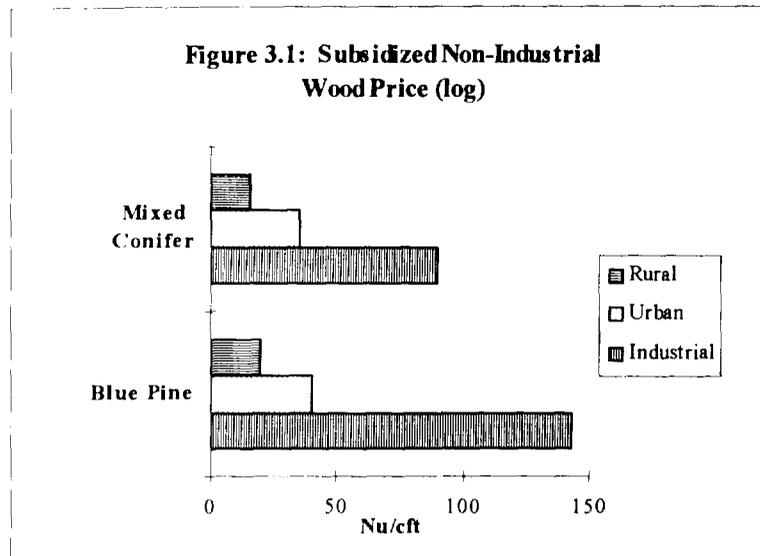
The first step is to obtain a certificate to verify how the wood will be used. In the case of a rural resident, a certification must be obtained from the local civil authority through the village administration verifying that the person is the head of household, a rural resident, will use the wood to build a house in the area, and has not received a subsidized wood allotment in the last 25 years. After getting the certification, the consumer is referred to the District Office of the FSD, which determines whether the rural resident lives close enough to a road to get wood from a sawmill. If not, the consumer is allotted standing trees to be felled and sawn by him/herself. If the consumer resides fairly close to a road, he/she is then referred to BLC, which in turn authorizes an order from the sawmill of the consumer's choice. From start to finish, this step can take as much as 1 to 2 months. Urban residents are never allocated standing timber, and can obtain lumber only from a sawmill. First the urban resident must acquire certification for the house plot from the town planner. The consumer takes this certificate to BLC, which authorizes an order to be placed with the sawmill of the consumer's choice. The elapsed time for this step can be as long as 2 to 3 months.

The next step is similar for both rural and urban residents acquiring wood from a sawmill. Once the consumer goes to BLC with the proper certification and states his/her preference for a sawmill, BLC issues a Letter of Authorization to the sawmill for the order. The letter states the consumer's name, and the exact type and quantity of wood he/she should receive. The sawmill operator must take the letter of authorization to BLC's office and pay in advance for the order. After paying, the sawmill operator receives a release order, which also specifies the consumer's name and the exact type and quantity of wood he /she should receive, which the sawmill operator takes to a BLC depot to pick-up the timber.

However, there is also a queue for access to the BLC depots by sawmills. Sawmills in a particular area typically operate on a turn system. In the Thimphu area for example, the 8 local sawmills are allocated turns each month based on 2 sawmills per day with access to the depot on a rotating basis. When a sawmill's turn comes up, the sawmill operator goes to the depot with the Release Order and selects the logs to supply the order. However, the sawmill cannot get more logs than will meet certified orders, and will lose its turn if the depot does not have logs to meet the exact volume of the orders. Once the sawmill acquires the logs for the order, it cuts the lumber to the specifications on the Release Order. The consumer pays for the lumber in cash when he picks up the lumber at the mill, and receives a receipt called a Challan that again indicates the name of the customer, and the exact type and volume of wood purchased. The cut lumber is marked with a special stamp indicating the Release Order number and Challan number. This final step of the lumber acquisition process can take as long as 1 to 3 months.

3.47. The 3-tier pricing system provides an opportunity for black market transactions in wood and wood products -- wood acquired for one category of use being illegally sold or used for another less-subsidized use or exported. To prevent cheating, the administration of the 3-tier pricing system is complex, and as described previously, its transaction costs are extremely high.

3.48. In addition to high transaction costs, this system may discourage the efficient utilization of Bhutan's timber resources by distorting allocation among the three categories. It also has an adverse effect on the profitability of BLC's commercial logging operations, as the cost charged to domestic consumers by BLC is in fact below its cost of production. To date, this loss has been covered by cross-subsidies from export profits.



3.49. The cross-subsidization scheme exposes BLC to significant financial risks associated with changes in export prices and volumes of wood and wood products. Recently, BLC's logging volume has declined as a direct result of logging restrictions. In addition, export prices have reportedly dropped as much as 20-30 percent since December 1993.³⁹ If export volumes and prices do not rise substantially, domestic wood prices will have to be revised upwards to maintain BLC's financial viability, or the subsidy will have to be financed through regular budgetary outlays.

3.50. The difference between export and non-industrial domestic wood prices suggests a subsidy of Nu 155 million for the period 1990-92.⁴⁰ However, this underestimates the full opportunity cost of selling wood domestically rather than exporting it, because exported timber is on average of lesser quality than that sold domestically. Domestic consumers have first preference for logs and timber.

3.51. Decontrolling domestic wood prices, dismantling the system of allocating wood through administrative controls, and introducing a market-based system would likely increase the availability of commercially harvested wood in the domestic market and rationalize the balance between export and domestic use. By eliminating wood subsidies, there would be clearer incentives for sustained forest management and efficient timber harvest and wood use. RGOB would improve economic efficiency and reduce environmental damage at no net financial cost to the RGOB.

³⁹ The cause of drop in the export price is not known, although it may be due to reduction of India's import duty on wood. As a response, the RGOB introduced a floor price to the auction in Phuntsholing, which is equal to the average of previous three months' auction price.

⁴⁰ An FAO consultant report (1992) (Report of the Consultant on Wood and Wood Products Marketing and Prices in Bhutan, TCP/BHU/2251) estimated the implicit subsidy as Nu 37 million in 1990.

3.52. Royalties. Royalties collected by the government should be based on prices that promote resource sustainability, efficient end-use of forest products and the highest level of net benefits to the community. Currently, the royalty system is complex to administer effectively and distortionary with respect to prices. Furthermore, the RGOB could capture a larger portion of economic rents from commercial forest use, while promoting efficient timber harvesting.

3.53. The current royalty assessment system is complex, cumbersome and costly, and should be replaced with a cost-responsive royalty assessment system. Rates differ depending on species (delineated into six classes) and girth, and whether the wood is for rural or commercial (urban or industrial) use. Royalties for trees are levied at a fixed rate based on a specified girth irrespective of height, whereas royalties for logs are computed on a volume basis.

3.54. The adverse impact of subsidized domestic wood price is also observed in the royalty system. The current large subsidies are afforded to timber consumers (as standing trees or/and conversions), especially those allocated for rural sector. This requires reductions in the royalty as well. For example, the royalty rate for rural use is Nu 0.40/cft. This level is far below economic resource rents, i.e., the difference between market (export) price and cost of production, including a reasonable rate of return.

3.55. Adoption of a correct royalty assessment system would not only bring fiscal benefits it would also lead to resource allocation with the greatest benefits. It would also introduce an effective economic criterion to measure the actual value of forest resources. This knowledge would enable planners to target investments for the forestry sector and to determine the potential of Bhutan's forests to contribute to the economic development of the country.

3.56. There is substantial room for the RGOB to increase royalties.⁴¹ Suppose the royalty is raised by Nu 50/cft on the average, then royalty revenues for the Government under the current extraction level would increase by more than Nu 67 million. As discussed earlier, by doubling commercial logging in FMUs, additional revenue would be more than Nu 100 million.⁴²

3.57. It is important, however, that the royalty increase be implemented concurrently with BLC's expansion into new FMUs. BLC is currently operating below its capacity and is unable to cover its fixed costs. This makes it difficult for the Government to collect greater royalty revenues from BLC. Allowing BLC greater logging volumes will allow BLC to cover its fixed costs and realize sufficient financial returns to pay higher royalty rates.

⁴¹ For example, the current royalty for blue pine lumber is Nu 24 /cft. Given that the current export price of blue pine lumber is Nu 165/cft and BLC's variable costs for logging is Nu 21/cft, the royalty rate could potentially be raised to Nu 132/cft. See FAO Report TCP/BHU/2251.

⁴² It has to be noted, however, that these potential revenues are gross of the additional costs associated with developing and implementing the FMUs, which would be necessary to ensure that the increased cut is sustainable.

3.58. Conclusions. Despite Bhutan's abundant forest resources, commercial forestry has been constrained in Bhutan by lack of knowledge about the level of harvesting which is compatible with resource sustainability. It is expected that FMUs will allow the RGOB to make better use of these resources. Royalties collected by the Government should be based on prices that promote resource sustainability, efficient end-use of forest products and the highest possible level of net benefits to the community. Royalty payments themselves should seek to capture a significant proportion of the residual rent available after production costs and a fair return to the processing enterprise are subtracted from undistorted market prices for the end products.

Annex: Bhutan's Forest Management Unit

Name	Dzongkhag	Area (ha)
<i>(Existing)</i>		
Chamgang-Helela	Thimpu	4,694
Giadakom	Thimpu	13,000
IFDP (Karshong)	Bumthang	11,300
IFMP (Ura)	Bumthang	6,817
Haa - East	Haa	7,040
Korilla	Mongar	13,408
Nahi	Wangdue	7,645
Paro-Zonglela	Paro	16,154
Wangdigang	Zhemgang	9,620
Total		89,678
<i>(In Progress)</i>		
Bhangtaar	S/Jongkhar	11,000
Chendebji	Trongsa	17,600
Chapleykhola	Zhemgang	15,538
Lingmethang	Monggar	5,267
Khaling-Kharungla	Tashingang	7,276
Khotokha	Wangdue	8,175
Sinchula-Tharana	Thimphu	8,158
Total		73,014

Source: Forest Resources Development Section

Forestry Services Division, Ministry of Agriculture, Thimpu

Statistical Appendix

	Page No.
Table 1	Gross Domestic Product at Factor Cost at 1980 Prices, 1985-94 51
Table 2	Gross Domestic Product at Factor Cost at Current Prices, 1985-94 52
Table 3	Gross and Net Domestic Product and Related Aggregates 53
Table 4	Gross Domestic Product by Expenditure and Other Major Aggregates 54
Table 5	Crop Production Estimates, 1983-90 55
Table 6	Numbers of Livestock and Poultry, 1985-92 56
Table 7	Sales of Major Industries 57
Table 8	Consumer Price Index, 1985-93 58
Table 9	Balance of Payments Summary, 1989/90-1993/94 59
Table 10	Balance of Payments with India, 1989/90-1993/94 60
Table 11	Exports to India, 1985-92 61
Table 12	Imports from India, 1985-92 62
Table 13	Balance of Payments with Third Countries, 1989/90-1993/94 63
Table 14	Exports to Third Countries, 1987-92 64
Table 15	Direction of Trade, 1985-92 65
Table 16	Imports by Food Corporation of Bhutan, 1985/86-1993/94 66
Table 17	Gross International Reserves, 1986/87-1992/93 67
Table 18	Concessional Loan Commitments, Debt Structure and Terms 68
Table 19	Convertible Debt and Debt Service, 1988/89 - 1993/94 69
Table 20	Government Budget Summary 1988/89-1994/95 70
Table 21	Government Current Expenditure, 1989/90-1994/95 71
Table 22	Government Capital Expenditure, 1989/90-1994/95 72
Table 23	Tourism Statistics, 1989-93 73
Table 24	Electricity Generation and Trade with India, 1989/90-1993/94 74

TABLE 1
ESTIMATES OF GROSS DOMESTIC PRODUCT AT FACTOR COST (1980 PRICES), 1985-94
(Millions of Ngultrum)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
									Est.	Proj.
Agriculture (including animal husbandry)	580.2	613.7	642.6	677.1	716.4	743.1	782.0	757.2	791.1	808.9
Forestry	253.7	267.3	283.2	262.6	246.5	252.8	250.4	249.2	270.3	295.3
Mining	12.6	22.2	21.6	19.0	21.7	19.3	27.4	23.5	21.3	21.1
Manufacturing	75.4	71.0	105.0	110.3	128.2	158.1	186.7	208.8	233.3	260.5
Electricity and gas	6.0	60.4	229.0	225.1	231.5	204.1	200.4	201.6	212.3	206.0
Construction	169.0	141.8	152.3	129.0	133.8	136.8	116.2	156.6	159.7	173.4
Wholesale and retail trade, hotels and restaurant	132.4	143.4	142.4	129.2	133.6	134.7	145.1	160.7	161.2	171.2
Transport	79.4	83.9	91.3	122.1	142.4	172.1	182.0	192.3	201.4	219.2
Finance, insurance and housing	110.1	126.2	135.7	141.0	163.5	212.2	208.8	215.8	235.2	244.1
Government Services	126.0	168.6	200.0	210.0	217.0	223.3	233.2	251.2	262.0	275.9
Less: Imputed bank services charges	(25.0)	(24.0)	(30.0)	(31.5)	(41.1)	(28.8)	(21.0)	(28.1)	(30.2)	(30.2)
Total	1,519.8	1,674.5	1,973.1	1,993.9	2,093.5	2,227.7	2,311.2	2,388.8	2,517.6	2,645.4
(Percent change)		10.2%	17.8%	1.1%	5.0%	6.4%	3.7%	3.4%	5.4%	5.1%

Source: Central Statistical Office, 1980 to 1994.

TABLE 2
ESTIMATES OF GROSS DOMESTIC PRODUCT AT FACTOR COST AT CURRENT PRICES, 1985-94
(Millions of Ngultrum)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
									Est.	Proj.
Agriculture (including animal husbandry)	856.6	966.5	1,087.6	1,225.7	1,378.9	1,532.4	1,709.4	1,841.7	2,090.8	2,300.4
Forestry	379.6	432.7	535.9	520.6	545.4	562.5	595.7	610.1	729.4	845.6
Mining	20.2	37.4	37.0	33.4	35.7	44.8	90.0	98.8	88.3	88.0
Manufacturing	128.3	137.1	204.7	226.5	302.5	396.7	499.5	647.4	773.2	932.8
Electricity	6.8	96.6	377.0	388.0	391.0	384.7	384.4	445.5	543.0	554.2
Construction	290.5	267.5	349.9	309.0	358.2	398.7	359.7	595.1	703.8	839.9
Wholesale and retail trade, hotels and restaur	203.3	234.1	248.2	258.5	268.8	321.6	382.9	479.7	448.4	513.5
Transport	104.1	114.2	126.0	180.6	235.6	346.7	398.5	471.2	521.1	614.3
Finance, insurance and housing	149.3	170.7	210.5	263.9	306.9	378.0	409.4	438.8	472.2	526.7
Government Services	262.2	350.8	416.0	507.8	525.1	540.5	564.4	608.9	633.9	721.2
Less: Imputed bank service charges	(51.0)	(49.0)	(62.0)	(63.1)	(67.0)	(58.4)	(51.8)	(68.0)	(68.0)	(68.0)
Total	2,349.9	2,758.6	3,530.8	3,850.9	4,281.1	4,848.2	5,342.1	6,169.2	6,936.1	7,868.6
(Percent change)		17.4%	28.0%	9.1%	11.2%	13.2%	10.2%	15.5%	12.4%	13.4%

Source: Central Statistical Office, 1980 to 1994.

TABLE 3
GROSS AND NET DOMESTIC PRODUCT AND RELATED AGGREGATES
(in current and 1980 prices)

(Nu million)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 (estimate)
IN CURRENT PRICES														
1. Net domestic product at factor cost	1,033.8	1,206.3	1,411.8	1,650.5	1,941.0	2,212.0	2,567.0	3,200.2	3,488.6	3,908.9	4,397.2	4,838.5	5,587.2	6,306.2
2. Consumption of fixed capital	61.2	73.8	86.3	103.0	118.9	137.6	191.6	330.6	362.3	399.0	451.0	503.6	590.7	663.2
3. Gross domestic product at factor cost (million Nu.)	1,095.0	1,280.1	1,498.1	1,753.5	2,059.9	2,349.6	2,758.6	3,530.8	3,850.9	4,307.9	4,848.2	5,342.1	6,177.9	6,969.4
4. Indirect taxes less subsidies ^{1/}	17.9	21.2	23.6	34.8	45.6	41.8	43.0	76.7	3,850.9	73.7	134.2	159.4	176.0	316.5
5. Gross domestic product at market prices	1,112.9	1,301.3	1,521.7	1,788.3	2,105.5	2,391.4	2,801.6	3,607.5	3,933.7	4,381.6	4,982.4	5,501.5	6,353.6	7,285.9
6. Net factor income from abroad (million Nu.)	-200.0	-269.7	-321.6	-456.1	-387.8	-449.7	-467.0	-349.5	-344.3	-171.6	-296.3	-439.8	-645.1	-645.1
7. Gross national product at market prices (million Nu.)	912.9	1,031.6	1,200.1	1,332.2	1,717.7	1,941.7	2,334.6	3,256.0	3,589.4	4,210.0	4,686.1	5,061.7	5,708.5	6,640.8
8. Population (in million)	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
9. Per capita gross domestic product at market prices (Nu.)	951.2	1,093.5	1,257.6	1,453.9	1,671.0	1,853.8	2,122.4	2,672.2	2,850.5	3,175.1	3,304.0	3,619.2	4,113.2	4,814.9
10. Per capita gross national product at market prices (Nu.)	780.3	866.9	991.8	1,083.1	1,363.3	1,505.2	1,768.6	2,413.3	2,601.0	3,050.7	3,304.0	3,619.2	4,113.2	4,814.9
IN 1980 PRICES														
1. Net domestic product at factor cost	1,033.8	1,134.4	1,194.5	1,287.4	1,378.0	1,426.2	1,552.6	1,775.7	1,792.1	1,878.5	2,006.6	2,070.0	2,146.4	2,268.6
2. Consumption of fixed capital (mill. Nu.)	61.2	70.4	74.7	82.8	87.7	93.6	121.9	197.4	201.8	215.0	218.0	233.4	242.4	249.0
3. Gross domestic product at factor cost (mill. Nu.)	1,095.0	1,204.8	1,269.2	1,370.2	1,465.7	1,519.8	1,674.5	1,973.1	1,993.9	2,093.5	2,224.6	2,303.4	2,388.8	2,517.6
4. population (in million)	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
5. per capita gross domestic product at factor cost(Nu.)	935.9	1,012.4	1,048.9	1,114.0	1,163.3	1,178.1	1,268.6	1,461.6	1,424.2	1,495.4	1,574.7	1,643.2	1,706.2	1,798.3

1/ Excludes excise refunds from Government of India.

Source: Central Statistical Organization.

TABLE 4
GROSS DOMESTIC PRODUCT BY EXPENDITURE AND OTHER MAJOR AGGREGATES
(Millions of Ngultrum)

(Nu million)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1. Net domestic product at factor cost	1,033.8	1,206.3	1,411.8	1,650.5	1,941.0	2,212.0	2,567.0	3,200.2	3,488.6	3,908.9	4,397.2	4,838.5	5,587.2	-
2. Consumption of fixed capital	61.2	73.8	86.3	103.0	118.9	137.6	191.6	330.6	362.3	399.0	451.0	503.6	590.7	-
3. Gross domestic product at factor cost	1,095.0	1,280.1	1,498.1	1,753.5	2,059.9	2,349.6	2,758.6	3,530.8	3,850.9	4,307.9	4,848.2	5,342.1	6,177.9	6,969.4
4. Indirect taxes less of subsidies ^{1/}	17.9	21.2	23.6	34.8	45.6	41.8	43.0	76.7	82.8	73.7	134.2	159.4	176.0	-
5. Gross domestic product at market prices	1,112.9	1,301.3	1,521.7	1,788.3	2,105.5	2,391.4	2,801.6	3,607.5	3,933.7	4,381.6	4,982.4	5,501.5	6,353.9	7,285.9
6. Net export of goods and Services	-256.7	-408.8	-474.4	-561.2	-608.7	-760.3	-747.3	-435.1	-782.9	-758.4	-562.0	-936.9	-2,278.8	-1,425.7
7. Domestic supply of goods and services	1,369.6	1,710.1	1,996.1	2,349.5	2,714.2	3,151.7	3,548.9	4,042.6	4,723.8	5,140.0	5,544.4	6,438.4	8,632.7	8,711.6
8. Gross domestic capital formation	345.1	500.5	615.5	712.0	765.3	1,084.5	1,135.1	1,088.2	1,518.4	1,452.4	1,624.3	1,710.3	2,982.4	-
9. Final consumption expenditure	1,024.5	1,209.6	1,380.6	1,637.5	1,948.9	2,067.2	2,413.8	2,954.4	3,199.3	3,460.8	3,875.0	4,307.8	5,004.9	-
(a) Government	275.9	287.3	326.7	442.9	513.2	560.9	576.3	633.6	641.1	879.0	948.7	1,015.1	1,215.2	-
(b) Households	748.6	922.3	1,053.9	1,194.6	1,435.7	1,506.3	1,837.5	2,320.8	2,558.2	2,581.8	2,926.3	3,292.7	3,789.7	-
10. Net capital inflow	450.2	636.4	738.2	928.7	887.2	1,089.4	1,079.6	635.3	989.9	539.2	751.2	693.8	1,953.7	-
11. Gross domestic saving	-105.1	-135.9	-122.7	216.7	-121.9	-4.9	55.5	452.9	528.5	913.2	873.1	1,016.5	1,028.7	-
(a) Government	-174.2	-167.6	-189.1	-246.9	-237.1	-303.4	-236.2	208.1	163.9	74.0	71.3	-29.4	277.8	-
(b) Non-govt. sector	69.1	31.7	66.4	30.2	115.2	298.5	291.7	244.8	364.6	839.2	801.8	1,045.9	750.9	-
Rates of Growth														
1. Rate of gross domestic capital formation in current prices (%)	31.0	38.5	40.5	39.8	36.8	45.3	40.5	30.2	38.6	33.1	32.6	31.1	46.9	-
2. Rate of gross domestic saving in current prices (%)	-9.4	-10.4	-8.1	-12.1	-5.8	-0.2	2.0	12.6	13.4	20.8	17.5	18.5	16.2	-

^{1/} Excludes excise refunds from Government of India.

Source: Central Statistical Organization.

TABLE 5
CROP PRODUCTION ESTIMATES, 1983-90

	1983	1986	1987	1988	1990
	<u>Survey</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Estimate</u>	<u>Survey</u>
Area: '000 ha					
Paddy	30.6	32.5	33.2	33.8	26.2
Wheat/barley	14.4	15.4	15.7	16.0	10.2
Maize	58.4	57.1	58.2	59.4	74.0
Buckwheat/millet	20.6	20.0	20.4	20.8	13.2
Subtotal: Foodgrains	<u>124.0</u>	<u>125.0</u>	<u>127.5</u>	<u>130.0</u>	<u>123.6</u>
Potatoes	4.1	4.9	5.0	5.1	4.2
Chillies	1.0	1.0	1.0	1.0	n/a
Mustard	5.0	5.2	5.3	5.4	7.0
Beans and pulses	3.2	3.2	3.3	3.3	n/a
Subtotal: four annual crops	<u>13.3</u>	<u>14.3</u>	<u>14.6</u>	<u>14.8</u>	<u>11.2</u>
Oranges	7.9	8.7	8.9	9.1	6.6
Apples	1.6	1.6	1.6	1.7	1.8
Cardamom	8.5	7.6	7.8	7.9	5.7
Subtotal: three perennial crops	<u>18.0</u>	<u>17.9</u>	<u>18.3</u>	<u>18.7</u>	<u>14.1</u>
Yield: metric tons/ha					
Paddy	2.1	2.2	2.2	2.3	2.3
Wheat/barley	1.1	1.1	1.1	1.1	1.1
Maize	1.5	1.5	1.5	1.5	1.6
Buckwheat/millet	0.8	0.8	0.8	0.8	0.8
Potatoes	8.0	8.0	8.2	8.3	7.4
Chillies	3.6	3.6	3.7	3.7	n/a
Mustard	0.7	0.7	0.7	0.7	0.7
Beans and pulses	0.8	0.8	0.8	0.8	n/a
Oranges	4.9	4.9	5.0	5.1	5.5
Apples	2.2	2.3	2.3	2.4	2.5
Cardamom	0.4	0.4	0.4	0.4	0.4
Production: '000 metric tons					
Paddy ^{1/}	65.0	71.5	72.9	74.4	59.5
Wheat/barley	16.0	17.1	17.6	17.8	11.2
Maize	87.3	84.7	86.4	88.1	100.1
Buckwheat/millet	16.8	16.0	16.3	16.6	10.7
Subtotal: Foodgrains ^{1/}	<u>185.1</u>	<u>189.3</u>	<u>193.2</u>	<u>196.9</u>	<u>181.5</u>
Potatoes	32.6	39.1	39.9	40.7	31.1
Chillies	3.6	3.6	3.7	3.7	5.2
Mustard	3.4	3.5	3.6	3.6	5.2
Beans and pulses	2.6	2.6	2.7	2.7	n/a
Oranges	38.7	42.6	43.5	44.3	36.4
Apples	3.5	3.7	3.6	3.6	4.7
Cardamom	3.0	2.7	2.8	2.8	2.6

^{1/} Official estimates of paddy rather than rice with that of other grains. To convert paddy production to rice, the estimates should be multiplied by a million outturn of 60-70 percent.

Source: Department of Agriculture.

TABLE 6
NUMBERS OF LIVESTOCK AND POULTRY, 1985-92
(in thousands)

	1985	1986	1987	1988	1989	1990	1991	1992
Cattle	347	339	383	362	412	359	335	335
Yaks	31	36	30	36	37	33	32	30
Sheep/Goats	52	75	90	84	81	80	63	47
Pigs	60	89	69	66	63	59	58	47
Poultry	179	211	226	237	218	218	180	140

Source: Ministry of Agriculture.

TABLE 7
SALES OF MAJOR INDUSTRIES, 1993 (or latest available data)
(Millions of Ngultrum)

Industry	Total
(1) Army Welfare Project	150.4
Exports to India	45.5
Exports to Third Countries	0.0
Sales in Bhutan	105.0
(2) Bhutan Board Products Limited	165.9
Exports to India	165.9
Exports to Third Countries	0.0
Sales in Bhutan	0.0
(3) Bhutan Carbide & Chemicals Limited	356.8
Exports to India	355.6
Exports to Third Countries	0.6
Sales in Bhutan	0.7
(4) Bhutan Fruit Products Limited	92.3
Exports to India	81.1
Exports to Third Countries	4.4
Sales in Bhutan	6.8
(5) Bhutan Polythene Company	12.2
Exports to India	6.2
Exports to Third Countries	0.0
Sales in Bhutan	5.9
(6) Gedu Wood Manufacturing Corporation	67.6
Exports to India	n/a
Exports to Third Countries	n/a
Sales in Bhutan	n/a
(7) Penden Cement Authority	113.8
Exports to India	95.9
Exports to Third Countries	2.1
Sales in Bhutan	15.7
(8) Lhaki Cement Private Ltd.	45.9
Exports to India	24.4
Exports to Third Countries	0.0
Sales in Bhutan	21.5
Total	1004.8
Exports to India	774.5
Exports to Third Countries	7.1
Sales in Bhutan	155.6

TABLE 8
CONSUMER PRICE INDEX, 1985-93
(1979=100)

	(Weight)	Food Items (72.3)	Nonfood Items (27.7)	All Items (100.0)	Annual Percentage Change			Indian CPI (APC) *
					Food	Nonfood	Total	
1985								
June		155.6	171.1	159.9	5.1	8.6	0.7	6.1
December		160.8	178.1	165.6	2.1	3.4	2.9	6.2
1986								
June		165	204.2	175.9	6	19.3	10	8.4
December		169.2	215.2	182.0	5.2	20.8	9.9	9.6
1987								
June		171.7	217.5	184.4	4.1	6.5	4.8	8.1
December		183.8	229.3	194.4	8.6	6.6	6.8	9.3
1988								
June		191.7	235.5	203.8	11.6	8.3	10.5	8.5
December		201.8	250.6	215.3	9.8	9.3	9.6	5.9
1989								
June		208.4	258.4	222.3	8.7	9.7	9.1	7.0
December		218.3	273.4	233.6	8.1	9.1	8.5	4.0
1990								
June		225.6	299.2	246.0	8.2	15.8	10.7	8.0
December		236.1	306.5	255.6	8.1	12.1	9.4	12.0
1991								
June		251.6	331.6	273.7	11.5	10.8	11.3	12.5
December		271.6	336.2	289.5	15.1	9.7	13.3	13.7
1992								
June		301.2	360.1	317.5	19.7	8.6	16.0	13.9
December		316.0	387.2	335.7	16.3	15.2	16.0	8.6
1993								
June		335.4	426.6	360.6	11.4	18.5	13.6	--
December		339.4	443.3	368.2	7.4	14.5	9.7	--

* APC = Annual Percentage Change.

Source: Central Statistical Office.

TABLE 9
BALANCE OF PAYMENTS SUMMARY , 1989/90-1993/94
(Millions of U.S. Dollars)

Item	1989/90	1990/91	1991/92	1992/93 Prov.	1993/94 Est.
Exports, fob	66.7	69.8	63.1	66.2	66.8
India	58.1	60.3	56.6	54.8	58.2
Other	8.6	9.5	6.5	11.4	8.7
Imports, cif	95.1	81.4	83.1	125.0	97.6
India	77.7	67.0	70.2	75.1	77.1
Other	17.4	14.4	12.9	49.9 ^{1/}	20.5
Trade balance	-28.4	-11.6	-20.0	-58.8	-30.7
India	-19.6	-6.7	-13.5	-20.3	-18.9
Other	-8.8	-4.9	-6.5	-38.5	-11.8
Service and private transfers(n)	-2.5	-8.2	-7.0	-13.3	-16.6
India	-4.9	-8.7	-8.4	-12.4	-13.7
Other	2.3	0.5	1.4	-0.9	-2.8
Current account balance	-30.9	-19.8	-26.9	-72.1	-47.3
India	-24.5	-15.4	-21.9	-32.7	-32.6
Other	-6.4	-4.4	-5.1	-39.4	-14.7
Capital account balance^{2/}	42.5	51.2	45.7	73.9	61.5
India	32.3	39.0	32.5	37.7	30.6
Other	10.2	12.3	13.2	36.2	30.9
Errors and omissions	-17.5	-16.9	3.1	10.1	-2.1
India	-31.8	-35.4	-18.3	-7.5	3.0
Other	14.3	18.5	21.3	17.6	-5.1
Overall balance	-6.0	14.5	21.8	11.9	12.0
India	-24.0	-11.8	-7.6	-2.4	1.0
Other	18.0	26.4	29.5	14.4	11.0

1/ Including the purchase of an aircraft for US\$23.2 million and equipment for a ferrosilicon plant for US\$17.0 million.

2/ Including official transfers.

Source: IMF Estimates

TABLE 10
BALANCE OF PAYMENTS WITH INDIA
(Millions of Ngultrum)

Item	1989/90	1990/91	1991/92	1992/93 Prov.	1993/94 Est.
Current Account Balance	-415.5	-288.0	-565.6	-907.8	-1,024.6
Trade Balance	-332.9	-125.3	-349.0	-564.1	-594.3
Exports, fob	985.9	1,129.6	1,465.1	1,522.2	1,825.8
Chukha	280.2	374.4	397.3	355.1	537.3
Other	705.7	755.2	1,067.8	1,167.1	1,885.5
Imports, cif	-1,318.8	-1,254.9	-1,814.1	-2,086.3	-2,420.1
Services Balance	-82.7	-162.7	-216.6	-343.7	-430.3
Service and transfer receipts	231.6	228.7	235.1	201.4	200.3
Travel	34.2	37.4	41.9	46.1	46.1
Interest	67.6	40.9	22.8	0.7	2.0
Excise Duty	55.5	86.4	86.3	86.3	86.8
other	74.3	64.0	84.1	68.3	65.4
Service and transfer payments	-314.3	-391.4	-451.7	-545.1	-630.6
Travel	-34.2	-37.4	-41.9	-46.1	-46.1
Interest	-49.8	-49.7	-56.4	-83.7	-229.6
other	-230.3	-304.3	-353.4	-415.3	-354.9
Capital account balance	548.1	730.4	840.6	1,047.9	960.6
Loans (net)	-2.1	97.9	383.9	304.7	86.5
Receipts	0.0	100.0	386.0	497.8	183.7
Payments	-2.1	-2.1	-2.1	-193.1	-97.1
Grants	550.2	732.6	556.8	893.2	874.1
Budgetary	290.2	452.6	256.8	573.2	554.1
Non-budgetary	260.0	280.0	300.0	320.0	320.0
Errors and omissions	-540.2	-664.1	-472.4	-207.3	94.0
Overall balance	-358.4	-221.7	-197.4	-67.2	30.0

Source: IMF Estimates.

TABLE 11
EXPORTS TO INDIA, 1985-92
(Millions of Ngultrum)

	1985	1986	1987	1988	1989	1990	1991	1992
Agricultural Products	<u>105.3</u>	<u>124.9</u>	<u>105.0</u>	<u>135.7</u>	<u>112.2</u>	<u>82.9</u>	<u>75.8</u>	<u>108.6</u>
Cardomom	38.0	38.5	21.9	27.8	34.2	22.5	34.7	52.4
Fruit products	21.1	21.5	22.3	29.0	33.5	29	10.2	8.6
Apples	6.1	5.1	8.9	16.8	1.2	0.9	1.0	4.6
Oranges	13.3	17.6	19.7	24.0	13.1	11.1	7.5	10.4
Potatoes	16.1	23.6	23.2	31.3	23.6	16.6	16.7	21.8
Rosin	10.7	18.6	9.0	6.8	6.6	2.8	5.7	10.8
Wood and wood products	<u>68.5</u>	<u>75.1</u>	<u>151.4</u>	<u>228.4</u>	<u>153.5</u>	<u>179.8</u>	<u>150.0</u>	<u>90.0</u>
Timber	46.8	53.3	121.2	197.1	99.8	107.2	61.1	53.0
Veneer	6.9	0.6	0.9	0.3	0.7	--	0.3	0.4
Block boards	14.8	21.2	29.3	31.0	55.6	72.6	88.63	36.6
Cement	<u>50.2</u>	<u>72.6</u>	<u>96.2</u>	<u>110.5</u>	<u>135.5</u>	<u>187</u>	<u>140.7</u>	<u>132.3</u>
Electricity	--	<u>42.0</u>	<u>275.9</u>	<u>337.3</u>	<u>280.2</u>	<u>376.8</u>	<u>397.3</u>	<u>355.1</u>
Other products	<u>45.9</u>	<u>58.5</u>	<u>66.8</u>	<u>177.6</u>	<u>304.5</u>	<u>346.7</u>	<u>438.3</u>	<u>536.7</u>
Total	270.0	380.1	702.5	989.8	985.9	1,173.2	1,202.1	1,222.7

Source: Central Statistical Organization, Ministry of Planning, Revenue & Customs Division.

TABLE 12
IMPORTS FROM INDIA, 1985-92
(Millions of Ngultrum)

	1985	1986	1987	1988	1989	1990	1991	1992
Rice	<u>33.6</u>	<u>48.1</u>	<u>53.8</u>	<u>68.6</u>	<u>69.9</u>	<u>72.9</u>	<u>128.5</u>	<u>68.0</u>
Hydrocarbons	<u>85.8</u>	<u>84.0</u>	<u>67.8</u>	<u>84.8</u>	<u>102.9</u>	<u>102.9</u>	<u>131.2</u>	<u>149.4</u>
Diesel oil	53.4	54.8	45.1	49.1	49.1	65.0	81.1	89.9
Petrol	19.1	20.9	20.3	23.3	26.7	32.6	43.8	48.0
Bitumen	13.3	8.3	2.4	12.4	27.1	5.3	6.3	11.5
Transport Equipment	<u>78.9</u>	<u>49.1</u>	<u>85.7</u>	<u>76.1</u>	<u>69.0</u>	<u>204.3</u>	<u>195.4</u>	<u>142.5</u>
Tires and tubes	33.5	29.3	57.7	36.8	35.4	31.7	114.0	50.7
Truck chassis	41.4	15.2	21.4	31.0	16.6	54.4	53.1	22.3
Passenger cars	4.0	4.6	6.6	8.3	17.0	118.2	28.3	69.5
Other Manufactured Goods	<u>118.1</u>	<u>97.1</u>	<u>92.5</u>	<u>56.4</u>	<u>98.7</u>	<u>78.7</u>	<u>82.8</u>	<u>94.6</u>
Iron rods	21.7	25.7	43.7	15.6	16.3	16.9	14.9	33.8
Structure and parts	8.7	2.7	8.7	4.8	14.6	19.0	20.0	20.0
Machinery parts	49.6	36.3	21.2	13.8	35.3	9.9	10.2	1.9
Hardware	21.1	13.9	2.5	6.2	4.3	6.3	6.2	4.9
Fabrics	17.0	18.5	16.4	16.0	28.2	26.6	31.5	34.0
Electricity	<u>23.4</u>	<u>34.7</u>	<u>14.2</u>	<u>1.5</u>	<u>3.2</u>	<u>4.4</u>	<u>5.1</u>	<u>5.8</u>
Miscellaneous	<u>463.1</u>	<u>551.0</u>	<u>607.1</u>	<u>895.0</u>	<u>975.1</u>	<u>883.2</u>	<u>1,399.5</u>	<u>1,673.2</u>
Total	802.9	864.0	921.1	1,182.4	1,318.8	1,346.4	1,942.5	2,133.5

Source: Central Statistical Organization, Ministry of Planning, Revenue & Customs Division.

TABLE 13
BALANCE OF PAYMENTS ESTIMATES WITH THIRD COUNTRIES
(Millions of U.S. Dollars)

	1989/90	1990/91	1991/92	1992/93 Prov.	1993/94 Est.
Current account balance	-6.4	-4.4	-5.1	-39.4	-14.7
Trade balance	-8.8	-4.9	-6.5	-38.5	-11.8
Exports, f.o.b.	8.6	9.6	6.5	11.3	8.7
Imports, c.i.f.	17.4	14.4	12.9	49.9	20.5
Services balance	-2.3	-4.3	-4.0	-7.6	-9.6
Services receipts	9.9	7.8	8.1	11.5	11.0
Interest	4.9	4.7	2.3	4.6	4.1
Tourism	2.1	2.0	2.8	3.4	3.4
Druk Air	2.6	0.6	2.6	2.7	2.7
Other	0.3	0.4	0.4	0.8	0.8
Service Payments	12.2	12.1	12.1	19.1	20.7
Interest	2.4	2.3	2.0	2.0	2.1
Official Travel	1.6	1.0	0.9	1.2	1.2
Druk Air	0.2	0.1	0.2	0.4	0.4
Aid related	5.4	6.2	6.5	12.9	13.3
Other	2.6	2.9	2.7	2.6	3.6
Private transfers	4.6	4.8	5.4	6.7	6.7
Capital Account balance	19.3	25.2	26.9	64.2	62.8
Loans and grants (net)	12.7	16.4	16.8	31.9	33.1
Loans (net)	3.6	4.8	4.0	3.9	1.1
Receipts	5.3	4.9	4.5	6.3	3.6
Payments	1.7	1.8	2.3	2.4	2.5
Grants	9.1	11.6	12.9	28.1	32.0
Commercial loans	-2.5	-2.8	-2.8	4.2	-2.3
Receipts	0.0	0.0	0.0	7.0	-
Payments	2.5	2.8	2.8	2.7	2.3
Errors and omissions	14.3	18.5	21.3	17.6	-5.1
Overall balance	18.1	26.4	29.5	14.3	11.3

Source: IMF Estimates.

TABLE 14
EXPORTS TO THIRD COUNTRIES, 1987-92
 (Thousands of US Dollars)

	1987	1988	1989	1990	1991	1992
Agricultural products	<u>524.8</u>	<u>2,500.2</u>	<u>6,942.6</u>	<u>5,827.5</u>	<u>4,981.9</u>	<u>9,214.2</u>
Cardamom	524.8	669.8	436.1	613.9	1,309.5	503.4
Fruits	--	1,830.4	6,506.5	5,213.6	3,672.4	8,710.8
Wood and wood products	<u>74.0</u>	<u>140.9</u>	<u>198.0</u>	<u>197.7</u>	<u>142.2</u>	<u>363.2</u>
Timber		4.3	44.0	61.6	37.2	327.2
Processed wood	74.0	136.6	154.0	136.1	105.0	36.0
Mining and quarrying	<u>24.6</u>	<u>87.0</u>	<u>265.6</u>	<u>316.3</u>	<u>381.1</u>	<u>315.4</u>
Cement	--	--	68.7	231.1	181.9	141.4
Dolomite	24.6	87.0	196.9	85.2	199.2	174.0
Other	<u>355.0</u>	<u>679.0</u>	<u>1,643.0</u>	<u>3,216.0</u>	<u>1,670.0</u>	<u>1,509.0</u>
Total	<u>978.4</u>	<u>3,407.1</u>	<u>9,049.2</u>	<u>9,557.5</u>	<u>7,175.2</u>	<u>11,401.8</u>

Source: Data provided by Bhutanese authorities.

TABLE 15
DIRECTION OF TRADE, 1985-92
(Millions of US Dollars)

	1985	1986	1987	1988	1989	1990	1991	1992
Exports								
India	22.3	30.7	55.2	74.7	69.9	68.4	64.9	67.5
Singapore	21.8	30.1	54.2	71.1	60.7	57.8	58.8	56.6
Bangladesh	0.0	0.2	0.5	0.5	0.3	0.0	0.6	0.0
Other	0.0	0.0	0.0	1.9	8.0	7.3	5.3	10.4
	0.5	0.4	0.5	1.2	0.9	3.3	0.2	0.5
Imports								
India	75.1	92.7	86.9	124.0	92.2	79.7	77.1	117.8
Japan	64.7	64.6	69.4	79.7	74.8	65.3	64.2	67.9
Germany	2.7	16.7	2.0	7.3	4.2	4.2	4.0	21.0
United States	0.2	2.2	2.0	2.1	0.2	1.3	1.0	1.0
United Kingdom	0.7	2.3	0.3	0.1	0.7	1.0	1.0	1.0
Singapore	0.4	1.0	0.6	30.9 1/	1.0	0.5	1.0	23.2 1/
Switzerland	0.4	0.8	0.2	0.8	0.4	0.8	0.0	0.0
Hong Kong	0.3	0.2	0.3	0.4	0.0	0.2	0.0	0.0
Other	0.1	0.1	0.3	0.4	0.2	0.5	0.0	0.0
	5.6	4.8	11.8	2.3	10.7	5.9	5.9	3.7

1/ Includes the purchase of an aircraft.

Source: IMF Estimates.

TABLE 16
IMPORTS OF ESSENTIAL FOOD BY THE FOOD CORPORATION OF BHUTAN, 1985/86-1993/94
(Metric Tons)

	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
Rice	7,211	10,950	14,000	11,599	9,900	8,776	10,301	10,088	4,334
Wheat/wheat products	2,450	3,542	5,025	4,989	2,833	1,450	1,470	1,912	1,448
Sugar	2,749	3,395	3,139	3,616	3,040	3,447	2,540	3,856	1,492
Salt	5,689	5,195	3,241	6,759	4,318	4,483	3,521	4,887	--
Edible oils	557	1,115	960	399	340	240	560	493	493

Source: Food Corporation of Bhutan.

TABLE 17
GROSS INTERNATIONAL RESERVES, 1986/87-1992/93

End of Period	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93
<i>(In millions of rupees)</i>							
Rupee reserves	446.92	688.95	776.88	418.44	245.95	97.80	79.81
Royal Monetary Authority	10.68	12.34	81.05	14.85	25.77	10.86	30.07
Bank of Bhutan	436.24	676.61	695.83	403.59	220.18	86.94	49.74
Change in rupee reserves	75.90	242.03	87.93	-358.44	-172.49	-148.15	-17.99
<i>(In millions of U.S. dollars)</i>							
Convertible currency reserves	28.05	40.20	50.06	64.99	78.78	95.96	91.85
Royal Monetary Authority	26.93	37.93	47.57	62.46	76.66	93.32	87.48
Bank of Bhutan	1.12	2.27	2.49	2.53	2.12	2.64	4.37
Change in convertible currency reserves	7.40	12.15	9.86	14.93	13.79	17.18	-4.11
Memorandum Items:							
Exchange rate Nu/US\$	12.80	13.00	15.10	16.97	18.70	25.90	27.80
Period average							
Gross international reserves in months of imports				11.2	13.3	14.4	13.0

Sources: Royal Monetary Authority & IMF Estimates.

TABLE 18
CONCESSIONAL LOAN COMMITMENTS, DEBT STRUCTURE AND TERMS, JUNE 1994

Lender/Project	Amount		Date of Negotiation	Final Date of Disbursement	Grace Period (in years)	Maturity (in years)	Interest Rate (% p.a.)
	Loan Commitment (US\$ m)	Disbursed on 6/30/94 (US\$ m)					
AsDB	<u>44.5</u>	<u>26.0</u>					
Multiproject I	5.0	4.3	08/05/83	12/31/89	10	40	1
Multiproject II	7.4	8.4	11/03/84	12/31/89	10	40	1
Agriculture/Chirang Hill Irrigation	3.5	1.1	08/09/85	12/31/91	10	40	1
Roads	4.5	5.0	08/22/86	12/31/92	10	40	1
Animal Husbandry/Highland Livestock	4.8	3.9	10/30/86	09/30/92	10	40	1
Urban Centers Sewerage	3.3	-	01/29/87	06/30/91	10	40	1
Industrial Estate Project	1.2	0.6	07/30/88	06/30/92	10	40	1
Bhutan Dev. Finance Corporation	2.5	2.3	11/16/88	05/03/93	10	40	1
Technical & Vocational Education	7.1	.3	08/31/90	06/30/98	10	40	1
East-West Highway Maintenance	5.2	-	10/15/93	12/31/97	10	40	1
Kuwait Fund	<u>32.7</u>	<u>23.7</u>					
Gedu Wood	9.6	6.0	05/16/83	12/31/89	5	15	1.5
Tale Particle Board I	7.1	10.4	03/07/84	12/31/87	5	15	1.5
Tale Particle Board II	4.1	-	03/07/84	12/31/89	5	15	1.5
Calcium Carbide	7.0	6.6	05/22/85	12/31/89	5	15	2
Bhutan Development Finance Corporation	4.9	0.7	06/18/92	12/31/97	5	15	3
IFAD	<u>19.7</u>	<u>9.4</u>					
Small Farm Development	7.2	4.3	12/10/80	06/30/89	10	40	1
Tashigang-Mongar Development	5.9	3.5	03/17/86	03/31/93	10	40	1
Punakha-Wangdi Development	2.6	1.1	11/18/88	05/03/92	10	40	1
First Eastern Zone Agricultural Project	4.0	0.6	06/16/92	06/30/98	10	40	1
IDA	<u>28.2</u>	<u>18.2</u>					
Technical Assistance	3.0	3.3	02/29/84	12/31/89	10	30	0.75
Calcium Carbide	9.0	7.2	05/23/84	06/30/91	10	30	0.75
Forestry I	5.5	5.3	06/25/84	09/30/90	10	30	0.75
Forestry II	1.1	0.8	09/05/86	05/09/88	10	30	0.75
Primary Education	4.2	1.2	09/05/88	12/31/95	10	30	0.75
Forestry III	5.4	0.4	06/06/93	06/30/01	10	30	0.75
Total	<u>125.1</u>	<u>77.2</u>					

Source: National Budget and Aid Coordination Division.

TABLE 19
CONVERTIBLE DEBT AND DEBT SERVICE, 1988/89-1993/94
(In millions of U.S. dollars: end of period)

	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
					Prov.	Est.
Convertible Currency Debt (Total Outstanding, as of June 30)	72.7	74.8	76.7	78.8	85.9	86.1
Disbursement:						
Concessional debt	9.5	6.6	5.7	4.5	4.9	5.0
ASDB	3.4	1.9	3.4	3.3	2.2	1.7
IDA	2.8	2.8	1.8	0.5	0.7	2.0
IFAD	0.6	0.8	0.5	0.8	1.2	1.3
Kuwait Fund	2.8	1.1	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.8	0.0
Commercial debt	24.3	0.0	0.0	0.0	0.0	0.0
Debt service payments	3.8	6.7	6.1	5.0	7.0	6.5
Concessional	1.9	2.5	1.7	0.6	3.3	3.3
Commercial	2.0	4.1	4.4	4.4	3.8	3.2
Memorandum items:						
Debt/GDP (percent)	48.2	47.5	44.0	55.6	53.3	54.1
Debt service ratio (percent)	4.6	7.4	6.7	6.3	17.4	20.6

Source: National Budget and Aid Coordination Division.

Table 20
Government Budget Summary, 1988/89 - 1994/95
(Millions of Ngultrum)

	92/93				93/94		94/95		
	88/89	89/90	90/91	91/92	budget	Prov.	budget	est.	Projected
Revenues and Grants	1,638	1,469	1,749	1,919	2,955	2,486	3,435	3,440	4,396
Revenues	847	946	996	1,128	1,416	1,519	1,508	1,589	1,633
Tax Revenue	231	285	281	328	447	447	519	569	611
Non-Tax Revenue	616	661	715	800	969	1,071	989	1,020	1,022
(of which is Chukha)	(254)	(276)	(406)	(260)	(445)	(248)	(415)	(389)	(340)
Grants	791	523	753	791	1,539	967	1,927	1,851	2,763
from India	564	290	453	232	573	363	709	643	934
Other	227	233	300	559	966	604	1,218	1,208	1,829
Expenditures	2,128	1,859	1,796	2,190	2,813	2,503	3,307	3,449	4,708
Current Expenditures	909	1,069	1,082	1,152	1,259	1,212	1,485	1,527	1,720
Capital	1,086	711	670	919	1,554	1,126	1,822	1,691	2,997
Net lending	133	79	44	118	--	166	--	231	-9
Overall Balance (after grants)	-490	-390	-47	-271	142	-18	128	-9	-312
Financing	490	390	47	271	-142	18	-128	9	312
foreign	491	57	53	113	54	-23	22	-11	72
domestic	-1	333	-6	158	-196	40	-150	19	240
Memorandum Item:									
Budget Deficit as % of Expendit	-23.0%	-21.0%	-2.6%	-12.4%	5.0%	-0.7%	3.9%	-0.2%	-6.6%
Budget Deficit as % of GDP	-11.8%	-8.3%	-0.9%	-4.6%	2.4%	-0.3%	1.9%	-0.1%	-3.5%
Revenues as % of GDP	20.4%	20.2%	19.0%	19.0%	23.9%	22.3%	22.1%	20.4%	18.4%
Nominal GDP	4,158	4,682	5,241	5,927	5,928	6,820	6,821	7,774	8,860

TABLE 21
GOVERNMENT CURRENT EXPENDITURE, 1989/90-1994/95
(Millions of Ngultrum)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
				Provisional	Estimates	Estimates
General public services	376	434	471	553	765	880
Information & broadcasting	9	11	11	10	--	--
Non-development sector	367	423	460	543	765	880
Economic Services	399	371	368	358	397	427
Agriculture & irrigation	58	58	63	67	69	89
Food Corporation of Bhutan	12	13				
Animal Husbandry	43	45	45	56	70	52
Forestry	41	27	27	32	38	46
Industries, mining, trade and commerce	59	49	35	38	19	22
Public works department	63	62	70	70	98	88
Communications	56	49	80	31	47	64
Power	67	68	48	60	64	68
Social Services	294	277	314	305	364	414
Education	197	180	193	189	214	223
Health	90	89	112	107	141	176
Urban development & municipal corporations	7	8	9	9	10	14
Total Current Expenditure	1069	1082	1153	1212	1527	1720

Source: National Budget and Aid Coordination Division.

TABLE 22
GOVERNMENT CAPITAL EXPENDITURE, 1989/90-1994/95
(Millions of Ngultrum)

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
				Provisional	Estimates	Estimates
General public services	69	120	176	178	203	187
Information & broadcasting	4	1	1	1	--	--
Non-development sector	65	119	175	177	203	187
Economic Services	594	508	641	889	1236	2327
Agriculture & irrigation	76	159	223	239	296	287
Food Corporation of Bhutan	3	9				
Animal Husbandry	25	16	13	25	32	101
Forestry	32	32	26	13	37	47
Industries, mining, trade and commerce	53	13	22	19	53	104
Public works department	275	176	317	228	241	718
Communcations	57	41	28	335	432	257
Power	73	62	12	30	145	814
Social Services	48	42	103	59	252	482
Education	33	24	73	51	118	271
Health	13	17	28	6	126	200
Urban development & municipal corporations	2	1	2	2	7	11
Total Capital expenditure	711	670	920	1126	1691	2996

Source: National Budget and Aid Coordination Division.

TABLE 23
TOURISM STATISTICS, 1989-93^{1/}

	1989	1990	1991	1992	1993
Hotel rooms available (number)	184	184	184	414	414
Average length of stay (nights)	7	7	7	7	7
Total tourism receipts (millions of US Dollars)	1.95	1.93	2.30	2.99	3.24
Tourist arrivals (in number)	1,480	1,538	2,106	2,763	2,985
Tourist arrivals by country					
Germany ^{2/}	285	161	269	281	368
France	54	27	109	115	129
Italy	10	9	113	135	127
Other Europe	105	417	316	755	738
United States	479	377	509	571	709
Japan	317	445	631	646	645
Australia	4	14	91	12	63
Other	226	88	68	248	206
Tourist arrivals by purpose					
Touring	1,227	1,288	1,527	2,175	2,264
Trekking	253	250	579	588	721

1/ Convertibility Currency Paying Tourists

2/ Refers to the (former) Federal Republic of Germany

Source: Tourism Authority of Bhutan

TABLE 24
ELECTRICITY GENERATION AND TRADE WITH INDIA, 1989/90-1993/94

	1989/90	1990/91	1991/92	1992/93	1993/94 June-April
(million kWh)					
Domestic generation	1,556.9	1,542.2	1,554.4	1,674.6	1,338.8
Hydroelectric power	1,556.9	1,542.2	1,553.1	1,673.6	1,336.8
Diesel	0.0	0.0	1.3	1.0	0.1
Purchases from India	3.3	4.4	5.0	5.1	-
Exports to India	1,396.0	1,395.6	1,374.6	1,465.0	1,149.0
(million Nu)					
Exports to India	376.8	328.3	360.9	426.3	392.9

Source: Power Division