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**REPORT AND RECOMMENDATION
OF THE
PRESIDENT OF THE
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
AND
INTERNATIONAL DEVELOPMENT ASSOCIATION
TO THE
EXECUTIVE DIRECTORS
ON A
PROPOSED LOAN
IN AN AMOUNT EQUIVALENT TO US\$200.0 MILLION
AND A PROPOSED IDA CREDIT OF SDR 99.7 MILLION
TO INDIA
FOR THE
NARMADA RIVER DEVELOPMENT (GUJARAT)
SARDAR SAROVAR DAM AND POWER PROJECT**

February 6, 1985

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CURRENCY EQUIVALENTS
(As of February 4, 1985)

US\$1.00	=	Rs12.75
Rs 1.00	=	US\$0.078
Rs 1 million	=	US\$78,000

The US Dollar/Rupee exchange rate is subject to change. Conversions in the Staff Appraisal Report were, except as otherwise noted, made at the rate of US\$1 to Rs 12.

FISCAL YEAR

April 1 - March 31

ABBREVIATIONS

CAC	-	Construction Advisory Committee
CEA	-	Central Electricity Authority
CPU	-	Central Procurement Unit
DRP	-	Dam Review Panel
DSP	-	Dam Safety Panel
ERR	-	Economic Rate of Return
GOG	-	Government of Gujarat
GOI	-	Government of India
GOMP	-	Government of Madhya Pradesh
GOR	-	Government of Rajasthan
Ha	-	hectare
ID	-	Irrigation Department (GOG)
Kwh	-	kilowatt hour
Km	-	Kilometers
MISC	-	Management Information Systems Cell
NCA	-	Narmada Control Authority
NDD	-	Narmada Development Department
NHPC	-	Narmada High Powered Committee
NPG	-	Narmada Planning Group
NEC	-	Narmada Review Committee
NWDP	-	Narmada Water Disputes Tribunal
SEB	-	State Electricity Board

NARMADA RIVER DEVELOPMENT (GUJARAT)SARDAR SAROVAR DAM AND POWER PROJECTCREDIT, LOAN AND PROJECT SUMMARY

Borrower: India, acting by its President (GOI).

Beneficiaries: Governments of Gujarat (GOG), Madhya Pradesh (GOMP) and Maharashtra (GOM) 1/

Amounts: Bank Loan: US\$200.0 million.
IDA Credit: SDR99.7 million (US\$100 million equivalent).

Terms: Bank Loan: Repayment over 20 years, including five years' grace, at the applicable rate of interest.
IDA Credit: Standard.

On-lending Terms: From GOI to GOG, GOMP and GOM as part of central assistance to States for development projects on terms and conditions applicable at the time. GOI would bear the exchange and interest rate risks.

Project Description: The proposed dam and power project is part of an inter-state program for the development of multi-purpose hydropower and irrigation dams on the Narmada River and their associated irrigation canal networks. The program has been designed to (a) further the progress of India's long-term power plan through the addition of generation capacity within the Western Region; (b) bring potentially valuable agricultural land in Gujarat and Rajasthan, now prone to drought and water scarcity, under irrigation, and (c) supply domestic, municipal and industrial water for Gujarat. The proposed project consists of dams and power complexes, including a storage reservoir extending about 210 kms upstream from the dam in Gujarat into Maharashtra and Madhya Pradesh. A separate, parallel operation supported by the Bank Group would provide for the first phase construction of an extensive canal network extending for about 440 km through Gujarat to Rajasthan. The project would install 1,450 MW of hydroelectric generating capacity and associated transmission facilities, irrigate about 1.9 million ha in Gujarat and create the potential for the irrigation of 70,000 ha in Rajasthan, and supply about 1,300 million cubic meters per annum of

1/ The project would also benefit the Government of Rajasthan.

municipal and industrial water. As part of the river basin development, the project would contribute to the eventual improvement in the lives of over 11 million people in four States. As one of the largest developments ever conceived of and designed as an integrated set of investments, it will pose major challenges to GOI and the participating States in ensuring its execution and operation to very high technical standards. There are risks that financial constraints and difficult and lengthy land acquisition and resettlement proceedings could delay execution and the build-up of project benefits. These risks have been mitigated through special measures by GOI in ensuring the availability of sufficient financial resources, including co-financing from external sources, for the project, the formulation of a comprehensive resettlement plan, and the use of foreign civil contractors on key civil works. Overall, the risks are acceptable.

<u>Estimated Cost 1/:</u>	<u>(US\$ millions)</u>		
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
<u>Components:</u>			
Main Dam	315.8	139.9	455.8
Land acquisition and resettlement	140.1	-	140.1
Rockfill Dams, Link Channels, Saddle Dam, and Bypass Tunnels	24.1	6.5	30.5
Weir, Powerhouses 2/ and Transmission System	342.2	236.5	578.4
Hydrometeorological Network	11.8	2.8	14.6
Training and Technical Assistance	0.5	2.0	2.5
Total Base Costs	834.4	387.6	1,221.9
Physical Contingencies	78.9	33.2	112.1
Price Contingencies	407.1	192.3	599.4
Total Project Costs 3/	1,320.4	613.1	1,933.5

1/ Includes an estimate of US\$260 million in taxes and duties.

2/ Riverbed house with downstream weir and canal head powerhouse, and electric transmission system.

3/ Figures may not add due to rounding.

Financing Plan: 4/

		(US\$ millions)		
		<u>Local</u>	<u>Foreign</u>	<u>Total</u>
GOI		250.0	178.1	428.1
GOC		359.0	-	359.0
GOM		402.0	-	402.0
GOMP		280.4	-	280.4
GOR		29.0	-	29.0
Suppliers' Credits 5/		-	135.0	135.0
Bank Group		-	300.0	300.0
Total		1,320.4	613.1	1,933.5

Estimated Disbursements 6/

	(US\$ millions)									
	<u>FY85</u>	<u>FY86</u>	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>
Annual	6.3	28.2	50.1	57.0	50.6	50.9	20.6	18.5	12.1	6.1
Cumulative	6.3	34.5	84.6	141.6	191.8	242.7	263.3	281.8	293.9	300.0

Rate of Return: About 13%

Appraisal Report: No. 5107-IN, dated February 12, 1985.

4/ Includes contributions from outside sources.

5/ For power generation equipment.

6/ By Bank Group fiscal year.

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
AND
INTERNATIONAL DEVELOPMENT ASSOCIATION

REPORT AND RECOMMENDATION OF THE PRESIDENT TO THE
EXECUTIVE DIRECTORS ON A PROPOSED LOAN AND CREDIT
TO INDIA FOR THE NARMADA RIVER BASIN (GUJARAT)
SARDAR SAROVAR DAM AND POWER PROJECT

1. I submit the following report and recommendation on a proposed loan and development credit to India for US\$200.0 million and SDR99.7 million (US\$100.0 million equivalent) respectively to help finance the construction of a dam and power complex on the Narmada River in Gujarat. Amortization of the Bank loan would be over 20 years including five years of grace. The IDA Credit would be made on standard terms. The Government of India (GOI) would channel the proceeds of the loan and credit to GOG, in accordance with GOI's standard terms and arrangements for financing development projects. Additional financing for the project, in amounts up to US\$135.0 million, is expected to be provided from suppliers' credits to finance power equipment. The exchange and interest rate risks will be borne by GOI.

PART I - THE ECONOMY 1/

2. An economic report, "Situation and Prospects of the Indian Economy - A Medium Term Perspective" (4962-IN, dated April 16, 1984), was distributed to the Executive Directors on April 23, 1984. Country data sheets are attached as Annex I.

Background

3. India is a large and diverse country with a population of about 750 million (in mid-1984) and an annual per capita income of US\$260. The economy is dominated by agriculture which employs more than two-thirds of the labor force. However, the land base is not sufficient to provide an adequate livelihood to everyone engaged in agricultural activities, especially those who own little or no land. Growth of value-added in agriculture -- 2.2% since 1950/51 -- has been slower than growth of industrial value-added (5.3% per annum). As a result, there has been a gradual decline in the share of agriculture in GDP (at factor cost) from 52% in 1950/51 to about 33% in 1981/82, while the share of industry rose from 20% to around 26%. But industrialization has not been rapid enough to absorb the growing labor force, or to bring about a rapid economic transformation, with significantly higher productivity and income levels. As a result economic growth has been slow over the past three decades, averaging about 3.6% per annum since 1950/51.

4. Nevertheless, there has been steady progress, with per capita income rising by about 1.4% per year in the period 1950 to 1980. Despite the large population base and its relatively rapid growth, India has been able to eliminate persistent dependence on foodgrain imports through significant improvements in agricultural production. Savings and investment have increased

1/ Parts I and II of the report are similar to Parts I and II of the President's Report for the Bombay Urban Development Project (No.P-3920-IN), dated January 7, 1984.

markedly since 1950/51: the gross national savings rate more than doubled from 10.8% of GDP (at factor cost) to 22.7% in 1983/84, while the gross domestic investment rate rose from 12.5% of GDP to 24.8% in 1983/84. Foreign savings (balance of payments deficit on current account) have never financed a major portion of domestic investment: a peak of about 20% was reached during the early 1960s. Currently, foreign savings account for about 8% of investment. External assistance has been low both as a percentage of GDP and in per capita terms, never rising above 3% of GDP and averaging below 1% for the past five years. Net use of foreign savings has never risen above 3% of GDP, and presently stands at 2.1%.

5. Before the 1970s, India placed relatively less emphasis on export promotion and more on import substitution. The volume growth of exports between 1950/51 and 1969/70 averaged only 2.2% per annum, while the volume growth of imports over the same period was 4.3%. In the early to mid-1970s, however, India's terms of trade, which had remained roughly constant during the 1960s, deteriorated sharply. In response, the Government introduced various policy measures designed to stimulate exports. As a result, the volume of India's exports grew on average about 7.3% per annum for the 1970s as a whole, a performance which demonstrates that sustained rapid growth is possible. While expanding world markets, particularly in the nearby Middle East, contributed to this growth, liberalized access to imported inputs and more effective export incentives played a major role.

6. Moving into the second half of the 1970s, the Indian economy was buoyed by higher levels of investment and an expanding level of foodgrain output. As a result, growth in real GDP and in agricultural and industrial value-added substantially exceeded the historical 30-year trends (paragraph 3) averaging 5.3%, 3.3% and 8.1%, respectively, during the 1975/76 to 1978/79 period. In 1979/80, however, this momentum was broken when the worst drought in recent years, combined with a doubling of international oil prices and domestic supply shortages, led to a sharp fall in foodgrain production, a decline in GDP, and the opening up of a relatively large trade deficit. Severe inflationary pressures also emerged after several years of virtual price stability. These setbacks coincided with the preparation of the Sixth Five-Year Plan which laid down a program of adjustment that aimed at improving the trade deficit, removing infrastructural bottlenecks and ensuring price stability with an overall growth of the economy of 5.2% per annum.

Recent Trends

7. Despite the effects of two severe droughts in 1979/80 and 1982/83, India's economy in the early 1980s continued to grow at the faster pace of the second half of the 1970s. Between the two droughts (from 1979/80 to 1982/83), GDP growth averaged almost 5% per annum, while between the two recovery years (from 1980/81 to 1983/84), it was 4.5% per annum -- substantially higher than India's long-term growth rate of 3.6%. Continued rapid economic growth has resulted from a development strategy which includes higher investment levels and liberalized policies on imports, industrial licensing, prices, and commercial borrowing. These policies, by easing constraints on the supply of infrastructure and basic commodities, were a determining factor in the improved performance of the economy and the industrial sector. This overall improvement in performance, combined with a more restrictive monetary policy in 1981/82 and 1982/83, resulted in a sharp decline in the rate of inflation. The growth rate of wholesale prices declined from over 18% in 1980/81 to only 2.6% in 1982/83,

but rose to over 9% in 1983/84, mainly due to the effect of the 1982/83 drought on food prices. Further improvements in the policy environment will be required to maintain these higher levels of economic growth and investment without putting undue pressure on the balance of payments or reviving inflationary expectations.

8. Economic growth in the early 1980s has not been steady, mainly because of the effect of uneven rainfall on agricultural production during the period. In 1980/81 and 1981/82, the economy substantially recovered from the 1979 drought, with real GDP growing by 7.6% and 5.3%, respectively. While industrial output expanded by 4% in 1980/81 and 8.6% in 1981/82, recovery was particularly robust in agriculture where normal weather helped output to rise by more than 15% and 5.5%, respectively. The supply of power, coal, and rail transport, already improved in 1980/81, was further expanded in 1981/82, recording growth rates of about 10%, 9.6% and 12.5%, respectively. This overall improvement in the Indian economy was halted in 1982/83 by a severe drought in mid-1982 which reduced agricultural production by 4%, brought down the GDP growth rate to 1.8%, and put further strains on the already difficult balance of payments and domestic resource situation. The timely implementation of various economic policies relating to foodgrain imports, procurement and distribution, and the allocation of power to irrigation pumps mitigated the otherwise very distressing effects of the poor monsoon. The economy recovered in 1983/84, led by a robust agricultural sector - GDP grew by about 6.5% to 7% with agricultural production growth in the 9%-10% range and industrial growth of 4.5%. The major factors contributing to the good economic performance during 1983/84 were the excellent monsoon, combined with adequate agricultural policies and programs, and satisfactory performance of the coal and transport sectors. The power sector, however, emerged again as a constraint on higher growth, especially in industry.

9. Agricultural production rebounded strongly in 1983/84 in response to the monsoon, improved use of inputs and continued expansion of irrigation. Overall foodgrain production rose by 10%-12% over the previous year, reaching a new record of 142-144 million tons, a substantial increase over the previous peak of 133 million tons in 1981/82. Corrected for weather variations, foodgrain production continues to grow at a trend of 2.6% per annum--sufficient to maintain a broad balance between supply and steadily increasing domestic demand. Nonetheless, the balance remains delicate, and the need for foodgrain imports to maintain consumer supplies or adequate buffer stocks could arise from time to time. Thus, adequate management of foodgrain stocks and programs to expand irrigation, strengthen extension and encourage the efficient use of other agricultural inputs continue to receive high priority.

10. Basic infrastructure services had a mixed performance in 1983/84, partially because of sluggish demand from industry during the first half of the year but also due to a failure to maintain the productivity gains of 1980-82. Electricity generation grew only by about 3.7% due to low reservoir water levels during the first half of the year, delays in the commissioning of new capacity, and a deterioration of capacity utilization in thermal plants. As a result, power generation was about 11.5% below requirements and constituted a major bottleneck in the economy. Key industries which were adversely affected by power constraints included steel, fertilizers, cement, and coal. To improve performance in the power sector, the Government recently increased incentives for higher labor and management productivity in thermal plants. Railway freight traffic, measured in ton-kms, grew by only 0.5% in

1983/84, reflecting sluggish demand. Coal production increased by about 6.5% in 1983/84 reaching 139 million tons. When combined with stocks already available this level of production was sufficient to meet the relatively slow demand growth. Infrastructural constraints would have emerged much more sharply had the pace of industrial growth and demand been more rapid. It is therefore critically important that India maintain the pace of investment in these key sectors, mobilize sufficient resources to do so, and implement programs to enhance productivity.

11. The Indian economy has reverted from a situation of resource surplus in the late 1970s to an aggregate resource deficit. The gap between gross investment and national savings increased from negligible levels during the late 1970s to an average equivalent to 2.1% of GDP in 1980-84. India's gross national savings rate, which averaged 22.6% of GDP in the last four years, is high by any standard, particularly considering India's low income and the large proportion of its population below the poverty line. The scope for a substantial increase in the savings rate is therefore quite limited. If India is to maintain investment at about 25% of GDP, a major effort will be required to raise additional domestic resources particularly in the public sector. Future increases in savings will depend heavily upon the enhanced profitability of public sector enterprises which would require better utilization of capacity, more efficient operations and adequate pricing policies. This would also allow a marginal decline in the use of foreign savings from the recent 2.1%-2.3% of GDP to 1.5%-1.8%, to ensure a sustainable external debt service burden.

12. India's external resource position has changed notably since the late 1970s. The current account balance, which recorded surpluses from 1976/77 to 1978/79, reverted to deficits averaging US\$3.5 billion and 2.1% of GDP during 1980/81 to 1983/84. Several developments contributed to these relatively larger current account deficits. First, the terms of trade deteriorated sharply in 1979/80 due to the second round of oil price increases and continued to move against India during the first three years of the 1980s. Second, a more liberal import policy towards industrial inputs was pursued. Third, net invisibles declined as travel receipts fell off, workers' remittances stagnated (reflecting slower development activity in the Middle East), and payment of interest on higher levels of foreign debt increased. Faced with severe infrastructural constraints and a deterioration in its balance of payments, India initiated an adjustment program in 1980/81 designed to raise the growth rate from its historical level of 3.6% to 5.2% while adjusting the country's external balance to the adverse price developments in the world markets. The main elements of this strategy, which is being successfully implemented, are export promotion, import substitution where economically justifiable, implementation of a coherent energy policy designed to meet the energy needs of the economy while curbing the growth of oil imports, and continued movement toward a more liberal import policy aimed at providing producers with access to inputs for higher capacity utilization, greater efficiency, improved technology and capacity expansion.

13. A positive development in India's balance of payments is the reduction in the trade deficit from US\$7.7 billion in 1980/81 to US\$5.9 billion in 1983/84 despite unfavorable world market conditions and import liberalization. Export volume growth and import substitution of oil and petroleum products, metals and fertilizers more than offset the substantial increase in "other" imports. These "other" imports consist mainly of industrial imports and capital goods which historically have been in chronic short supply and which are of

critical importance to capacity utilization, product quality, and plant modernization and expansion. A major factor in the decline of the trade deficit was the lower net import bill for petroleum, which dropped from US\$6.7 billion in 1980/81 to US\$3.4 billion in 1983/84 in response to a successful oil development program that reduced import needs and allowed crude oil exports, which totalled about US\$1.5 billion in 1983/84. These structural changes in the balance of payments are to a significant degree the result of India's development and adjustment efforts over the past three years. It is expected that the balance of payments will continue to be under strain for the next several years, since the adjustment strategy will continue to require high levels of imports.

14. Even assuming a favorable export performance, India will need external capital flows to augment its own resources for the foreseeable future, given the low per capita income level in the country, the already high savings rate, and the structural adjustment process. Faced with a growing need for external capital inflows and stagnation in the availability of concessional assistance, India decided at the start of the Sixth Plan to increase borrowings from the International Monetary Fund (IMF) and commercial banks to substantial levels. In the period covering the fiscal years 1981/82 to 1983/84, India drew SDR 3.9 billion from the Extended Fund Facility of the IMF. In addition, India borrowed significant amounts on commercial terms from the Euro-dollar market and increased the use of suppliers' and export credits. In the period 1980-84, India contracted commercial loans totalling over US\$6,000 million and suppliers' credits of over US\$1,000 million. The bulk of this borrowing has been used for specific development projects in the public and private sector (mostly for petroleum exploration and development, steel, power, aluminum and shipping). India's favorable debt service position and the nature of its borrowings, for project-related purposes instead of direct balance of payments support, enabled it to tap commercial capital markets at favorable spreads. This larger commercial borrowing and transfer of funds under the arrangement with the IMF has stemmed the use of foreign exchange reserves which had fallen to less than four months of import coverage in 1981/82.

Development Prospects

15. The experience of recent years illustrates that India has the capacity to grow and develop at a more rapid pace. Although the industrial sector is small compared to the size of the economy, it nevertheless is large in absolute terms and has a highly diversified structure, capable of manufacturing a wide variety of consumer and capital goods. Basic infrastructure -- irrigation, railways, telecommunications, power, roads and ports -- is extensive compared to many countries, although there is considerable need for additional capacity as well as improvement in the utilization of existing capacity. India also has a wide range of institutions capable of fostering development and is well-endowed with human resources. Finally, India has an extensive natural resource base in terms of land, water, and minerals (primarily coal and ferrous ores, but also gas and oil). With good economic policies and reasonable access to foreign savings, India has the capability for managing these considerable resources to accelerate its long-term growth.

16. The Government is currently preparing the Seventh Plan which will lay down the development strategy for 1985/86-1989/90. This strategy is expected to continue the emphasis of the Sixth Plan on agriculture, energy development, export promotion, domestic import substitution where economically justifiable

and the removal of infrastructural bottlenecks. Overall Sixth Plan performance has been encouraging, with aggregate real investment projected to be about 30% higher than in the period 1975-80--a creditable performance indeed. The Sixth Plan expenditure targets, however, will not be fulfilled as resource mobilization by the public sector will fall short of the financing requirements of planned public investment. Actual aggregate real investment is projected to be about 7% below the original target for the period 1980-85, private investment being 5% to 10% higher and public investment about 20% lower in real terms than actually projected. In terms of meeting Plan expenditure targets, the performance of the Central Government is considerably better than that of the State Governments. The Central Government's Plan outlays are likely to reach about 80% to 90% of the original Plan allocation in real terms, while the States' will probably achieve only about 50% of their targets, due principally to shortfalls in resource generation. Bottlenecks in key sectors such as power, transport and irrigation are likely to persist as a consequence of real investment shortfalls relative to original Plan allocations.

17. Although Sixth Plan expenditure targets will not be met, India's capital formation rates have increased from 22.6% in 1975-80 to 24.7% of GDP in 1980-84. Recent higher capital formation rates are encouraging for future income growth, but returns to investment have so far been relatively low. Much of this phenomenon relates to India's stage of development, in which a large and growing proportion of investment has been needed to build up basic infrastructure services which have inherently high capital-output ratios. However, there is scope to reduce capital-output ratios through improvements in efficiency. As discussed in greater detail in our recent economic reports, performance in the basic service sectors can be improved through better planning and management, thus leading to higher productivity and capacity utilization throughout the economy. At the same time, programs to expand domestic capacity are vital. In the case of tradeable commodities like coal, steel and cement, this is justified on the grounds of comparative advantage. For sectors such as irrigation, power and transportation, expansion of planned capacity in accordance with the requirements of the rest of the economy will be vital for sustained growth.

18. Under the Sixth Plan, India has an ambitious oil development program backed by substantial financial commitment. Performance under the program has been excellent with real investment and oil production levels running well ahead of Plan Targets. In 1981, and again in early 1983, resources for exploration and development were raised by successive price increases for domestic crude and products. While the gap between domestic consumption of petroleum and production remains large, India's dependence on oil imports dropped from 63% of consumption in 1979/80 to about 41% in 1983/84 and is expected to decrease to about 33% of consumption by 1984/85. The rapidly expanding level of exploration activity, combined with the possibilities for accelerated offtake from known fields, offers much encouragement for India's longer-term energy prospects. At the same time, the increases in domestic petroleum prices have helped encourage conservation and slow demand growth.

19. India's development prospects over the next few years will hinge on the extent to which the economy can be brought into both internal and external balance, while at the same time achieving more rapid growth than in the past. This will require the continuation of the current development strategy which assigns high priority to export promotion, public finance discipline, improvement of economic efficiency, and investment in infrastructure, supported by

adequate flows of external borrowing and aid. In the short term, a relatively large level of external borrowing, including an increased emphasis on commercial borrowing, will be necessary to cope with the balance of payments consequences of such a growth strategy. However, an important element in providing India with the capacity to adjust flexibly will be adequate flows of concessional assistance since India is still a very poor country with a large rural sector and enormous investment requirements for human development and basic infrastructure. Although India is currently in a position to increase borrowing on commercial terms from the very low levels of the past, there are, of course, limits beyond which India will choose to sacrifice growth objectives rather than accept debt on unfavorable or unmanageable terms. Nevertheless, with a more open trade policy and expanded efforts to remove constraints on the growth of productive capacity, supported by adequate mobilization of both foreign and domestic savings, India is demonstrating that it can sustain a rate of growth closer to 5.0% per annum than to the long-run trend of 3.6% per annum. If the rate of population growth can be brought to below 2.0% per annum, a 5.0% growth rate would mean a doubling of the trend rate of growth of per capita income of 1.4% per annum. Success in these efforts would make a significant difference to the prospects of easing poverty in India.

20. A large and growing population and severe poverty underline the need to accelerate India's development efforts. The 1981 Census indicated there was no decline in the rate of population growth, which remained about 2.2% per annum in the 1970s despite a measurable decline in fertility rates. The population growth rate failed to decline in the past decade due to a reduction in the infant mortality rate and an increase in life expectancy, reflecting larger availability of food and health services. While this is a welcome development, it implies a greater strain on the economy and re-emphasizes the need for continuing efforts to strengthen the health and family planning programs in a broad range of activities and services. These efforts are given high priority in the Sixth Plan, which aims at a rise in the proportion of protected couples in the reproductive age group from its estimated 1979/80 level of about 23% to over 35% by 1984/85. The Government is reviewing its population policy for the Seventh Plan, with indications of a determination to retain the emphasis on the implementation of family planning, health, education and literacy programs aimed at reducing fertility rates.

21. Reduction of poverty remains the central goal of Indian economic and social policy. More than one-third of the world's poor live in India, and more than 80% of the Indian poor belong to the rural households of landless laborers and small farmers. About 51% of the rural population and 40% of the urban population subsist below the poverty line. Significant reductions in poverty will depend primarily on an acceleration of economic growth, particularly in agriculture, combined with effective implementation of poverty alleviation programs. India's poverty alleviation strategy appropriately recognizes that production-oriented programs, which aim at accelerating the overall pace of economic growth, and poverty alleviation programs, targeted at those least able to participate in the general growth of the economy, can be mutually reinforcing rather than substituting for each other. Major poverty programs operating on a nationwide basis at present include: the Minimum Needs Program (MNP), the Integrated Rural Development Program (IRDP), and the National Rural Employment Program (NREP). The IRDP and NREP are targeted programs aimed at increasing the incomes of the poor rapidly, either through the transfer of productive assets or direct employment. The MNP, aims at broadening the provision of social infrastructure and basic services which enhance the human capi-

tal of the poor and improve living standards. These programs represent a vitally important commitment of the Government to address the needs of the poorest. The scale of the poverty problem in India, combined with the inherent difficulties in implementing poverty programs in any country, imply the need for continued efforts to enhance the effectiveness of these programs.

PART II - BANK GROUP OPERATIONS IN INDIA

22. Since 1949, the Bank Group has made 82 loans and 165 development credits to India totalling US\$6,526 million and US\$12,268 million (both net of cancellation), respectively. Of these amounts, US\$1,524 million has been repaid, and US\$6,207 million was still undisbursed as of September, 30, 1984. Bank Group disbursements to India in the current fiscal year through September 30, 1984 totalled US\$171 million, representing a decrease of about 40 percent over the same period last year. Annex II contains a summary statement of disbursements as of September 30, 1984.

23. Since 1959, IFC has made 29 commitments in India totalling US\$223 million, of which US\$34 million has been repaid, US\$56 million sold and US\$34 million cancelled. Of the balance of US\$98 million, US\$91 million represents loans and US\$7 million equity. A summary statement of IFC disbursements as of September 30, 1984, is also included in Annex II (page 4).

24. The thrust of Bank Group assistance to India has been consistent with the country's development objectives in its support of agriculture, energy and infrastructure. Of particular importance have been investments in irrigation, extension and on-farm development designed to increase agricultural productivity, and efforts to improve the availability of basic agricultural inputs to farmers through credit, fertilizer, marketing, storage, and seed projects. Major elements of the lending program have also been directed at helping to meet the energy needs of the economy while curbing the growth of oil imports, and to ease the infrastructure bottlenecks which have hampered economic growth in India, particularly through power generation and distribution, and railways and telecommunications projects. The Bank Group has also provided financing for a broad range of medium- and small-scale industrial enterprises, primarily in the private sector, through its support of development finance institutions. Recognizing the importance of improving the ability to satisfy the essential needs of urban and rural populations, the Bank Group has supported nutrition and family planning programs, a rural roads project, as well as water supply and sewerage and other urban infrastructure projects.

25. This pattern of assistance remains highly relevant and consonant with Government priorities as reflected in the Sixth Plan. Continuation of the Bank's Group current priorities can be strongly justified on the basis of the approach that is being taken by GOI in the preparation of the Seventh Plan. First, continued support of GOI's agricultural program is warranted. While India has made significant progress in agriculture, productivity growth will have to be sustained to improve the balance between food demand and supply and to contribute to poverty alleviation and employment. Thus, we will continue our support to irrigation, fertilizer production and distribution, and agricultural extension and credit. Second, the review of performance under the Sixth Plan confirms the high priority that should continue to be given to the expansion and more efficient use of basic infrastructure capacity and to the development of India's indigenous hydrocarbon resources. Accordingly, the Bank will continue to support the development of the energy, transport and telecom-

munications sectors to alleviate critical shortages which constrain output in both agricultural and industrial sectors. Third, support of urban development and other GOI basic social services programs for the poor must also continue in light of the growth in population which, despite successes in lowering birth and death rates, still increases by about 16 million each year. Finally, the major departure from our previous strategy will be a substantial increase in the Bank's assistance to India's industrial development substantially aimed at supporting GOI's efforts in promoting greater efficiency and faster development of the industrial sector.

26. The need for a substantial net transfer of external resources in support of the development of India's economy has been a recurrent theme of Bank economic reports and of the discussions within the India Consortium. Thanks in part to the response of the aid community, India successfully adjusted to the changed world price situation of the mid-1970s. However, India continues to require a substantial level of foreign assistance both to offset the overall deterioration in the world trade environment, and to sustain the relatively higher investment and growth rates achieved during the first four years of the Sixth Plan. As in the past, Bank Group assistance for projects in India should aim to include the financing of local expenditures. India imports relatively few capital goods because of the capacity and competitiveness of the domestic capital goods industry. Consequently, the foreign exchange component tends to be small in most projects. This is particularly the case in such high-priority sectors as agriculture and irrigation.

27. India's poverty and needs are such that whenever possible, external capital requirements should be provided on concessional terms. Accordingly, the bulk of the Bank Group assistance to India in the past was provided from IDA. However, IDA lending to India is declining from a peak of US\$1.6 billion in FY82, mostly due to funding constraints related to IDA. The amount of IDA funds available to India is likely to remain small in relation to India's needs for external support. Thus, this requirement for additional assistance will have to be met, in part, through larger Bank lending. Given its development prospects and policies, India is judged creditworthy for Bank lending to supplement IDA assistance. A continuation of efforts already underway to achieve growth in productive capacity, trade expansion, higher levels of savings, foodgrains self-sufficiency and a reduction in the rate of population growth should result in continued economic growth and improvement in the balance of payments. Despite recent setbacks, India's external payments position is still manageable. The ratio of India's debt service to the level of its total current account was about 12.9% in 1983/84. Over the next several years this ratio is projected to rise to around 20% and remain around that level through 1995/96. As of September 30, 1984, outstanding loans to India held by the Bank totalled US\$5,176 million, of which US\$2,713 million remain to be disbursed, leaving a net amount outstanding of US\$2,463 million.

28. Of the external assistance received by India, the proportion contributed by the Bank Group has grown significantly. In 1969/70, the Bank Group accounted for 34% of total commitments, 13% of gross disbursements, and 12% of net disbursements as compared with 62%, 33% and 37%, respectively, in 1983/84. On March 31, 1984, India's outstanding and disbursed external public debt was estimated to be about US\$26.9 billion, of which the Bank Group's share was US\$9.6 billion or 36% (IDA's US\$7.8 billion and IBRD's US\$1.8 billion). In 1983/84, about 19.0% of India's total debt service payments were to the Bank Group.

PART III - POWER AND IRRIGATION IN INDIA

The Power Sector in India and in the Western Region

29. The Sixth Five Year Plan (1980-85) continued to accentuate the priority given by India to the development of irrigation and power resources which, between them, will account for about one-third of public expenditures during the Plan period. Shortages of energy are a critical constraint on India's economic development. The country remains dependent, to a large extent, on imported oil to meet rapidly growing demand, and India's energy policy is to limit the use of petroleum to those sectors where it cannot be substituted by other resources. In recognizing the need to develop indigenous energy resources to relieve the strain on its balance of payments on account of petroleum imports, coal based generation has been receiving high priority in Central and State Government planning. It is also recognized, however, that substantial resources will need to be allocated to accelerating the exploitation of hydro resources, where untapped potential exists in major basins such as the Narmada River Basin.

30. Since 1970, power supplies have fallen short of demand due principally to delays in commissioning new power plants, operating and maintenance problems, budget constraints, unstable coal supplies and transport difficulties. Under the Sixth Plan generation capacity increased from 31,000 MW to its current level of about 39,000 MW, of which about 63% is conventional thermal, 35% is hydro and 2% nuclear. Installed capacity is projected to grow at about 9.5% per annum by 1994/95, with the thermal/hydro balance intended to be about 56:41, with nuclear capacity remaining low at about 3%. Over the past 10 years, the thrust of the Bank Group's assistance has been to expand Centrally-owned generation capacity. Recently there has been a moderate shift towards projects owned by State authorities in attempts to improve operational efficiency and project implementation capacity. Since 1954, the Bank Group has made 16 loans and credits to India for power projects totalling about US\$3.8 billion. Essentially the objectives of the Bank's assistance to the power sector are to improve the investment mix by accelerating remaining economic hydropower resources and extending transmission and distribution systems; to improve capacity utilization; to formulate technical, commercial and financial operating policies for regional and national power systems; and to improve the organization, management, finance and training of State and Central level power institutions. Details of the Bank Group's experience in the power sector are at Annex IV.

31. The Western Region, in which the proposed project is located, comprises the States of Gujarat, Maharashtra and Madhya Pradesh. Total installed capacity in the region is about 10,045 MW, of which 78% is thermal. Load growth in the Western Region over the ten years 1971-81 averaged 7.4%, slightly higher than the national average of 6.4%. India's long-term power plan forecasts load growth rates for the region of between 9.7% and 11.3% per annum

through 1984/85 and 7.4% to 8.3% for the period 1984/85-1994/95. Some 19,000 MW of generating capacity will therefore need to be installed within the next decade to meet projected demand within the region, including suppressed demand.

Power Sector Institutions

32. The institutional structure of the Indian power sector is complex. Under the Indian Constitution, the responsibility for supplying power is shared between the central government and the State governments, and full agreement between the Center and the States is required for the implementation of most actions. Various agencies have been established with a view to promoting integrated power development in the country. The principal agencies in the sector are: the State Electricity Boards (SEBs), the Regional Electricity Boards, the Central Electricity Authority (CEA), the two central power corporations--the National Thermal Power Corporation and the National Hydro-Electric Power Corporation--and the Rural Electrification Corporation.

33. The three SEBs in the western region were constituted under the Electricity (Supply) Act, 1948, and are responsible for generation, transmission, and distribution of electricity throughout their respective States. The SEBs' accounting systems are not fully in line with accepted commercial accounting practices. Moreover, they have not implemented recent State government directives to adopt the revised forms of annual accounting prescribed by CEA in consultation with the comptroller and auditor general of India. However, the SEBs, under the third Rural Electrification Project, agreed that they would introduce, from April 1, 1985, a system of commercial accounts to be prescribed by GOI (similar undertakings have been submitted by fourteen SEBs). GOI has initiated the preparation of a suitable unified SEB accounting system, to be introduced in April 1985, including the hiring of local consultants by each SEB to verify and adjust the existing accounts, and to provide the necessary guidance and training during the initial stage of the system implementation.

Agriculture and Irrigation in India and in Gujarat

34. Agriculture is the dominant sector of the Indian economy, contributing some 40% to GDP. GOI development plans have sought to raise foodgrain production through the expansion and improved reliability of irrigation water supplies, fertilizers, plant protection, and seeds of improved variety. Projections of demand for foodgrains by the end of the Seventh Plan Period (1989/90) call for foodgrain production in excess of 150 million tons compared to production in 1983/84 of 145 million tons, which represents an annual growth rate of about 3% compared to the post-"Green Revolution" (1966-67) growth rates of about 2.5% per annum. Shortages of cultivable land will dictate the need for increasing production through more intensive cropping. This in turn requires, inter-alia, the extension of irrigation systems into large drought-prone areas where it is feasible to do so, through investments such as those contemplated for the Narmada River Basin. Bank Group lending for Indian agriculture has been, and continues to be, consonant with GOI objectives of raising agricultural growth and productivity, focussing on areas where techni-

cal constraints, including the provision of reliable water supplies, are most severe. Bank Group investments in irrigation essentially aim at expanding and improving the efficiency of irrigation infrastructure, and providing optimal and coordinated resource use through improved water management.

35. Gujarat's population is 36 million and growing at an annual rate of about 2.5%. Agriculture accounts for more than 30% of the GDP and employs more than 60% of its working population. Much of Gujarat is characterized by low and highly variable rainfall, with consequent susceptibility to drought and famine. GOG therefore allocates high priority to irrigation development. While only 54% of Gujarat's ultimate irrigation potential has been developed to date, most surface water available for irrigation outside the Narmada Basin will have been developed within a decade. Three-quarters of the undeveloped water potential is located in areas whose requirements can be met by transfers from the Narmada Basin. Therefore, the only feasible means of sustaining an adequate level of agricultural growth in Gujarat is through the development of water supplies from the Narmada River. The project will also create the potential for irrigation of about 70,000 ha of drought-prone land in Rajasthan, a State which contains large areas of desert with low foodgrain yields. The Bank Group has provided significant support to Gujarat for the development of its irrigation systems beginning in 1961 and, since 1979, of its agricultural extension and research systems (details are in Annex V).

The Narmada Basin

36. The Narmada is the largest westward-flowing river in India. It rises in eastern Madhya Pradesh and discharges into the Gulf of Cambay, draining about 98,800 km² in Madhya Pradesh, Gujarat and Maharashtra. Its average annual flow is greater than the total of the Ravi, Beas and Sutlej flows that feed the Indus Basin. Previous plans for the development of Narmada's resources could not be implemented due to interstate disputes over the allocation of water. In December 1979 the GOI-appointed Narmada Water Disputes Tribunal (NWDI) made an award covering most aspects of the basin developments, including the scope of the main investments, water allocations, cost and benefit sharing, resettlement and rehabilitation of the oustees, and institutional mechanisms for implementation and operation of project facilities. The NWDI's award has created the potential for a very significant development of water and power resources in India. The Basin plan calls for the ultimate construction of 30 major (21 irrigation, 5 hydropower and 4 multipurpose) projects, some 400 medium schemes and several thousand minor schemes which would bring under irrigation 4-5 million ha of potentially valuable agricultural land which are currently drought-prone. It would provide at least 2,700 MW of hydro power capacity and enhance domestic and industrial water supplies. The basin-wide program of development would take 40-50 years to complete. The first critical investments in the Narmada Basin will be the Sardar Sarovar Dam and Hydropower Project -- the subject of this report -- and the associated Water Delivery and Drainage Project in Gujarat described in the accompanying President's Report, No. P-3938-IN, dated February 6, 1985, Bank Group involvement in the Narmada Basin to date has consisted of providing funds under the project preparation facilities attached to the Gujarat II Irrigation Project (Credit 1101-IN, dated May 12, 1980) and the Second UP Tubewells Project (Credit 1132-IN, dated March

31, 1983) for preparation of the high priority investments in the basin. In addition, Bank staff and consultants have contributed substantially to optimizing the basin plan and the design of the initial project investments.

PART IV - THE PROJECT

37. The Dam and Power Project was appraised by missions which visited India in March, June and September, 1983. A post-appraisal mission on the resettlement component visited India in August 1984. Negotiations were held in Washington, D.C. in November, 1984, and in January 1985 with the Indian delegation coordinated by Mr. A. Thapan, of the Government of India's Department of Economic Affairs, Ministry of Finance. The complexity of the project and the need for interstate coordination explain the time taken for appraisal and negotiations. The Staff Appraisal Report, 5107-IN, dated February 12, 1985 is being circulated to the Executive Directors separately. A President's Report pertaining to the Water Delivery and Drainage Project is being distributed simultaneously. A Supplementary Data sheet for the dam and hydropower project is attached at Annex III.

Project Objectives

38. The project, together with the Water Delivery and Drainage Project, being considered simultaneously, would provide storage and regulation of Narmada River flows needed to establish a reliable and efficient supply of hydroelectric power, particularly long-term peaking capacity, to the Western Region grid. The projects would also provide storage and regulation of the Narmada River flows needed to establish efficient, reliable and equitable irrigation water supplies coupled with effective drainage, to very large, dry and drought-prone areas in Gujarat and Rajasthan. These investments would create a state-wide water conveyance network and thus be a major engine of growth for Gujarat's whole economy and be the principal basis for its agricultural development in the 21st century. Water would also be supplied to urban and rural population centers and to industries in Gujarat. Development of a large untapped water resource, such as the Narmada River, would complement on-going efforts to improve utilization of existing irrigation facilities through upgrading of water delivery systems and improved management practices.

Rationale for Bank Group Involvement in the Narmada River Development

39. The Sardar Sarovar Dam and associated canal networks would be the largest Indian irrigation system planned and designed as one unit. It has been designed and planned, and would be constructed to standards not hitherto used in India, and thus permit higher levels of reliability and timeliness of water delivery than previously achieved. It thus represents a break with traditional modes of Indian irrigation development. The Bank's influence to date has been instrumental in five ways: (a) the establishment of a high-level planning agency (the Narmada Planning Group); (b) the conduct of key studies in systems planning, design, implementation and operation, and in resettlement; (c) the use of foreign expertise to supplement local resources for formulating systems designs, studies and planning methodologies; (d) the resolution of unique technical and institutional issues, thereby enabling the development of large

and hitherto untapped water resources; and (e) the formulation of a comprehensive and equitable resettlement and rehabilitation program for oustees. Further Bank Group involvement is justified to ensure the continued adoption of new technologies in systems communication, operation and control, including ensuring the introduction of dependable rotational water supplies to individual farmers spread over large areas, and contributing to increased reliability and efficiency of water use over very large areas. It would also be instrumental in facilitating interstate coordination, which is essential if the basin resources are to be developed in optimal fashion, given the interdependence of the investments. Bank Group participation is justified to ensure that new technologies are adopted in the construction, operation and maintenance of other critical basin investments. It could also result in the attraction of suppliers' credits and other forms of commercial financing to the project. Finally, Bank Group involvement in the basin would set new standards and thus catalyze the modernization of large parts of the Indian irrigation sector.

Project Description

40. The Sardar Sarovar Dam and Power Project, whose location is shown in the attached Map No. IBRD 17694, consists of the following components:

(a) Sardar Sarovar Dam: A concrete gravity dam structure 128.5 meters high, creating a reservoir with live storage of 5800 million cubic meters and extending some 210 kms upstream. About 370 square kilometers would be submerged at full reservoir level.

(b) Power Generating Facilities: An underground powerhouse in the right abutment of the dam accommodating six 200 MW reversible turbine-generator units which would necessitate construction of a downstream weir for pump-back operations; another powerhouse located near the rim of the reservoir upstream of the head of the main irrigation canal containing five conventional turbine-generator units of 50 MW each.

(c) Rockfill Dams, Link Channels, Saddle Dam and Bypass Tunnel: A saddle dam, including intake facilities to the canalhead powerhouse, a bypass tunnel for use when the powerhouse is not in operation and re-regulation ponds with inter-linking channels located between the powerhouse and the main canal head regulator.

(d) Power Transmission Lines: Facilities would consist of 400 KV double-circuit transmission lines to evacuate the power generated under the project.

(e) Flood Warning Network: Consisting of meteorological stations, rainfall recording stations, streamflow gauging stations, reservoir water level monitoring stations, all connected by a communications and data transmission network to data storage, retrieval and evaluation systems located at project operation centers.

(f) Resettlement and Rehabilitation: The establishment and funding of institutions to design, implement, monitor and evaluate comprehensive programs

for the resettlement and rehabilitation of peoples and communities displaced by the dam and reservoir complex.

(g) Technical Assistance and Training: Funds would be provided for training in environmental sciences, resettlement and rehabilitation; and in all aspects of project operation and maintenance of large dams, reservoirs and power equipment including power marketing and dispatching. Technical assistance for the dam and powerhouse complex would cover overall project design and construction quality control, and dam and power operations. Funds would also be provided for technical assistance in establishing and implementing the hydrometeorological network, in the overall monitoring and evaluation of the resettlement and rehabilitation plan, and training related thereto, and for establishing and maintaining the Dam Safety Panel.

41. The project would be implemented in conjunction with: water conveyance and distribution facilities, drainage facilities, roads, and other infrastructure, which are described in a accompanying document entitled "President's Report and Recommendation on the Narmada River Development (Gujarat), Water Delivery and Drainage Project", dated February 6, 1985. The two projects have synchronized implementation schedules. It is essential to commence work on the canal network so as to ensure that water available upon completion of the Sardar Sarovar Dam could be used for irrigation and municipal and industrial purposes at the earliest possible date.

Project Organization and Management

42. The Narmada Development Department (NDD) of the Government of Gujarat (GOG) has primary responsibility for planning, design, implementation, and operation and maintenance (O&M) of the project. Several agencies within Gujarat have been established to plan and execute the project. These are described below in paragraphs 43-49. Because of the interstate nature of the project, a number of coordinating institutions were set up to guide project implementation.

Gujarat State Agencies

43. The Narmada Development Department. The NDD, to be headed by an Additional Chief Secretary, was recently created under the Minister of Irrigation to implement all Narmada-related investments, and will be responsible for the implementation of both the Dam and Power Project and the Water Delivery and Drainage Project. Current staff strength of Gujarat's total irrigation organization, including its Irrigation Department, 1/ is 7,516 engineers, of whom 1,370 (including 94 at senior level) are presently assigned to the NDD. Staff requirements will peak in 1988/89 at about 6,630 (technical and engineering staff), including 230 at senior level. GOG would maintain the

1/ The Irrigation Department, headed by a Secretary, will continue to be responsible for all other State irrigation and command area development activities outside the NDD.

NDD at all times with such powers, functions, responsibilities, organization, staffing and funds as are required to implement and manage the project (Section 2.07, Gujarat Project Agreement).

44. Centralized Procurement Unit (CPU). In order to efficiently perform the complex procurement tasks necessary for the Narmada development, procurement responsibilities would be centralized in one organizational unit responsible for the procurement of all goods, works, and services for the entire scheme, reporting directly to the Additional Chief Secretary. The CPU would engage all the financial, commercial, legal and engineering talents needed to manage procurement activities, and would service all engineering aspects of the project in selecting the source, arriving at a price, and preparing the contracts for all works, goods, and services. The CPU would also monitor the progress of the contracts. GOG has established the Central Procurement Unit for the project within the NDD and would maintain it during project implementation with such powers, functions, responsibilities, staffing, organization and funds as shall be required (Section 2.09(a), Gujarat Project Agreement).

45. Narmada High Power Committee (NHPC). This committee is responsible for coordination and ensuring timely interaction between various GOG departments and provides guidance on policy issues related to the project. The NHPC is chaired by the Chief Minister of Gujarat and includes the Ministers of Finance, Irrigation, Power, and Agriculture among its members.

46. Narmada Planning Group (NPG). The NPG, within the NDD, reports directly to the NHPC and is responsible for carrying out major planning studies of the overall project in Gujarat and of the Narmada River Basin. It is chaired by the Irrigation Minister.

Gujarat would maintain the NHPC and NPG with such powers, functions, responsibilities, staffing and organization and funds as shall be required to enable them to carry out their respective responsibilities (Section 2.08, Gujarat Project Agreement).

47. Other Gujarat Agencies. Because of the magnitude of the project and its statewide importance, a number of other GOG departmental agencies have been and would continue to be involved in planning and implementing the project. These include the Departments of Finance, Agriculture, Forestry, Public Works, Transportation, Communications, and the Water Supply and Sewerage Board.

48. Dam Safety Panel (DSP). A Panel was formed in 1981 with both local and expatriate consultants. That panel has systematically reviewed the technical data, analyses, designs, and implementation plans, to ensure the adequacy of the overall design, safety, and economic efficiency of the main dam and appurtenances, including the reservoir, spillways, powerhouses, foundations and river diversion facilities. Completed reviews covered selection of the dam site; foundation explorations; layout of the dam complex; flood hydrology study results including effects of the probable maximum flood on the main dam, the spillway, and appurtenant facilities; seismicity coefficients appropriate for the site; dynamic analyses of the structure; stability analyses; design

criteria to be adopted; and design of the underground powerhouse. Upon completion of the project design phase, the panel was disbanded.

49. In view of the continuing need for review of critical aspects of dam construction and operation, GOG would, by April 1, 1985, establish and thereafter maintain an internationally constituted Dam Safety Panel (DSP) throughout the implementation of the main dam and appurtenances under arrangements and with membership satisfactory to the Bank Group, inter-alia, to review the adequacy of plans and designs of critical project works and conduct semi-annual reviews throughout project implementation and operation (Section 2.18, Gujarat Project Agreement). In addition, the NDD would, by April 1, 1985 prepare, in consultation with the Bank Group, and maintain a list of consultants on which to draw for advice on technical issues as the need arises (Section 2.03(b), Gujarat Project Agreement).

50. Other interstate agencies have been established as follows:

(a) Narmada Control Authority (NCA). The NCA is a coordinating and decision-making entity consisting of seven high-ranking engineers from each participating State and from GOI as members, and a supporting staff. It is expected to play a key part in coordinating the future operation of the project and other major irrigation and power projects in the basin. The NCA would participate with the GOG, GOMP and GOM in project implementation. It would play a key role in the operation of the hydrometeorological network and in the daily operation of the Sardar Sarovar Dam and Reservoir, and through the GOI, in the monitoring and evaluation of the resettlement and rehabilitation program. Upon project commissioning, the NCA would issue periodic directives concerning the interstate allocation of water and power, functioning along the lines of the Bakhra Management Board, which has been successful in guiding the irrigation and power operations of the Indus Basin in Punjab, Haryana, Himachal Pradesh, and Rajasthan. It would also review designs and coordinate the construction program for the main canal.

(b) The Sardar Sarovar Construction Advisory Committee (CAC). This advisory committee was formed to review and make recommendations concerning the planning, design, and construction of the dam and power complex. It is chaired by the Secretary of Irrigation, GOI, and has representation from Central Government authorities handling irrigation and power, and from the States. It would be actively involved in reviewing designs, cost estimates, contract proposals and implementation progress.

(c) Narmada Review Committee (NRC). This committee is chaired by the Union Minister of Irrigation, and includes the concerned chief ministers of each State as members. It has the right to review and suspend any decisions made by the NCA.

GOI and the concerned States would at all times maintain the above interstate agencies with such powers, functions, responsibilities, staffing, funds and membership as shall be required for the accomplishment of their purposes (Sections 3.03, Development Credit Agreement, 2.06, Gujarat, Madhya Pradesh and Maharashtra Project Agreements).

Training and Technical Assistance

51. It would be necessary for relevant agencies in State and Central Governments to establish training programs for staff engaged in project activities. The most important areas are resettlement and rehabilitation, environmental studies and preventive measures, and project operation and maintenance. The above training initiatives would be supported by an allocation of US\$0.7 million (including contingencies) of Bank Group funds over the 10-year implementation period. The project training allocation would finance expatriate fees, the costs of travel and expenses of project technical and administrative staff abroad, as well as instruction in India, and acquisition of up-to-date training equipment such as audiovisual or other special equipment required to accomplish specific training tasks. The training will be designed to instruct staff in all aspects of construction operation and maintenance of large multipurpose dam and power projects, including resettlement and rehabilitation of the oustees and programs to protect the environment. Plans, schedules, syllabi and budgets, would be submitted to the Bank Group for approval by December 31, 1985 for training programs related to the environment and the resettlement and rehabilitation of project oustees; and by June 30, 1989 for training programs for the operation and maintenance of project facilities (Sections 2.11, Gujarat Project Agreement, and 2.08, Madhya Pradesh and Maharashtra Project Agreements). Due to the unusual magnitude, complexity and high level of technical expertise needed for the project, it would be necessary for the NDD to utilize foreign and local technical experts and consultants covering a broad range of project activities, particularly for project design, procurement, construction, including quality control and O&M. About 312 man-months of foreign and local assistance would be required, costing about US\$12.7 million, including contingencies. The terms of reference for the consultants would be satisfactory to the Bank Group and would be the responsibility of the NDD, in consultation with the DSP. Consultants with qualifications and experience acceptable to the Bank Group would be selected by procedures and work under terms of reference acceptable to the Bank Group (Sections 2.03(a) and (c), Gujarat Project Agreement and Section 3.04, Development Credit Agreement).

Evaluation and Monitoring

52. In order to provide adequate monitoring control and evaluation capabilities to manage the project, a Management Information Systems Cell (MISC) within the NDD with adequate computer facilities will need to be established. The MISC would produce data to control, plan, monitor, and forecast financial, material, and staff requirements for design and construction, so as to ensure effective overall management of project implementation. The MISC would be responsible for preparation of progress reports, and subsequently also manage and monitor water allocation scheduling, agricultural progress, water rates and crop trends as the project becomes operational. The MISC would be fully staffed and operational by December 31, 1985 (Section 2.11(b), Gujarat Project Agreement).

Reporting

53. GOG, GOMP and GOM would submit to the Bank Group semi-annual and annual reports covering progress in meeting their respective obligations and responsibilities under the project, within three months after the end of each reporting period. The reports would compare planned and actual implementation in physical and financial terms, describe deviations from plans and explain the reasons therefor, and provide revised implementation schedules. GOG would submit to the Bank Group a project completion report not later than six months after the Closing Date of the Loan/Credit (Sections 2.13 and 2.12(d), Gujarat Project Agreement). Furthermore, GOG would, commencing September 30, 1985, furnish to the concerned authorities and to the Bank Group semi-annual reports on the implementation of the resettlement and rehabilitation plan, these reports to include submissions by the institutions which will be monitoring and evaluating progress under the plan (Schedule 2, Gujarat Project Agreement).

Operations and Maintenance Planning

54. The responsibility for O&M plan has been assigned to the NPG. Those responsible will, therefore, form the nucleus of the O&M organization for the project, and will formulate proposals for a permanent O&M organization. Initially, the NPG will perform such tasks as analyzing and preparing plans and requirements of the proposed O&M training facility. Thereafter, it will be responsible for reviewing the detailed organization, facilities, equipment, and staffing needs for the initial and full development stages of the project and to recommend permanent organizational arrangements. It will prepare detailed plans to guide the operation and maintenance of the power facilities to be constructed under the project. The Planning Unit will also prepare specifications, responsibilities and arrangements for power sharing among the benefitting States.

Project Operation and Maintenance (O&M)

55. The NDD would be responsible for overall O&M of the project facilities until completion of an approved O&M plan and the establishment of a permanent O&M organization. A specialized O&M unit would have to be created within the NDD to operate the dam and power complex in a manner that will ensure adequate interface of power operations with water supply delivery operations. The operation of the facilities would need to be in accordance with the mandate of the Tribunal concerning the sharing of water between irrigation, power and municipal and industrial uses, and the sharing of benefits among the participating States. In order to determine appropriate arrangements for such O&M, detailed studies will be needed to delineate organizational responsibilities, facilities and staffing and to prepare manuals to guide the operation and maintenance of each facility and its structures. Thus, the NPG would develop a detailed plan for operation and maintenance for submission to the Bank Group for approval by December 31, 1987 (Section 2.02(b), Gujarat Project Agreement). By December 31, 1988, GOG would establish and thereafter maintain a full-time O&M organization with powers, functions, responsibilities, staffing and funds needed to operate and maintain completed project works (Section 2.07(d), Gujarat Project Agreement).

Hydrometeorological Network

56. A hydrometeorological network would be established for the Narmada Basin to provide flood warnings and to improve day-to-day operation of its many reservoirs. Coordination among the participating States would be needed during both the implementation and the operational phases, and would be provided by the NCA. The system would be operational by June 30, 1988 (Section 2.02(g), Gujarat Project Agreement).

Resettlement and Rehabilitation

57. The Sardar Sarovar Reservoir would inundate about 41,000 ha of land and require the evacuation of over 67,000 people in Gujarat, Madhya Pradesh and Maharashtra. The Tribunal issued detailed instructions regarding resettlement and rehabilitation. While more than two-thirds of the oustees are located in Madhya Pradesh, the Tribunal directed that the burden for implementing the resettlement and rehabilitation effort fall on all three States. ^{1/} Gujarat is required to offer land, civic facilities and financial assistance to those families being resettled within the State. (Only if oustees now living in Madhya Pradesh and Maharashtra do not wish to migrate to Gujarat are Madhya Pradesh and Maharashtra required to provide resettlement and rehabilitation facilities, and compensation--reimbursable by Gujarat--to them.) Each displaced family owning land and relinquishing more than 25% of its holdings, would be allotted irrigable land of the same size as the holding that would be lost, with a minimum of 2 ha per family. Irrigation facilities are to be provided by the State in whose territory oustees are resettled. Ousteers are to be compensated for the land they lose. However, only part (50%) of the cost of new land given to them needs to be paid initially. The remainder can be debited and repaid over 20 years (interest-free). While the Tribunal's mandate covered many of the interstate aspects of the resettlement effort, it was not explicit on the compensation to be given to ousteers in Gujarat itself, nor on how landless people were to be compensated for displacement and consequential loss of livelihood. It was required therefore that the Tribunal compensation package be expanded. Of particular concern was the need to ensure that the landless, most of whom are tribal peoples, normally reluctant to adopt fixed abodes and agricultural activities as a livelihood, had their standards of living protected. In addition, planning and financing of the resettlement effort had to be integrated into the project and its timing made consonant with rising water levels resulting from dam construction. Also, arrangements for monitoring and evaluation of the plan had to be established. During project appraisal, an overall program for resettlement and rehabilitation for oustees was drawn up, and time-bound schedules for resettlement of all affected villages and the costs thereof assessed. In addition, a detailed rehabilitation plan for phase I of the program, covering oustees affected by reservoir submergence up to 350 ft (to be accomplished by 1987/88) were discussed and agreed

^{1/} About 45,000 oustees are located in Madhya Pradesh, 11,700 in Maharashtra and 10,500 in Gujarat.

with the concerned States. These plans have, as their minimum objectives, the restitution of the previous standards of living of all oustees. They also aim at their economic and social integration into the host communities. In order to ensure that adequate land is available to oustees, forest lands, currently under the control of GOI, may need to be made available. If so, GOI will provide Gujarat, Madhya Pradesh and Maharashtra necessary forest land currently reserved under the Forestry (Conservation) Act of 1980 to enable those States to implement the resettlement and rehabilitation program (Section 3.02, Development Credit Agreement). Landless oustees would thus have access to agro-forest land to pursue their livelihood. Alternatively, they would be provided with acceptable, permanent employment which will provide annual income above GOI's established poverty datum line (US\$120 per annum). Guidelines on the assignment of responsibilities, on the conduct of necessary studies, on the institutional and financial requirements for the resettlement and rehabilitation effort in each State, and on the implementation of detailed rehabilitation action programs have been agreed. Necessary staff from State Governments, including Departments of Agriculture, Fisheries, Forestry and Tribal Development will be made available. Each State will, by March 31, 1985, retain an independent research institution to monitor and evaluate the resettlement and rehabilitation program and recommend adjustments, if required, over the 10-year implementation period, under terms of reference satisfactory to the Bank Group. The GOI assisted by the NCA will be responsible for overall monitoring and evaluation of the entire resettlement and rehabilitation effort and for reporting thereon to the Bank Group under arrangements acceptable to the Bank Group (Section 3.05, Development Credit Agreement). Participating States will resettle and rehabilitate all those displaced by the project in accordance with plans, including principles, objectives and institutional arrangements, satisfactory to the Bank Group (Schedule 3, Development Credit Agreement; Sections 2.10, Gujarat Project Agreement, 2.07 of Madhya Pradesh and Maharashtra Project Agreements).

Environmental Effects

58. Characteristically the creation of large man-made lakes results in significant environmental changes in the area. In this case, submergence would cause loss of forest and agricultural lands, cultural infrastructure and a limited loss of wildlife habitat. Effects on existing fisheries remain to be assessed. However, creation of a more positive ecocycle on the periphery of the reservoir may be expected in terms of improved soil moisture for nearby forests and other biomass and improved wildlife habitat. Opportunities would be created for improved local river transportation and freshwater fisheries. Below the dam, frequent low-intensity flood damage would be controlled, but the potential for degradation of the Narmada streambed would be increased and the upward migration of existing fish species would be halted. The objectives and outlines of a comprehensive environmental protection program covering fish and fisheries, forests and wildlife and public health have been agreed with the concerned States. All proposed studies and programs can be implemented through institutions which already exist. Detailed work plans and schedules for meeting the requirements of a comprehensive environmental protection program will be submitted to the Bank Group by December 31, 1985 and implemented thereafter (Sections 2.11(a)(i) and (b), Gujarat Project Agreement, and 2.08(a)(i) and

(b) of Madhya Pradesh and Maharashtra Project Agreements). Gujarat, Madhya Pradesh and Maharashtra would also take all necessary measures to minimize the risk of malaria, filaria, schistosomiasis, and other water-related diseases that may result from the implementation of the project (Section 2.11, Gujarat Project Agreement and Sections 2.14 of Madhya Pradesh and Maharashtra Project Agreements).

Project Costs and Financing

59. The total costs of the project are estimated at US\$1,934 million equivalent, including an estimated US\$260 million in taxes and duties. Foreign exchange costs are estimated at US\$613 million. Physical contingencies were estimated separately for each component and average 9% of base cost estimates. Price contingencies account for about 31% of total project costs (including contingencies) and are based on local rates of 8.5% for the period 1984/85 through 1990/91 and 6% per annum thereafter. Foreign inflation rates used are 9.75% in 1984/85, 8.75% in 1985/86, 7% in 1986/87 and 6% thereafter.

60. The costs of the project would be borne by the four participating States in proportions mandated by the Tribunal as follows: 1/ Gujarat - US\$359 million or about 26%; Madhya Pradesh - US\$280 million or about 15%; Maharashtra - US\$402 million or 29% and Rajasthan - US\$29 million or 1.5%. For the two last-mentioned States, financial obligations under the project are small in relation to the States' development programs, so that they should face little difficulty in mobilizing the resources necessary to meet them. With respect to Gujarat and Madhya Pradesh, however, investments in the Narmada Basin will be major undertakings which will absorb considerable financial resources. Given the long gestation period of the Narmada investments, cost recovery from them is excluded as a source of revenue for these States. Prospective budgetary resource availabilities and investment programs for Gujarat (irrigation) and for Madhya Pradesh (irrigation and power), for the Seventh Plan period (1985/86 - 1989/90) have been analyzed to ensure that Narmada investments can be accommodated without undue displacement of investments in other sectors or critical operation and maintenance expenditures in each State. Gujarat is expected to allocate approximately one-third of its overall plan resources to the irrigation sector. Total contributions from Gujarat to the Dam and Power Project, to the Water Delivery and Drainage Project and to the upcoming Narmada Sagar project in MP are expected to absorb about 65% of Gujarat's irrigation investment budget over the Seventh Plan period. Madhya Pradesh will finance these investments from its irrigation and power budgets which, together, are expected to receive some 70% of MP's overall plan resources. Of this proportion, commitments to ongoing projects and to planned Narmada investments will absorb about 80% of resources to be allocated to the irrigation and power sectors.

61. Since each State has stated under the Seventh Plan its intention of according the highest priority to Narmada investments, Narmada investments are

1/ Excludes contributions from GOI and outside sources.

expected to be supportable under each State's plan. Furthermore, since Narmada investments are interstate projects of considerable national importance, GOI has indicated that special provision could be made, if needed, for additional funds to ensure that sufficient resources are available to ensure timely completion of the investments. In any event, GOI would provide sufficient funds to ensure timely implementation of the project (Section 3.01, Development Credit Agreement).

62. The Bank Group contribution of a loan of US\$200.0 million and a credit of SDR 99.7 million (US\$100.0 million equivalent) will finance about 18% of total project costs, net of taxes and duties. About 49% of the project's foreign exchange costs would be financed by the Bank Group's contribution. In addition, commercial cofinancing would be encouraged by requesting, as part of ICB bidding procedures, suppliers' credits to cover a portion of the foreign exchange cost of the power generating equipment. The Bank loan would be made to GOI for 20 years including five years of grace, at the prevailing variable interest rate. The IDA credit would be on standard terms. Bank Group funds would be channelled to GOG in accordance with GOI's standard terms and arrangements for financing development projects.

Procurement and Disbursement

63. Annex VI to this report details the manner in which items will be procured under the project. Civil works contracts costing about US\$498.5 million (or 99% of the total) would be let under International Competitive Bidding procedures. These contracts would cover construction of the main dam, fabrication and installation of all gates, construction of the irrigation bypass tunnel and civil works for the underground powerhouse. Some additional small works contracts totalling US\$4.5 million have been scheduled which, because of their size, would not be of interest to foreign bidders and would be let following Local Competitive Bidding in accordance with procedures which are acceptable to the Bank Group. Additionally, the purchase, construction and installation of the hydrometeorological network throughout the Narmada Basin would be undertaken at many scattered sites. Individual works contracts for these would not exceed US\$100,000 per contract with a total not to exceed US\$1.5 million. Qualified Indian contractors would receive a preference of 7.5% in the evaluation of ICB bids. A contract for the supply of special steel for penstocks (estimated to cost US\$3.9 million) ^{1/} would be let through ICB. Instruments for the hydrometeorological network (estimated to cost US\$15 million) ^{1/} would also be procured through ICB. A preference of 15% or the prevailing customs duty, whichever is lower, will be received by qualified local suppliers of goods. Local shopping requiring at least three quotations will be used to procure specialized equipment for the training program, estimated to cost less than US\$30,000. Works contracts in excess of US\$1 million and goods contracts in excess of US\$100,000 would be subject to pre-action by the Bank Group. All other contracts would be subject to post-review. Procurement action on the two major contracts, namely, dam and under-

^{1/} excluding price contingencies.

ground powerhouse, which represent 94% of the project's works contracts, has begun. Prequalification of contractors to construct the main dam is complete, while prequalification for the underground powerhouse is underway. Power generating equipment not to be financed by the Bank will be procured from recognized international suppliers.

64. In order to match disbursements with the project's financial requirements, disbursements would be accelerated during the first five years with the goal of disbursing up to 80% of the funds by the end of FY1990. No disbursement profiles are applicable for projects of this duration, especially since special provision has been made to accelerate disbursements over the early years of the main civil works contracts. Disbursements of Bank Group funds will be restricted to expenses related to the main dam, the civil works contract for tunnelling and concreting in the riverbed powerhouse, the irrigation by-pass tunnel and related gates, penstocks and other metal work, the hydrometeorological network, and training and technical assistance. Disbursements would be made for (a) 100% of foreign expenditures for directly imported goods; (b) 100% of ex-factory expenditures or 70% of expenditures for equipment procured locally; (c) 70% of expenditures on the hydrometeorological network; (d) 45% of expenditures for civil works from FY85-90 and 15% in subsequent fiscal years; and (e) 100% of training and technical assistance expenditures. Disbursements for all payments for training and for payments of less than Rs 300,000 for works, or Rs 150,000 for goods, would be made against certificates of expenditures. Documentation for these expenditures would be retained by GOC and made available for inspection by the Bank. Full documentation would be required for all other disbursements. It is expected that disbursements would be completed by June 1995.

Accounts and Audits

65. GOC, GOMP and GOM would maintain separate accounts for project expenditures, ensure that such project accounts are audited annually and that copies of such accounts, certified as to their accuracy by an independent auditor acceptable to the Bank, are submitted to the Bank not later than nine months after the end of its fiscal year. They would also have final audits prepared for project accounts for each fiscal year by an auditor acceptable to the Bank and forward such audit reports to the Bank immediately after their finalization, and make complete accounts and financial statements available for inspection during Bank review missions. Certificates of expenditures would be audited annually, and the audited statements would be submitted to the Bank once a year along with the audited accounts (Sections 3.01 and 3.02, Gujarat, Madhya Pradesh and Maharashtra Project Agreements).

Ownership and Financial Arrangements Relating to the Power Facilities 1/

66. According to the Tribunal decision, the net power generated at the project's power facilities would be shared as follows: 57% to Madhya Pradesh, 27% to Maharashtra, and 16% to Gujarat. In addition, both capital and annual O&M costs of the power facilities, to be constructed under the Sardar Sarovar Dam and Power Project, would be shared in the same ratio as the above power benefits. The power assets to be created under the project would be owned by the participating states in those proportions. The entitlement of power and energy for any one day can be utilized fully or partly by the States, or sold to one another by mutual agreement.

67. Under the project, and in accordance with the Tribunal decision, transmission lines are to be constructed by GOG to the borders of each participating State. Thereafter, by December 31, 1991, each respective State government will, within its territory, construct necessary facilities to connect these lines to the Western Region grid (Sections 2.02(d), Gujarat, Madhya Pradesh and Maharashtra Project Agreements).

68. GOG, through an agency to be designated by it, is to operate and maintain all power facilities (generation and transmission) within Gujarat, while each participating State would operate and maintain their respective transmission facilities. While the ownership of the power facilities to be constructed under the project would be vested with each participating State, it has not yet been decided who would purchase the power produced under the project on behalf of each State for re-sale to consumers. The purchasing agencies could be the respective SEBs or other operating electric utility organizations. Such agencies could be independent authorities, corporations or other electric supply utilities. The precise form of these organizations would be firmed up at the time that the project O&M organization is to be established.

69. GOG would, by December 31, 1988, designate an agency to supervise the installation of and be responsible for commissioning of the hydropower equipment, and for operation and maintenance of the power facilities on behalf of the participating States. Also, GOMP and GOM would provide their respective financial contributions related to the costs of construction and the operation and maintenance of power facilities under the project.

70. In order to ensure that the power to be produced under the project would be priced economically, the three participating States, by a date not later than six months before the commissioning of the first turbine generator, would enter into contracts, satisfactory to the Bank, with appropriate electric utility organizations for the bulk supply and sale of electricity generated under the project. Bulk supply contracts with each State would contain provi-

1/ This section addresses cost recovery for power only. Recovery of costs for irrigation, municipal and industrial and domestic water supplies are contained in the President's Report pertaining to the Water Delivery and Drainage Project.

sions for pricing power at levels which will recover all investment costs and full O&M costs and will produce a satisfactory internal rate of return to project investments over the life of the assets. The internal rate of return would reflect an acceptable real rate of return to capital and, in addition, an estimate of expected future inflation (Section 3.03, Gujarat Project Agreement; Sections 2.15, Madhya Pradesh and Maharashtra Project Agreements). In this manner, real recovery of assets by the participating States will be assured. The precise levels of tariffs to be charged under the bulk supply contracts (to be negotiated six months before commissioning of the power facilities) would be subject to review every three years.

Benefits, Justification and Risk 1/

71. The power facilities would form part of the least-cost capacity expansion sequence in India's western region grid even when carrying 100% of the cost of the dam and reservoir. The benefits from power generation have been assessed by attaching an estimate of the social value of energy to the volume of energy to be produced. An attempt was made to estimate the maximum willingness to pay for power in the industrial and agricultural sectors, which together make up for some 75% of energy demand in the western grid. Based on these estimates and on average tariffs paid by consumers in these and other sectors an estimate of the average financial willingness to pay was calculated and then adjusted to the economic value of energy generated. The resulting economic price of energy at generation is Rs 0.66/kWh, whereas the average financial revenue (at present tariffs) would be about Rs 0.45/kWh. All energy (firm and spill energy) has been valued at this economic price. As upstream abstractions increase over time, power generated from the riverbed powerhouse would change from a dual baseload and peaking operation to a prime peaking operation. Due to a low daily plant factor (15%-30%) and the downstream storage provided by the canalhead regulating regulator, the canalhead powerhouse would be operated to meet peak daily loads.

72. Most benefits would result from a replacement of rainfed by irrigated crops and a corresponding intensification of cultivation. Under this project, the value of agricultural output (in constant financial prices) would rise by over 370% over a 20-25 year period; without it, production would rise by less than 30%. Incremental production at full development (mainly wheat, but also cotton, paddy, sorghum, pearl millet and pulses) is estimated at about 2.5 million tons annually. Overall the project would transform Gujarat's economy by increasing its agricultural production by 45%. About 340,000 farm families would benefit directly from this project. The project would generate an additional 0.7 million man-days of full on-farm employment, while project construction activities would generate a further 125,000 seasonal jobs annually.

1/ Since the costs of the dam and reservoir cannot be strictly allocated between power generation and water supply, this section analyzes the economics of the Sardar Sarovar Dam and Power Project, together with the Water Delivery and Drainage Project.

73. Projections of future water demand and supply for urban centers, villages and industries reveal substantial deficits of suitable supplies. Under the project 1,300 million cubic meters of municipal and industrial water would be supplied to population centers containing (in the year 2021) over 29 million people. The project represents the least-cost way of providing these water supplies to the population centers. In addition there would be considerable non-quantifiable benefits to health and living standards resulting from improved water quality.

74. For the project as a whole, considering the scale of transformation of the Gujarat and western region economies that would be effected through the Narmada development, the quantitative analysis will understate secondary income and employment effects of the investments. The project's three functions of power generation, irrigation and municipal and industrial water supplies are inter-dependent. Therefore, while calculation of separate ERRs for each component would be possible, such calculations would not have operational or decision-making significance. The base case economic rate of return (ERR) of projects is about 13%. While it should be noted that a "power-only" project yields an ERR higher than that of the overall project, a power project alone would not meet the main objective of the Narmada development which is to provide the basis of State and regional plans to provide irrigation and municipal and industrial water supplies for large sections of population currently living in drought-prone conditions. The ERR is sensitive in relatively minor respects to delays in dam construction and reservoir filling. A delay of some two years in completion of the dam would reduce the ERR to 12%, the estimated opportunity cost of capital in India. The ERR is also sensitive to shortfalls in irrigated crop yields and to crop prices but is somewhat less sensitive to factors such as cost overruns and lower irrigation efficiencies. Sensitivity tests performed on many parameters demonstrate that the economic viability of the project is maintained even with very significant (but unlikely) adverse movements in those parameters. A risk analysis calculated under 500 different sets of assumptions with respect to key project variables, demonstrates that the chances of the ERR falling below 10% are about one in six.

75. The project, however, does face greater risks than normal irrigation, power, and water supply operations in India, given its immense size and complexity. As one of the largest investments of its kind built anywhere, and the largest in India to date, its implementation could be subject to delays and cost increases. It will absorb large amounts of human and financial resources of the benefitting States. Having been designed to meet Gujarat's requirements in the 21st century, it will use modern designs and state-of-the-art technology and systems operation in both water supply and power components, and will require considerable interstate coordination to ensure timely execution. Moreover, its benefits will be maximized only with the timely construction of critical investments upstream in Madhya Pradesh. To mitigate these risks, a number of features have been incorporated into the project. Institutions charged with project execution responsibilities will be strengthened by additions of staff and by the acceptance of a Centralized Procurement Unit and a Management Information System Cell. Financial resources from Central Government and suppliers' credits will supplement local resource

availabilities. Pursuant to the Decision of the NWDI, Madhya Pradesh would execute a critical investment, the Narmada Sagar Project, so as to maximize power generation from the Sardar Sarovar Dam. Project authorities would continue the practice that has been adopted throughout project preparation of relying considerably on consultant expertise, both local and foreign, to supplement their design, planning and execution capabilities. Suitably qualified contractors will be associated with the major civil works items. The intricate interstate coordination committees initiated by the Tribunal will be continued. The Dam Safety Panel and Canal Consultancy Board will ensure the adoption of appropriate design and construction standards. Overall, given the excellent performance to date during project preparation and design, the project authorities, with continued use of private sector consultancies, are considered to be able to execute the project in timely fashion. It is thus considered highly unlikely that delays in project execution and consequential cost escalation could jeopardize the viability of the project.

PART V - LEGAL INSTRUMENTS AND AUTHORITY

76. The draft Development Credit and Loan Agreements between India and the Association and the Bank, respectively, the draft Project Agreements among the Association and the States of Gujarat, Madhya Pradesh, and Maharashtra; and the Recommendation of the Committee provided for in Article V, Section I(d) of the Articles of Agreement of the Association and the Report of the Committee provided for in Article III, Section 4(iii) of the Articles of Agreement of the Bank are being distributed to the Executive Directors separately.

77. Special conditions of this project are listed in Section III of Annex III.

78. Special conditions of effectiveness of the Credit and Loan are that (a) all conditions precedent to the effectiveness of the Loan Agreement related to this project and (b) the Credit Agreement related to the Narmada River Development (Gujarat) Water Delivery and Drainage Project will have been fulfilled (other than the effectiveness of the Development Credit Agreement for this project) (Section 5.01, Development Credit Agreement).

79. I am satisfied that the proposed credit and loan would comply with the Articles of Agreement of the Association and the Bank.

PART VI - RECOMMENDATION

80. I recommend that the Executive Directors approve the proposed credit and loan.

A.W. Clausen
President

February 6, 1985

TABLE 3A

INDIA INDIA	- SOCIAL INDICATORS DATA SHEET				
	REFERENCE GROUPS (WEIGHTED AVERAGES) /a				
	1980/1	1970/1	MOST RECENT ESTIMATE/1	LOW INCOME ASIA & PACIFIC	MIDDLE INCOME ASIA & PACIFIC
AREA (THOUSAND SQ. KM)					
TOTAL	3287.6	3287.6	3287.6	.	.
AGRICULTURAL	1763.3	1780.5	1812.3	.	.
GDP PER CAPITA (US\$)	60.0	100.0	260.0	278.6	1091.2
ENERGY CONSUMPTION PER CAPITA (KILOGRAMS OF OIL EQUIVALENT)	79.0	113.0	138.0	272.0	367.3
POPULATION AND VITAL STATISTICS					
POPULATION, MID-YEAR (THOUSANDS)	434849.0	347569.0	716985.0	.	.
URBAN POPULATION (% OF TOTAL)	19.0	19.8	24.1	21.7	34.7
POPULATION PROJECTIONS					
POPULATION IN YEAR 2000 (MILL)			994.4	.	.
STATIONARY POPULATION (MILL)			1707.2	.	.
POPULATION MOMENTUM			1.7	.	.
POPULATION DENSITY					
PER SQ. KM.	132.3	166.6	213.4	166.6	261.9
PER SQ. KM. AGRI. LAND	246.6	307.3	387.1	345.5	1735.1
POPULATION AGE STRUCTURE (%)					
0-14 YRS	40.9	42.7	39.3	35.6	39.0
15-64 YRS	54.5	54.2	57.6	59.8	57.6
45 AND ABOVE	4.6	3.1	3.1	4.3	3.3
POPULATION GROWTH RATE (%)					
TOTAL	1.8	2.3	2.2	1.9	2.3
URBAN	2.5	3.3	3.9	4.1	4.3
CRUDE BIRTH RATE (PER THOUS)	47.7	41.4	34.2	27.7	30.1
CRUDE DEATH RATE (PER THOUS)	23.8	17.8	12.7	10.1	9.5
GROSS REPRODUCTION RATE	2.9	2.4	2.2	1.8	2.0
FAMILY PLANNING					
ACCEPTORS, ANNUAL (THOUS)	64.0	3782.0	6826.0	.	.
USERS (% OF MARRIED WOMEN)	..	11.7	28.0	..	52.7
FOOD AND NUTRITION					
INDEX OF FOOD PROD. PER CAPITA (1969-71=100)	98.0	102.0	101.0	112.8	123.0
PER CAPITA SUPPLY OF					
CALORIES (% OF REQUIREMENTS)	96.0	91.0	86.0	97.7	114.4
PROTEINS (GRAMS PER DAY)	34.0	30.0	46.0	56.8	57.0
OF WHICH ANIMAL AND PULSE	17.0	15.0	13.0 /c	14.9	14.1
CHILD (AGES 1-4) DEATH RATE	26.2	20.7	11.0	9.8	7.2
HEALTH					
LIFE-EXPECT. AT BIRTH (YEARS)	42.5	47.5	54.6	60.0	60.4
INFANT MORT. RATE (PER THOUS)	165.0	139.0	94.0	83.8	66.3
ACCESS TO SAFE WATER (IPOP)					
TOTAL	..	17.0	33.0 /d	32.9	37.0
URBAN	..	60.0	83.0 /d	70.9	54.8
RURAL	..	6.0	20.0 /d	22.1	26.4
ACCESS TO EXCRETA DISPOSAL (% OF POPULATION)					
TOTAL	..	18.0	20.0 /e	18.1	41.3
URBAN	..	85.0	87.0 /e	72.8	47.4
RURAL	..	1.0	2.0 /e	4.6	33.3
POPULATION PER PHYSICIAN	4850.0	4890.0	3690.0 /f	3484.2	7749.4
POP. PER NURSING PERSON	10980.0	7420.0	5460.0 /f	4793.1	2460.4
POP. PER HOSPITAL BED					
TOTAL	2180.0	1650.0	1290.0 /f	1066.3	1044.2
URBAN	..	..	370.0 /d	298.0	651.2
RURAL	..	..	10410.0 /d	5993.4	2594.6
ADMISSIONS PER HOSPITAL BED	..	..	..	..	27.0
HOUSING					
AVERAGE SIZE OF HOUSEHOLD					
TOTAL	5.2	5.6	5.2 /g	..	..
URBAN	5.2	5.6	4.8 /g	..	..
RURAL	5.2	5.6	5.3 /g	..	..
AVERAGE NO. OF PERSONS/ROOM					
TOTAL	2.6	2.8	..	..	..
URBAN	2.6	2.8	..	..	..
RURAL	2.6	2.8	..	..	..
ACCESS TO ELECT. (% OF DWELLINGS)					
TOTAL	..	..	..	..	..
URBAN	..	..	..	..	..
RURAL	..	..	..	..	..

TABLE 3A

INDIA	- SOCIAL INDICATORS DATA SHEET				
	REFERENCE GROUPS (WEIGHTED AVERAGES) /a				
	(MOST RECENT ESTIMATE) /b				
	1960/b	1970/b	MOST RECENT ESTIMATE /b	LOW INCOME ASIA & PACIFIC	MIDDLE INCOME ASIA & PACIFIC
EDUCATION					
ADJUSTED ENROLLMENT RATIOS					
PRIMARY: TOTAL	61.0	73.0	79.0	97.4	102.0
MALE	80.0	90.0	93.0	110.5	105.9
FEMALE	40.0	56.0	64.0	83.7	98.2
SECONDARY: TOTAL	20.0	26.0	30.0	35.9	46.0
MALE	30.0	36.0	39.0	44.6	48.7
FEMALE	10.0	15.0	20.0	26.8	43.1
VOCATIONAL (% OF SECONDARY)	2.8	1.0	0.7 /e	2.2	17.5
PUPIL-TEACHER RATIO					
PRIMARY	46.0	41.0	54.0	38.5	31.8
SECONDARY	16.0	21.0	..	18.7	23.5
ADULT LITERACY RATE (%)	27.8	34.1	36.2	53.4	72.9
CONSUMPTION					
PASSENGER CARS/THOUSAND POP	0.6	1.1	1.4 /f	0.9	10.1
RADIO RECEIVERS/THOUSAND POP	4.9	21.5	43.6	112.1	113.6
TV RECEIVERS/THOUSAND POP	0.0	0.0	1.7	15.7	50.1
NEWSPAPER ("DAILY GENERAL INTEREST") CIRCULATION PER THOUSAND POPULATION	10.6	16.2	19.4 /h	16.2	53.9
CINEMA ANNUAL ATTENDANCE/CAPITA	3.2	6.2	3.7 /e	3.6	3.4
LABOR FORCE					
TOTAL LABOR FORCE (THOUS)	185951.0	219194.0	282169.0	..	..
FEMALE (PERCENT)	30.7	32.5	31.8	33.3	33.5
AGRICULTURE (PERCENT)	74.0	74.0	71.0	69.6	52.2
INDUSTRY (PERCENT)	11.0	11.0	13.2	15.8	17.9
PARTICIPATION RATE (PERCENT)					
TOTAL	42.8	40.0	39.4	42.6	38.7
MALE	57.0	52.4	52.0	54.7	50.9
FEMALE	27.3	26.9	25.9	29.8	26.6
ECONOMIC DEPENDENCY RATIO	1.1	1.1	1.1	1.0	1.1
INCOME DISTRIBUTION					
PERCENT OF PRIVATE INCOME RECEIVED BY					
HIGHEST 5% OF HOUSEHOLDS	26.7	26.3 /f	22.2 /e	22.2	22.2
HIGHEST 20% OF HOUSEHOLDS	51.7	48.9 /f	49.4 /e	48.0	48.0
LOWEST 20% OF HOUSEHOLDS	4.1	6.7 /f	7.0 /e	6.4	6.4
LOWEST 40% OF HOUSEHOLDS	13.6	17.2 /f	16.2 /e	15.5	15.5
POVERTY TARGET GROUPS					
ESTIMATED ABSOLUTE POVERTY INCOME LEVEL (US\$ PER CAPITA)					
URBAN	..	..	132.0 /h	133.9	188.6
RURAL	..	..	114.0 /h	111.6	152.0
ESTIMATED RELATIVE POVERTY INCOME LEVEL (US\$ PER CAPITA)					
URBAN	..	..	..	..	177.9
RURAL	..	..	..	..	164.6
ESTIMATED POP. BELOW ABSOLUTE POVERTY INCOME LEVEL (%)					
URBAN	..	..	40.3 /h	43.8	23.4
RURAL	..	..	50.7 /h	51.7	37.7
..	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 1980 and 1982.

/c 1977; /d 1976; /e 1975; /f 1978; /g 1962; /h 1979; /i 1964-65.

JUNE, 1984

DEFINITIONS OF DATA TERMINOLOGY

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 Importers" group where "Middle Income North Africa and Middle East" is chosen because of stronger socio-economic affiliation). In the reference population comparison, the subject country is compared with the reference country on the basis of the indicator 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 coverage of one indicator to another. These coverage are only useful in comparing the value of one indicator of a time across the country and

AREA (thousand sq.m.)

(1) - Total surface area comprising land area and inland waters; 1960, 1970 and 1981 data.

(2) - Estimate of agricultural area used temporarily or permanently for crops, pastures, meadows and hedges; 1960, 1970 and 1981 data.

GDP PER CAPITA (1980) - GDP per capita estimate at current market prices, calculated by using conversion method as World Bank Atlas (1980-82 basis); 1960, 1970, and 1982 data.

ENERGY CONSUMPTION PER CAPITA - Annual apparent consumption of commercial primary energy (coal, oil, gas, hydro, nuclear and geothermal electricity) in kilowatt-hours per capita; 1960, 1970, and 1981 data.

POPULATION AND VITAL STATISTICS

Total Population (1980) - As of July 1, 1980, 1970, and 1982 data.

Urban Population (percentage of total) - Ratio of urban to total population; different definitions of urban areas may affect comparability of data among countries; 1960, 1970, and 1982 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 three combinations of mortality and fertility trends for projection purposes.

Stationary Population - Is one in which age- and sex-specific mortality rates remain constant over a long period, while age-specific fertility rates have stabilised at replacement level (low reproduction rate). In such a population, the birth rate is constant and equal to the death rate, the age structure is also constant, and the growth rate is zero. 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.

Population Doubling - Is the tendency for population growth to continue beyond the time that replacement-level fertility has been achieved; that is, even after the net reproduction rate has reached unity. The doubling of a population in the year 2 is measured as a ratio of the ultimate stationary population to the population in the year 1, given the assumption that fertility remains at replacement level from year 1 onward, 1980 data.

Population Density

Per sq. km. - 1980 population per square kilometer (1/4 national of total area; 1960, 1970, and 1981 data.

Per sq. km. agricultural land - Computed as above for agricultural land only; 1960, 1970 and 1981 data.

Population Age Structure (percentage) - Children (0-14 years), working-age (15-64 years), and retired (65 years and over) as percentage of mid-year population; 1960, 1970, and 1982 data.

Population Growth Rate (percentage) - Annual growth rate of total mid-year population for 1960-69, 1970-79, and 1980-81.

Population Growth Rate (percentage) - Annual growth rate of urban population for 1960-69, 1970-79, and 1980-81.

Crude Birth Rate (per thousand) - Annual live births per thousand of mid-year population; 1960, 1970, and 1982 data.

Crude Death Rate (per thousand) - Annual deaths per thousand of mid-year population; 1960, 1970, and 1982 data.

Crude Mortality Rate - Average number of daughters a woman will bear to her natural reproductive period if she experiences present age-specific fertility rates; usually five-year averages ending in 1960, 1970, and 1982.

Family Planning - Aggregate annual (thousands) - Annual number of couples of birth-control device under auspices of national family planning program.

Family Planning - Share (percentage) of married women - Percentage of married women of childbearing age practicing any form of contraception to all married women. Women of childbearing age are generally women aged 15-49, although for some countries contraceptive usage is measured for other age groups.

FOOD AND NUTRITION

Index of Food Production per Capita (1980-1970) - Index of per capita annual production of all food commodities. Production includes seed and food use in an calendar year basis. Computation covers primary goods (e.g., cereals, oilseeds, 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; 1961-69, 1970, and 1982 data.

Per capita supply of calories (percentage of requirements) - Computed from energy equivalent of net food supplies available to country per capita per day. Available supplies comprise domestic production, imports less exports, and include animal feed. For countries with significant food stocks, 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 weight, age and sex distribution of population, and allowing 10 percent for waste at household level; 1961-69, 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 plant protein, of which 10 grams should be animal protein. These standards are lower than those of 75 grams of total protein and 25 grams of animal protein as an average for the world, proposed by FAO in the Third World Food Survey; 1961-69, 1970 and 1980 data.

Per capita protein supply (grams per day) - Protein supply of food derived from animal and plant sources in grams per day; 1961-69, 1970 and 1977 data.

Child (age 1-14) Death Rate (per thousand) - Annual deaths per thousand in age group 1-14 years, as compared to this age group; few countries having complete 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 1982 data.

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

Source of Drinking Water (percentage of population) - Total, urban, and rural - Number of people (total, urban, and rural) with reasonable access to safe water supply (includes treated surface water or untreated but uncontaminated water such as that from protected springs, and sanitary wells) as percentage of their respective populations. In an urban area a public fountain or standpipe located not more than 200 meters from a house may be considered as having within reasonable access of that house. In rural areas reasonable access would imply that the household 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 Sanitary Disposal (percentage of population) - Total, urban, and rural - Number of people (total, urban, and rural) served by sanitary disposal as percentage of their respective populations. Sanitary disposal may include the collection and disposal, with or without treatment, of human excreta and wastewater by water-borne systems or the use of pit latrines and similar installations.

Population per Physician

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 hospitals 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 inpatient accommodation and provide a limited range of medical facilities.

Population 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.

Number of persons per room - Total, urban, and rural - Average number of persons per room in all urban, and rural occupied dwellings, respectively. Dwellings include non-permanent structures and unoccupied parts.

Access to Electricity (percentage of population) - Total, urban, and rural - Commercial 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 percentage of respective primary school-age populations; normally includes children aged 6-11 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 (preparation, practice general, vocational, or teacher training institutions for 10-12 years of 12-17 years of age; correspondence courses are generally excluded.

Vocational enrollment (percentage of population) - Vocational institutions include technical, industrial, or other programs with separate independent or as departments of secondary institutions.

Higher education - Total, male and female - Total students enrolled in primary and secondary levels divided by number of teachers at the corresponding levels.

Adult literacy rate (percentage) - Literate adults (age 15 and over) 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, hearse, and utility vehicles.

Radio Receivers (per thousand population) - All types of receivers for radio broadcast 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.

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

Crude Annual Mileage per Vehicle per Year - Based on the number of tickets sold during the year, including additions to drive-in stadiums on mobile units.

LABOR FORCE

Total Labor Force (thousands) - Economically active persons, including armed forces and unemployed not including students, students, etc., covering population of all ages. Definitions in various countries are not comparable; 1960, 1970 and 1982 data.

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

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

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

Participation Rate (percentage) - 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-structure of the population, and long time trend. A few estimates are from national sources.

Sex Ratio (percentage) - Ratio of male to female population under 15 and over to the working age population (those aged 15-64).

INCOME DISTRIBUTION

Percentage of Income (household) (rich to poor and blind) - Received by richest 5 percent, richest 20 percent, poorest 20 percent, and poorest 40 percent of households.

POVERTY INDEX

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

Estimated Absolute Poverty Income Level (USD per capita) - Urban and rural - Absolute poverty income level is that income level below which a critical nutritionally adequate diet plus essential non-food requirements is not affordable.

Estimated Relative Poverty Income Level (USD per capita) - Urban and 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 (percentage) - Urban and rural - Percent of population (urban and rural) who are absolute poor.

ECONOMIC DEVELOPMENT DATA
GDP PER CAPITA IN 1981 US\$260 a/

GROSS DOMESTIC PRODUCT IN 1982/83 b/

ANNUAL RATE OF GROWTH (% Constant Prices) c/

	US\$ Bln.	%	1955/56-1959/60	1960/61-1964/65	1965/66-1969/70	1970/71-1974/75	1975/76-1979/80
GDP at Market Prices	170.74	100.0	3.7	3.6	3.7	2.9	4.1
Gross Domestic Investment	41.99	24.6					
Gross National Saving	38.12	22.3					
Current Account Balance	- 3.87	- 2.3					

OUTPUT, LABOR FORCE AND PRODUCTIVITY IN 1981

	Value added (at factor cost)		Labor Force 1/		V.A. Per Worker	
	US\$ Bln.	%	Mill.	%	US\$	% of National Average
Agriculture	51.7	35.1	172.7	70.6	299	50
Industry	35.2	23.9	31.6	12.9	1114	185
Services	60.6	41.0	40.3	16.5	1504	249
Total/Average	147.5	100.0	244.6	100.0	603	100

GOVERNMENT FINANCE

	General Government e/			Central Government		
	Rs. Bln.	% of GDP		Rs. Bln.	% of GDP	
	1982/83	1982/83	1978/79-1982/83	1982/83	1982/83	1978/79-1982/83
Current Receipts	333.34	20.3	19.5	175.61	10.7	10.5
Current Expenditures	340.09	20.7	19.0	188.39	11.5	10.8
Current Surplus/Deficit	- 6.75	- 0.4	0.5	- 12.98	- 0.8	- 0.4
Capital Expenditures f/	131.28	8.0	8.1	95.13	5.8	5.7
External Assistance (net) d/	19.30	1.2	1.0			

MONEY, CREDIT AND PRICES

	1970/71	1975/76	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	February 1983	February 1984
	(Rs Billion outstanding at end of period)									
Money and Quasi Money	109.8	224.8	329.1	401.1	472.3	555.5	624.9	723.8	711.7	845.7
Bank Credit to Government (net)	54.6	106.3	137.3	159.3	200.1	257.2	309.1	352.4	353.5	406.6
Bank Credit to Commercial Sector	64.6	156.2	212.2	255.3	310.1	363.5	430.5	504.5	487.7	576.4
	(Percentage or Index Numbers)									
									Apr-Feb 1982/83	Apr-Feb 1983/84
Money and Quasi Money as a % of GDP	27.3	30.3	36.7	41.1	44.1	43.6	42.0	44.0		
Wholesale Price Index (1970/71 = 100)	100.0	173.0	185.8	185.8	217.6	257.3	281.4	288.6	288.1	314.8
Annual percentage changes in:										
Wholesale Price Index	7.7	-1.1	5.2	-	17.1	18.2	9.4	2.6	2.3	9.3
Bank Credit to Government (net)	15.0	22.7	16.3	16.0	25.6	28.5	20.2	14.0	21.0 g/	18.9 h/
Bank Credit to Commercial Sector	19.4	22.7	12.6	20.2	21.5	17.2	18.4	17.2	15.5 g/	17.9 h/

a/ The per capita GNP estimate is at market prices, using World Bank Atlas methodology, base period 1979-1981.

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

b/ Quick Estimates, Central Statistical Organisation.

c/ Computed from trend line of GNP at factor cost series, including one observation before first year and one observation after last year of listed period.

d/ World Bank estimates of net disbursement of concessional aid and IBRD.

e/ Transfers between Centre and States have been netted out.

f/ All loans and advances to third parties have been netted out.

g/ Percentage change from end-March 1982 to end-February 1983.

h/ Percentage change from end-March 1983 to end-February 1984.

i/ Total Labor Force and percentage breakdown from 1981 Census. Excludes data for Assam.

<u>BALANCE OF PAYMENTS</u> (US\$ Mln.)	<u>1980/81</u>	<u>1981/82</u>	<u>1982/83^{1/}</u>	<u>1983/84^{1/}</u>
Exports of Goods <u>g/</u>	8,304	8,319	8,001	8,466
Imports of Goods <u>g/</u>	-14,204	-13,500	-14,249	-14,412
Trade Balance	- 7,700	- 6,981	- 6,248	- 5,946
NFS (net)	1,365	974	940	856
<u>Resource Balance</u>	- 6,335	- 6,007	- 5,308	5,090
Interest Income (net) <u>h/</u>	600	286	- 415	- 648
Net Transfers <u>1/</u>	2,771	2,318	1,849	1,790
<u>Balance on Current Account</u>	- 2,964	- 3,403	- 3,874	- 3,948
<u>Official Loans & Grants</u>				
Gross Disbursements	2,651	2,570	3,086	3,441
Amortisation	- 700	- 674	- 701	- 783
Transaction with IMF (net)	1,035	690	1,980	1,295
All Other Items <u>o/</u>	- 367	- 1,581	12	531
Increase in Reserves (-)	345	2,398	- 503	- 536
Gross Reserves (end year) <u>p/</u>	6,859	4,461	4,964	5,500
Net Reserves (end year) <u>q/</u>	6,532	3,497	2,088	1,449
<u>Fuel and Related Materials</u>				
Imports (Petroleum) <u>g/</u>	6,672	5,590	4,613	3,395

RATE OF EXCHANGE

June 1966 to mid-December 1971	:	US\$1.00 = Rs 7.50 Rs 1.00 = US\$0.13333
Mid-December 1971 to end-June 1972	:	US\$1.00 = Rs 7.77927 Rs 1.00 = US\$0.137376
After end-June 1972	:	Floating Rate
Spot Rate end-March 1983	:	US\$1.00 = Rs 10.0901 Rs 1.00 = US\$0.0997
Spot Rate end-March 1984	:	US\$1.00 = Rs 10.7181 Rs 1.00 = US\$0.0933

1/ Estimated

h/ Figures given cover all investment income (net). Major payments are interest on foreign loans and charges paid to IMF, and major receipts is interest earned on foreign assets.

1/ Figures given include workers' remittances but exclude official grant assistance which is included within official loans and grants, and non-resident deposits which are included within all other items.

m/ Exclude net use of IMF credit.

n/ Amortisation and interest payments on foreign loans as a percentage of total current receipts.

o/ Includes exchange rate adjustments to the valuation of reserves and financing of imbalances in rupee trade.

p/ Excluding gold.

q/ Net of crude petroleum exports.

r/ Including iron and steel.

<u>MERCHANDISE EXPORTS (AVERAGE 1979/80-1982/83) <u>g/</u></u>	<u>US\$ Mln.</u>	<u>%</u>
Engineering Goods <u>r/</u>	980	12
Tee	435	6
Cane	779	9
Clothing	573	7
Leather and Leather Products	480	6
Jute Manufactures	333	4
Iron Ore	380	5
Cotton Textiles	328	4
Sugar	86	1
Others	3,849	46
<u>Total</u>	<u>8,243</u>	<u>100</u>

EXTERNAL DEBT, MARCH 31, 1983

	<u>US\$ billion</u>
Outstanding and Disbursed	19.6
Undisbursed	11.1
Outstanding including Undisbursed	30.7
<u>DEBT SERVICE RATIO FOR 1982/83 <u>1/</u> <u>n/</u></u>	<u>10.1 per cent</u>

IBRD/IDA LENDING, MARCH 31, 1984 1/

	<u>US\$ million</u>	<u>IBRD</u>	<u>IDA</u>
Outstanding and Disbursed	1,826	7,924	
Undisbursed	2,061	4,331	
Outstanding including Undisbursed	3,907	12,255	

THE STATUS OF BANK GROUP OPERATIONS IN INDIA

A. STATEMENT OF BANK LOANS AND IDA CREDITS
(As of September 30, 1984)

Loan or Credit No.	Fiscal Year of Approval	Purpose	US\$ million (Net of Cancellations)		
			Bank	IDA 1/	Undisbursed 2/
50 Loans/ 93 Credits fully disbursed			2,164.0	-	-
			-	5,535.2	-
482-IN	1974	Karnataka Dairy	-	30.0	8.15
610-IN	1976	Integrated Cotton Development	-	18.0	0.03
1251-IN	1976	Andhra Pradesh Irrigation	145.0	-	24.94
1273-IN	1976	National Seeds I	25.0	-	11.19
1335-IN	1977	Bombay Urban Transport	25.0	-	1.17
680-IN	1977	Kerala Agric. Development	-	30.0	8.45
682-IN	1977	Orissa Agric. Development	-	20.0	1.65
690-IN	1977	West Bengal Agricultural Extension & Research	-	12.0	7.32
1394-IN	1977	Gujarat Fisheries	14.0	-	2.62
720-IN	1977	Periyar Vaigai Irrigation	-	23.0	1.52
728-IN	1977	Assam Agricultural Development	-	8.0	1.34
747-IN	1978	Second Foodgrain Storage	-	107.0	52.65
761-IN	1978	Bihar Agricultural Extension & Research	-	8.0	4.93
1511-IN	1978	IDBI Joint/Public Sector	25.0	-	1.72
1549-IN	1978	Third Trombay Thermal Power	105.0	-	3.60
788-IN	1978	Karnataka Irrigation	-	117.6	37.38
793-IN	1978	Korba Thermal Power	-	200.0	30.11
806-IN	1978	Jammu-Kashmir Horticulture	-	14.0	9.91
815-IN	1978	Andhra Pradesh Fisheries	-	17.5	8.40
816-IN	1978	National Seeds II	-	16.0	4.86
1592-IN	1978	Telecommunications VII	120.0	-	15.10
824-IN	1978	National Dairy	-	150.0	43.85
842-IN	1979	Bombay Water Supply II	-	196.0	141.11
844-IN	1979	Railway Modernization & Maintenance	-	190.0	25.05
848-IN	1979	Punjab Water Supply & Sewerage	-	38.0	5.28
855-IN	1979	National Agricultural Research	-	27.0	14.06
862-IN	1979	Composite Agricultural Extension	-	25.0	2.94
871-IN	1979	National Cooperative Development Corporation	-	30.0	0.83
1648-IN	1979	Ramagundam Thermal Power	50.0	-	50.00
874-IN	1979	Ramagundam Thermal Power	-	200.0	10.71
889-IN	1979	Punjab Irrigation	-	129.0	38.32
899-IN	1979	Maharashtra Water Supply	-	48.0	6.72
911-IN	1979	Rural Electrification Corp. II	-	175.0	4.45
925-IN	1979	Uttar Pradesh Social Forestry	-	23.0	2.24
954-IN	1980	Maharashtra Irrigation II	-	210.0	42.74
961-IN	1980	Gujarat Community Forestry	-	37.0	6.51
963-IN	1980	Inland Fisheries	-	20.0	16.07
981-IN	1980	Population II	-	46.0	27.63

Loan or Credit No.	Fiscal Year of Approval	Purpose	US\$ million (Net of Cancellations)		
			Bank	IDA 1/	Undersubursed 2/
1003-IN	1980	Tamil Nadu Nutrition	-	32.0	19.48
1011-IN	1980	Gujarat Irrigation II	-	175.0	94.88
1012-IN	1980	Cashewnut	-	22.0	16.11
1027-IN	1980	Singrauli Thermal II	-	300.0	159.67
1028-IN	1980	Kerala Agricultural Extension	-	10.0	7.56
1033-IN	1980	Calcutta Urban Transport	-	56.0	17.76
1034-IN	1980	Karnataka Sericulture	-	54.0	30.32
1046-IN	1980	Rajasthan Water Supply & Sewerage	-	80.0	49.09
1843-IN	1980	Industry DFC XIII	100.0	-	5.37
1887-IN	1980	Farakka Thermal Power	25.0	-	25.00
1053-IN	1980	Farakka Thermal Power	-	225.0	113.52
1897-IN	1981	Kandi Watershed and Area Development	30.0	-	20.31
1072-IN	1981	Bihar Rural Roads	-	35.0	14.38
1078-IN	1981	Mahanadi Barrages	-	83.0	42.64
1082-IN	1981	Madras Urban Development II	-	42.0	19.49
1108-IN	1981	M.P. Medium Irrigation	-	140.0	85.73
1112-IN	1981	Telecommunications VIII	-	314.0	89.58
1116-IN	1981	Karnataka Tank Irrigation	-	54.0	37.68
1125-IN	1981	Hazira Fertilizer Project	-	400.0	117.86
1135-IN	1981	Maharashtra Agricultural Ext.	-	23.0	13.92
1137-IN	1981	Tamil Nadu Agricultural Ext.	-	28.0	17.08
1138-IN	1981	M.P. Agricultural Ext. II	-	37.0	28.05
1146-IN	1981	National Cooperative Development Corp. II	-	125.0	70.25
1172-IN	1982	Korba Thermal Power Project II	-	400.0	273.61
1177-IN	1982	Madhya Pradesh Major Irrigation	-	220.0	154.99
2050-IN	1982	Tamil Nadu Newsprint	100.0	-	18.15
1178-IN	1982	West Bengal Social Forestry	-	29.0	19.92
1185-IN	1982	Kanpur Urban Development	-	25.0	15.13
2051-IN	1982	ICICI XIV	150.6	-	57.70
2076-IN	1982	Ramagundam Thermal Power II	300.0	-	269.54
2095-IN	1982	ARDC IV	190.0	-	0.43
1219-IN	1982	Andhra Pradesh Agricultural Ext.	-	6.0	4.69
2123-IN	1982	Refineries Rationalization	200.0	-	96.43
2165-IN	1982	Rural Electrification III	304.5	-	274.48
2186-IN	1982	Kallada Irrigation	20.3	-	20.00
1269-IN	1982	Kallada Irrigation	-	60.0	30.57
1280-IN	1983	Gujarat Water Supply	-	72.0	60.11
1286-IN	1983	Jammu/Kashmir and Haryana Social Forestry	-	33.0	24.97
1288-IN	1983	Chambal Madhya Pradesh Irrigation II	-	31.0	19.65
1289-IN	1983	Subernarekha Irrigation	-	127.0	105.96
2205-IN	1983	Krishna-Godavari Exploration	165.5	-	140.52
2210-IN	1983	Railways Modernization & Maintenance II	200.0	-	197.04

Loan or Credit No.	Fiscal Year of Approval	Purpose	US\$ million (Net of Cancellations)		
			Bank	IDA 1/	Undisbursed 2/
1299-IN	1983	Railways Modernization & Maintenance II	-	200.0	177.00
2241-IN	1983	South Bassein Gas Development	139.3	-	133.71
1319-IN	1983	Haryana Irrigation II	-	150.0	114.38
1332-IN	1983	U.P. Public Tubewells II	-	101.0	89.79
1356-IN	1983	Upper Indravati Hydro Power	-	170.0	148.38
2278-IN	1983	Upper Indravati Hydro Power	156.4	-	156.01
1369-IN	1983	Calcutta Urban Development III	-	147.0	132.10
1383-IN	1983	Maharashtra Water Utilization	-	32.0	26.95
2308-IN	1983	Maharashtra Water Utilization	22.7	-	22.64
2283-IN	1983	Central Power Transmission	250.7	-	250.07
2295-IN	1983	Himalayan Watershed Management	46.2	-	45.89
2329-IN	1983	Madhya Pradesh Urban	24.1	-	24.04
1397-IN	1984	Orissa Irrigation II	-	105.0	33.20
1424-IN	1984	Rainfed Areas Watershed Dev.	-	31.0	25.37
1426-IN	1984	Population III	-	70.0	66.23
1432-IN	1984	Karnataka Social Forestry	-	27.0	25.57
2387-IN	1984	Nhava Sheva Port	250.0	-	249.38
2393-IN	1984	Dudhichua Coal	151.0	-	150.62
2403-IN	1984	Cambay Basin Petroleum	242.5	-	241.90
2415-IN	1984	Madhya Pradesh Fertilizer	203.6	-	203.09
1483-IN	1984	Upper Ganga Irrigation	-	125.0	117.38
1496-IN	1984	Gujarat Medium Irrigation	-	172.0	164.14
2417-IN	1984	Railways Electrification*	280.7	-	280.70
2442-IN	1984	Farakka II Thermal Power*	300.8	-	300.80
Total			6,526.3	12,268.3	
of which has been repaid			1,350.8	173.0	
Total now outstanding			5,175.5	12,095.3	
Amount Sold					133.8
of which has been repaid					133.8
Total now held by Bank and IDA 3/			5,175.5	12,095.3	
Total undisbursed (excluding *)			2,712.69	3,494.35	

1/ IDA Credit amounts for SDR-denominated Credits are expressed in terms of their US dollar equivalents, as established at the time of Credit negotiations and as subsequently presented to the Board.

2/ Undisbursed amounts for SDR-denominated IDA Credits are derived from cumulative disbursements converted to their US dollar equivalents at the SDR/US dollar exchange rate in effect on September 30, 1984.

3/ Prior to exchange adjustment.

* Not yet effective.

B. STATEMENT OF IFC INVESTMENTS
(As of September 30, 1984)

<u>Fiscal</u> <u>Year</u>	<u>Company</u>	<u>Amount (US\$ million)</u>		
		<u>Loan</u>	<u>Equity</u>	<u>Total</u>
1959	Republic Forge Company Ltd.	1.5	-	1.5
1959	Kirloskar Oil Engines Ltd.	0.8	-	0.8
1960	Assam Sillimanite Ltd.	1.4	-	1.4
1961	K.S.B. Pumps Ltd.	0.2	-	0.2
1963-66	Precision Bearings India Ltd.	0.6	0.4	1.0
1964	Fort Gloster Industries Ltd.	0.8	0.4	1.2
1964-75-79	Mahindra UGINE Steel Co. Ltd.	11.8	1.3	13.1
1964	Lakshmi Machine Works Ltd.	1.0	0.3	1.3
1967	Jayshree Chemicals Ltd.	1.1	0.1	1.2
1967	Indian Explosives Ltd.	8.6	2.9	11.5
1969-70	Zuari Agro-Chemicals Ltd.	15.1	3.8	18.9
1976	Escorts Limited	6.6	-	6.6
1978	Housing Development Finance Corporation	4.0	1.2	5.2
1980	Deepak Fertilizer and Petrochemicals Corporation Ltd.	7.5	1.2	8.7
1981	Coromandel Fertilizers Limited	15.9	-	15.9
1981	Tata Iron and Steel Company Ltd.	38.0	-	38.0
1981	Mahindra, Mahindra Limited	15.0	-	15.0
1981	Nagarjuna Coated Tubes Ltd.	2.9	0.3	3.2
1981	Nagarjuna Signode Limited	2.3	-	2.3
1981	Nagarjuna Steels Limited	1.5	0.2	1.7
1982	Ashok Leyland Limited	28.0	-	28.0
1982	The Bombay Dyeing and Manufacturing Co. Ltd.	18.8	-	18.8
1982	Bharat Forge Company Ltd.	15.5	-	15.5
1982	The Indian Rayon Corp. Ltd.	8.1	-	8.1
1984	The Gwalior Rayon Silk Manufacturing (Weaving) Co. Ltd.	3.7	-	3.7
	TOTAL GROSS COMMITMENTS	210.7	12.1	222.8
	Less: Sold	53.0	3.4	56.4
	Repaid	34.0	-	34.0
	Cancelled	33.0	1.4	34.4
	Now Held	90.7	7.3	98.0
		=====	=====	=====
	Undisbursed	44.1	-	44.1
		=====	=====	=====

INDIA

NARMADA RIVER BASIN (GUJARAT)

SARDAR SAROVAR DAM AND POWER PROJECT

SUPPLEMENTARY PROJECT DATA SHEET

Section I: Timetable of Key Events

(a) Time taken by the country to prepare the project

About four years.

(b) The agency which has prepared the project

The Governments of Gujarat with consultant and Bank staff assistance.

(c) Date of first presentation to the Bank Group and date of first mission to consider the project

August/December 1980.

(d) Date of departure of appraisal missions

March, June, September 1983 and August 1984.

(e) Date of completion of negotiations

February 1, 1985

(f) Planned date of effectiveness

June 30, 1985

Section II: Special Conditions

(a) GOG to establish and maintain a Dam Safety Panel throughout project implementation (para 49);

(b) GOI and participating States to maintain key interest agencies during project implementation (para 50);

(c) GOG to establish a project O&M organization by December 31, 1988 (para 55);

- (d) GOI, GOMP and GOM to implement a Plan satisfactory to Bank Group for the rehabilitation and resettlement of oustees (para 57);
- (e) GOG, GOMP and GOM to implement environmental work plans covering fisheries, forests, wild life or public health (para 58);
- (f) GOG, GOMP and GOM would, six months prior to the commissioning of the first turbine generator, enter into bulk supply contracts with electric utility organizations. Sales prices are to recover investment and full O&M costs, and provide a satisfactory internal rate of return to investment (para 70).

BANK GROUP LENDING IN THE POWER SECTOR

1. Since 1954, the Bank Group has made 16 loans to India for power projects amounting to US\$1,525 million and 16 credits totalling US\$2,266 million. Of these amounts, US\$2,600.8 million is for generating plant; US\$23 million for construction equipment for the Beas Hydroelectric Project; US\$630.7 million for the provision of high-voltage transmission; and US\$536.5 million for the support of rural electrification schemes. Sixteen projects have been completed; ten for generating plant, the Beas Project, four for power transmission, and the First Rural Electrification Project. The First Singrauli (Credit 685-IN of April 1977), Third Trombay (loan 1549-IN of June 1978), and Second Rural Electrification (Credit 911-IN of June 1979) Projects are scheduled to be completed this year. The First Korba (Credit 793-IN of May 1978) and First Ramagundam (Credit 874-IN and Loan 1648-IN of February 1979) Thermal Power Projects are in an advanced stage of implementation. The loan for the Third Rural Electrification Project (Loan 2165-IN) was approved in June 1982. The loan for the Central Power Transmission Project (Loan 2283-IN), and the loan and credit for the Upper Indravati Hydro Project (Loan 2278-IN and Credit 1356-IN), were approved in May 1983. The loan and Special Fund credit for the Boddghat Hydroelectric Project and a loan for the Fourth Trombay Thermal Power Project were approved in May and June 1984, respectively. The Singrauli and Korba projects are on schedule, but some delays have occurred in the Third Rural Electrification Project. The first five units of the Singrauli project and the first two units of the Korba project were commissioned on schedule. The Farakka and Ramagundam projects are proceeding satisfactorily, the first unit at Ramagundam having been commissioned four months ahead of schedule. Unit 5 at Trombay (the Third Trombay Project) was synchronized in January 1984, about a year behind schedule.

2. A project performance audit was conducted in 1980 for the Second Power Transmission Project (Credit 242-IN). The project was considered to have been successful in assisting the nine beneficiary SEBs in extending their transmission systems to help meet their growing power requirements. Utilization of generating capacity in these SEBs exceeded the appraisal forecast. Upgrading the financial management practices of the SEBs, which commenced under this project, is continuing under subsequent projects. The audit highlighted the difficulties of adequately supervising this project, which consisted of many widely-scattered sub-projects, and of effecting institutional improvements in the absence of a close working relationship between the Bank Group and the beneficiary SEBs. With the assumption of increased responsibilities by the CEA, which have resulted in greater involvement in SEB operations and project preparation, a considerably more effective relationship with the SEBs is envisaged.

Bank Group Strategy in the Power Sector

3. The objectives of the Bank Group's assistance strategy in the sector have evolved from a continuing dialogue with the Government concerning the policies and programs required to deal with the complex

problems confronting the Indian electricity supply industry. They are aimed at supporting the efforts of the Indian authorities to:

- (a) eliminate power shortages through the expansion of generating and transmission capacity, and measures to improve operation and maintenance of existing plant;
- (b) introduce long-range system planning, on a nationwide basis, to assure implementation of least-cost power development;
- (c) assist in institution-building by promoting improvements in sector organization and training; and
- (d) strengthen the financial management of the institutions in the sector, particularly the SEBs.

4. In line with these objectives, the Bank Group has emphasized the need for the Government to pursue a program of improvements in five high priority areas: (a) the performance of thermal power plants; (b) coordination of power development with the development of other sectors; (c) hydroelectric power development; (d) the role of the Central sector in the development of power generation and transmission; and (e) the financial objectives and practices of SEBs. The recommendations of GOI's Committee on Power, established in 1978 to review all aspects of the power sector and, as contained in the comprehensive program prepared by GOI in 1982 for the implementation of power sector improvements, reflected the priorities emphasized by the Bank.

5. Satisfactory progress has been made in each of the five areas, as the following examples illustrate. To improve operational efficiency in thermal plants, teams of specialists, including representatives from CEA, SEBs and manufacturers, were established by the Department of Power to visit all power plants with 100/120 MW and 200/210 MW thermal generating units in the country to diagnose technical and operational problems, propose solutions and assign responsibilities for their implementation. Based upon their investigations, a detailed program has been developed which includes for each power plant, remedial measures and their relevant costs and time-frames for implementation, as well as the expected consequent improvement in plant performance. GOI is expected to present to the Bank in the near future a proposed thermal power plant rehabilitation project for Bank Group financing. A pilot program for thermal plant rehabilitation in the State of Madhya Pradesh has already been included as a component in a recently-approved hydropower project. In late 1982, CEA completed its national long-term power development plan, responding to the Bank's emphasis on the need for a nationwide long-range plan for power development in India. The plan forecasts growth in power demand and corresponding capacity expansion and equipment requirements to meet this demand through the year 2000, according to alternative scenarios based upon projections of India's growth and performance. The plan also provides least-cost generation expansion programs and is now being used as the basis for preparation of both five-year plans and annual investment programs for the power sector. The first Bank Group-supported hydroelectric project in India (Upper Indravati) was approved in 1983, a second (Bodhghat) was approved recently and a number of other projects are in advanced stages of preparation. GOI, through NTPC, now has under construction and partly in operation about 10,000 MW of power generating capacity, which includes, as well as the four large thermal plants at Singrauli, Korba, Ramagundam and Farakka being financed by the Bank Group,

two large thermal plants (Rihand and Vindhyachal) begun by NTPF in 1982. The first Central Power Transmission Project, approved in 1983, is designed to reinforce the Centrally-owned power transmission grid, and provide the first stage of integration of the Northern, Western and Southern Regional grids. The establishment of the REBs, NTPC and NHPC have been important steps towards an improved organizational structure of the power sector. NTPC has decentralized its operations on a regional basis to provide more local and effective monitoring, control and operation of its power generation and transmission facilities. Finally, legislation for amendment of the financial provisions of the Electricity (Supply) Act, 1948, to enable the SEBs to operate along commercial lines was recently enacted by GOI; a uniform system of commercial accounting for the SEBs is under development; and new financial performance criteria for the SEBs have been introduced.

SEBs Financial Structure

6. Historically, SEBs have secured their investment funds principally through borrowings from State Governments, resulting in heavy debt/equity ratios in the SEBs' capital structures. This applies to all SEBs in India. With respect to the three participating SEBs, their debt/equity ratios in FY83 were 97:3, 98:2 and 95:5 for MEB, MPEB, and GEB, respectively. The amendments to the Electricity Supply Act of 1979 permitted State governments to convert their SEB loans into equity or to make equity contributions to SEB investments. However, it will take time for the SEBs and State governments to agree on a common approach and on realistic action plans to restructure the capital of each SEB. The Bank has entered into a dialogue with GOI on how this is to be achieved. The ultimate objective would be to achieve debt/equity ratios of about 60:40.

Revaluation of Fixed Assets

7. Indian accounting practice uses historical prices to reflect the asset base and cost structure of Government-owned entities to assess their financial performance of Government-owned entities. Although the financial performance of SEBs is now measured by the proportion of investments financed by internal cash generation, it is necessary to test the adequacy of the level of cash generation by calculating the rate of return on the entities' revalued assets. Under the Second Farakka Thermal Project, the adequacy of National Thermal Power Corporation's financial performance will be measured on the basis of the proforma revaluation of its assets. The Bank has suggested various methodologies for revaluing SEBs fixed assets with the concerned authorities within GOI. On reaching agreement with Central Government authorities, programs for introducing revised practices on asset revaluation in each SEB will be drawn up.

BANK GROUP LENDING FOR IRRIGATION AND EXTENSION IN GUJARAT

1. The Bank Group has assisted Gujarat to finance a number of projects for irrigation development. The first Credit (Cr. 13-IN, 1961, US\$4.5 million) financed construction of Shetrunji's canal system. The project failed to achieve its agricultural objectives because of inadequate agricultural supporting services and lagging construction of field channels and drains. The lessons learned were taken into account in preparation of the Kadana Irrigation Project (Cr. 176-IN, 1970, US\$35 million), which emphasized on-farm development and the agricultural support program. Due to extreme floods and other construction problems, the project was completed two years behind schedule. However, the project area now is one of the most prosperous and productive areas in Gujarat.

2. Three IDA assisted projects presently are under implementation in the State: the Gujarat Irrigation Project (Cr. 808-IN, 1978, US\$85 million), the Gujarat Irrigation II Project (Cr. 1011-IN, 1980, US\$175 million) and the Gujarat Medium II Irrigation Project (Cr. 1429, 1984, US\$172 million). The three credits are financing nearly all Gujarat's annual irrigation investments. The projects include operational improvements and modernization of existing irrigation systems, construction of new schemes, small scale watershed development, reclamation of saline coastal lands and establishment of a water management training institute. New planning procedures and improved standards for design and construction of irrigation projects have been introduced. Initial project implementation suffered from weak management and lower than expected quality of design and construction, partly due to the complex and innovative nature of many components. However, implementation performance is gradually improving and the two credits are expected to strengthen the capacity of the Irrigation Department in Gujarat to design, construct and operate projects which can deliver timely and reliable water supply.

3. Credit No. 808-IN was a first time-slice operation to support medium irrigation projects (MIPs) which individually are too small to justify Bank participation. The time-slice was to finance: (i) construction of new MIPs; (ii) modernization of existing schemes; (iii) a network of automatic discharge measuring stations; and (iv) establishment of a Water and Land Management Institute (WALMI). The distribution system was to be designed for rotational water supply (RWS) and to be lined to the 8 ha outlet. Individual MIPs were to be appraised by an Appraisal Committee (AC) especially established for this purpose in the Central Water Commission. The AC was authorized to approve MIPs meeting the technical criteria, costing less than Rs 70 million and having a benefit/cost ratio higher than 1.0. All others were to be approved by IDA.

4. In 1978 the US Government approved US\$30 million of USAID funds for the medium irrigation project. Accordingly, the project scope was extended to cover an accelerated MIP program. The actual cost of most MIPs have proved to be higher than estimates due to: (i) a revision of hydrology and dam design; (ii) an increase in the cost of cement; and (iii) a higher than estimated cost of lining. By mid-March 1984, IDA

disbursements amounted to US\$79 million (about 93% of the credit) and GOG expected to complete by the end of March 1984 works to fully utilize both IDA and USAID funds.

5. Twenty-nine MIPs have been cleared by the AC. In most of the MIPs work concentrated on headworks. Consequently, secondary canals in some of the MIPs, and works on the minor distribution system in most of them are lagging behind schedule. Construction of the dams in some MIPs was delayed because the flood hydrology had to be revised following an unprecedented cyclonic storm in 1979 in the Sahrashtra region. This has delayed completion of many of the dams by about a year. During the first two to three years of project implementation, the most serious constraint was shortage of staff, which was substantially resolved at the beginning of 1982 through recruitment of new staff. Technical standards which were initially inadequate have also improved considerably following Bank intervention and training courses at WALMI. Quality control and construction standards were also improved after the issuance of new standards by GOG. The project has suffered from poor management. A study aimed at improving planning through the use of small computers has been undertaken by the Operations Research Group (a consultancy group). The network of automatic discharge measuring stations has been completed.

6. Overall, the project achieved most of its objectives. The Bank assisted with the design of the minor system through establishment of pilot water management areas and training courses for design engineers were conducted. In addition, GOG has initiated pilot RWS activities with assistance from the Water Management Team at the Bank's New Delhi Office. A WALMI has been established in temporary buildings and a permanent campus is being constructed near the Agricultural University at Anand. Sub-projects were appraised in accordance with Bank guidelines. The MIPs started under the project cover a total area of 213,300 ha of cultivable command area, and in 72,800 ha, over 50% of the distribution system was completed, which compares favorably with the appraisal target of 63,000 ha. Modernization works have been completed over about 22,000 ha, and similar works at various stages of completion are underway in another area of about 140,000 ha, which also compares favorably with the appraisal estimate of 55,000 ha. Finally, the water management studies conducted under the project resulted in development of detailed design and operation criteria which have been incorporated in Phase II.

7. The Gujarat II Irrigation Project (Credit 1011-IN) was the most complex irrigation project in India until the preparation of the Narmada Basin investments. It was a sector lending operation. Project components included: protection and reclamation of saline coastal lands, operational improvements and modernization of existing irrigation systems, and construction of new irrigation systems. Institution building to improve the ability of the State engineers in the project design and implementation was a major Bank objective under the project.

8. The complex and innovative nature of the project led to some delays during the start-up period. The project suffered from overall weak management and implementation planning exacerbated by procurement problems

and some indecision on project scope. The quality of canal network construction was initially disappointing due to poor training and inexperience of Irrigation Department staff responsible for the work.

9. While the project remains behind schedule, there has been a considerable acceleration in progress since early 1982 as a result of improved staffing of the Irrigation Department and more concentrated Bank supervision. Progress is expected to continue to improve in the future as most of the project management problems have been resolved. The Government of Gujarat has established a Water and Land Management Institute in the Irrigation Department which has improved GOG's project implementation capabilities and improved construction standards of the minor irrigation network. GOG has also established a central cell for project monitoring and is developing an improved management information system, both of which will further enhance project implementation.

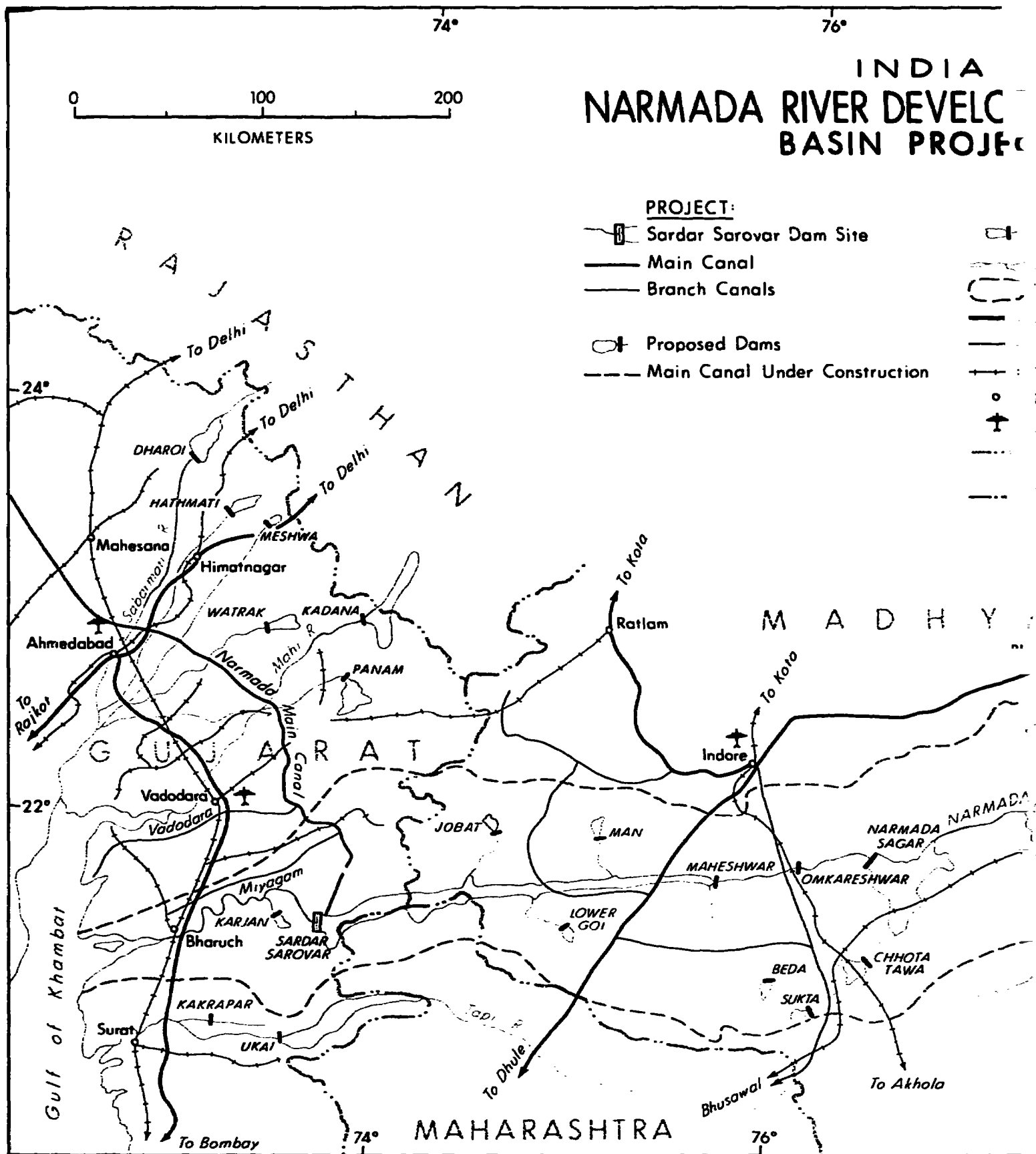
Agricultural Extension and Research in Gujarat

10. The IDA assisted "Training and Visit" (T&V) system of agricultural extension was introduced in Gujarat in 1979 under the Composite Agricultural Extension Project (Credit 862-IN). Under this project, regular demonstrations and up-to-date advice on farming practices were provided to the farmers through regular visits from trained village extension workers (VEWs). The T&V system seeks to reorganize extension staff to work exclusively on extension in a single line of command under the district agricultural officer or the Department of Agriculture and provides for facilities and equipment to support extension and training programs. It also provides for increased staff and adequate field coverage aiming at one VEW serving a group of about 500-800 farm families. The progress with the extension project has generally been satisfactory. Thus, extension in the project area is adequate to support the Sardar Sarovar and the Water Delivery Projects. Furthermore, a second phase extension project in Gujarat which aims at further broadening and deepening agricultural extension activities is at an advanced stage of preparation.

11. The Gujarat Agricultural University (GAU) is responsible for all agricultural research activities through its four campuses at Anand, Dantiwada, Junagadh, and Navsari, representing four broad agro-climatic zones of the State. Research facilities of GAU have been strengthened under the National Agricultural Research Project (Credit 855-IN). GAU maintains 13 research stations specializing in different crops. Their work involves, among others, selection and testing of superior varieties, improved cultural practices, and plant protection. Each campus conducts locality-specific research to meet the needs of the farmers in the area and coordinates the research activities of these stations. Research findings are tested through a network of 38 sub-stations throughout the State before dissemination to the farmers. Technical breakthroughs achieved by GAU in pearl millet, cotton, and castor, in particular, have helped to improve the productivity of these crops in the State and other parts of the country. GAU has released 77 improved varieties of different crops having better yield potential, and quality characteristics.

Procurement Arrangements

Item	Procurement Method			Total Cost
	ICB	LC3	Other	
	(US\$ M)			
1. Works				
Main dam	425.00			425.00
Instruments, furnish & install in dam		1.00		1.00
Irrigation by-pass tunnel	10.00			10.00
Pumps, furnish & install		.06		.06
Elevators, fabricate & install		.20		.20
Gates, other than crest	10.00			10.00
Crest gates	12.00			12.00
Penstocks, furnish & install		1.70		1.70
Riverbed powerhouse, tunnelling	41.50			41.50
Hydrometereological network		1.50		1.50
Sub-total	498.50	4.46		502.96
2. Goods				
Instruments, hydro-meteorological network	15.45			15.45
Steel for penstocks	3.90			3.90
Sub-total	19.35			19.35
3. Training & Technical Assistance			3.43	3.43
Total	517.85	4.46	3.43	525.74
Percentage of Total (Rounded)	98.0	less than 1.0	less than 1.0	100.00

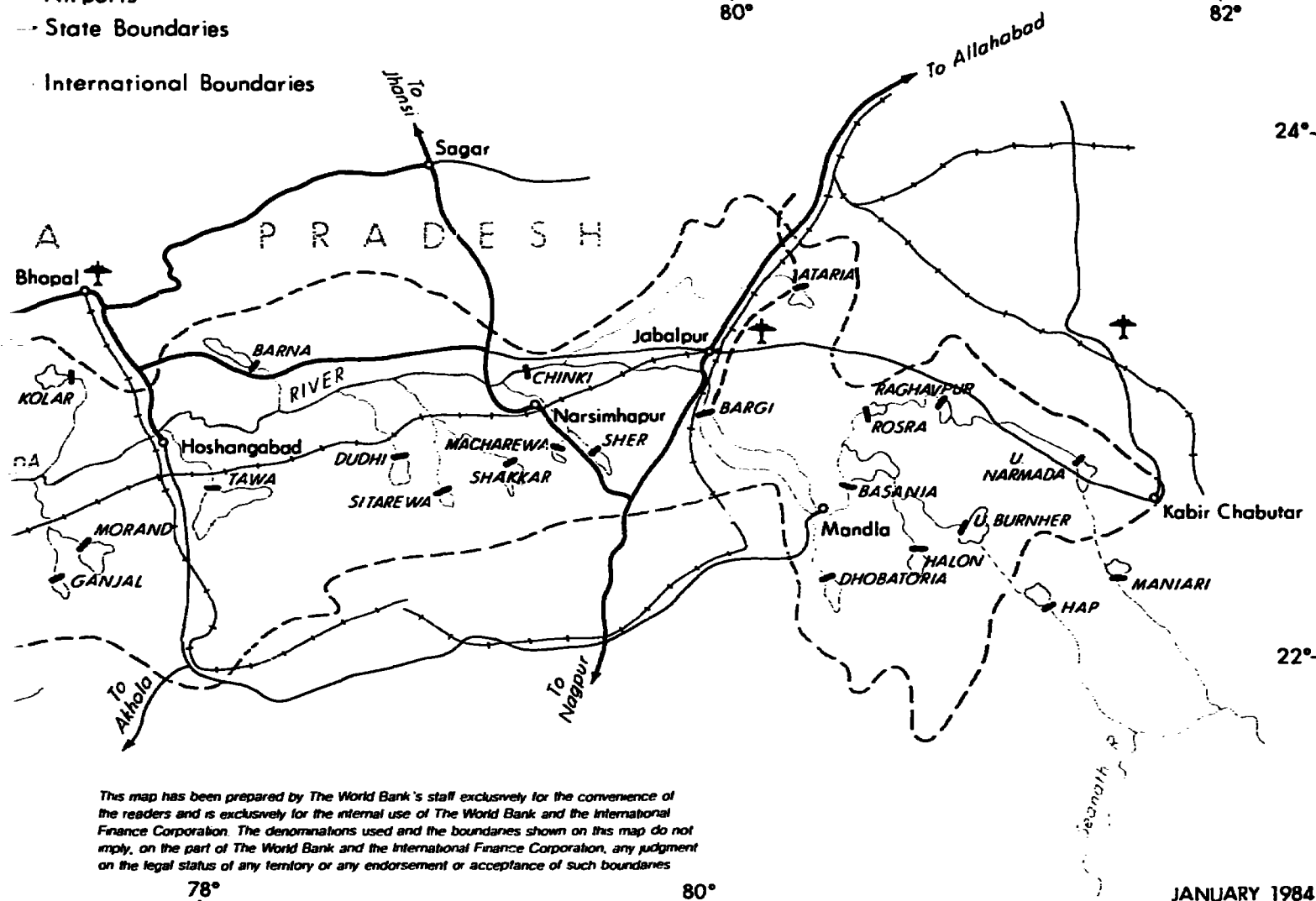
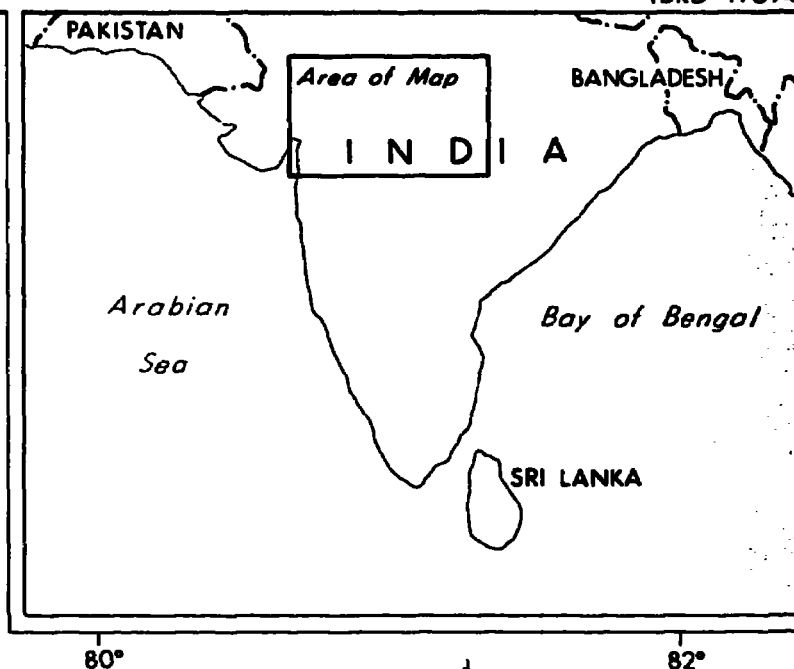


78°

PROJECT - GUJARAT CIRCUITS

EXISTING:

- Dams
- Rivers and Streams
- Basin Boundary
- National Highways
- State Highways
- Railroads
- Principal Cities
- Airports
- State Boundaries
- International Boundaries



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78°

80°

JANUARY 1984

