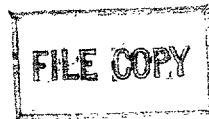


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**Report No. P-3737-NEP**

**REPORT AND RECOMMENDATION**  
**OF THE**  
**PRESIDENT OF THE**  
**INTERNATIONAL DEVELOPMENT ASSOCIATION**  
**TO THE**  
**EXECUTIVE DIRECTORS**  
**ON A**  
**PROPOSED CREDIT OF SDR 10.2 MILLION**  
**TO THE**  
**KINGDOM OF NEPAL**  
**FOR**  
**THE KARNALI PREPARATION PROJECT - PHASE I**

**March 1, 1984**

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CURRENCY EQUIVALENT

Currency Unit	=	Nepalese Rupee (NRe)
US\$1	=	NRs 15.65
NRe 1	=	US\$0.06

FISCAL YEAR

July 16 - July 15

PRINCIPAL ABBREVIATIONS

ADB	-	Asian Development Bank
CC	-	Coordinating Committee
Chisapani	-	Karnali (Chisapani) Multipurpose Project
CIDA	-	Canadian International Development Agency
ED	-	Electricity Department
GOI	-	Government of India
HMG	-	His Majesty's Government of Nepal
CK	-	Committee on Karnali
NEA	-	Nepal Electricity Authority
NEC	-	Nepal Electricity Corporation
NK	-	Nippon Koei Co. Ltd.
SMHA	-	Snowy Mountains Hydroelectric Authority
WEC	-	Water and Energy Commission

UNITS AND MEASURES

1 kilowatt (kW)	-	1000 Watts
1 Megawatt (MW)	-	1000 Kilowatts
1 Gigawatt (GW)	-	1000 Megawatts
1 kilowatt-hour (kWh)	-	1000 Watt-hour
1 Gigawatt-hour (GWh)	-	1,000,000 kilowatt-hour

NEPAL

KARNALI PREPARATION PROJECT - PHASE I

CREDIT AND PROJECT SUMMARY

Borrower: Kingdom of Nepal

Beneficiary: Ministry of Water Resources

Amount: SDR 10.2 million (US\$11.0 million equivalent)

Terms: Standard

Project Objectives and Description: The main objective of the proposed project would be to assess the economic justification and technical viability of the Karnali (Chisapani) Multipurpose Project on the Karnali River in Nepal. The studies under Phase I would be carried out over about two and a half years and would include the following components:

- (a) preparation of the feasibility study for the Karnali (Chisapani) Multipurpose Project. The project has a power potential of about 3600 MW;
- (b) prefeasibility of a smaller hydroelectric project upstream of Chisapani; and
- (c) provision of consulting services to HMG in the form of general advice on all aspects related to the studies being undertaken by the main consultants.

Benefits and

Risks:

The project's main risk is that the future physical works might not be economically justifiable or technically viable. However, previous studies indicate that the project is very attractive and technically possible and that further studies are justified. To minimize this risk the studies are being phased, and only phase I is being proposed now.

<u>Estimated Cost:</u>	<u>Item</u>	<u>US\$ Millions</u>		
		<u>Foreign</u>	<u>Local</u>	<u>Total</u>
1.	Consulting Services			
	(a) For the Studies	5.6	1.2	6.8
	(b) HMG Advisors	0.6	0.1	0.7
2.	Equipment and Tools	0.5	0.3	0.8
3.	Miscellaneous			
	Construction	2.3	0.8	3.1
4.	Operation Expenses			
	Project Office	<u>0.1</u>	<u>0.4</u>	<u>0.5</u>
	Base Costs	9.1	2.8	11.9
	Contingencies			
	Physical	0.9	0.2	1.1
	Price	<u>0.8</u>	<u>0.2</u>	<u>1.0</u>
	Net Total Cost	10.8	3.2	14.0
	Taxes and Duties	<u>      </u>	<u>0.6</u>	<u>0.6</u>
	Gross Total Cost	10.8	3.8	14.6
		====	===	====

<u>Financing Plan:</u>	<u>US\$ Millions</u>		
	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
IDA	10.8	0.2	11.0
HMG		3.6	3.6

<u>Estimated Disbursements:</u>	IDA FY	<u>US\$ Millions</u>			
		<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
	Annual	4.5	5.0	1.0	0.5
	Cummulative	4.5	9.5	10.5	11.0

Rate of Return: Not applicable

Staff Appraisal Report: None

Map: IBRD 17021

## INTERNATIONAL DEVELOPMENT ASSOCIATION

### REPORT AND RECOMMENDATION OF THE PRESIDENT OF THE ASSOCIATION TO THE EXECUTIVE DIRECTORS ON A PROPOSED CREDIT TO THE KINGDOM OF NEPAL FOR THE KARNALI PREPARATION PROJECT - PHASE I

1. I submit the following report and recommendation on a proposed development credit to the Kingdom of Nepal of SDR 10.2 million (US\$11.0 million equivalent) on standard IDA terms to help finance a Karnali Preparation Project - Phase I.

#### PART I - THE ECONOMY

2. The most recent economic report, Nepal: Recent Developments and Selected Issues in Trade Promotion (Report No. 4663-NEP), was distributed to the Executive Directors on October 14, 1983. The principal features and recent performance of the economy are described below. Country data are shown in Annex I.

3. Nepal is one of the least-developed countries in the world. Per capita income is estimated at US\$150 (1981) and health and education standards are below the average for South Asia: life expectancy at birth is only about 45 years; infant mortality, about 148 per thousand; and adult literacy, only 20%. The population, estimated to be 15.0 million (1981), grew at a rate of about 2.6% per year during 1971 and 1981. About 95% of the population live in rural areas.

4. Population density with respect to arable land (356 per sq km) has reached very high levels, and cultivation has been extended onto marginal lands and forests. Forests have been further denuded to meet the growing demand for fuelwood, on which Nepal depends for over 90% of its energy consumption, mostly for household cooking and heating. On account of deforestation and excessive grazing on the hills and mountains, with high rainfall, there is accelerated soil erosion leading to silting of rivers, downstream flooding and loss of agricultural productivity all along.

5. Agriculture, largely rainfed, still accounts for nearly 60% of Nepal's GDP and 80% of merchandise exports, and provides the main source of livelihood to over 90% of the population. Crop production accounts for about 60% of agricultural output, livestock for 30%, and forestry for 10%. Paddy is the principal food crop (planted on about half of the total cropped area), followed by maize, wheat, millet and barley. Cash crops (oilseeds, jute, sugarcane and tobacco) are grown on about 10% of the cropped area. About 15% of total rural incomes rise from nonagricultural activities, of which cottage industries are one of the more important and engage over one million people on a part-time basis.

6. Apart from agricultural land, Nepal's only other important exploitable resources are hydropower and tourist attractions. The exploitation of the vast hydropower resources beyond that required to satisfy the country's own power demand, however, will depend crucially on Nepal's ability to enter complex financial, exploitation and export agreements with neighboring countries. The tourism sector, based on Nepal's mountain environment and its rich cultural heritage, has been dynamic, though it accounts for only about 1% of GDP. Tourism now provides about 20% of the country's foreign exchange earnings. About 60% of earnings from tourism are retained in Nepal.

7. Following centuries of self-imposed isolation, efforts to develop the economy of Nepal began in the mid-1950s against extremely heavy odds. The country had virtually no physical infrastructure, an ancient administrative system, and limited educational and health services. The resource base is relatively narrow and its development hindered by the difficult topography and landlocked position. Against this background, Nepal's primary development objective for twenty years, between 1955 and 1975, was to build basic infrastructure and lay the groundwork for future economic growth. The country has made good progress in pursuit of that objective. It now has a basic road network linking many economic centers. Kathmandu and a few other towns have basic utilities and public transport. Schools have been built for almost half of the primary school age children and there are a number of high schools and a national university. A rudimentary hospital system, including rural health posts, has been built. Some progress has also been made in establishing the institutional framework for agricultural and industrial development, including extension and research activities, financial institutions and industrial enterprises. Yet in all these areas, the country has a long way to go to achieve a level of development comparable to other developing countries: thus, for example, the public and private institution in Nepal must continue to expand and upgrade essential physical facilities, acquire the necessary expertise in handling economic and financial affairs, build up adequate technical and managerial cadres, and establish merit-based systems of personnel management.

8. The Fifth Plan (1975/76-1979/80) marked a shift in development objectives, with increased emphasis being placed on acceleration of economic growth, employment creation, and raising the living standards of the population. These objectives have been reiterated in the Sixth Plan (1980/81-1984/85). Moreover, the stated strategy of the Sixth Plan quite appropriately (a) accords high priority to developing agriculture, small-scale industries and Nepal's abundant water resources; (b) stresses soil conservation and population control; and (c) emphasizes full utilization of existing infrastructure and alleviation of absorptive capacity constraints, including human resource development. The development strategy also calls for increased involvement of the private sector in agriculture, manufacturing, trade, tourism, construction and transport operations. Investment expenditures, supported by growing foreign assistance, have increased rapidly over the last two Plans, from US\$146 million (9% of GDP) in 1974/75 to about US\$390 million (15% of GDP) in 1981/82, and there have been substantial shifts in the composition of spending away from transport to

agriculture, power and social services. GDP growth, however, has barely kept up with that of population.

9. Part of the explanation for this stagnation lies in factors beyond Nepal's control such as, for example, the difficult topography and the poor resource base. But factors within Nepal's control have also contributed to the stagnation. Severe project implementation problems have been encountered by Government and donors alike in most sectors of the economy, thereby lowering the rate of growth of capital formation. In addition, the expected returns on those investments which took place often did not materialize largely because necessary complementary investments or current spending were lacking, and because of managerial deficiencies. A good example is the agriculture sector. In the past, insufficient attention was paid to bringing water down to the farm level and this was compounded by inadequate support services such as extension and research, by the lack of timely supplies of improved seed, fertilizer and other inputs such as credit, by the lack of farm-to-market roads, and by very low producer margins. Future development of irrigation and agriculture would therefore need to emphasize complementary investments, improvements in agricultural input supplies and adequate producer margins.

10. The shortage of funds for current spending needs to be addressed by further efforts at domestic resource mobilization. In recent years, Nepal's efforts at resource mobilization have focussed on tightening income tax assessment and collection; on discretionary measures largely in the area of indirect taxes; and on reducing subsidies to public enterprises. While there has, as a result, been a steady increase in revenues, the tax structure remain inelastic. Some scope exists for increasing Nepal's tax elasticity by shifting items on the indirect tax schedules from specific to ad valorem basis. There also seems to be scope for increasing yields from the land tax, urban property taxes and income taxes.

11. Over the past two years, several positive steps have been taken to strengthen public sector management. These steps have included increases in the traditionally very low civil service salaries, establishment of public service training facilities, simplification of budgetary procedures accompanied by stricter enforcement of expenditure accounting, and granting of more autonomy to public enterprises in matters concerning personnel and pricing policies. The implementation of these administrative reforms would have to be pursued by a high-level monitoring of important administrative issues such as appointment of competent staff, job security and decision-making authority. Also, public enterprise reform needs to be pursued by measures aimed at reducing costs and increasing efficiency. In this regard, the Government has taken initial steps, subjecting public enterprises to increased competition from the private sector through liberalization of licensing in industry, transport and small-scale hydropower generation. At the same time, in September 1983, the Government announced its intention to involve the private sector in the ownership and control of public enterprises through the sale of some public enterprise shares to private investors.

12. Because of slow economic growth, Nepal's balance of payments has been characterized by widening trade deficits, partly offset by surpluses from invisibles. The current account deficit (averaging US\$100 million annually during 1979/80-1981/82) has traditionally been more than matched by inflows of official grants and concessional loans (averaging US\$128 million annually during 1979/80-1981/82), leading to surpluses in the overall balance of payments in most years. Nevertheless, foreign exchange reserves have declined from being equivalent to about one year of imports in the early 1970s to six months in 1982, and four months in mid-1983.

13. To sustain and further develop its economy, Nepal must therefore mobilize additional free foreign exchange through export promotion and efficient import substitution. Improving agricultural production, rural incomes and food distribution within the country is a major way of doing so, if only to avoid the need to import and distribute large quantities of foodgrains in the future. Agricultural development also remains the key to a gradual expansion of Nepal's traditional merchandise exports. In addition, development of energy resources is a major means to strengthening the balance of payments by reducing the need to import fuel and opening up an export potential. Recently, Nepal has legislated a wide range of fiscal and administrative incentives for industrial investors and exporters, particularly in the private sector. The implementation of these incentives, and the alleviation of the severe transport and transit constraints facing the country's trade sector, must constitute essential elements of a trade promotion strategy for Nepal.

14. Nepal is faced with highly challenging prospects and tasks in addressing its multiple long-term development problems. While it attempts to mobilize domestic resource to finance about 40-50% of development expenditures, external assistance, at concessional terms, will continue to be a vital factor in financing investment and effecting economic growth. In the last three years, aid commitments to Nepal have averaged about US\$250 million per year, almost entirely in the form of grants and concessional credits with grant elements in excess of 70%. Aid disbursements have grown from about \$110 million in 1979/80 to an estimated US\$175 million in 1982/83. Nearly 70% of total aid disbursements have come from members of the Nepal Aid Group, formed in 1976 and now comprising eight DAC countries and four multilateral agencies.

15. As of December 31, 1982, Nepal's official foreign debt outstanding was US\$297 million, of which US\$251 million was due to multilateral agencies. As virtually all loans have been concessional, debt service payments, including payments to the IMF, have remained small in relation to exports of goods and services. In 1982/83, debt service payments were about US\$15 million, equivalent to 7% of exports of goods and services. Over the medium term, these payments are projected to remain at less than 10% of Nepal's exports of goods and services.



PART II - BANK GROUP OPERATIONS IN NEPAL 1/

16. Bank Group operations in Nepal began in FY70 with an IDA credit of US\$1.7 million equivalent for a telecommunications project. Since then, 32 additional credits have been approved, bringing total IDA assistance to Nepal to US\$369.5 million equivalent, net of cancellations. In view of Nepal's many development needs, this assistance has been for projects in a wide variety of sectors. Six of these sectors account for about 86% of IDA credits by amount: irrigation/agriculture (US\$170.0 million for twelve projects); water supply and sewerage (US\$46.8 million for three projects), power (US\$40.8 million for one project); telecommunications (US\$21.7 million for three projects); highways (US\$19.2 million for two projects); and rural development (US\$19.0 million for two projects). The proposed credit would be the second in FY84, the first being Second Forestry Project for a credit of US\$18.0 million equivalent which was approved by the Executive Directors on July 12, 1983. It will bring the total amount of IDA assistance to Nepal to US\$380.5 million equivalent, net of cancellations. No Bank loans have been made to Nepal. IFC made its first investment in Nepal (US\$3.1 million) in a hotel project in Kathmandu in FY75. In addition, IFC approved a loan of US\$6.23 million equivalent to Nepal Orind Magnesite (Private) Limited (i.e. a private company) on March 16, 1982. The loan was to help finance a US\$24.9 million project to mine and process magnesite ore.

17. Bank Group lending to Nepal has so far been at a modest level compared to the country's need for external assistance. The international community has shown considerable interest in Nepal's economic development and, to date, the shortage of funds has not been a major bottleneck. The main constraint on the utilization of increased aid has been Nepal's limited absorptive capacity, affecting the pace of project preparation and implementation. The Bank Group has provided assistance to the Government in project preparation through a Technical Assistance Credit (Credit No. 659-NEP) and by acting as Executing Agency for a number of technical assistance projects financed by UNDP. Furthermore, the present Resident Representative in Kathmandu has had a significant impact in improving project implementation performance. As a result, the rate of disbursements is improving; during FY82 and FY83, US\$28.5 and US\$37.4 million equivalent, respectively, was disbursed compared to an annual average disbursement of about US\$17 million during the previous five years. Project completion reports have been prepared for five projects--First Telecommunications (Credit No. 166), First Highways (Credit No. 223), Tourism (Credit No. 291), Birganj Irrigation (Credit No. 373) and Settlement Project (Credit No. 505). All five projects experienced delays in implementation, and institutional improvements were less than anticipated; however, all five generated acceptable rates of return.

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1/ As of September 30, 1983.

18. The Bank Group's current lending strategy places major emphasis in assisting the Government in its efforts to contain the high level of population growth, address major constraints in the country's development of human resources and promote agricultural development. Selected infrastructure mostly in transport and power will be undertaken to alleviate serious development constraints. In population, a project is being prepared with Government and other donor interest to cofinance it has already been expressed. For the development of human resources, in addition to the proposed project in primary education, other projects under preparation include an agricultural manpower project, engineering education, vocational education and a secondary education project. For agriculture, the basic strategy is to assist Nepal maintain overall foodgrain self-sufficiency, where possible promote exports of agricultural products and encourage afforestation efforts. Projects under preparation would extend the assistance provided so far in building the irrigation infrastructure in the Terai mainly to increase paddy production, helping reduce the food deficits in the Hills both through rural development projects which emphasize increasing food production and through specific Hill food projects.

### PART III - THE ENERGY SECTOR

19. Nepal's energy resources consist mainly of hydroelectric potential estimated to be around 83,000 MW of which only 113 MW have been developed. Traditional fuels, primarily wood, represent around 95% of Nepal's total energy use. Commercial energy, which accounts for 5% of total use (coal, petroleum, and electricity), supplies industry, commerce, transport, and residential users in the capital city of Kathmandu and other major towns. Coal and petroleum products are imported as there is no domestic production or known reserves of fossil fuels in Nepal.

#### The Power Subsector

20. About 5% of the total population in Nepal has access to electricity and the annual per capita generation is about 18 kWh compared to 36 kWh in Burma, 29 kWh in Bangladesh, and 170 kWh in India. In 1982 the total energy generated in Nepal was 229 GWh and another 55 GWh were imported from India. Of the 122,000 consumers registered in 1982, 89% were residential, most of whom are located in the major towns of the Kathmandu valley. These consumers used about 49% of the electricity whereas industry used 32% and commerce and others 19%.

21. The installed capacity operated by the utilities in Nepal amounts to 138 MW of which 82% (113 MW) are hydro and the remainder (25 MW) are

diesel. There are some 12 MW operated privately. Current plans for expansion up to 1993 include the addition of 313 MW of hydro power. <sup>1/</sup> Nepal is administratively divided into five regions: Eastern, Central, Western, Mid-Western and Far Western. The Central Region system is interconnected at 66 kV and there is a 132 kV single circuit line connecting the central system with Pokhara (150 km to the west of Kathmandu) and one more under construction that will connect the Central and Eastern Regions by 1985/86. The distribution system is overloaded and poorly maintained. Consequently electricity losses are high (30-35% compared to a desirable 10-15%) and service interruptions are frequent. HMG has undertaken a program for loss reduction and upgrading of the distribution system under the auspices of the ADB and the World Bank. The plan was prepared with the assistance of external consultants and is being implemented successfully.

22. Despite the constrained supply of electricity, total sales grew at an annual rate of around 18% in FY71-78 and at 9% during the last five years. In an effort to improve the living conditions in the rural areas and to control the rapid deforestation of the country, the Government has promoted rural electrification of small villages; and it is expected that this program would add to the demand of electricity in the near future. Total demand is expected to grow through 1991 at an annual rate of about 14.7%.

23. In spite of this growth in demand, Nepal will not be in a position to use a substantial amount of its hydropower potential in the coming 40 to 50 years. Due to the limitations of the local market, Nepal has been building small projects (up to 60 MW) at high unit costs. On the other hand, the construction of medium- and large-size hydropower projects with lower production costs is not possible unless Nepal can export a substantial portion of the electricity generated to India, the natural customer for it. Electricity exports would not only reduce the cost of internal consumption through the economies of scale but also would generate foreign exchange to support development efforts in Nepal. Under these circumstances, Nepal recently started its planning actions to a more systematic analysis of hydropower development considering both its internal needs as well as export possibilities.

24. India's electricity is supplied through five regional systems, one of which is the northern system serving the area adjacent to Nepal. The Government of India is planning to interconnect the regional systems in the coming decade through a 400 kV transmission grid. The northern system is the biggest in terms of installed capacity, being about 10,266 MW as of March 1983 (of which 43% is hydro). There are plans to substantially increase this capacity from 1984 to 1995 by adding about 22,000 MW of which 63% would be hydro. This region has had shortages in recent years, both in energy as well

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<sup>1/</sup> Devighat, 14 MW, 1984;  
Kulekhani II, 30 MW, 1985;  
Marsyangdi, 69 MW, 1987; and  
Sapt Gandaki, 100 MW in 1991, and 100 MW in 1993.

as in capacity terms, which are expected to continue at least until 1990. Regional demand is growing annually at about 13%. Although the region has attractive hydro sites under study and an abundant supply of coal, the large potential of the Karnali River in Nepal and the relative low cost of generation make it a very attractive source of electricity for the Northern region, as well as for the country when interconnected. Chisapani, with 3,600 MW installed capacity could contribute a significant portion of the region's electricity requirements around the year 2000.

#### Institutional Aspects

25. Electricity planning and development in Nepal are the responsibility of the Ministry of Water Resources. Electricity development programs are integrated into the five-year plans through the Planning Commission. To assist in the planning of water and energy sectors the Government created in 1976 the Water and Energy Commission (WEC) and in 1978 retained consultants financed by the Canadian International Development Agency (CIDA) to help WEC in the development of planning capabilities. Power sector planning is only in its early stages in Nepal and has been limited during the last one or two years to the preparation of demand forecasts and to the identification and ranking of potential hydropower projects. Preparation of a long-term power expansion program is planned as a next step but it may take long before it is available.

26. There are two authorities involved in the construction and operation of power projects in Nepal:

(a) Electricity Department (ED) of the Ministry of Water Resources;  
and

(b) Nepal Electricity Corporation (NEC).

27. The Electricity Department under a Chief Engineer, is responsible for the investigation, engineering, construction and commissioning of new power facilities which upon completion are turned over to NEC for operation. However, because of the limited implementation capability on the part of ED and NEC, the construction of Kulekhani Hydroelectric Power Project (para. 31) was managed by a separate Development Board. Similarly, another Development Board has been established for the management of the Construction of the proposed Marsyangdi Hydroelectric Power Project (para. 32). In addition, small hydropower stations, varying between 25 KW and 500 KW are presently being constructed and operated by a Small Hydro Development Board.

28. NEC is a government-owned corporation responsible for generation, transmission, and distribution of electricity throughout the country. It is the largest entity in the power sector. NEC also takes care of routine minor distribution expansions, extends supply to new customers and is responsible for metering, billing and collections.

29. Currently, the Government assisted by consultants is carrying out an institutional study financed by ADB. Phase I of the study has been

completed. Based on its conclusions, ADB and HMG signed, in November 1982, a memorandum of understanding to form a single entity called the Nepal Electricity Authority (NEA), incorporating ED and NEC. This decision, when implemented, would improve considerably the coordination required for the sector expansion.

#### Human Resources and Training

30. Nepal's shortage of qualified personnel and skilled labor as well as the lack of experience in planning, design, and construction of major projects makes it necessary to provide for intensive training and external assistance in the planning and execution of medium- and large-sized projects. HMG has undertaken to send 20 to 30 engineers each year to India with this purpose in mind. The first group is about to return to Nepal, and it is expected that some of the engineers will be retained to work on the proposed project studies. Local staff would be directly retained by the consultants or seconded from government agencies.

#### Past Bank Experience in the Sector

31. The first Bank operation in the power sector in Nepal was an IDA credit in January 1976, of US\$26.0 million (Cr. 600-NEP) for the construction of the Kulekhani Hydroelectric Project (2x30 MW units). The cost of the project was estimated at the time of appraisal in 1974 at US\$68.0 million. The additional financing came from OECF-Japan (US\$10.0 million), Kuwait Fund (US\$15.9 million), UNDP (US\$3.0 million), OPEC Fund (US\$3.3 million) and the balance from HMG. The project, which cost US\$120.8 million equivalent, represents by far the largest civil works ever undertaken under a single project in Nepal to date, with the participation of an unprecedented number of donors (five). It also introduced for the first time two donors (OECF-Japan and Kuwait Fund) who have since remained important sources of development assistance to the country. Moreover, it offered Nepalese officials and engineers an opportunity for practical experience with major civil works related to a hydropower scheme.

32. The project was inaugurated in December 1982, 1-1/2 years behind schedule. This delay, however, is not considered excessive when compared to projects of the same nature and technical complexity. In addition, the remoteness and conditions of the site made the construction even more difficult. The project had cost overrun of about 75% due to much higher than anticipated price escalation of unit costs and to a lesser degree quantities as well as some changes in design. Moreover, there was a substantial appreciation of the yen in dollar terms when a major portion of expenditures for equipment and consulting services were committed in that currency. On May 10, 1979, the Association approved a supplementary credit of US\$14.8 million and a Special Action Credit (from the European Community Fund) of US\$3.0 million to assist in the financing of the cost overrun. Other donors and lending agencies involved, as well as HMG, met the balance. IDA appraised in November 1982, a second hydropower project, Marsyangdi (3x23 MW units), to assist in the supply of electricity through 1991. In addition, a Bank mission visited Nepal in November 1982 to carry out a comprehensive

energy assessment. The report containing the findings and recommendations of the mission was discussed with HMG and subsequently issued in August 1983 (Report N-4474-NEP).

### Bank Lending Goals and Strategy

33. IDA's strategy for power development in Nepal comprises the following objectives:

- (a) to assist HMG in the supply of power required for industrial and agricultural development as well as for domestic uses;
- (b) to pursue, in coordination with HMG and other lenders, the necessary sectoral reorganization and improved efficiency in sector management and operations; and
- (c) to help upgrade local technical and managerial capabilities through technical assistance and on-the-job and formal training.

## PART IV - THE PROJECT

### Project Origin

34. In 1962, HMG obtained financial aid from UNDP for a survey of the Karnali River potential. The studies, carried out by Nippon Koei Co. Ltd. (NK) of Japan between December 1962 and February 1966, identified ten sites with potentials ranging between 18 and 1800 MW. Out of these, two appeared especially promising for which the consultants completed more advanced prefeasibility studies. One was at the Chisapani gorge (with a high dam and a run-of-river alternative of 1800 MW and 75 MW, respectively) while the other was Lakarpata, a run-of-river site (360 MW) upstream from Chisapani. The consultants recommended consideration of the Chisapani high dam alternative as the first option for future development due to its relatively low unit cost and its advantageous location in regard to the main load centers in northern India. The project is located about 45 km north of the Indian border (see map).

35. The studies and recommendations of NK were reviewed by the Snowy Mountains Hydroelectric Authority (SMHA) of Australia in 1968 who were employed by HMG with funding from UNDP. They agreed with the general conclusions of NK but recommended an increase in the installed capacity of Chisapani to 3600 MW and a gravel fill dam instead of a concrete arch gravity dam proposed by NK. In 1976 HMG hired two firms, Norconsult from Norway and Electrowatt from Switzerland, to review both recommendations and resolve the differences. Both firms concurred with the SMHA recommendation and proposed further studies for final designs of the Karnali (Chisapani) multipurpose project, the main features of which were construction of a gravel fill dam of about 35 million cubic meters, two power houses of 6 x 300 MW units each totalling 3600 MW and the necessary substations and transmission lines. The

construction period was to be 12 years with an estimated cost of about US\$3.0 billion in 1983 prices.

36. In view of the results of the studies, HMG and the Government of India (GOI) established a Committee on Karnali (CK) to promote bilateral discussions on Chisapani. <sup>1/</sup> The Committee met in 1978, 1979, 1981, and February 1984. At the first meeting, the Committee agreed to review the consultant's reports and the economic and financial aspects of the proposed project. In addition, it agreed to form separate groups in each country to study the use of power from the project as well as flood and irrigation consequences downstream of Chisapani for both Nepal and India. At a meeting in January 1981 in Kathmandu, CK agreed in principle to pursue the studies for Chisapani under joint supervision, mutually agreed terms of reference, and jointly selected consultants. Subsequently, IDA was invited to propose draft terms of reference (TOR) for the studies of Chisapani. The draft TOR were completed in September 1981 and were reviewed by both Governments. After receiving comments from both sides, an IDA mission visited Kathmandu in June 1982 to assist in the preparation of a revised draft. This draft was the basis for the appraisal of the proposed project. At the meeting of February 1984, CK approved TOR for the Chisapani studies, and the powers, functions and responsibilities of the Coordinating Committee (CC) (para. 42), as agreed during negotiations.

37. The proposed project was appraised in February-March 1983. GOI sent a team of four representatives to Nepal during appraisal to work together with HMG's and IDA staff, and the proposed TOR for the execution of the study related to Chisapani were agreed upon. Negotiations for the credit took place May 26-30, 1983. HMG's delegation was led by Mr. M. Dhakal, Secretary, Ministry of Water Resources. There is no separate Staff Appraisal Report. A supplementary data sheet is attached as Annex III.

#### Project Objectives

38. The main objective of the proposed project would be to assess the economic justification and technical viability of the Karnali (Chisapani) Multipurpose Project on the Karnali River in Nepal. The project would also assess the prefeasibility of a smaller hydropower project upstream of Chisapani. The findings of the feasibility studies on Chisapani would form the basis on which the two countries would decide whether or not to undertake the next phase which would include detailed engineering, design and the preparation of bidding documents.

#### Project Description

39. The project consists of:

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<sup>1/</sup> Karnali (Chisapani) Multipurpose Project.

- (a) preparation of the final feasibility study for Chisapani including all the necessary engineering work to confirm the technical and economic feasibility of the scheme;
- (b) prefeasibility of a proposed smaller project upstream of Chisapani; and
- (c) provision of consulting services to HMG for general advice on all aspects related to the project.

In order to carry out the services mentioned above, the proposed Credit includes financing for special equipment, materials, vehicles, instruments necessary for field investigation and office work, and minor construction works, including temporary housing and office facilities at the project sites, rehabilitation of about 45 km of access roads and the small aircraft runway of about 2 km and related airport facilities at Chisapani, construction of a small heliport at Karnali bend, and about 800 meters of exploratory tunnels.

#### Arrangements for Project Execution

40. The studies under the project would be carried out by consultants selected and retained according to IDA guidelines. The project is expected to be completed by June 1988. The studies for Chisapani would be carried out in accordance with TOR approved by CK in its February 1984 meeting and satisfactory to IDA. The feasibility for the smaller project upstream of Chisapani would be executed under TOR satisfactory to IDA.

41. The Ministry of Water Resources would be the agency responsible for the administration of the project. HMG has appointed a Project Director, whose qualifications, experience and terms of reference are acceptable to IDA. The Project Director, who would report to the Secretary of Water Resources, would be the Chief Executive for the project, and would take care of the day-to-day administrative matters. He would provide the necessary logistic support to the consultants and would serve as liaison between the parties involved in the project. He would have the necessary staff to assist him in discharging his duties including disbursements and payments, procurement and supplies, project accounting, housing, and transport. The responsibilities of the Project Director were agreed upon during the appraisal of the project.

42. The Coordinating Committee (CC), established with equal numbers of technical staff appointed by both Governments, is considerably smaller than CK and would advise CK on technical matters regarding the execution of the Chisapani studies. Powers, functions and responsibilities of the CC have been approved by CK during its February 1984 meeting.

43. At present, Nepal does not have the capability to properly execute projects of the size and complexity of Karnali and it is necessary to provide for adequate technical assistance to HMG. HMG would retain, under the project, consultants acceptable to IDA and independent from the main



consultants, to serve as general project advisors to HMG. The consultants, who would be employed under IDA guidelines, would station in Kathmandu a lead advisor, with broad experience in similar projects, who would report to the Secretary, Ministry of Water Resources. The consultants would also provide for specialized staff as needed. The advisory services would cover, among others, general management, contract administration, review and analysis of the main consultant's proposals and recommendations, assistance in preparing for discussions with the Chisapani consultants or within the committees and review of approach and staffing proposed by the consultants for the main contract.

#### Project Cost and Financing

44. Total project cost is estimated at US\$14.0 million net of taxes and duties, of which US\$10.8 million (77%) are foreign exchange costs. The base costs of US\$11.9 million have been estimated at end 1983 prices. It is estimated that about 440 man-months of consulting services would be necessary for the feasibility studies and about 50 man-months for the advisory services to HMG. The cost of the services is estimated at US\$11,500 per man-month of senior staff and US\$9,500 for other staff. These figures include salaries, fringe benefits, and overhead. Allowances have been included in project costs for reimbursable expenditures. In accordance with HMG's desire for local staff training and participation, it is also estimated that some 150 man-months of local staff would be used by the consultants in charge of the feasibility studies. Project costs provide for the purchase of equipment and instruments for field investigations estimated at about US\$0.8 million. Necessary construction work estimated at US\$3.1 million (base cost) is also included in the project costs. Physical contingencies for the project are estimated to average 10%; and an 8% price contingency over total costs has been provided.

45. The proposed IDA Credit of US\$11.0 million would finance 79% of total project cost; the remaining 21% (US\$3.6 million) would be provided by HMG. The IDA credit would finance 100% of the foreign exchange cost (US\$10.8 million) and about US\$0.2 million of local costs.

Procurement

46. Proposed procurement arrangements are summarized below:

<u>Project Component</u>	<u>Procurement Method</u>				<u>Total Base Cost</u> (US\$ Million)
	<u>ICB</u>	<u>LCB</u>	<u>Other</u>	<u>NA</u>	
Consulting Services	7.5	-	-	-	7.5 (6.2) /a
Construction		3.1 (2.3)			3.1 (2.3)
Equipment and Vehicles		0.1	0.7	/b	0.8 (0.7)
Operating Costs				0.5	0.5 (0.1)
Total	7.5	3.2	0.7	0.5	11.9

/a Figures in parenthesis represent IDA financing.

/b Limited international bidding.

47. The consultants for the feasibility studies and the general advisors to HMG would be recruited in accordance with IDA guidelines (estimated to cost US\$7.5 million or 54% of the project cost). In view of the specialized nature of the equipment and parts required for the engineering work, procurement of these goods (except vehicles), would be through limited international bidding according to IDA guidelines, after obtaining bids from at least three sources (estimated cost of this item totals US\$0.7 million). Contracts for the supply of other non-specialized goods such as vehicles would be procured through local competitive bidding procedures acceptable to IDA (estimated at US\$0.1 million). Due to the nature and small size of the construction works international competitive bidding is not justified and it is proposed that civil works be contracted on the basis of local competitive bidding procedures acceptable to IDA. However, foreign contractors would be allowed to participate (construction work is estimated at US\$3.1 million or 22% of total project costs). All contracts for procurement of goods having an estimated cost of more than US\$100,000 equivalent each or contracts for civil works having an estimated cost of more than US\$300,000 equivalent each would be subject to IDA's prior review.

Disbursements

48. The credit would be disbursed against 100% of foreign expenditures for: (a) consulting services for the feasibility studies; (b) consulting services of the general advisors to HMG; (c) materials, equipment (including vehicles) and instruments necessary to carry out the project; (d) miscellaneous construction works; and (e) costs of travel and operation of the

Project Director's office and of the Coordinating Committee. The credit would also finance 65% of local expenditures on imported instruments, materials or equipment (including vehicles) locally procured. Disbursements would be fully documented and are expected to begin during the first quarter of FY85 and be completed by December 31, 1988.

#### Project Justification and Risks

49. Preliminary studies indicate that the Chisapani Project would be able to produce abundant electricity at low cost (around US\$0.02 per kWh) compared to current costs in Nepal (US\$0.14-0.17 per kWh) and in India (some US\$0.03 per kWh) which makes it a very attractive power generation source for both countries. The advantageous location of Chisapani and the natural conditions of the site make it unique in facilitating the supply of electricity to the northern part of India at a relatively low cost. Chisapani also has the potential to become a good source of foreign exchange to Nepal. In addition to Chisapani, there may be other projects of a similar nature suitable for joint development to the benefit of both Nepal and India, and Karnali can serve as an initial step and model to establish an appropriate approach and to resolve many of the issues that are common to such projects. The proposed Phase I project would provide an opportunity to enhance the technical and managerial skills of the local staff through direct association with the consultants, which will facilitate the learning of techniques to explore and identify new projects needed in Nepal.

50. The main risk of the Phase I project is that the future physical works might not be technically viable or economically justifiable. However, given the amount of information provided by the previous studies, it appears that Chisapani is very attractive and technically possible and that further studies are warranted. To minimize this risk further and to keep it at an acceptably low level the engineering work has been phased, and only phase I is being proposed now. Another risk concerns future implementation. Although there cannot be a formal commitment of Nepal and India at this stage to execute the future physical works, formation of CK, and the establishment of the CC indicate the interest of both countries in the project. Implementation of future physical works requires substantial financial resources as well as binational agreements on power prices and other related issues. The proposed studies are geared to confirm the competitiveness of Chisapani as a low-cost source of energy to facilitate the agreements leading to project construction.

#### PART V - LEGAL INSTRUMENT AND AUTHORITY

51. The Draft Credit Agreement between the Kingdom of Nepal and IDA and the recommendation of the Committee provided for in Article V, Section 1 (d), of the Articles of Agreement are being distributed to the Executive Directors separately. There are no special conditions.

52. I am satisfied that the proposed credit would comply with the Articles of Agreement of the Association.

PART VI - RECOMMENDATION

53. I recommend that the Executive Directors approve the proposed credit.

A.W. Clausen  
President  
By Ernest Stern

Attachments .

March 1, 1984  
Washington, D.C.

T A B L E 3A

NEPAL	- SOCIAL INDICATORS DATA SHEET				
	NEPAL			REFERENCE GROUPS (WEIGHTED AVERAGES) /a	
	1960/b	1970/b	MOST RECENT ESTIMATE /b	LOW INCOME ASIA & PACIFIC	MIDDLE INCOME ASIA & PACIFIC
<b>AREA (THOUSAND SQ. KM)</b>					
TOTAL	140.8	140.8	140.8	.	.
AGRICULTURAL	35.3	36.8	41.2	.	.
<b>GNP PER CAPITA (US\$)</b>	60.0	80.0	150.0	276.7	1028.6
<b>ENERGY CONSUMPTION PER CAPITA</b> (KILOGRAMS OF COAL EQUIVALENT)	3.0	15.0	13.0	398.4	792.8
<b>POPULATION AND VITAL STATISTICS</b>					
POPULATION, MID-YEAR (THOUSANDS)	9447.0	11355.0	15029.0	.	.
URBAN POPULATION (% OF TOTAL)	3.1	4.9	6.4	21.5	32.9
<b>POPULATION PROJECTIONS</b>					
POPULATION IN YEAR 2000 (MILL)			24.2	.	.
STATIONARY POPULATION (MILL)			73.3	.	.
YEAR STATIONARY POP. REACHED			2155	.	.
<b>POPULATION DENSITY</b>					
PER SQ. KM.	67.1	80.6	104.0	161.7	260.7
PER SQ. KM. AGRI. LAND	267.4	308.6	355.7	363.1	1696.5
<b>POPULATION AGE STRUCTURE (%)</b>					
0-14 YRS	39.1	42.0	42.4	36.6	39.4
15-64 YRS	57.4	55.0	54.6	59.2	57.2
65 AND ABOVE	3.5	3.0	3.0	4.2	3.3
<b>POPULATION GROWTH RATE (%)</b>					
TOTAL	1.3	1.8	2.5/c	1.9	2.3
URBAN	4.4	6.3	5.0	4.0	3.9
<b>CRUDE BIRTH RATE (PER THOUS)</b>	43.6	45.5	43.6	29.3	31.3
<b>CRUDE DEATH RATE (PER THOUS)</b>	26.5	23.7	19.8	10.9	9.6
<b>GROSS REPRODUCTION RATE</b>	2.7	3.0	3.1	2.0	2.0
<b>FAMILY PLANNING</b>					
ACCEPTORS, ANNUAL (THOUS)	..	37.4	146.0/d	.	.
USERS (% OF MARRIED WOMEN)	..	0.7/f	4.3/e, f	48.1	46.6
<b>FOOD AND NUTRITION</b>					
INDEX OF FOOD PROD. PER CAPITA (1969-71=100)	106.0	101.0	82.0	111.4	125.2
<b>PER CAPITA SUPPLY OF</b>					
CALORIES (% OF REQUIREMENTS)	94.0	94.0	86.0	98.1	114.2
PROTEINS (GRAMS PER DAY)	51.0	51.0	45.0	56.7	57.9
OF WHICH ANIMAL AND PULSE	9.0	9.0	8.0/e	13.9	14.1
<b>CHILD (AGES 1-4) DEATH RATE</b>	32.6	27.8	22.5	12.2	7.6
<b>HEALTH</b>					
LIFE EXPECT. AT BIRTH (YEARS)	37.6	40.5	44.6	59.6	60.2
INFANT MORT. RATE (PER THOUS)	194.5	172.5	147.7	96.6	68.1
<b>ACCESS TO SAFE WATER (%POP)</b>					
TOTAL	..	2.0	8.0/g	32.9	37.1
URBAN	47.7	53.0	81.0/g	70.8	54.8
RURAL	..	..	5.0/g	22.2	26.4
<b>ACCESS TO EXCRETA DISPOSAL</b> (% OF POPULATION)					
TOTAL	..	1.0	1.0/h	18.1	41.4
URBAN	..	14.0	14.0/h	72.7	47.5
RURAL	..	..	..	4.7	33.4
<b>POPULATION PER PHYSICIAN</b>	73800.0	51380.0/i	30060.0/e	3506.0	7771.9
POP. PER NURSING PERSON	..	70530.0/i	33420.0/e	4797.9	2462.6
<b>POP. PER HOSPITAL BED</b>					
TOTAL	8290.0	6940.0	6390.0	1100.6	1047.2
URBAN	290.0	390.0	450.0	298.4	651.1
RURAL	..	..	..	5941.6	2591.9
<b>ADMISSIONS PER HOSPITAL BED</b>	..	..	..	..	27.0
<b>HOUSING</b>					
<b>AVERAGE SIZE OF HOUSEHOLD</b>					
TOTAL	..	5.5	..	..	..
URBAN	5.4	..	..	..	..
RURAL	..	..	..	..	..
<b>AVERAGE NO. OF PERSONS/ROOM</b>					
TOTAL	..	..	..	..	..
URBAN	2.0	..	..	..	..
RURAL	..	..	..	..	..
<b>ACCESS TO ELECT. (% OF DWELLINGS)</b>					
TOTAL	..	..	..	..	..
URBAN	30.2	..	..	..	..
RURAL	..	..	..	..	..

TABLE 3A

NEPAL		- SOCIAL INDICATORS DATA SHEET				
NEPAL		REFERENCE GROUPS (WEIGHTED AVERAGES) /a				
		MOST RECENT ESTIMATE /b			(MOST RECENT ESTIMATE) /b	
		1960/h	1970/b	ESTIMATE /b	LOW INCOME ASIA & PACIFIC	MIDDLE INCOME ASIA & PACIFIC
<b>EDUCATION</b>						
<b>ADJUSTED ENROLLMENT RATIOS</b>						
PRIMARY:	TOTAL	10.0	26.0	91.0	96.1	101.2
	MALE	19.0	43.0	126.0	107.8	106.0
	FEMALE	1.0	8.0	53.0	82.9	97.5
SECONDARY:	TOTAL	6.0	10.0	21.0	30.2	44.9
	MALE	11.0	16.0	33.0	37.3	50.0
	FEMALE	2.0	3.0	9.0	22.2	44.6
VOCATIONAL (% OF SECONDARY)		0.2	5.8	6.8/e	2.3	18.5
<b>PUPIL-TEACHER RATIO</b>						
	PRIMARY	33.0	22.0	38.0	34.4	32.7
	SECONDARY	32.0	..	31.0	18.4	23.4
<b>ADULT LITERACY RATE (%)</b>						
		8.8	14.3	19.0	53.5	72.9
<b>CONSUMPTION</b>						
	PASSENGER CARS/THOUSAND POP	0.1	0.4	..	1.6	9.7
	RADIO RECEIVERS/THOUSAND POP	3.0/j	4.8	20.5	96.8	113.7
	TV RECEIVERS/THOUSAND POP	..	..	..	9.9	50.1
	NEWSPAPER ("DAILY GENERAL INTEREST") CIRCULATION PER THOUSAND POPULATION	0.7	2.4	7.3/g	16.4	54.0
	CINEMA ANNUAL ATTENDANCE/CAPITA	..	..	..	3.6	3.4
<b>LABOR FORCE</b>						
	TOTAL LABOR FORCE (THOUS)	4875.0	5537.0	7140.0	..	..
	FEMALE (PERCENT)	40.5	39.2	39.0	33.3	33.6
	AGRICULTURE (PERCENT)	95.0	94.0	93.0	69.0	50.9
	INDUSTRY (PERCENT)	2.0	2.0	2.0	15.8	19.2
<b>PARTICIPATION RATE (PERCENT)</b>						
	TOTAL	51.6	48.8	47.5	42.5	38.6
	MALE	61.5	58.8	57.6	54.4	50.7
	FEMALE	41.8	38.6	37.3	29.8	26.6
ECONOMIC DEPENDENCY RATIO		0.8	0.9	1.0	1.0	1.1
<b>INCOME DISTRIBUTION</b>						
PERCENT OF PRIVATE INCOME RECEIVED BY						
	HIGHEST 5% OF HOUSEHOLDS	..	..	35.3/g	16.5	22.2
	HIGHEST 20% OF HOUSEHOLDS	..	..	59.2/g	43.5	48.0
	LOWEST 20% OF HOUSEHOLDS	..	..	4.6/g	6.9	6.4
	LOWEST 40% OF HOUSEHOLDS	..	..	12.6/g	17.5	15.5
<b>POVERTY TARGET GROUPS</b>						
ESTIMATED ABSOLUTE POVERTY INCOME LEVEL (US\$ PER CAPITA)						
	URBAN	..	..	95.0	133.9	194.5
	RURAL	..	..	45.0	111.6	155.0
ESTIMATED RELATIVE POVERTY INCOME LEVEL (US\$ PER CAPITA)						
	URBAN	..	..	..	..	178.0
	RURAL	..	..	41.0	..	164.8
ESTIMATED POP. BELOW ABSOLUTE POVERTY INCOME LEVEL (%)						
	URBAN	..	..	55.0/e	43.8	24.4
	RURAL	..	..	61.0/e	51.7	41.1

.. NOT AVAILABLE  
. NOT APPLICABLE

NOTES

/a The group averages for each indicator are population-weighted arithmetic means. Coverage of countries among the indicators depends on availability of data and is not uniform.

/b Unless otherwise noted, "Data for 1960" refer to any year between 1959 and 1961; "Data for 1970" between 1969 and 1971; and data for "Most Recent Estimate" between 1979 and 1981.

/c Estimated annual growth rate for 1972-79 is 2.6%; /d 1978; /e 1977; /f Government program only; /g 1976; /h 1975; /i Personnel in government services only; /j 1963.

## DEFINITIONS OF SOCIAL INDICATORS

Notes: Although the data are drawn from sources generally judged the most authoritative and reliable, it should also be noted that they may not be internationally comparable because of the lack of standardized definitions and concepts used by different countries in collecting the data. The data are, nonetheless, useful to describe orders of magnitude, indicate trends, and characterize certain major differences between countries.

The reference groups are (1) the same country group of the subject country and (2) a country group with somewhat higher average income than the country group of the subject country (except for "High Income" Oil Exporters" group where "Middle Income North Africa and Middle East" is chosen because of stronger socio-cultural affinities). In the reference group data the averages are population weighted arithmetic means for each indicator and shown only when majority of the countries in a group has data for that indicator. Since the coverage of countries among the indicators depends on the availability of data and is not uniform, caution must be exercised in relating averages of one indicator to another. These averages are only useful in comparing the value of one indicator at a time among the country and reference groups.

**AREA** (thousand sq. km.)

**Total** - Total surface area comprising land area and inland waters; 1960, 1970 and 1980 data.

**Agricultural** - Estimate of agricultural area used temporarily or permanently for crops, pastures, market and kitchen gardens or to lie fallow; 1960, 1970 and 1980 data.

**GNP PER CAPITA (US\$)** - GNP per capita estimates at current market prices, calculated by same conversion method as World Bank Atlas (1979-81 basis); 1960, 1970, and 1981 data.

**ENERGY CONSUMPTION PER CAPITA** - Annual apparent consumption of commercial primary energy (coal and lignite, petroleum, natural gas and hydro-, nuclear and geothermal electricity) in kilograms of coal equivalent per capita; 1960, 1970, and 1980 data.

**POPULATION AND VITAL STATISTICS**

**Total Population, Mid-Year (thousands)** - As of July 1; 1960, 1970, and 1981 data.

**Urban Population (percent of total)** - Ratio of urban to total population; different definitions of urban areas may affect comparability of data among countries; 1960, 1970, and 1981 data.

**Population Projections**

**Population in year 2000** - Current population projections are based on 1980 total population by age and sex and their mortality and fertility rates. Projection parameters for mortality rates comprise of three levels assuming life expectancy at birth increasing with country's per capita income level, and female life expectancy stabilizing at 77.5 years. The parameters for fertility rate also have three levels assuming decline in fertility according to income level and past family planning performance. Each country is then assigned one of these nine combinations of mortality and fertility trends for projection purposes.

**Stationary population** - In a stationary population there is no growth since the birth rate is equal to the death rate, and also the age structure remains constant. This is achieved only after fertility rates decline to the replacement level of unit net reproduction rate, when each generation of women replaces itself exactly. The stationary population size was estimated on the basis of the projected characteristics of the population in the year 2000, and the rate of decline of fertility rate to replacement level.

**Year stationary population is reached** - The year when stationary population size will be reached.

**Population Density**

**Per sq. km.** - Mid-year population per square kilometer (100 hectares) of total area; 1960, 1970, and 1980 data.

**Per sq. km. agricultural land** - Computed as above for agricultural land only; 1960, 1970 and 1980 data.

**Population Age Structure (percent)** - Children (0-14 years), working-age (15-64 years), and retired (65 years and over) as percentages of mid-year population; 1960, 1970, and 1981 data.

**Population Growth Rate (percent) - total** - Annual growth rates of total mid-year population for 1950-60, 1960-70, and 1970-81.

**Population Growth Rate (percent) - urban** - Annual growth rates of urban populations for 1950-60, 1960-70, and 1970-81.

**Crude Birth Rate (per thousand)** - Annual live births per thousand of mid-year population; 1960, 1970, and 1981 data.

**Crude Death Rate (per thousand)** - Annual deaths per thousand of mid-year population; 1960, 1970, and 1981 data.

**Gross Reproduction Rate** - Average number of daughters a woman will bear in her normal reproductive period if she experiences present age-specific fertility rates; usually five-year averages ending in 1960, 1970, and 1981.

**Family Planning - Acceptors, Annual (thousands)** - Annual number of acceptors of birth-control devices under auspices of national family planning program.

**Family Planning - Users (percent of married women)** - Percentage of married women of child-bearing age (15-44 years) who use birth-control devices to all married women in same age group.

**FOOD AND NUTRITION**

**Index of Food Production per Capita (1969-71=100)** - Index of per capita annual production of all food commodities. Production excludes seed and feed and is on calendar year basis. Commodities cover primary goods (e.g. sugarcane instead of sugar) which are edible and contain nutrients (e.g. coffee and tea are excluded). Aggregate production of each country is based on national average producer price weights; 1961-65, 1970, and 1981 data.

**Per capita supply of calories (percent of requirements)** - Computed from energy equivalent of net food supplies available in country per capita per day. Available supplies comprise domestic production, imports less exports, and changes in stock. Net supplies exclude animal feed, seeds, quantities used in food processing, and losses in distribution. Requirements were estimated by FAO based on physiological needs for normal activity and health considering environmental temperature, body weights, age and sex distribution of population, and allowing 10 percent for waste at household level; 1961-65, 1970 and 1980 data.

**Per capita supply of protein (grams per day)** - Protein content of per capita net supply of food per day. Net supply of food is defined as above. Requirements for all countries established by USDA provide for minimum allowances of 60 grams of total protein per day and 20 grams of animal and pulse protein, of which 10 grams should be animal protein. These standards are lower than those of 75 grams of total protein and 23 grams of animal protein as an average for the world, proposed by FAO in the Third World Food Survey; 1961-65, 1970 and 1980 data.

**Per capita protein supply from animal and pulse** - Protein supply of food derived from animals and pulses in grams per day; 1961-65, 1970 and 1977 data.

**Child (ages 1-4) Death Rate (per thousand)** - Annual deaths per thousand in age group 1-4 years, to children in this age group; for most developing countries data derived from life tables; 1960, 1970 and 1981 data.

**HEALTH**

**Life Expectancy at Birth (years)** - Average number of years of life remaining at birth; 1960, 1970 and 1981 data.

**Infant Mortality Rate (per thousand)** - Annual deaths of infants under one year of age per thousand live births; 1960, 1970 and 1981 data.

**Access of Safe Water (percent of population)** - total, urban, and rural - Number of people (total, urban, and rural) with reasonable access to safe water supply (includes treated surface waters or untreated but uncontaminated water such as that from protected boreholes, springs, and sanitary wells) as percentages of their respective populations. In an urban area a public fountain or standpost located not more than 200 meters from a house may be considered as being within reasonable access of that house. In rural areas reasonable access would imply that the housewife or members of the household do not have to spend a disproportionate part of the day in fetching the family's water needs.

**Access to Excreta Disposal (percent of population)** - total, urban, and rural - Number of people (total, urban, and rural) served by excreta disposal as percentages of their respective populations. Excreta disposal may include the collection and disposal, with or without treatment, of human excreta and waste-water by water-borne systems or the use of pit privies and similar installations.

**Population per Physician** - Population divided by number of practicing physicians qualified from a medical school at university level.

**Population per Nursing Person** - Population divided by number of practicing male and female graduate nurses, assistant nurses, practical nurses and nursing auxiliaries.

**Population per Hospital Bed** - total, urban, and rural - Population (total, urban, and rural) divided by their respective number of hospital beds available in public and private general and specialized hospital and rehabilitation centers. Hospitals are establishments permanently staffed by at least one physician. Establishments providing principally custodial care are not included. Rural hospitals, however, include health and medical centers not permanently staffed by a physician (but by a medical assistant, nurse, midwife, etc.) which offer in-patient accommodation and provide a limited range of medical facilities. For statistical purposes urban hospitals include WHO's principal/general hospitals, and rural hospitals, local or rural hospitals and medical and maternity centers. Specialized hospitals are included only under total.

**Admissions per Hospital Bed** - Total number of admissions to or discharges from hospitals divided by the number of beds.

**HOUSING**

**Average Size of Household (persons per household)** - total, urban, and rural - A household consists of a group of individuals who share living quarters and their main meals. A boarder or lodger may or may not be included in the household for statistical purposes.

**Average number of persons per room** - total, urban, and rural - average number of persons per room in all urban, and rural occupied conventional dwellings, respectively. Dwellings exclude non-permanent structures and unoccupied parts.

**Access to electricity (percent of dwellings)** - total, urban, and rural - Conventional dwellings with electricity in living quarters as percentage of total, urban, and rural dwellings respectively.

**EDUCATION****Adjusted Enrollment Ratios**

**Primary school** - total, male and female - Gross total, male and female enrollment of all ages at the primary level as percentages of respective primary school-age populations; normally includes children aged 5-11 years but adjusted for different lengths of primary education; for countries with universal education enrollment may exceed 100 percent since some pupils are below or above the official school age.

**Secondary school** - total, male and female - Computed as above; secondary education requires at least four years of approved primary instruction; provides general, vocational, or teacher training instructions for pupils usually of 12 to 17 years of age; correspondence courses are generally excluded.

**Vocational enrollment (percent of secondary)** - Vocational institutions include technical, industrial, or other programs which operate independently or as departments of secondary institutions.

**Pupil-teacher ratio** - primary, and secondary - Total students enrolled in primary and secondary levels divided by numbers of teachers in the corresponding levels.

**Adult literacy rate (percent)** - Literate adults (able to read and write) as a percentage of total adult population aged 15 years and over.

**CONSUMPTION**

**Passenger Cars (per thousand population)** - Passenger cars comprise motor cars seating less than eight persons; excludes ambulances, hearses and military vehicles.

**Radio Receivers (per thousand population)** - All types of receivers for radio broadcasts to general public per thousand of population; excludes unlicensed receivers in countries and in years when registration of radio sets was in effect; data for recent years may not be comparable since most countries abolished licensing.

**TV Receivers (per thousand population)** - TV receivers for broadcast to general public per thousand population; excludes unlicensed TV receivers in countries and in years when registration of TV sets was in effect.

**Newspaper Circulation (per thousand population)** - Shows the average circulation of "daily general interest newspaper", defined as a periodical publication devoted primarily to reporting general news. It is considered to be "daily" if it appears at least four times a week.

**Cinema Annual Attendance per Capita per Year** - Based on the number of tickets sold during the year, including admissions to drive-in cinemas and mobile units.

**LABOR FORCE**

**Total Labor Force (thousands)** - Economically active persons, including armed forces and unemployed but excluding housewives, students, etc., covering population of all ages. Definitions in various countries are not comparable; 1960, 1970 and 1981 data.

**Female (percent)** - Female labor force as percentage of total labor force.

**Agriculture (percent)** - Labor force in farming, forestry, hunting and fishing as percentage of total labor force; 1960, 1970 and 1981 data.

**Industry (percent)** - Labor force in mining, construction, manufacturing and electricity, water and gas as percentage of total labor force; 1960, 1970 and 1981 data.

**Participation Rate (percent)** - total, male, and female - Participation or activity rates are computed as total, male, and female labor force as percentages of total, male and female population of all ages respectively; 1960, 1970, and 1981 data. These are based on ILO's participation rates reflecting age-sex structure of the population, and long time trend. A few estimates are from national sources.

**Economic Dependency Ratio** - Ratio of population under 15 and 65 and over to the total labor force.

**INCOME DISTRIBUTION**

**Percentage of Private Income (both in cash and kind)** - Received by richest 5 percent, richest 20 percent, poorest 20 percent, and poorest 40 percent of households.

**POVERTY TARGET GROUPS**

The following estimates are very approximate measures of poverty levels, and should be interpreted with considerable caution.

**Estimated Absolute Poverty Income Level (US\$ per capita)** - urban and rural - Absolute poverty income level is that income level below which a minimal nutritionally adequate diet plus essential non-food requirements is not affordable.

**Estimated Relative Poverty Income Level (US\$ per capita)** - urban and rural - Rural relative poverty income level is one-third of average per capita personal income of the country. Urban level is derived from the rural level with adjustment for higher cost of living in urban areas.

**Estimated Population Below Absolute Poverty Income Level (percent)** - urban and rural - Percent of population (urban and rural) who are "absolute poor".

ECONOMIC INDICATORS - NEPALGNP PER CAPITA IN 1981: US\$150

	<u>GROSS DOMESTIC PRODUCT IN 1981/82</u>		<u>ANNUAL RATE OF GROWTH, 1970-1981 a/</u> (%, constant prices)
	<u>US\$ Mln.</u>	<u>%</u>	
GDP at Market Prices	2,514	100.0	2.1
Gross Domestic Investment	389	15.5	
Gross Domestic Saving	216	8.6	
Current Account Balance (exc. official grants)	-120	-4.8	
Exports of Goods, NFS	277	11.0	
Imports of Goods, NFS	450	17.9	

OUTPUT, LABOR FORCE AND PRODUCTIVITY IN 1979/80

	<u>Value Added</u>		<u>Labor Force b/</u>		<u>Value Added</u>
	<u>US\$ Mln.</u>	<u>%</u>	<u>Mln.</u>	<u>%</u>	<u>Per Worker</u> <u>US\$</u>
Agriculture	1,065	57	6.9	93	155
Industry c/	251	14	0.1	2	1,696
Services	543	29	0.4	5	1,468
Total/Average	1,859	100	7.4	100	251

GOVERNMENT FINANCE

	<u>CENTRAL GOVERNMENT</u>				<u>% of GDP</u> <u>1982/83</u>
	<u>1979/80</u>	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83</u>	
Current Receipts	1,853	2,403	2,866	3,001	8.3
Regular Expenditures	1,055	1,264	1,589	2,025	5.6
Current Surplus	798	1,139	1,277	976	2.7
Development Expenditure	2,309	2,731	4,034	4,808	13.2
External Assistance (Net)	1,318	1,374	1,953	2,607	7.8

MONEY, CREDIT AND PRICES

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
	(Million Rs outstanding mid-July)				
Money and Quasi Money	4,512	5,285	6,308	7,459	8,780
Bank Credit to Government	1,176	1,362	1,357	2,132	3,185
Bank Credit to Public Enterprises	436	501	668	618	981
Bank Credit to Private Sector	1,976	2,547	3,231	3,363	3,717
Money and Quasi Money as % of GDP	20.3	22.6	21.7	22.9	24.2
General Price Index (1974/75 = 100)	116.6	125.5	148.0	159.7	180.5
Annual Percentage Changes in:					
General Price Index	10.0	7.6	17.9	7.9	13.0
Bank Credit to Government	21.8	15.8	-0.4	57.1	49.4
Bank Credit to Public Enterprises	24.3	14.9	33.3	-7.5	58.7
Bank Credit to Private Sector	24.3	28.9	26.9	4.1	10.5

Note: All conversions to US dollars in this table are at the average exchange rate prevailing during the period covered.

a/ World Development Report 1983.

b/ Total labor force; unemployed are allocated to sector of their normal occupation.

c/ Includes mining, manufacturing, construction and utilities.

.. not available



TRADE PAYMENTS AND CAPITAL FLOWS

BALANCE OF PAYMENTS

	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83 a/</u>
	(Millions US\$)		
Exports, f.o.b. <u>c/</u>	134.4	115.4	67.3
Imports, f.o.b. <u>c/</u>	352.6	363.6	408.3
<u>Trade Balance</u>	-218.2	-248.2	-341.0
Services, net	75.4	87.3	78.1
of which: Tourism	64.5	51.4	61.4
Transfers, net	46.4	40.5	37.6
of which: Private Remit.	38.9	34.5	..
Indian Excise Refund	4.7	3.1	2.5
<u>Current Account Balance</u>	-96.4	-120.4	-225.3
(exc. grants)			
Official Grants	71.7	89.3	102.5
Official Capital, net	52.8	59.3	72.1
Private Capital, net	-12.0	10.8	14.6
<u>Change in Reserves</u>	-16.1	-39.0	36.1
(- = Increase)			
Gross Official Reserves (mid-July)	195.8	232.6	159.7

MERCHANDISE EXPORTS 1981/82 b/

	<u>US\$ Mln.</u>	<u>%</u>
Agricultural products	92.0	80.0
Manufactures	<u>23.0</u>	<u>20.0</u>
Total	115.0	100.0

EXTERNAL DEBT, DECEMBER 31, 1982

	<u>US\$ Mln.</u>
Public Debt, inc. guaranteed	296.6
Non-Guaranteed Private Debt	-
Total Outstanding & Disbursed	296.6

DEBT SERVICE RATIO for 1982/83 d/

	<u>%</u>
Public Debt, inc. guaranteed	7.0

IBRD/IDA LENDING, September 30, 1983 (Millions US\$)

	<u>US\$ Mln.</u>	
	<u>IBRD</u>	<u>IDA</u>
Outstanding & Disbursed	-	175.1
Undisbursed	-	<u>194.4</u>
Outstanding, incl. undisbursed	-	369.5

RATE OF EXCHANGE

	<u>From October 1975</u>	<u>From March 20, 1978</u>	<u>From September 19, 1981</u>	<u>From December 17, 1982</u>
	<u>to March 20, 1978</u>	<u>to September 18, 1981</u>	<u>to December 16, 1982</u>	<u>to May 31, 1983</u>
US\$1.00 = NRs 10.56	US\$1.00 = NRs 12.5	US\$1.00 = NRs 12.00	US\$1.00 = NRs 13.2	US\$1.00 = NRs 14.3
NR 1.00 = US\$ 0.095	NR 1.00 = US\$ 0.08	NR 1.00 = US\$ 0.083	NR 1.00 = US\$ 0.076	NR 1.00 = US\$ 0.070

- a/ Estimate  
b/ Customs basis.  
c/ Payments basis.  
d/ Ratio of Debt Service to Exports of Goods and Services.

. not applicable  
.. not available

South Asia Programs Department  
October 1983

STATUS OF BANK GROUP OPERATIONS IN NEPALA. STATEMENT OF IDA CREDITS (as of September 30, 1983) /a

<u>No.</u>	<u>Year</u>	<u>Borrower</u>	<u>Purpose</u>	US\$ million	
				<u>IDA</u>	<u>Undisbursed</u>
Eight credits fully disbursed				71.3	
470	1974	Kingdom of Nepal	Water Supply and Sewerage	11.8	1.3
617	1976	Kingdom of Nepal	Rural Development	8.0	1.6
659	1976	Kingdom of Nepal	Technical Assistance	3.0	0.1
704	1977	Kingdom of Nepal	Second Water Supply & Sewerage	8.0	2.5
705	1977	Kingdom of Nepal	Industrial Dev. Corporation	4.0	0.8
730	1977	Kingdom of Nepal	Second Highway	17.0	2.7
772	1978	Kingdom of Nepal	Technical Education	5.7	3.0
799	1978	Kingdom of Nepal	Telecommunications III	14.5	7.6
812	1978	Kingdom of Nepal	Irrigation (Sunsari-Morang)	30.0	18.2
856	1978	Kingdom of Nepal	Irrigation (Narayani Zone)	14.0	8.1
939	1979	Kingdom of Nepal	Second Rural Development	11.0	10.0
1008	1980	Kingdom of Nepal	Community Forestry	17.0	15.8
1055	1980	Kingdom of Nepal	Irrigation (Mahakali)	16.0	14.6
1059	1980	Kingdom of Nepal	Third Water Supply & Sewerage	27.0	17.5
1062/c	1980	Kingdom of Nepal	Grain Storage	6.2	4.6
1093/c	1981	Kingdom of Nepal	Irrigation (Babai)	3.5	0.6
1100/c	1981	Kingdom of Nepal	Agricultural Extension & Res.	17.5	8.8
1101/c	1981	Kingdom of Nepal	Hill Food Production	8.0	5.2
1191/c	1982	Kingdom of Nepal	Cottage & Small Industries	6.5	5.5
1198/c	1982	Kingdom of Nepal	Second Education	14.3	13.1
1260/c	1982	Kingdom of Nepal	Petroleum Exploration Promotion	9.2	7.5
1316/c	1983	Kingdom of Nepal	Irrigation VII-Bhairawa-Lumbini	16.0	15.3
1339/c	1983	Kingdom of Nepal	Cash Crop Development Project	6.0	6.0
1379/c	1983	Kingdom of Nepal	Second Technical Assistance Project	6.0	6.0
1400	1984	Kingdom of Nepal	Second Forestry Project	<u>18.0</u>	<u>18.0</u>
Total,				369.5	194.4
of which has been repaid				<u>0.2</u>	
Total now outstanding /b				<u>369.3</u>	
Total now held by IDA				<u>369.3</u>	
Total Undisbursed					<u>194.4</u>

/a No Bank loans have been made to Nepal.

/b Prior to exchange adjustments.

/c IDA 6th Replenishment Credits, principal amounts shown in U.S. dollar equivalent at date of negotiations, as shown in President Reports, and Disbursed amounts shown in US dollar equivalent at the rate of exchange for the SDR on September 30, 1983.

NOTE: The status of the projects listed in Part A is described in a separate report on all Bank/IDA financial projects in execution, which is updated twice yearly and circulated to the Executive Directors on April 30 and October 31.

B. STATEMENT OF IFC INVESTMENT (as of September 30, 1983)

<u>Year</u>	<u>Obligor</u>	<u>Type of Business</u>	<u>Amount (\$ millions)</u>		
			<u>Loan</u>	<u>Equity</u>	<u>Total</u>
1975	Soaltee Hotel (Pvt) Ltd.	Hotel	2.7	0.4	3.1
1982	Nepal Orind Magnesite (Private) Limited	Mine and process magnesite ore	<u>6.2</u>	<u>-</u>	<u>6.2</u>
			8.9	0.4	9.3
Total commitments now held by IFC			8.5	0.4	8.9

NEPAL

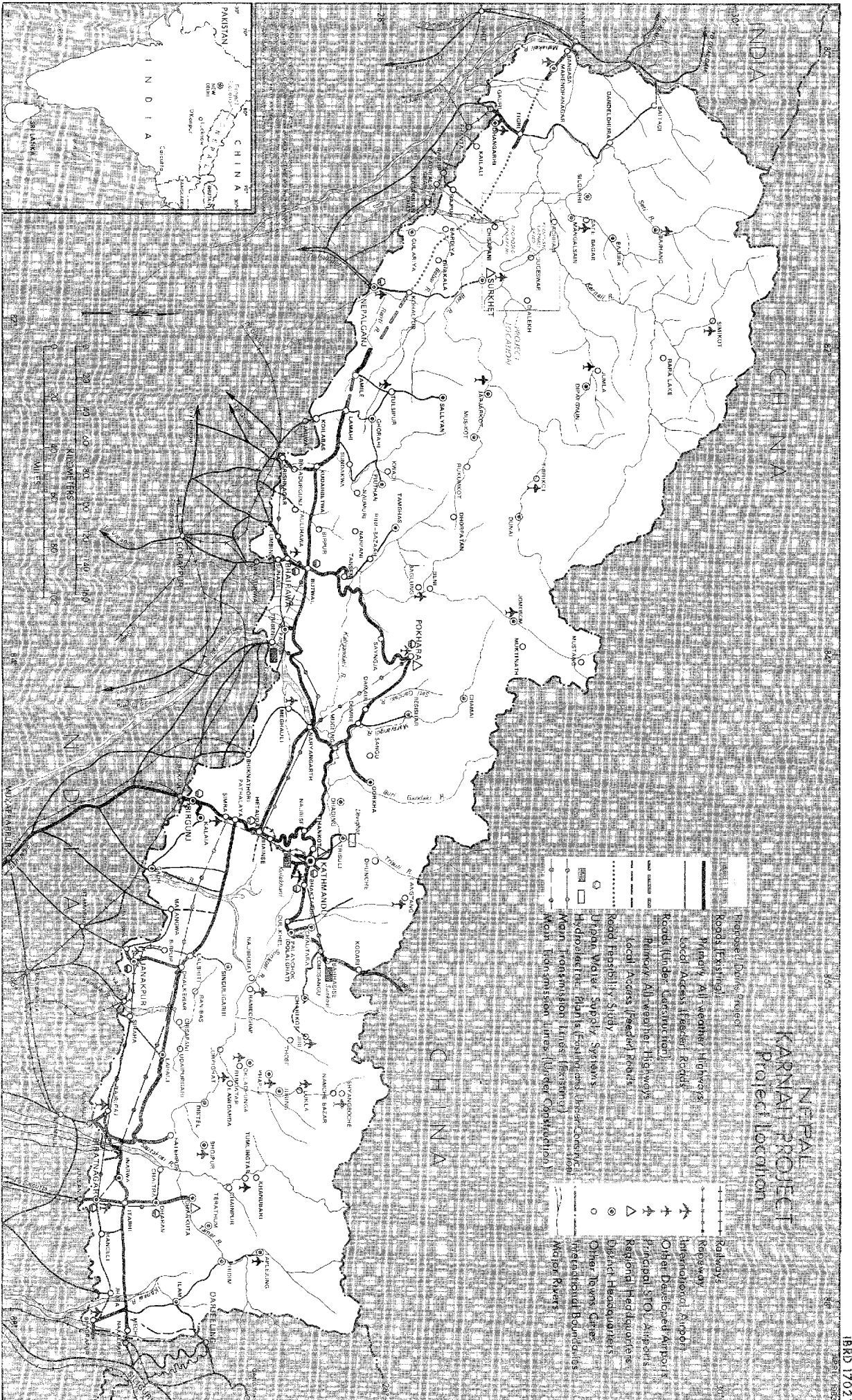
KARNALI PREPARATION POWER - PHASE I

Supplementary Data Sheet

- Section I:      Timetable of Key Events:
- (a) Time taken for the country to prepare the project:  
4 years
  - (b) The agency which has prepared the project:  
Ministry of Water Resources
  - (c) Date of first presentation to the Bank and date of the first mission to consider the project:  
February 1981  
June 1982
  - (d) Date of departure of the appraisal mission:  
February 18, 1983
  - (e) Date of Completion of negotiations:  
May 30, 1983
  - (f) Planned date of effectiveness:  
July 1984

Section II:      Special Bank Implementation Actions:  
None

Section III:     Special Conditions:  
None



**NEPAL**  
**KARNALI PROJECT**  
 Project Location

- Hydro-Electric Dam, Project
- Roads: Existing
- Roads: Under Construction
- Railways: Existing
- Railways: Under Construction
- Other Developed Airport
- Principal STO, Airports
- Regional Headquarters
- District Headquarters
- Other Towns, Cities
- International Boundaries
- Major Rivers
- Major Water Supply Systems
- Hydroelectric Plants (Existing and Under Construction)
- Main Transmission Lines (Under Construction)
- Local Access (Feeder Roads)
- Roads: All-weather, Highways
- Roads: Under Construction
- Local Access (Feeder Roads)
- Roads: Feasibility Study
- Urban Water Supply Systems
- Hydroelectric Plants (Existing and Under Construction)
- Main Transmission Lines (Under Construction)

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