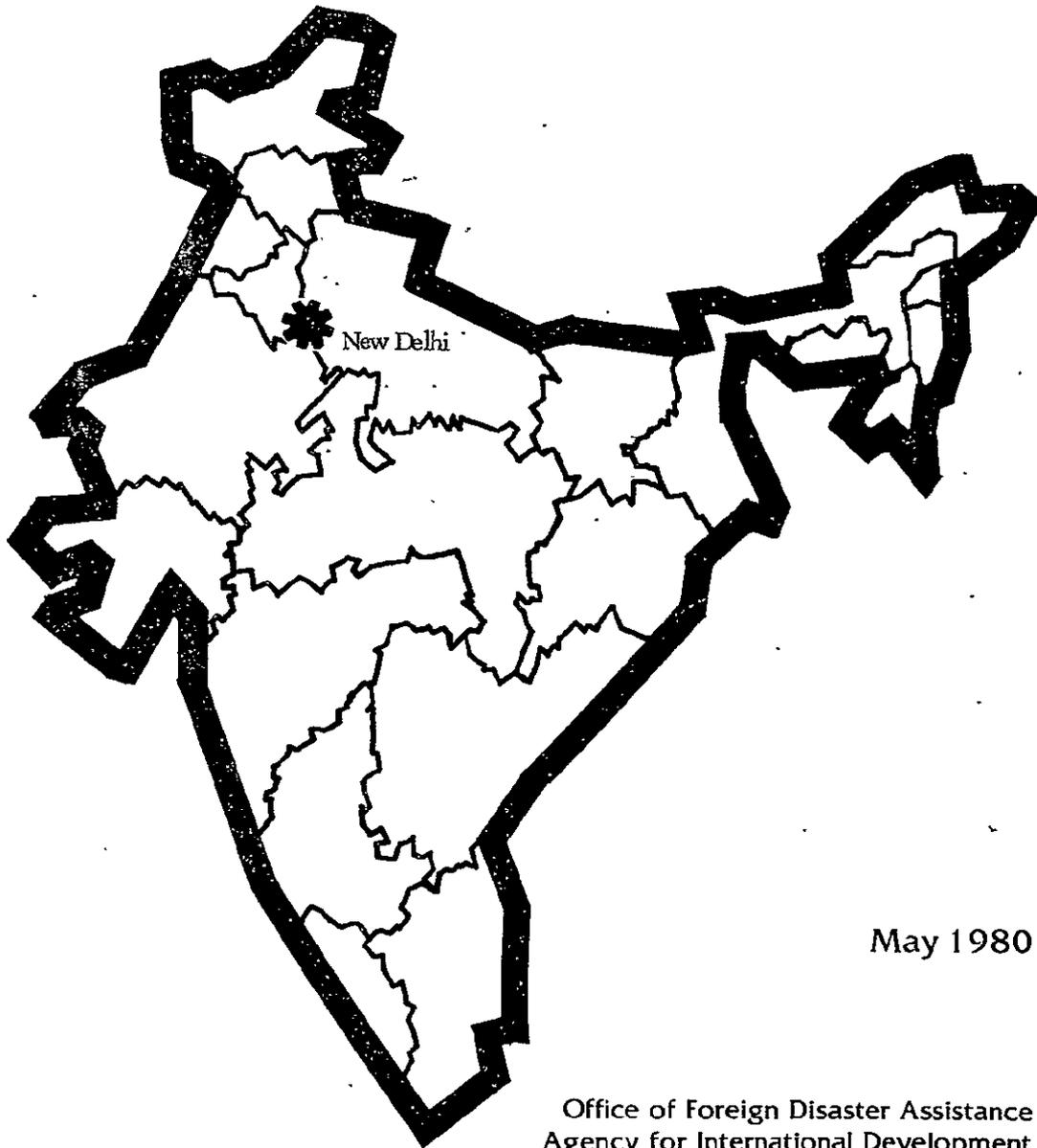


India

A Country Profile



May 1980

Office of Foreign Disaster Assistance
Agency for International Development
Washington, D.C. 20523

INDIA: A COUNTRY PROFILE

prepared for

The Office of U. S. Foreign Disaster Assistance
Bureau for Private and Development Cooperation
Agency for International Development
Department of State
Washington, D. C. 20523

by

Evaluation Technologies, Inc.
Arlington, Virginia
under contract AID/SOD/PDC-C-0283

The profile on India is one in a series designed to provide baseline country data in support of the planning, analysis and relief operations of the Office of U. S. Foreign Disaster Assistance (OFDA). Content, scope and sources have evolved over the course of the last three years, and no doubt will continue to do so. The relatively narrow focus is intentional. To avoid redundancy, some topics one might expect to find in a "country profile" are not covered here.

If the information provided can also be useful to others in the disaster assistance and development communities, so much the better. Every effort is made to obtain current, reliable data; unfortunately it is not possible to issue updates as fast as changes would warrant. A cautionary note, therefore, to the reader: statistics are indicators at best, and if names and numbers matter, the bibliography will point to a current source.

We invite your comments and corrections. Address these and other queries to OFDA, AID, as given above.

May 1980

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NEAR EAST

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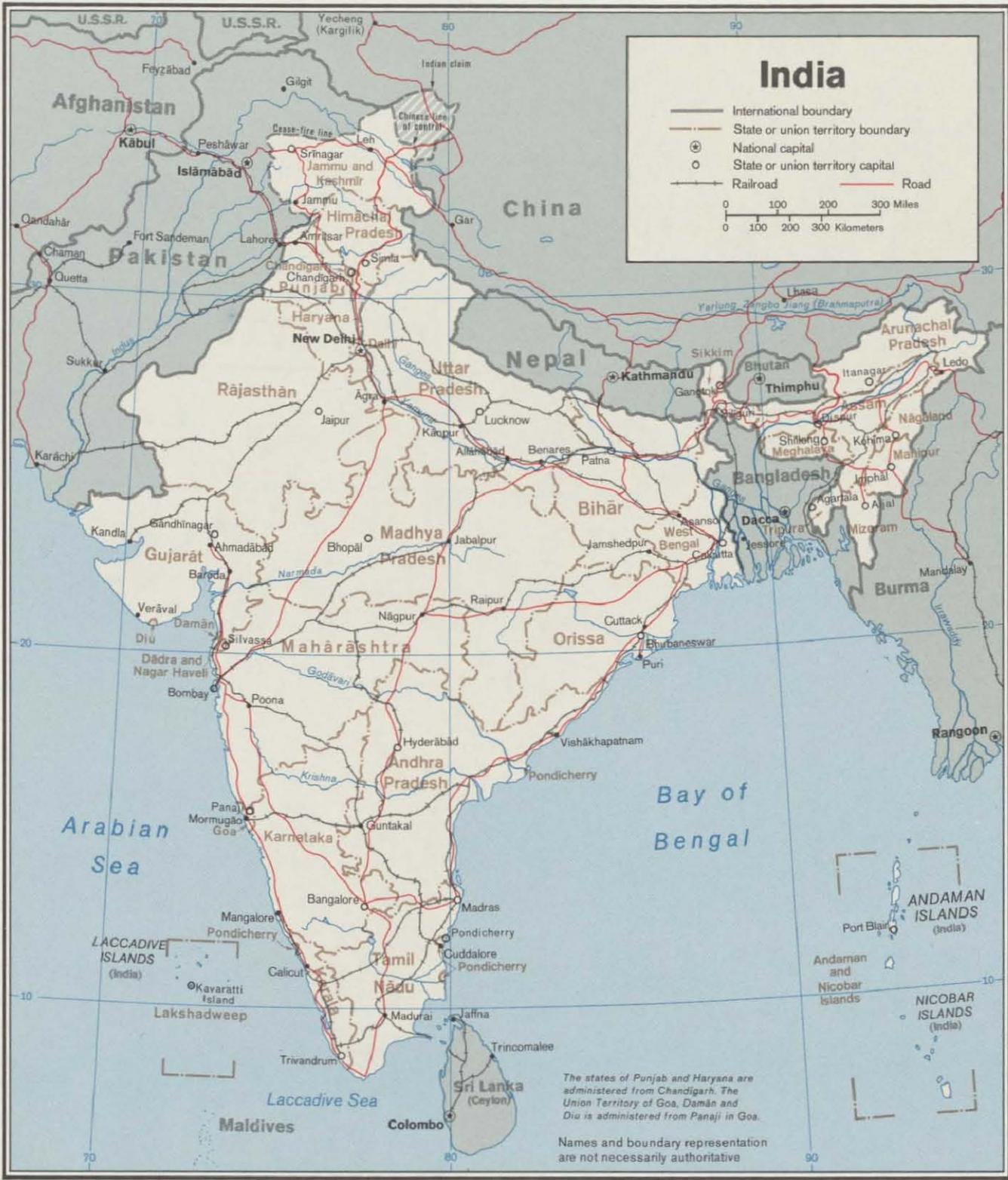
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Fiji
Tonga
Western Samoa

INDIAN OCEAN

Island Countries of the
Indian Ocean

* in preparation



TO:

COUNTRY PROFILE USER Dear _____

Please use this form to note any changes, additions, corrections or suggestions you think would update and improve this country profile. Since our aim is to make these profiles as relevant as possible, your critique is essential and very much wanted. Return comments to Lucy Drobot, OFDA Country Profiles, Room 1262A.

NAME/OFFICE: _____ PHONE: _____ Date: _____

TOPIC

COMMENTS

TOPIC	COMMENTS

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1. General Information1.1 Geographic Codes

AID	386
State region	NEA
FIPS	IN

1.2 Country Names

Legal	Republic of India, Bharat Varsha
Local	India, Hindustan
Short	India

1.3 Calendar and Holidays

Republic Day	January 26
Independence Day	August 15
Gandhi Jayanti	October 2
Christmas Day	December 25
Good Friday	Mar-Apr
Holi	Mar-Apr
Ram Navami	Apr-May
Buddha Purnima	May-Jun
Janam Ashtami	Jul-Aug
Dassehra	Sep-Oct
Diwali	Oct-Nov
Guru Nanak's Birth	Oct-Nov

* Muharram	October 31, 1979
* Id-ul-Fitr	August 14, 1980
* Id-ul-Zuha	November 30, 1979

* Muslim holidays occur approximately 10 days earlier each year.

1.4 Currency (August 1979)

Unit of currency:	rupee
Floating rate:	Rs. 7.55 = US\$ 1.00

1.5 Time Zones

EST + 10.5 hours; GMT + 5.5 hours

1.6 US Mission and Staff (May 1980)

Embassy of the United States
Shanti Path, Chanakyapuri 21,
New Delhi, India
Tel: 690351

Ambassador.....Robert F. Goheen
Deputy Chief of Mission.....Archer K. Blood
Economic/Commercial Section.....Martin G. Heflin
Commercial Officer.....Edward W. M. Bryant
Political Officer.....Herbert Levin
Labor Officer.....John P. Becker
Consular.....Ann Campbell
Administrative Section.....Richard W. Smith
Regional Services Officer.....Nicholas Mariano
Scientific Attache.....Thomas Vrebalovich
Agricultural Officer.....W. Garth Thorburn
Agency for International Development.....Patricia Boughton
Public Affairs Officer.....Jay W. Gildner

Bombay - Lincoln House, 78 Bhulabhai Desai Rd.
Consulate: Bombay, India Tel: 363611/8

Consular General.....William F. Courtney
Political/Economic Officer.....Edward B. Rosenthal
Economic/Commercial Officer.....Monroe E. Aderhold
Administrative Officer.....Francis E. Matthews
Agricultural Officer.....John H. Davenport
Branch Public Affairs Officer.....Edgar E. Noel

Calcutta - 5/1 Ho Chi Minh Sarani
Consulate: Calcutta, India Tel: 443611/6

Consular General.....Raymond L. Perkins, Jr.
Economic/Commercial Officer.....Peter J. Lydon
Administrative Officer.....Thomas F. Calhoun
Branch Public Affairs Officer.....Mary F. Cowan

Madras - Mount Rd.- 6
 Consulate: Madras, India Tel: 83041

Consular General.....Douglas M. Cochran
 Political/Economic Officer.....James D. O'Shaughnessy
 Administrative Officer.....Arthur P. Strellick
 Branch Public Affairs Officer.....Christopher Sholes

1.7 Sister Cities

Ahmadabad	Warren, MI
Bombay	Los Angeles, CA & Honolulu, HI
Mercara	Darien, CT
Salem	Salem, OR
Simla	Carbondale, IL

1.8 Host Country Mission and Staff in US (February 1980)

Embassy of India
 2107 Massachusetts Avenue, N.W.
 Washington, D. C. 20008
 Tel: 202/265-5050

Ambassador.....Vacant
 Minister (Deputy Chief of Mission).....Ashok B. Gokhale
 Counselor (Consular).....R. S. Nathan
 First Secretary (Administration).....Atish Sinha
 Minister (Commerce and Supply).....R. K. Jerath
 Military and Naval Attache.....Brigadier R. N. Mahajan
 Air Attache.....Air Commodore P.K. Dey

Consulates General: In California, District of Columbia, Illinois,
 Louisiana, Massachusetts, New York, Ohio, and
 Washington.

1.9 Treaties and Agreements

Agricultural commodities agreements with exchange of notes. 1960, 1962, 1963, 1964; amendments, 1960, 1961, 1962, 1963, 1964.

Agricultural commodities agreements with annex 1967, related agreements - 1967, 1968, 1969, 1970, 1971.

Agreements regarding consolidation and rescheduling of payments under PL-480 Title I agricultural commodities agreements, with annexes. 1973.

Agricultural commodities agreements, 1975.

Agreement relating to transit privileges for military aircraft, 1949. Amendments, 1955, 1963.

Agreement amending above, 1964.

Military sales agreements 1951, 1958, 1962, 1965.

General agreement for technical cooperation, 1950. Related agreements, 1952, extension, 1957.

Agreements regarding debts owed US Government, 1973, 1974, 1975.

Agreement on PL-480 and other funds, 1974.

Agreement for termination of agreement of January 2 and 6, 1958 (TIAS 3994) concerning development of transportation facilities, 1963.

Indian Ocean expedition agreement, 1962.

Agreement on use of US aircraft to collect meteorological data for Indian Ocean expedition, 1963.

Investment guaranties agreement, 1957, and amendments, 1959, 1966.

Peace Corps agreement, 1962.

Agreement for duty-free entry of voluntary agency supplies and equipment, 1967.

Agreement relating to reciprocal authorization to permit licensed amateur radio operators to operate stations in the other country, 1966.

1.10 International Organization Memberships

Member of: ADB, AIOEC, Colombo Plan, Commonwealth, FAO, G-77, GATT, IAEA, IBRD, ICAC, ICAO, ICO, IDA, IFC, IHO, ILO, International Lead and Zinc Study Group, IMCO, IMF, IPU, ITC, ITU, IWC-International Wheat Council, NAM, U.N., UNESCO, UPU, WHO, WIPO, WMO, WSG, WTO.

1.11 Travel and Visa Information

Transit visa, valid 14 days, .25. Entry visa, valid 3 mos., 1 entry, \$1.80. Tourist visa, valid 3 mos. from date of entry into India, 3 entries within 6 mos. of issue, \$1.80. 2 photos required. For stay over 30 days, check local registration authorities on arrival. Check automobile regulations before arrival. Airport fee/tax charged on departure. Apply Embassy, Wash., DC 20009; or Consulate General, New York 10621; Chicago 60601; or San Francisco 94105; check specific requirements.

Cholera immunization and smallpox vaccination required when leaving for countries which impose quarantine restrictions for arrivals from India. Yellow fever immunization required for arrivals from infected areas.

1.12 Ethnic and Sociocultural Groups

Two major ethno-linguistic groups: Indo-Aryan speakers in northern 3/5ths of country, 73% of population; and Dravidian speakers in the southern 2/5ths, 24.5% of population. Tribal peoples, concentrated in hill areas and in the northeast may speak an Austro-Asiatic or Sino-Tibetan language or one belonging to a majority language group. 1971 census classified 38 million people as tribal, but social and racial distinctions between tribal and caste societies not necessarily clear-cut. Parsis (1-200,000), Jews (18,500), and Anglo-Indians (including Goanese) are small but well-defined minorities.

Racial elements blurred: generally Caucasoid types predominate in north and northwest, Mongoloid in northeast and Dravidian or Australoid in south and in isolated tribal groups.

Along with language and religion, the caste system defines social groups for both Hindus and Muslims. Ideally, it divides society into four categories (varnas): Brahmins (priests, scholars), Kshatriyas (warriors, rulers), Vaishyas (traders, moneylenders), and Sudras (artisans). Outside, and inferior to the varnas, are untouchables. The first three varnas (the twice-born, who have greater ritual purity and often higher status) comprise 20% of the population, the Sudras 60%; more twice-born castes in north than in south. On the local level caste is expressed in terms of jatis, local hereditary endogamous kin-based groups whose members share ritual, social, economic and political roles. Functionally, caste (jati) is a local phenomenon; its role in a modernizing, urbanizing society is often diminished and/or transformed.

1.13 Languages

Constitution recognizes Hindi, English as national languages. Regional languages recognized are: (Indo-Aryan) Hindi, Oriya, Gujarati, Marathi, Bengali, Assamese, Punjabi, Urdu, Kashmiri, Sindhi; (Dravidian) Tamil, Kannada, Telugu, Malayalam.

Hindi spoken by about 30% of population; dialects are numerous and often not mutually intelligible; vary with caste and religion as well as locality. Efforts to phase out English as national language and substitute Hindi have provoked riots in the south and forced delays in process.

1.14 Religions

Hinduism (84% of population) and Islam (11.2%) are major religions. Christians (2.6%), Sikhs (1.9%), Jains (0.7%), Buddhists (0.7%) are important minorities. Zoroastrians (Parsis), Jews, various tribal religions also present. Minority religions, including Islam, tend to concentrate in certain geographic locations, are often limited to particular social groups.

<u>Religion</u>	<u>Area</u>	<u>% of Population</u>
Muslim	Jammu & Kashmir	65%
	Assam	24%
	West Bengal	20%
	Kerala	20%
Sikh	Punjab	60%
	Jammu & Kashmir	7%
Buddhist	Maharashtra	6%
Christian	Mizoram	86%
	Nagaland	67%
	Meghalaya	47%
	Goa	31%
	Manipur	27%
	Kerala	21%

1.15 Education and Literacy

Great strides in education since Independence: in 1951 only 19.2% of primary age children enrolled in school. Adult literacy rate (1977): 36%.

Percent Enrollment in 1975/76

	<u>Boys</u>	<u>Girls</u>	<u>Total</u>
Primary level (6-11 years)	99.0	67.6	83.9
Middle level (11-14 years)	48.9	24.1	36.9
Secondary level (14-17 years)	31.5	13.0	22.4

Source: World Bank, Economic Situation and Prospects of India, 1979.

2. Government

2.1 National Government

1950 constitution provides for a parliamentary, republican, and federal system. Prime Minister is Chief of Government, President Chief of State. (In practice, President's powers are titular, real executive power vested in Prime Minister and Cabinet.) Parliament divided into upper and lower houses: Rajya Sabha (Council of States), members elected by State legislatures for 6-yr terms; and Lok Sabha (House of the People) elected for 5-yr terms by direct universal suffrage. Independent judiciary headed by Supreme Court with broad powers of judicial review.

Until 1977 three Congress Party Prime Ministers dominated independent India: Jawaharlal Nehru (1947-64), Lal Bahadur Shastri (1964-66) and Indira Gandhi (1964-77). In July 1975 Mrs. Gandhi, under political and legal attack, declared a state of emergency, suspended press freedom, imprisoned many opposition leaders, and imposed authoritarian rule. Elections in 1977, intended to legitimize the emergency, instead resulted in Mrs. Gandhi's overwhelming defeat. However, the succeeding coalition government, headed by Morarji Desai, unable to govern effectively and was dissolved in 1979.

2.2 Current Status (April 1980)

Elections in January 1980 returned Mrs. Gandhi to power, reflecting both inability of her opponents to unite and her own stature as the only national political figure of acknowledged competence. Elections also revealed near total breakdown of party politics and the dominance, even at the national level, of personal rivalries and alliances.

2.3 Regional Organization

9 union territories administered by central union government, 22 states with parliamentary governments headed by governors, appointed by president. Governor selects Chief Minister, whose position is analogous to Prime Minister's; Governors act as agents of central government; must approve bills passed by state legislatures before they become laws.

Districts are principal subdivisions of states. District collector (appointed civil servant) is state's agent for non-technical land matters, revenue collection, maintenance of law and order; coordinates central and state policy within district. Local urban government: large cities - corporations, smaller cities - municipal committees or boards. Rural government by Panchayati Raj system (panchayat = village council) being developed in effort to decentralized district system, improve local participation in government. Virtually all rural areas now covered by panchayats; panchayat samitis (development block level coordinating bodies); zila parishads (district level advisory bodies).

A bureaucracy consisting of the all-India services, Union public services, and State public services train and provide administrators for the various public services, at union, state, and district levels.

2.4 Major Government Figures (July 1980)

President.....	Reddy, Neelam Sanjiva
Vice President.....	Hidayatullah, Mohammad
Prime Minister.....	Gandhi, Indira, Mrs.
Min. of Agriculture.....	Singh, Rao Birendra
Min. of Atomic Energy.....	Gandhi, Indira, Mrs.
Min. of Chemicals & Fertilizer.....	Patil, Veerendra
Min. of Coal.....	Choudhury, Abdul Barkat Ataul Ghani Khan
Min. of Commerce, Civil Supplies & Cooperation.....	Mukharjee, Pranab Kumar
Min. of Communications.....	Stephen, C.M.
Min. of Defense.....	Gandhi, Indira, Mrs.
Min. of Education.....	Shankaranand, B.
Min. of Electronics.....	Vacant
Min. of Energy.....	Choudhury, Abdul Barkat Ataul Ghani Khan
Min. of External Affairs.....	Rao, P.V. Narasimha
Min. of Finance.....	Venkataraman, Ramaswamy Iyer
Min. of Health & Family Welfare.....	Shankaranand, B.
Min. of Home Affairs.....	Singh, Giani Zail
Min. of Industry.....	Venkataraman, Ramaswamy Iyer
Min. of Information & Broadcasting.....	Sathe, Vasant Puroshottam
Min. of Irrigation.....	Pandey, Kedar
Min. of Labor.....	Patnaik, Janaki Ballav
Min. of Law, Justice & Company Affairs.....	Shankar, Shiv Narain
Min. of Parliamentary Affairs.....	Singh, Bnisma Narain

Min. of Petroleum.....	Patil, Veerendra
Min. of Planning.....	Tiwari, Narain Dutt
Min. of Railways.....	Tripathi, Kamalapati
Min. of Science & Technology.....	Ghandi, Indira, Mrs.
Min. of Shipping and Transport.....	Sharma, Anant Prasad
Min. of Social Welfare.....	Shankaranand, B.
Min. of Space.....	Gandhi, Indira, Mrs.
Min. of Steel & Mines.....	Mukherjee, Pranab Kumar
Min. of Supply & Rehabilitation.....	Sathe, Vasant Puroshottam
Min. of Tourism & Civil Aviation.....	Patnaik, Janaki Ballav
Min. of Works & Housing.....	Sethi, Prakash Chand

3. Disaster Preparedness

3.1 Host Country Disaster Plan

No national disaster planning. Under Indian federal system, disaster management is responsibility of state governments. Central government disaster involvement headed by Relief Commissioner (in 1979 Additional Secretary, Ministry of Agriculture); central responsibilities include research, surveys, guidelines, and provision of financial assistance to states. In time of disaster multidisciplinary central government team, at invitation of state, visits same, assesses damage, and makes recommendations for assistance. Army, police, and public services assistance also available.

Role of central government in disaster assistance under review in wake of recent recommendations that its responsibilities be expanded. In mid-1979 Ministry of Agriculture circulated model action plans for disaster (monsoon, flooding) preparedness to states. Plans provide checklist of action points at state, district, and subdivisional levels; suggest central authority for disaster management at state level, assisted by coordinating committee from various departments; recommend that all flood-prone areas be identified and steps taken to assure that they can be reached by telephone or wireless in case of flood; and that relief articles and essential medicines be stored and inventories verified.

State of Tamil Nadu has been particularly active in disaster planning in the wake of November 1977 cyclone. Components include: definition of high risk areas and highly vulnerable development schemes, planning measures, action plan, and training programs.

3.2 US Plan

No detailed US plan. In general, AID Handbook 8, "Foreign Disaster Assistance," which outlines policy, authority requirements, and guidelines for emergency assistance in the event of disaster in area, to be followed. Contact to be established with GOI Relief Commissioner as well as voluntary and international agencies.

3.3 Major Voluntary Agencies

CARE/India - Allan Turnbull, Country Director
 B-28, Greater Kailash I
 New Delhi 100 048
 Tel: 697583 & 694821

Catholic Relief Services - Donald J. Crosson, Dir. of India Program
 CRS India Headquarters
 2 Community Center, East of Kailash
 New Delhi 110 024

Indian Red Cross Society
 1 Red Cross Road
 New Delhi 110 001

Lutheran World Relief - Maj. J.K. Michael, Exec. Director
 CASA
 2, Rajendra Place, Rusa Road
 New Delhi 110 003

3.4 American-based Voluntary Agencies

<u>Agency</u>	<u>Personnel</u> <u>Int'l/Local</u>	<u>Programs</u>
AFL-CIO Asian-Amer. Free Labor Inst.		Ind Dev
Agriculture Missions Foundation	1/50	CD; Food Prod & Ag; Med. & PH; Nutr; Women; Youth
American Baptist Churches	27/812	CD; Ed; Med & PH; Pop & Fam Serv
American Council of the Ramabai Mukti Mission	9/42	Comm; Ed; Food Prod & Ag Med & PH; SW; Women
American Jewish Joint Distribution Committee		Ed; Med & PH; SW; Youth
American Leprosy Mission	1/	Med & PH
American Lutheran Church	3/	CD; Ed; Med & PH; SW

<u>Agency</u>	<u>Personnel Int'l/Local</u>	<u>Programs</u>
American ORT Federation	26/	Ed
American Red Cross		Equip & Mat Aid
American Women's Hospital Service	/4	Med & PH; Women
AMG International	/100	Ed; Med & PH; SW; Youth
Assemblies of God	90/	Ed; Food Prod & Ag; Med & PH; SW; Women; Youth
Auroville Association	2/	CHP; Ed; Food Prod & Ag; Ind Dev; Med & PH; Nutr
Baptist World Relief		Equip & Mat Aid; Food Prod & Ag
Brethren in Christ Missions		Ed; Med & PH
CARE	12/511	CD; CHP; Ed; Food Prod & Ag; Med & PH; Nutr; Pop & Fam Serv; SW
Catholic Medical Mission Board		Food Prod & Ag; Med & PH
Catholic Relief Services - U.S.C.C.	10/143	CD; CHP; Ed; Equip & Mat Aid; Food Prod & Ag; Med & PH; Nutr; Women; Youth
Sisters of Charity of Nazareth	8/115	Ed; Med & PH; SW; Women
Christian Children's Fund	/54	Ed; SW; Youth
Christian Church (Disciples of Christ)	7/	CD; Ed; Food Prod & Ag; Med & PH
Christian Nationals' Evangelism Commission	/8	Comm; CHP; Ed; Equip & Equip & Mat Aid
Christian Reformed World Relief Committee		Med & PH; Nutr; Youth
Church of God		Ed; Food Prod & Ag; SW; Youth

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
Church of the Brethren General Board	3/	Food Prod & Ag; Med & PH Youth
Church of the United Brethren in Christ	1/1	Med & PH
Church World Service	3/83	CD; CHP; Coop; Ed; Equip & Mat Aid; Food Prod & Ag; Ind Dev; Med & PH; Nutr; SW; Youth
Churches of God, General Conference	1/14	Ed; SW
The Committee of 1000		Ed; Equip & Mat Aid; Med & PH; SW; Youth
Community Service		CD; Ed; Food Prod & Ag; Med & PH
Compassion	/10	Ed; SW; Youth
Compassion International	1/	CD; Med & PH
Conservative Baptist Foreign Mission Society		Ed; Med & PH; SW; Women; Youth
Cooperative League of the USA	5/5	Coop; Ed; Food Prod & Ag Ind. Dev
Damien-Dutton Society for Leprosy Aid		Med & PH
Taraknath Das Foundation		Ed
Darien Book Aid Plan		Ed; Equip & Mat Aid; Med & PH
Direct Relief Foundation	8/	Equip & Mat Aid; Med & PH
Society of the Divine Word	5/1,112	Comm; Ed; Food Prod & Ag Med & PH
Thomas A. Dooley Foundation/ INTERMED-USA		Med & PH

<u>Agency</u>	<u>Personnel Int'l/Local</u>	<u>Programs</u>
The Evangelical Alliance Mission	46/	Ed; Med & PH
Family Planning International Assistance/Planned Parenthood		Equip & Mat Aid; Pop & Fam Serv.
Farmers and World Affairs	/1	Ed; Food Prod & Ag
The Ford Foundation		CD; Ec & Dev Pl; Ed; Food Prod & Ag; Nutr; Pop & Fam Serv; Pub & Bus Adm
Third Order Regular of St. Francis	30/44	CHP; Ed; Food Prod & Ag; Med & PH
Free Methodist Church of North America	/2.	Ed; Med & PH; SW; Youth
General Conference Mennonite Church	8/200	Ed; Med & PH
Good Shepherd Agricultural Mission	3/22	Ed; Food Prod & Ag; Med & PH; Youth
International Christian Fellowship	13/	Med & PH
Internat'l Christian Leprosy Mission		Med & PH
Internat'l Church Relief Fund		CD; CHP; Equip & Mat Aid Med & PH
Internat'l Executive Service Corps		Pub & Bus Adm
International Missions	29/	Med & PH
International Pentecostal Church of Christ	3/2	Ed; SW; Women; Youth
International Program for Human Resource Development	/15	CD; Coop; Food Prod & Ag Ind. Dev; Youth
Helen Keller International	2/20	Med & PH; SW
Laubach Literacy International	/78	Comm; Ed; Women

<u>Agency</u>	<u>Personnel</u> <u>Int'l/Local</u>	<u>Programs</u>
Ludhiana Christian Medical College Board, USA	8/1600	Ed; Equip & Mat Aid; Med & PH; Pop & Fam Serv
Lutheran Church in America	14/	Ed; Med & PH; SW
The Lutheran Church - Missouri Synod		CHP; Ed; Equip & Mat Aid Food Prod & Ag; Med & PH Nutr; SW
Lutheran World Ministries	8/	CD; CHP; Ed; Equip Mat Aid; Food Prod & Ag; Ind Dev; Med & PH; SW; Women Youth
Lutheran World Relief	2/42	CD; CHP; Coop; Ec & Dev Pl; Ed; Equip & Mat Aid; Food Prod & Ag; Ind Dev; Med & PH; Nutr; Pop & Fam Serv; Women
MAP International	1/1	CD; Med PH; Youth
Meals for Millions Foundation		Ed; Food Prod & Ag; Ind Dev; Nutr
Medical & Surgical Relief Committee		Equip & Mat Aid; Med & PH
Medical Mission Sisters (S.C.M.M.)	23/195	Coop; Ed; Equip & Mat Aid; Food Prod & Ag; Ind Dev; Med & PH; Nutr; SW; Women; Youth
Mennonite Central Committee	8/	CD; CHP; Ed; Equip & Mat Aid; Food Prod & Ag; Ind Dev; Med & PH; Women
Mennonite Economic Development Assoc.	1/3	Coop; Food Prod & Ag; Ind Dev
MILL HILL Missionaries	22/59	CD; CHP; Coop; Ed; Food Prod & Ag; Ind Dev; Med & PH; SW; Women; Youth

Agency	Personnel Int'l/Local	Programs
Missionary Church	1/3	Ed; Food Prod & Ag; SW; Youth
Missionary Sisters, Servants of the Holy Spirit (S.Sp.S.)	1/2	Ed; Equip & Mat Aid; Med & PH; Nutr; SW; Women
National Association of Free Will Baptists	1/1	Ed
National Council of Catholic Women	1/1	Med & PH; SW; Women; Youth
National 4-H Council	1/1	Ed; Food Prod & Ag; Youth
Lds. Nihs	1/1	SW; Youth
Sisters of Notre Dame (S.N.D.)	14/469	Comm; CD; CHP; Ed; Equip & Mat Aid; Med & PH; SW; Women; Youth
Oxfam-America	1/1	CD; Med & PH; Nutr; Women; Youth
Pontifical Institute for Foreign Missions (P.I.M.E.)	2/410	Ed; Food Prod & Ag; SW; Youth
The Population Council	/1	Pop & Fam Serv
Reorganized Church of Jesus Christ of Latter Day Saints	/2	Equip & Mat Aid; Med & PH
The Rockefeller Foundation	1/1	Food Prod & Ag
Rural India Health Project	1/1	CHP; Med & PH; Pop & Fam Serv; SW; Youth
Salesians of St. John Bosco	1/1	Ed; Food Prod & Ag; Med & PH; SW; Youth
The Salvation Army	6/	Ed; Equip & Mat Aid Food Prod & Ag; Med & PH; Nutr; SW; Women; Youth

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
Save the Children Federation	1/	CD; Ed; SW; Youth
Seventh-Day Adventist World Service		Equip & Mat Aid
Share the Care International	/2	Med & PH; SW
Southern Baptist Convention	10/169	Ed; Food Prod & Ag; Med & PH; Nutr
United Church Board for World Ministries	27/	CD; Ed; Food Prod & Ag; Ind Dev; Med & PH; Nutr; Pop & Fam Serv; SW; Women; Youth
United Methodist Church		CD; Ed; Food Prod & Ag; Ind Dev; Med & PH; Nutr; Pop & Fam Serv; SW; Women
United Methodist Committee on Relief	/1	CD; CHP; Ed; Food Prod & Ag; Ind Dev; Med & PH; Nutr; Pop & Fam Serv; SW; Youth
The United Presbyterian Church/U.S.A.	51/	Ed; Med & PH; SW
United World Mission	/11	Ed; Med & PH
Vellore Christian Medical College Board	25/407	CD; Ed; Med & PH; Nutr; SW
The Wesleyan Church	2/19	Med & PH
Wheat Ridge Foundation		Ed; Med & PH; Nutr; Pop & Fam Serv
World Concern	9/	Equip & Mat Aid; Food Prod & Ag; Med & PH; Nutr
World Mission Prayer League		Med & PH

<u>Agency</u>	<u>Personnel Intl/Local</u>	<u>Programs</u>
World Neighbors	/97	CD; Coop; Ed; Food Prod & Ag; Ind Dev; Med & PH; Nutr; Pop & Fam Serv
World Presbyterian Missions	5/20	Ed; Med & PH; SW; Youth
World Rehabilitation Fund	1/2	Ed; Equip & Mat Aid; Med & PH; SW
World Relief		Ed; Equip & Mat Aid; Food Prod & Ag; SW; Youth
World Vision Relief Organization		CD; Ed; Equip & Mat Aid; Food Prod & Ag; Med & PH; Nutr; Pop & Fam Serv; Youth
YMCA		CD; Ed; Ind Dev; Med & PH; Nutr; Pop & Fam Serv; SW; Women

For further information on agencies listed see TAICH country report on India.

Key

Comm	Communications
CD	Community Development
CHP	Construction, Housing, Planning
Coop	Cooperatives, Credit Unions, Loans
Ec & Dev Pl	Economic and Development Planning
Ed	Education
Equip & Mat Aid	Equipment and Material Aid
Food Prod & Ag	Food Production and Agriculture
Ind Dev	Industrial Development
Med & PH	Medicine and Public Health
Nutr	Nutrition
Pop & Fam Serv	Population and Family Services
Pub & Bus Adm	Public and Business Administration
SW	Social Welfare
Women	Women
Youth	Youth

3.5 International Organizations

FAO - A.S. Alwan, Representative phone: 690410
55, Lodi Estate
New Delhi 110 003

UNDP - Jan Huyser, Resident Representative phone: 690410
55, Lodi Estate
New Delhi 110 003

UNICEF - David Haxton, Regional Director phone: 618371
11, Jorbagh
New Delhi 110 003

WHO - Dr. V. Gunaratne, Regional Director phone: 270181
Indraprastha Estate, Ring Road
New Delhi 110 001

WFP -
55, Lodi Estate
New Delhi 110 003

3.6 Disaster Types and History

A disaster - flood, drought, or storm - strikes in some part of India virtually every year. Most recent major disaster have been a major drought in north India, particularly Bihar, in 1967; cyclones in Tamil Nadu, Andhra Pradesh and Kerala in 1977; major drought in north India in 1979.

North Indian plain and Himalayas are also vulnerable to earthquakes, though none has occurred in recent years.

Summary Disaster History

<u>Disaster</u>	<u>Location</u>	<u>Strike Date</u>	<u>Number Killed</u>	<u>Number Victims</u>	<u>\$DMG (000)</u>
Flood	Andhra Pradesh	9/29/64	36	18,400	\$500
Flood & Famine	Mysore	8/00/64	0	166,000	0
Drought	Rajasthan	7/00/64	0	3,000,000	0
Cyclone	Rameswaram	12/00/64			
Flood	Manipur & Assam	8/00/66	47	900,047	1,400
Smallpox	Nationwide	1/00/67	3,029	13,576	0
Storm	Madras State	11/03/66	18	150,018	4,200

<u>Disaster</u>	<u>Location</u>	<u>Strike Date</u>	<u>Number Killed</u>	<u>Number Victims</u>	<u>\$DMG (000)</u>
Drought	Nationwide except S	/67	1,500,000	100,000,000	100,000
E'quake	Maharashtra	12/11/67	177	264,000	400
Floods	North & Central	9/05/67	300	1,000,000	
Cyclone	Bay of Bengal	11/11/67	23	300	
Flood	Rajasthan & Gujarat	7/09/69	1,129	6,300,000	40,000
Flood	NE,W Bengal, Assam	10/07/68	3,763	1,200,000	54,200
Windstorm	Andra Pradesh	5/17/69	849	260,000	8,330
Cyclone	Guntur, Krishna, Godav	5/17/69	608		
Cyclone	Godavari, Krishna, Viz		250		
	Kannaman	7/22/69	15	92	
	Bay of Bengal	11/11/69	23	30	
Floods	Uttar Pradesh	7/20/70	112	6,000,000	
Floods	NE, Ganges R System	7/20/70	515	10,000,000	101,200
Floods		71	195		
Displaced					
Persons	NE, W Bengal	3/25/71	5,560	10,000,000	
Cyclone	Orissa State	10/29/71	9,658	4,900,000	30,000
Floods	Uttar Pradesh	9/09/71	300	35,000	
Coldwave	Uttar Pradesh, Bihar	1/05/73	115		
Drought	Central India	72	0	200,000,000	100,000
Windstorm	Srinagar, Kashmir	10/21/72	50	75	
Coldwave	Bihar, Delhi	12/23/73	146		
E'quake	Himachal Pradesh	1/19/75	0	0	
Cyclone	West Bengal State	8/15/74	20	4,000	
Flood	NW, Bihar	7/00/75	350	27,000,000	227,397
Mine Expl	Dhanbad, Bihar	12/27/75	372	0	
Storm	Eastern India	8/00/75	450		200,000
Monsoons	Bulandshar, U.P.	9/00/75	30	0	
Storm	Gujarat	10/22/75	21	0	
Flood	Ganges System	8/06/77	0	0	
3 Cyclone	Tamil, Kerala, Andra	11/12/77	11,161	7,100,000	368,648
Floods	Northern Regions	9/00/78	965	29,269,000	108,700

4. Population

4.1 National Demographic Characteristics

World's second most populous country. 1971 census gives total as 548 million, 25% increase since 1961. Figures officially conceded to be low by 1.7%; unofficial estimates as high as 3%. Population growth rate officially put at 2.2% per annum, unofficial estimates as high as 2.5%. World Bank (moderate) projections for 1981 and 2001 are 677 and 886 million, respectively.

Male/female ratio (1971) reported as 1000/930. Trend, unusual by international standards, has increased since turn of century; little doubt that main cause is high female mortality due to both neglect of female children and high maternal mortality. Preponderance of men in cities. (Bombay and Calcutta both had fewer than 650 women/1000 men).

Already young age distribution continues to become younger. Dependency ratio 1.1.

Selected Demographic Characteristics by States for 1971

State/Union Territory	Area (000' sq.km)	Population		Population per sq.km	% of Urban to Total
		1971	3/79 est.		
Andhra Pradesh	276.8	43.43	49.74	157	19.3
Assam	78.5	14.63	18.55	186	8.8
Bihar	173.9	56.35	64.16	324	10.0
Gujarat	196.0	26.70	32.00	136	28.1
Haryana	44.2	10.04	11.74	227	17.7
Himachal Pradesh	55.7	3.46	3.77	62	7.0
Jammu & Kashmir	222.2	4.62	5.38	21	18.6
Karnataka	191.8	29.30	33.96	153	24.3
Kerala	38.9	21.35	25.06	549	16.2
Madhya Pradesh	442.8	41.65	49.93	94	16.3
Maharashtra	307.8	50.41	59.17	164	31.2
Manipur	22.4	1.07	1.25	48	13.1
Meghalaya	22.5	1.01	1.18	45	14.5
Nagaland	16.5	0.52	0.58	31	9.9
Orissa	155.8	21.94	25.68	141	8.4
Punjab	50.4	13.55	15.68	269	23.7
Rajasthan	342.2	25.76	30.53	75	17.6
Sikkim	7.3	0.21	n.a.	29	9.5
Tamil Nadu	130.1	41.20	47.12	317	30.2

State/Union Territory	Area (000' sq.km)	Population		Population per sq.km	% of Urban to Total
		1971	3/79 est.		
Tripura	10.5	1.56	1.81	149	10.4
Uttar Pradesh	294.4	88.34	99.32	300	14.0
West Bengal	87.9	44.31	52.80	504	24.7
A & N Islands	8.3	0.12	0.13	14	22.6
Arunachal Pradesh	83.6	0.47	0.55	6	3.6
Chandigarh	0.1	0.26	0.30	2,257	90.7
Dadra&Nagar Haveli	0.5	0.07	0.09	151	n.a.
Delhi	1.5	4.07	5.60	2,738	89.7
Goa, Daman & Diu	3.8	0.86	1.00	225	26.5
Lakshadweep	0.03	0.03	0.04	994	n.a.
Mizoram	0.5	0.33	n.a.	983	41.9
Pondicherry	21.1	0.47	0.55	16	11.4
All-India	3,287.8	548.2	640.8 ^{a/}	177	19.9

a/ Revised estimate is 643.29 for which State-wise estimates are not available.

Source: Office of the Registrar-General of India.

<u>Age Group</u>	<u>% of Population (1971)</u>
under 5 years	14.9
5-14 years	25.5
15-19 years	10.5
20-39 years	28.5
40-59 years	15.3
60 years and over	5.3

Source: 1971 Census; see also section 5.2 (National Vital Statistics)

4.2 Regional Distribution

Population density greatest in Indo-Gangetic plain, southeastern and southwestern coastal plains and drainage areas of peninsular rivers. (Some of these among most densely populated agricultural regions in world.) Mountain areas (north, north-east along Burmese border, central India) and Rajasthan desert sparsely populated.

4.3 Urban Centers

20% of population urban in 1971; increased from 11% in 1901 to 18% in 1961; only 4% live in 10 largest cities. Increase in urban population slow despite overall population increase, and despite heavy urban migration trends elsewhere in Asia and Africa.

Cities over 400,000 Population in 1971

Agra (UP)	637,785	Jaipur (Raj)	613,144
Ahmadabad (Guj)	1,588,378	Jamshedpur (Bih)	465,200
Allahabad (UP)	513,997	Kanpur (UP)	1,273,016
Amritsar (Pun)	432,663	Lucknow (UP)	826,246
Baroda (Guj)	467,422	Ludhiana (Pun)	401,124
Bombay (Mah)	5,968,546	Madras (TN)	2,470,288
Calcutta (WB)	7,005,362	Madurai (TN)	548,298
Cochin (Ker)	438,420	Nagpur (Mah)	866,144
Delhi	3,629,842	Patna (Bih)	490,265
Dhanbad (Bih)	433,085	Poona (Mah)	853,226
Gwalior (MP)	406,755	Srinagar (J&K)	403,612
Hyderabad (AP)	1,798,910	Surat (Guj)	471,815
Indore (MP)	572,622	Trivandrum (Ker)	409,761
Jabalpur (MP)	533,751	Varanasi (UP)	582,915

Source: 1971 Census.

5. Health, Nutrition, and Housing

5.1 Overall Health and Nutrition Status

Accurate statistics on incidence of disease lacking. Following are known to be serious health problems.

Malnutrition - highly correlated with income. Some 40% of pre-school children in middle and low income groups exhibit some clinical sign of malnutrition. Primary effects in adults and children are increased susceptibility to disease and decreased activity levels.

Vitamin and other deficiencies - vitamin B deficiency appears in rice-eating areas; vitamin C, and iron deficiencies associated with lack of fruits and vegetables in diet; vitamin D and calcium deficiencies common among slum women and children; goiter common in sub-Himalayan belt. Hookworm infestation, serious in South India, Bengal, and Assamese plantations, aggravated by nutrient deficiencies.

Malaria - formerly endemic and epidemic everywhere below 5000 ft.; massive spraying program almost eliminated problem by late '60's but premature curtailment resulted in resurgence; some 6.4 million cases in 1976. Government again funding large-scale program.

Smallpox - India declared free of smallpox by WHO in 1977.

Leprosy - 3.2 million cases, 20% infectious, in 1976.

Cholera - endemic, particularly in south and east coast.

Filariasis - 14 million manifest cases in 1976; prevalent in humid, high rainfall areas.

Tuberculosis - endemic among children and adults; 9 million active cases of which 2.2 million infectious in 1976; mortality as high as one half million annually.

High infant mortality - due to combination of malnutrition and gastrointestinal infection. Problem rooted in both poverty and food habits, especially infant weaning practices.

Many rural health problems caused and/or worsened by lack of protected drinking water supply in most Indian villages.

5.2 National Vital Statistics

Crude birth rate (1977)-	35.0 per 1000
Crude death rate (1977)-	14.0 per 1000
Infant mortality (1973)-	139.0 per 1000
Life expectancy	
Male (1976-81) -	52.6 years
Female (1976/81) -	51.6 years

Source: World Bank, Economic Situation and Prospects of India, 1979; (Infant mortality figure cited in World Bank, India: Occasional Papers, 1978.)

5.3 Health Services and Facilities

Central government determines broad health policy, provides financing and technical assistance to states which implement programs. National programs and facilities for malaria, VD, trachoma, filariasis, leprosy, TB, and goiter. Rural health network built around district hospital, primary health centers (approx. one per development block), and subcenters.

16,320 hospitals and inpatient care centers (1975); 313,800 hospital beds (1975); 1231 persons per hospital bed (1977); 5,372 primary health centers (1977); 37,745 subcenters (1977); 10,272 dispensaries (1975).

Outpatient facilities in 1974 included 51,112 maternal and child health service units, 489 dental clinics, 608 tuberculosis clinics, 189 venereal disease clinics, 278 leprosy control units, 2240 leprosy survey, education, and treatment clinics. Also 216 public health laboratories.

Family planning program still recovering from reaction to compulsory sterilization program of 1976-77. Government supports voluntary program; number of acceptors again rising, currently at early '70's levels. Goal of reducing birth rate to 30 per thousand by 1983 unlikely to be achieved. Substantial progress dependent upon availability of rural health care.

5.4 Health Personnel

No longer a shortage of doctors, although concentrated in urban areas, where most in private practice. Rural network staffed by government personnel. Nurses and auxiliary personnel in short supply. Western medicine called allopathic; other systems include ayurvedic (Hindu), unani (Muslim), homeopathic. Traditional practitioners widely used, especially in rural areas.

209,333 registered active doctors (1976); patients per doctor 3,135 (1977); 98,403 nurses (1974); 100,554 midwives (1974); 5,561 health visitors (1974); 39,798 auxiliary nurse-midwives (1974); 52,200 pharmacists (1974); 5,825 dentists (1974).

Ratios of Doctors and Hospital Beds to Population - 1977

<u>State/Union Territory</u>	<u>Population Per</u>	
	<u>Doctor</u>	<u>Hospital Bed</u>
Andhra Pradesh	2,789	1,477 (a)
Assam (e)	2,502 (a)	2,593
Bihar	4,666	2,510 (c)
Gujarat	2,628	1,378
Haryana	5,776 (b)	1,375
Himachal Pradesh	6,988 (b)	785
Jammu & Kashmir	3,709 (b)	1,000
Karnataka	4,869 (d)	1,057 (a)
Kerala	2,656	445 (b)
Madhya Pradesh	6,825	2,536 (a)
Maharashtra	1,785 (a)	792 (a)
Manipur	3,800	974
Meghalaya	8,333 (a)	833 (a)
Nagaland	3,764 (a)	492
Orissa	3,678	2,094
Punjab	2,024	1,150
Rajasthan	4,362	1,518
Sikkim	4,558	610 (a)
Tamil Nadu	3,408 (a)	975 (b)
Tripura	7,192	1,315
Uttar Pradesh	5,084 (a)	1,897
West Bengal	1,732 (a)	958 (a)

<u>State/Union Territory</u>	<u>Population Per</u>	
	<u>Doctor</u>	<u>Hospital Bed</u>
Andaman & Nicobar Islands	2,321	239
Arunachal Pradesh	3,333	418
Chandigarh	810	259
Dadra & Nagar Haveli	7,000	1,750
Delhi	1,400 (b)	415
Goa, Daman & Diu	1,790 (a)	404 (a)
Lakshadweep	2,000	300
Pondicherry	2,683	383
All-India	3,135	1,231

(a) Relates to 1976; (b) relates to 1975; (c) relates to 1974; (d) relates to 1972; (e) Includes Mizoram.

Source: Ministry of Health and Family Welfare, Pocket Book of Health Statistics of India, 1978.

5.5. Diet Summary:

Staple grains - millets, sorghum, maize (dry areas) for poor; wheat (whole wheat flour baked into flat unleavened bread) in north; rice (polished) in south and east if affordable.

Fats - vegetable oils, shortening; clarified butter (ghi).

Vegetables - lentils, chick peas, onions, potatoes, okra, beans, egg-plant, tomatoes, greens, chilis.

Fruits - bananas, papayas, mangos, oranges, apples, pineapples.

Meat and fish - mutton, chicken, fish in coastal areas.

Milk products - yogurt, cheese from buffalo, cow and goat milk.

Beverages - milk, buttermilk, tea with milk and sugar, coffee (south).

Other - eggs, unrefined sugar.

Prohibitions - Hindus do not eat beef nor Muslims pork. Many high-caste Hindus vegetarian, particularly in west and south. Bengali vegetarians eat fish; consumption of eggs by vegetarians now more common with commercial availability of nonfertile eggs.

Food preparation/acceptance behavior traditionally regulated by caste and extremely complex; however taboos tend to break down in towns and cities.

Local diets quite limited; villagers frequent reluctant to consume unfamiliar foods. Beliefs about "heating" and "cooling" foods common, e.g. fruit, milk products cooling, therefore should not be eaten in cold weather.

No special protein problem; diets sufficient in calories almost always protein sufficient as well.

5.6 Utensils

Cookers - open fires inside or out; clay or metal braziers.

Fuels - dried cowdung, wood (increasingly scarce), charcoal, kerosene.

Containers - all sizes; pottery, plastic, metal.

Cutlery - most foods eaten with fingers, flat breads used to scoop up other foods; large leaves used as plates.

5.7 Housing and Settlement Types

Rural housing varies with climate, building materials. In hills, houses usually of wood; elsewhere stone, mud, straw. In south, bamboo and other plant material used.

Distinction made between pakka (permanent) housing made of mortared brick or stone; and kaccha (impermanent) housing based on mud and thatch. Most villagers can afford only kaccha housing with mud floors, cowdung smoothed over exterior walls and floor. No sanitary facilities; water drawn from wells. Kaccha housing extremely vulnerable to storm/flood damage, but cheap to replace and perhaps less likely to result in injury to occupants if it collapses.

Government has devoted much effort to improving quality and quantity of rural housing, but severe shortages of both rural and urban housing persist. 1971 census reported 82.5 million usable housing units (66.4 million rural, 16.1 million urban); housing deficit in 1974 estimated at 15.6 million units.

More than 550,000 villages in country. In north, village houses built in compact mass for protection and this pattern has persisted. In south, houses spread further apart, often separated by coconut or fruit trees. Residential patterns in villages determined by caste.

6 Economy

6.1 Overview of Economy

Mixed economy. Central (union) government owns or controls most of country's infrastructure and strategic resources. State enterprises divided between union and state governments. Licensing, price controls, taxation, and right of nationalization insure government influence over private sector.

Resource base - no unused cultivable land; good irrigation and some hydroelectric potential. Inadequate petroleum, copper, lead, zinc, silver; coal, iron relatively abundant. Surplus of trained manpower, technical and other; under and unemployment pervasive. Major industrial and manufacturing capacity. However, India remains predominantly agricultural country, 80% rural, most too poor to be consumers in modern economy.

Industrial production centered in nine states, which together account for 90% of industrial output: Maharashtra, West Bengal, Tamil Nadu, Gujarat, Uttar Pradesh, Bihar, Andhra Pradesh, Karnataka, and Madhya Pradesh. Of the ten dominant industrial groups, largest is textiles (about 10% of plants). Other major industries are jute, sugar, paper and paper-board, photo paper and films, iron and steel, engineering and machine tools, drugs and pharmaceuticals, and petrochemicals.

Despite growth in the large industrial sector, village and small industries continue to play an important role. About 20 million engaged in these industries, of whom 9 million in handloom industries. Under Sixth Plan (1979-1984), as under earlier plans, strong emphasis placed on small-scale industrial sector, particularly as a means of creating jobs.

Industrial situation considerably improved in recent years as a result of good crops, increased foreign remittances and improved foreign exchange position. Industrial production jumped by 9.5% in 1976/77, fell back to 3.9% in 1977/78, then revived to 8-10% in 1978/79.

Balance of payments: export earnings disappointing, rose only 8% in 1978/79 after 22% increase previous year; import bill increased more than 16%. But as result of continuing invisible and aid receipts, balance of payments again in surplus despite trade deficit.

Problems: continuing dependence of whole economy on agriculture; continuing failure of government-run industries to operate at or near capacity, resulting in shortages of power, steel, transportation, fertilizers, etc. Current sixth five-year plan (1979-84) commits resources for power generation, irrigation, cement, fertilizer, coal production; also

was to reduce poverty and unemployment. However, binding constraint appears to be program development and effective implementation rather than financial resources.

See also section 7.1, Overview of Agriculture.

6.2 Key Indicators

GNP (1977): \$97,370 million

Per capita GNP (1977): \$150

Growth Rates and Distribution of GDP

	average annual growth (%)		distribution of GDP (%)	
	1960-70	1970-77	1960	1977
GDP	3.6	3.0	-	-
Agriculture	1.9	4.1	50	37
Industry	5.5	2.6	20	25
(Manufacturing)	4.8	4.1	14	16
Services	5.2	-	30	38

Income Distribution

% of Private Income Received by (1964-65)

highest 5% of households	25.0
highest 20% of households	53.1
lowest 20% of households	4.7
lowest 40% of households	13.1

Source: World Bank, World Development Report 1979; World Bank, Economic Situation and Prospects of India, 1979.

Balance of Payments
(at current prices - In US\$. million)

	<u>1975/76</u>	<u>1976/77</u>	<u>Profes- sional 1977/78</u>	<u>Pre- liminary Esti- mates 1978/79</u>
Merchandise Exports (f.o.b.)	4,672	5,753	6,276	6,800
Merchandise Imports (c.i.f.) (a)	-6,449	-5,928	-7,237	-8,400
<u>Trade Balance</u>	<u>-1,777</u>	<u>-175</u>	<u>-961</u>	<u>-1,600</u>
Non-Factor Services (net)	310	360	630	700 (c)
<u>Resource Balance</u>	<u>-1,467</u>	<u>185</u>	<u>-311</u>	<u>-900</u>
Investment Income (net)	-216	-180	-50	-
- Interest Paid on Foreign Loans	(-255)	(-270)	(-295)	(-340)
- Other	(39)	(90)	(245)	(340)
Current Transfers (net)	470	730	1,400	1,300 (c)
<u>Current Account Balance</u>	<u>-1,213</u>	<u>735</u>	<u>1,039</u>	<u>400</u>
Net Aid Disbursements	1,810	1,393	983	1,080
- Gross Disbursements	(2,341)	(1,953)	(1,628)	(1,805)
- Principal Repayments	(-531)	(-560)	(-645)	(-725)
Use of IMF Credit (net)	242	-337	-330	-158
Errors and Omissions	-45	-216	384	205
Use of Reserves (- = Increase)	-794	-1,575	-2,076	-1,527
<u>Capital Account Balance</u>	<u>1,213</u>	<u>-735</u>	<u>-1,039</u>	<u>-400</u>
<u>Reserve Level (end of year)</u>	<u>2,172</u>	<u>3,747</u>	<u>5,823</u>	<u>7,350</u>
No. of Months of Imports Covered by Reserves (b)	(4)	(8)	(10)	(11)

(a) From 1975/76, DGCIS import data have been adjusted to include imports of merchant ships.

(b) Calculated by comparing the level of external reserves at the end of the year with merchandise imports during the year.

(c) Non-factor services and current transfers together have been estimated as a residual in both 1977/78 and 1978/79, after allowance for a small errors and omissions item based on past trends and known book value and exchange rate adjustments.

- Sources:
1. Reserve Bank of India, India's Balance of Payments 1948/49 to 1961/62.
 2. Ministry of Commerce, Department of Commercial Intelligence and Statistics.
 3. Government of India, Economic Survey (various issues).
 4. IMF, International Financial Statistics.
 5. World Bank estimates.

6.3 Imports

As result of improvements in domestic economy and further liberalization of import policy, imports for 1977/78 up 22% over previous year.

Leading Imports (1977/78):

	<u>US\$ million</u>	<u>% of total</u>
Petroleum and products	1,816.6	25.6
Machinery	1,037.1	14.6
Edible oils	829.4	11.7
Chemicals	451.9	6.4
Diamonds (uncut)	375.3	5.3
Iron and steel	303.1	4.3
Fertilizers	301.5	4.3
Total, all imports	7,084.4	

Origin of Imports (1977-78):

	<u>% of total</u>		<u>% of total</u>
USA	12.5	USSR	7.4
W. Germany	9.2	Japan	7.1
Iran	9.1	Asia exc. Japan	7.0
U.K.	7.7	Iraq	5.5

Source: World Bank, Economic Situation and Prospects of India, 1979.

Merchandise Imports (at current prices - in US\$ million)

	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>
<u>Foodgrains</u>	<u>1,557.3</u>	<u>958.7</u>	<u>121.2</u>
Wheat	1,399.0	894.1	109.3
Rice	53.8	51.4	7.2
<u>POL</u>	<u>1,476.9</u>	<u>1,581.1</u>	<u>1,816.6</u>
Crude Petroleum	1,215.9	1,288.5	1,442.4
Petroleum Products	201.0	292.8	374.2
<u>Fertilizers (a)</u>	<u>609.5</u>	<u>214.4</u>	<u>301.5</u>
<u>Fertilizer Raw Materials (b)</u>	<u>100.7</u>	<u>97.6</u>	<u>92.6</u>
<u>Iron and Steel</u>	<u>360.4</u>	<u>245.5</u>	<u>303.1</u>

	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>
<u>Non-Ferrous Metals</u>	<u>116.0</u>	<u>175.7</u>	<u>222.9</u>
<u>Edible Oils</u>	<u>16.1</u>	<u>112.0</u>	<u>829.4</u>
Soybean Oil	2.6	57.2	229.6
Palm Oil	5.3	19.5	254.0
Rape, Colza and Mustard Oil	5.5	12.4	266.3
<u>Non-Edible Oils</u>	<u>3.5</u>	<u>20.0</u>	<u>31.5</u>
<u>Cotton (raw)</u>	<u>32.6</u>	<u>138.7</u>	<u>232.3</u>
<u>Other Fibers</u>	<u>91.8</u>	<u>80.6</u>	<u>269.1</u>
Wool	29.9	29.3	33.4
Synthetic Fibers	7.3	33.7	223.9
<u>Pulp and Paper</u>	<u>85.2</u>	<u>76.4</u>	<u>120.2</u>
<u>Chemicals</u>	<u>242.2</u>	<u>255.0</u>	<u>451.9</u>
Basic Chemicals	115.0	128.5	226.8
Others	127.2	126.5	225.1
<u>Machinery</u>	<u>898.4</u>	<u>980.9</u>	<u>1,037.1</u>
Electrical Machinery	232.0	162.6	202.5
Non-Electric Machinery	666.4	818.3	834.6
<u>Transport Equipment</u>	<u>181.6</u>	<u>191.0</u>	<u>271.0</u>
Road Vehicles	66.8	48.3	58.0
Aircraft	69.1	119.9	180.1
<u>Other Imports</u>	<u>223.7</u>	<u>258.7</u>	<u>401.7</u>
Food	75.3	90.0	129.2
Raw Materials	44.4	48.9	63.5
Manufactures	103.8	119.8	209.4
<u>Total Imports</u>	<u>6,084.3</u>	<u>5,676.0</u>	<u>7,033.1</u> ^{d/} <u>7,084.4</u>

b/ Rock phosphate, sulphur and unroasted iron pyrites, phosphoric acid and ammonia.

d/ Revised total, including revised monthly data through December 1977.

Source: Ministry of Commerce, Department of Commercial Intelligence and Statistics, Monthly Statistics of the Foreign Trade of India, Ministry of Commerce, Office of the Economic Advisor.

6.4 Exports

Industrial exports account for small share of total output; most firms oriented to domestic market. In 1977/78 non-Industrial manufactures (textiles, handicrafts, jewelry, etc.) accounted for 34.7% of total exports; agricultural products 25.8%; industrial manufactures 17.6%; raw materials 8.6%.

Leading Exports (1977/78)

	<u>US\$ Million</u>	<u>% of Total</u>
Engineering goods	720.1	11.5
Tea	648.5	10.3
Gems	637.4	10.2
Clothing	384.7	6.1
Leather and leather goods	306.8	4.9
Jute manufacturers	286.0	4.6
Iron ore	281.2	4.5
Total, all exports	6,275.5	

Destination of Exports (1977/78)

	<u>% of total</u>
USA	12.5
USSR	12.2
Asia except Japan	12.0
United Kingdom	9.7
Japan	9.4
Persian Gulf states	5.5

Source: World Bank, Economic Situation and Prospects of India, 1979.

Merchandise Exports
(at current prices - In US\$ million)

Commodity	1976/77	1977/78	Average Compound Growth Rate % per year	
			1976/77	1977/78
<u>Agricultural Products</u>	1,362.5	1,616.4	-2.2	-18.6
Tea	327.9	648.5	19.8	97.8
Oil Cakes	262.2	155.7	135.2	-40.6
Coffee	141.0	223.2	83.1	58.3
Sugar	165.7	20.2	-69.6	12.2
Spices	83.9	160.0	1.5	90.7
Fish	202.0	203.6	37.4	0.8
Cashews	118.7	174.6	6.8	47.1
Vegetable Oils ^{a/}	56.4	24.2	41.7	-57.1
Essential Oils	4.7	6.4	4.4	36.2
<u>Crude Materials</u>	637.2	538.8	-0.6	-15.4
Raw Cotton	30.2	0.8	-36.7	-97.4
Unmanufactured Tobacco	108.3	132.2	0.7	22.1
Iron Ore	266.8	281.2	8.0	5.4
Mica	19.4	20.2	14.8	4.1
Manganese	21.4	12.6	5.9	-41.1
Silver	191.1	91.8	-5.2	-52.0
<u>Manufactured Items</u>	2,848.6	3,282.5	43.0	15.2
Jute Manufactures	225.0	286.0	-22.4	27.1
Cotton Textile				
Mill-made	238.4	164.9	69.7	-30.8
Hand-loom	60.6	94.5	32.3	55.9
Coir Manufactures	26.8	27.9	21.8	4.1
Clothing	372.7	384.7	58.9	3.2
Cotton Yarn and Thread	31.5	35.3	325.7	12.1
Leather Manufactures	264.4	306.8	0.3	16.0
Gems	321.1	637.4	87.1	98.5
Other Handicrafts	100.7	238.5	57.8	26.4
Iron & Steel ^{d/}	323.0	217.6	313.5	-33.0
Engineering Goods ^{b/}	633.0	720.1	32.7	13.7
Chemicals ^{c/}	124.0	136.3	25.8	9.9
Mineral Fuels	36.9	32.5	13.8	-11.9
<u>Others</u>	904.8	837.7	40.2	-7.4
<u>Total Exports</u>		6,287.1 6,275.5 ^{d/}	23.1	9.1

- a/ Edible oils excluding yanaspati
- b/ In accordance with the classification followed by the Ministry of Commerce. In 1972 annual manufactured items formerly included under Iron & Steel were reclassified as Engineering Goods. Data from 1973/74 onwards follow the new classification and hence are not comparable with data for earlier years.
- c/ Excluding essential oils and plastics.
- d/ Revised total, including revised monthly data through December 1977.

7. Agriculture

7.1 Overview of Agriculture

Agriculture is the largest and most important sector of the economy, accounting for 37% of GDP in 1977. Subsistence of about 40% of population living in absolute rural poverty (landless laborers, tenants, etc.) tied to continued growth of agricultural production. Despite increased irrigation, vagaries of nature (especially monsoons, and flooding) continue to have major impact on production levels.

India is world's largest producer of sugar cane, peanuts, pulses, tea; leading producer of rice, wheat, sorghum, tobacco, cotton, jute, oil seeds. Climate and soil variations permit cultivation of most temperate and tropical crops somewhere in country. Plantation agriculture carried out in northeast (tea) and slopes of western Hills in Kerala and Tamil Nadu (tea, coffee, rubber).

Four distinct growing zones identified. Himalyan zone, of which only 7% cultivable, has rainfall levels from 1,000 to 2,500 mm; principal crops are wheat, maize, rice, market gardening, tea. Dry zone (Punjab, Haryana, Rajasthan, western Gujerat, southern plateau in lee of western hills) receives less than 700 mm of rain; principal crops are millets and wheat, gram maize; oil seeds and cotton also grown. Sub-humid zone, with rainfall from 700 to 1,250 mm (upper and middle Ganges plain, eastern half of the peninsula plateau) is most cropped in the country; major crops are wheat, sugar cane, rice, gram maize, millets, cotton, peanuts, oilseeds, and tobacco. Wheat is chief cereal in the upper Ganges plain, millets and wheat on the plateau, and rice in the coastal region and the middle Ganges plain. Wet zone (northeastern section of the peninsular plateau, Ganges delta, Brahmaputra Valley, west coast plain) has more than 1,250 mm rainfall; rice is dominant crop, with oilseeds, gram, millets, jute, tea, sugar cane, and spices all regionally important.

Production characterized by preponderance of food crops over non-food crops, foodgrains (including pulses) accounting for 77% of cropped area. Substantial part of agricultural production consumed or bartered locally, never reaching market economy.

India's ability to feed her growing population is due to the transformation of Indian agriculture by "Green Revolution." This began in northwest (Punjab, Haryana) in early 1960's with agricultural credit

program and electrification (facilitating tubewell irrigation). After high-yield dwarf wheat varieties introduced in late 60's impact was enormous: use of chemical fertilizer became universal, triple cropping common, and wheat acreage greatly expanded. High yielding varieties of rice adopted more slowly, but acreage under both improved wheat and rice varieties has continued to expand, now almost 70% for wheat. Cultivation of rice in northwest and wheat in eastern region, previously insignificant, now substantial.

Increased production combined with four years (1975/76 - 1978/79) of good/excellent weather, allowed India to virtually end import of foodgrains (which accounted for 25% of imports in 1975/76) and accumulate grain reserves (20 million tons at mid-1979). India a net exporter of agricultural commodities in 1976-78. But emphasis on foodgrain production has resulted in growing need to import vegetable oils, pulses, and horticultural products.

Emphasis in sixth five-year plan (1979-84) is on power and irrigation to ensure utilization of existing irrigation facilities and to exploit substantial irrigation potential. In 1977/78 about 27% of agricultural land irrigated; target for 1982/83 is 35%. Drought in 1979 underlined necessity of this approach.

Bullocks main power source for cultivators; tractors increasingly common in northwest. Buffalo major source of milk. Cattle also provide fuel, manure, hides, but little food. Substantial goat and sheep populations. Commercial poultry production continues to expand. Fishing resources extensive but underutilized.

About 20% of country forested with most forest land in public sector. Existing forests inadequate to meet domestic and industrial needs. Deforestation, especially in Himalayan hill area, a serious problem.

7.2 ProductionProduction of Principal Crops
Annual Average

<u>Commodity</u>	<u>1975/76</u>	<u>1976/77</u>	<u>1977/78</u>
<u>Foodgrains</u> (million tons)	<u>121.03</u>	<u>111.17</u>	<u>125.60</u>
A) <u>Cereals</u>	<u>107.99</u>	<u>99.81</u>	<u>113.81</u>
Rice	48.74	41.92	52.68
Wheat	28.95	29.01	31.33
Jowar	9.50	10.52	11.82
Bajra	5.74	5.85	4.71
Maize	7.26	6.36	5.95
Others	7.91	6.15	7.32
B) <u>Pulses</u> (million tons)	<u>13.04</u>	<u>11.36</u>	<u>11.80</u>
of which:			
Gram	5.88	5.42	5.45
<u>Non-Foodgrains</u>			
A) <u>Oilseeds</u> ^{a/} (million tons)	<u>9.91</u>	<u>7.83</u>	<u>8.93</u>
Groundnuts	6.75	5.26	6.07
Rapeseed & Mustard	1.94	1.55	1.62
B) <u>Sugarcane</u> (gur)	<u>14.41</u>	<u>15.85</u>	<u>18.78</u>
C) <u>Cotton</u> (million bales)	<u>5.95</u>	<u>5.84</u>	<u>7.10</u>
D) <u>Jute</u> (million bales)	<u>4.44</u>	<u>5.35</u>	<u>5.34</u>
<u>Mesta</u> (million bales)	<u>1.47</u>	<u>1.75</u>	<u>1.78</u>

a/ Five major oilseeds - groundnuts, rape & mustard, linseed, castorseed, and sesame.

Source: Ministry of Agriculture and Irrigation.

7.3 Crop Production By RegionAverage Compound Growth Rate Per Annum From 1964/65 to 1977
(% per annum)

<u>State</u>	<u>Cereals</u>	<u>Pulses</u>	<u>5 Major Oilseeds^(a)</u>	<u>Sugarcane</u>	<u>Cotton</u>
Andhra Pradesh	0.9	-0.2	0.4	1.4	3.9
Assam	1.6	0.0	3.2	1.1	-11.6
Bihar	3.0	-4.6	0.0	-2.4	
Gujarat	2.5	-1.8	0.9	2.9	3.6
Haryana	7.4	0.1	1.7	2.2	3.6
Himachal Pradesh	0.6	2.2	0.0	0.0	
Jammu & Kashmir	5.0	0.0	3.2		
Karnataka	2.9	3.9	0.1	4.0	3.4
Kerala	0.9	0.0	3.2	0.0	0.0
Madhya Pradesh	1.4	0.8	-0.1	2.2	-4.5
Maharashtra	3.7	1.2	-2.1	6.0	0.1
Orissa	0.5	2.0	5.8	2.0	
Punjab	7.8	-5.4	0.3	3.0	3.2
Rajasthan	1.6	4.5	4.1	12.6	7.3
Tamil Nadu	2.7	3.9	1.5	6.3	0.8
Uttar Pradesh	3.6	-3.2	-1.3	2.8	-5.2
West Bengal	3.1	-1.7	1.4	-0.4	
All-India	<u>3.1</u>	<u>-0.4</u>	<u>0.3</u>	<u>3.2</u>	<u>1.7</u>

(a) Groundnut, rapeseed & mustard, linseed, castorseed, and sesame.

Source: World Bank, Economic Situation and Prospects of India, 1979.

Production of Selected Crops by State
(million tons)

<u>State</u>	<u>Cereals</u>	<u>Pulses</u>	<u>5 Major Oilseeds^(a)</u>	<u>Sugarcane</u>	<u>Cotton</u>
Andhra Pradesh	8.24	0.33	1.08	1.46	0.23
Assam	2.39	0.04	0.09	0.15	0.02
Bihar	9.19	0.67	0.09	0.50	n.s.
Gujarat	3.72	0.15	1.91	0.35	1.94
Haryana	4.36	1.00	0.10	0.90	0.46
Himachal Pradesh	0.89	0.04	0.01	0.01	n.s.
Jammu & Kashmir	1.02	0.02	0.03	n.s.	n.s.
Karnataka	6.55	0.56	0.72	1.11	0.80
Kerala	1.28	0.02	0.03	0.04	0.01
Madhya Pradesh	10.04	2.03	0.59	0.24	0.27
Maharashtra	9.44	1.01	0.69	2.58	1.26
Orissa	4.81	0.57	0.25	0.26	0.01
Punjab	8.87	0.34	0.22	0.65	1.22
Rajasthan	5.13	2.03	0.42	0.28	0.45
Tamil Nadu	7.91	0.18	1.15	1.95	0.40
Uttar Pradesh	18.40	2.43	1.46	8.08	0.02
West Bengal	8.67	0.33	0.06	0.18	n.s.
All-India	<u>113.81</u>	<u>11.80</u>	<u>8.93</u>	<u>18.78</u>	<u>7.10</u>

(a) Groundnut, rapeseed & mustard, linseed, castorseed, and sesame.

Source: World Bank, Economic Situation and Prospects of India, 1979.

Wheat and Rice Production by Region

	Wheat		Rice	
	<u>1972/73-</u> <u>1974/75</u>	<u>1975/76</u> <u>1977/78</u>	<u>1972/73-</u> <u>1974/75</u>	<u>1975/76-</u> <u>1977/78</u>
<u>Production</u> (annual average in 000 tons)				
Punjab and Haryana	7,282	8,911	1,573	2,795
West Bengal, Orissa and Assam	15,360	19,538	27,439	31,950
Rest of India	23,539	29,728	40,958	47,778
<u>Yield</u> (annual average in kg per hectare)				
Punjab and Haryana	2,076	2,309	1,943	2,726
West Bengal, Orissa and Assam	1,805	1,941	1,008	1,077
Rest of India	1,046	1,196	1,099	1,219
All-India	1,260	1,425	1,089	1,215

Source: World Bank, Economic Situation and Prospects of India, 1979.

7.4 Harvest Dates

Generally two harvest seasons in India. Kharif crops are sown with the onset on monsoon rains (June/July) and harvested in the cold weather (October-January). Principal Kharif crops are rice, millets, maize, jute, sesame, and cotton. Rabi crops, sown after the end of the monsoon (October/November) are harvested in March-May. Principal Rabi crops are wheat, barley, pulses, linseed, rape, and mustard. Rabi crops are generally more dependent on irrigation than are the Kharif crops. Exceptions to two-harvest pattern are southern peninsula, where rains come from October-December; (sugarcane plantings), and highly irrigated areas in the northwest where triple cropping is not unusual.

Harvest Dates for Major Crops

	<u>Harvest Period</u>
Wheat:	
Bihar.....	Mar - Apr
Maharashtra.....	Feb - Mar
Madhya Pradesh.....	Feb - Mar
Punjab.....	Apr - May
Uttar Pradesh.....	Mar - Apr
Rajasthan.....	Apr - May
India Consolidated.....	Mar - May
Uttar Pradesh.....	Oct - Nov
Rajasthan.....	Nov - Dec
Tamil Nadu.....	Oct - Nov (K)
	Jan - Feb (R)
India Consolidated.....	Oct - Dec (K)
	Jan - Mar (R)
Rice:	
Andhra Pradesh	
Winter.....	Nov - Mar
Summer.....	Mar - May
Autumn.....	June - Sept
Assam	
Winter.....	Nov - Jan
Summer.....	Mar - Apr
Autumn.....	June - Aug
Bihar	
Winter.....	Nov - Dec
Summer.....	Feb - Mar
Autumn.....	Aug - Oct
Maharashtra	
Winter.....	Oct - Nov
Madhya Pradesh	
Winter.....	Oct - Nov
Tamil Nadu	
Winter.....	Sept - Jan
Summer.....	Apr - June
Orissa	
Winter.....	Dec - Jan
Summer.....	May - June
Autumn.....	Sept - Oct

West Bengal	
Winter.....	Nov - Jan
Summer.....	Mar - May
Autumn.....	July - Oct
Uttar Pradesh	
Winter.....	Sept - Dec
Barley:	
Bihar.....	Mar - Apr
Punjab.....	Mar - Apr
Uttar Pradesh.....	Mar
Rajasthan.....	Mar - Apr
India Consolidated.....	Feb - Apr
Maize:	
Bihar.....	Sept - Oct
Maharashtra.....	Sept - Oct
Punjab.....	Sept - Nov
Uttar Pradesh.....	Aug - Sept
Rajasthan.....	Sept - Nov
India Consolidated.....	Aug - Nov
Millets:	
Ragi (Eleusine Coracana):	
Andhra.....	Sept - Jan (K)
	Mar - May (R)
Maharashtra.....	Oct - Nov
Tamil Nadu.....	Oct - Feb (D)
Karnataka.....	Oct - Dec
Bihar.....	Sept
Bajra (Pennisetum Typhoideum):	
Andhra Pradesh.....	Sept - Dec
Maharashtra.....	Oct - Nov
Punjab.....	Oct - Nov
Uttar Pradesh.....	Oct - Nov
Rajasthan.....	Sept - Oct
Tamil Nadu.....	Oct - Feb (D)
India Consolidated.....	Aug - Nov
Jowar (Sorghum Vulgare):	
Maharashtra.....	Nov - Dec (K)
Andhra Pradesh.....	Jan - Apr (K)
Madhya Pradesh.....	Nov - Dec (K)
	Feb - Mar (R)

India Consolidated:	
Winter.....	Oct - Jan)
Summer.....	Mar - June)
Autumn.....	Aug - Dec)
Sugar Cane:	
Uttar Pradesh.....	Nov - Apr
Bihar.....	Dec - Apr
Punjab.....	Dec - Mar
Maharashtra.....	Nov - Apr
Tamil Nadu.....	Nov - Apr
Andhra.....	Jan - Apr
India Consolidated.....	Nov - Apr
Potatoes.....	Jan - Apr (W)
	May - Sept (S)
Sweet Potatoes.....	Dec - May
Cassava 1/.....	-
Vegetables 1/.....	-
Dry Beans 2/.....	-
Gram (Chick Peas).....	Feb - Apr
Masur (Lentils) 3/.....	-
Peas 4/.....	-
Other Pulses 5/.....	-
Citrus Fruit 1/.....	-
Peanuts:	
Andhra.....	Sept - Jan (D)
	May - July (I)
Maharashtra.....	Sept - Dec
Tamil Nadu.....	Aug - Jan (D)
Madhya Pradesh.....	Sept - Nov
Karnataka.....	Oct - Dec
Uttar Pradesh.....	Nov - Dec
India Consolidated.....	Sept - Jan
Linseed:	
India Consolidated.....	Jan - Apr
Rape and Mustard (Brassicanapus and Brassicanigra):	
India Consolidated.....	Jan - Apr

Sesame Seed:	
India Consolidated.....	Aug - Dec (K) May - July (R)
Castor Seed:	
India Consolidated.....	Jan - Feb (K) Mar - Apr (R)
Coffee:	
India Consolidated:	
Arabica.....	Oct - Mar
Robusta.....	Jan - Apr
Tea:	
North.....	Apr - Dec
South.....	Jan - Dec
Tobacco:	
Andhra.....	Feb
Maharashtra.....	Jan - Mar
Bihar.....	Feb - Apr
Uttar Pradesh.....	Sept - Apr
West Bengal.....	Feb - Apr
Madras.....	Jan - Mar
Mysore.....	Dec - Jan
India Consolidated.....	Feb - May
Cotton:	
India Consolidated.....	Sept - Apr
Jute:	
Assam.....	July - Aug
Bihar.....	Aug - Mid Sept
Orissa.....	Sept - Mid Oct
West Bengal.....	July - Sept
India Consolidated.....	July - Sept

- 1/ Supposed to be harvested the whole year round.
- 2/ Phaseolus radiatus and phaseolus mung mainly harvested in the Kharif season (September - January).
- 3/ Virtually the whole production is harvested in the Rabi season (February May).
- 4/ The whole production is harvested in the Rabi season.
- 5/ Lakh or khosari harvested only in the Rabi season; and tur or arhar (pigeon peas) supposed to be harvested then also.

- (K) Kharif: October - January Harvest
- (R) Rabi: March - May Harvest
- (I) Irrigated
- (D) Dry
- (W) Winter
- (S) Summer

7.5 Agricultural Imports

Agricultural imports 15.9% of total imports for 1977/78. Foodgrain at record low levels but import of edible oils up more than seven-fold over previous year in effort to hold down inflation. India may once again be forced to resume major foodgrain imports especially wheat, if bad crops in 1979 and subsequent years exhaust reserves.

Leading Agricultural Imports (1977/78)

	<u>US\$ million</u>
Edible oils	829.4
Foodgrains	121.2
Wheat	(109.3)

See also section 6.4, Imports.

7.6 Agricultural Exports

Agricultural exports 25% of total exports for 1977/78. Large sugar production mostly consumed internally; not a significant export.

Leading Agricultural Exports (1977/78)

	<u>US\$ million</u>
Tea	648.5
Coffee	223.2
Fish	203.6
Cashew (processed)	174.6
Spices	160.0
Oil cakes	155.7

See also section 6.5, Exports.

7.7 Current Crop Status (1980)

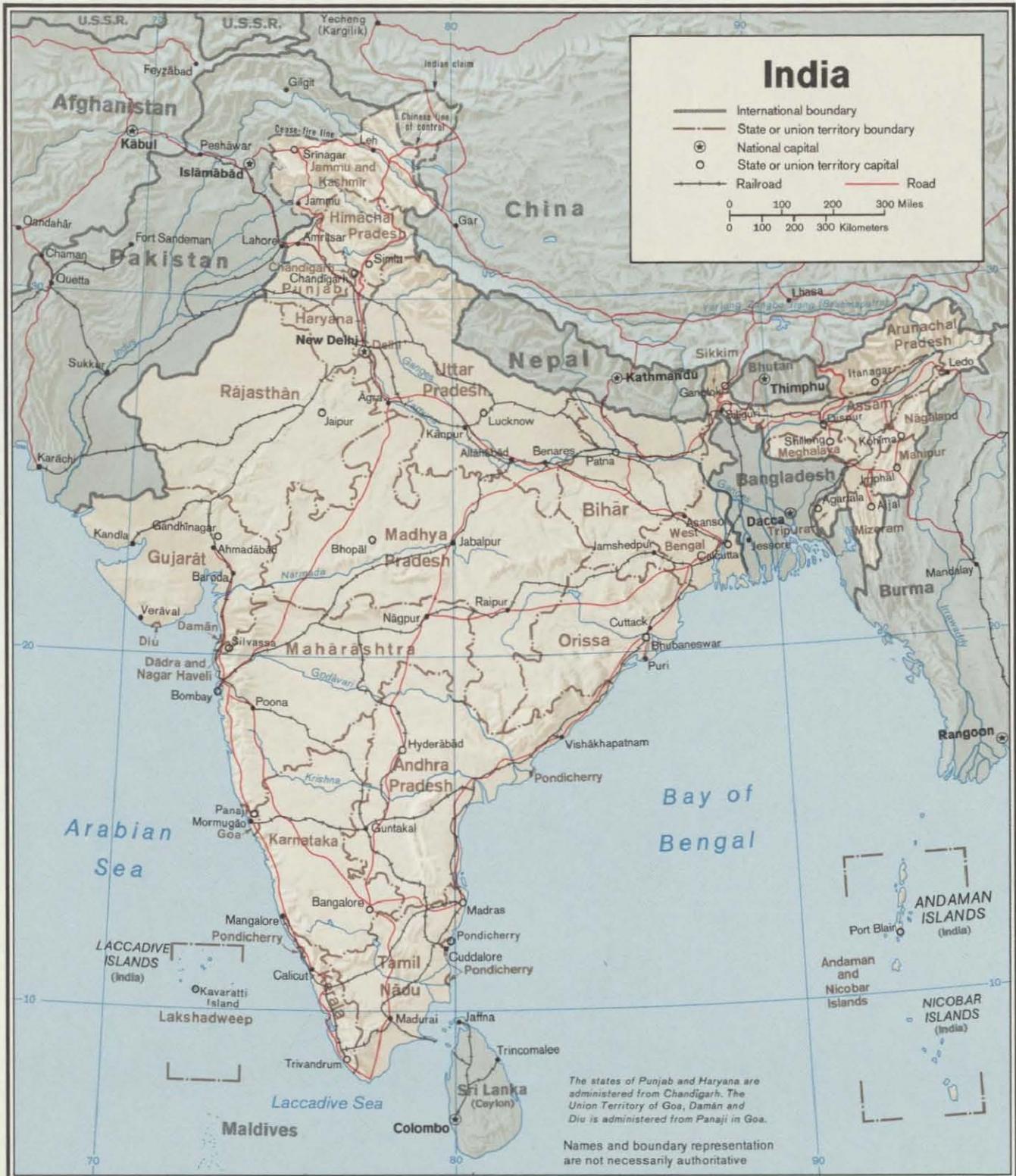
Failure of 1979 monsoon (July - Sept) rains damaged crops in 14 of India's 31 states and union territories. Effects of the drought worsened by shortages of diesel fuel and electric power that crippled pump-dependent irrigation. However, decline in crop production not as great as initially feared. Good rains in March 1980 benefited wheat crop in northern states, and 1980 wheat production expected to be only marginally lower than that 1979 record crop of 35 million tons. Total spring (rabi) foodgrain production will probably be 2-3 million tons lower than 1979 record production of 53 million tons. Rice production down, reflected in total 1979/80 foodgrain production expected at 118 million tons, compared to 131 million tons in 1979/80.

8. Physical Geography

8.1 Climate

Subcontinent isolated from rest of Asia by Himalayas. Climate characterized by extremes of heat and cold, rain and drought. Seasons: cool dry winter (Dec - Feb), dry hot summer (Mar - May), rainy season or southwest monsoon (June - Sept), post or retreating monsoon (Oct - Nov). Monsoon produced by differential heating of land and water; low pressure trough develops from Orissa to northwest. Onset of seasons varies; southwest monsoon begins on western coast in May - June, moves north by early July. Dramatic onset on coast with high winds, rain, sudden drop in temperature; changes less severe inland. Rain pattern of cloudbursts alternating with breaks. Monsoon retreats from Punjab at end of September, north India by end of October, west coast by end of November. Central and southern peninsula has relatively dry summer, northeast monsoon rains in Oct - Nov.

Regional variations pronounced. Himalayan climate changes with altitude: at 7,000 feet, average summer temperature is 65 degrees; at 15,000 feet rarely above freezing; in valleys, as high as 90-100F. Eastern Himalayas have twice the rainfall of western (floods common in East); snow found at 3,000 feet in west, in east not below 6,000 feet. Rainfall less seasonal than in other regions. Assam and West Bengal extremely humid, have high rainfall (Cherrapunji Rainfall of 428" annually is highest in world). Annual temperature range is slight, especially in Ganges Delta. Catastrophic cyclones typically occur in May, October. Indo-Gangetic Plain has graded climate pattern: west hot and dry, growing cooler, wetter in east. Calcutta's rainfall 6-7 times that of western desert. Western Ghats and adjoining coast form region of heavy rainfall (75-250"), most received during southwest monsoon. Climate uniformly hot. Hills of Peninsular interior, Southwest Rajasthan, Western Madhya Pradesh have drier climate (30" rain) with hot days, cool nights; rain only during southwest monsoon. Eastern Ghats and coast - rain source in north is southwest monsoon, in south, northeast. Drought frequent in south due to failure of monsoon. Occasional autumn cyclones. South Deccan in rain shadow, has 20-40" rainfall, severe thunderstorms, wide temperature range.



8.2 Temperatures (In Fahrenheit)

City	Range	Jan	Apr	Jul	Oct	Extreme
Ahmadabad	Max	85	104	93	97	118
	Min	58	74	79	73	36
Bangalore	Max	80	93	81	82	102
	Min	57	69	66	65	46
Bombay	Max	88	96	88	93	110
	Min	62	74	75	73	46
Calcutta	Max	80	97	90	89	111
	Min	55	76	79	74	44
Cherrapunji	Max	60	71	72	72	87
	Min	46	59	65	61	33
Hyderabad	Max	85	101	87	88	112
	Min	59	75	73	68	43
Jalpaiguri	Max	74	90	89	87	104
	Min	50	68	77	70	36
Lucknow	Max	74	101	92	91	119
	Min	47	71	80	67	34
Madras	Max	85	95	96	90	113
	Min	67	78	79	75	59
Mormugao	Max	86	88	83	86	98
	Min	70	79	75	75	59
New Delhi	Max	71	97	95	93	115
	Min	43	68	80	64	31
Silchar	Max	78	88	90	88	103
	Min	52	69	77	72	41

8.3 Precipitation (in inches)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ahmadabad	*	0.1	0.1	*	0.4	3.7	12.2	8.1	4.2	0.4	0.1	0.4
Bangalore	0.2	0.3	0.4	1.6	4.2	2.9	3.9	5.0	6.7	5.9	2.7	0.4
Bombay	0.1	0.1	0.1	.8	0.7	19.1	24.3	13.4	10.4	2.5	0.5	0.1
Calcutta	0.4	1.2	1.4	1.7	5.5	11.7	12.8	12.9	9.9	4.5	0.8	0.2
Cherrapunji	0.7	2.1	7.3	26.2	50.4	6.1	96.3	70.1	43.3	19.4	2.7	0.5
Hyderabad	0.3	0.4	0.5	1.2	1.1	4.4	6.0	5.3	6.5	2.5	1.1	0.3
Jalpaiguri	0.3	0.7	1.3	3.7	11.8	25.9	32.2	25.3	21.2	5.6	0.5	0.2
Lucknow	0.8	0.7	1.3	0.3	0.8	4.5	12.0	11.5	7.4	1.3	0.2	0.3
Madras	1.4	0.4	0.3	0.6	1.0	1.9	3.6	4.6	4.7	12.0	14.0	5.5
Mormugao	*	*	*	0.7	2.6	29.6	31.2	15.9	9.5	3.8	1.3	0.2
New Delhi	0.9	0.7	0.5	0.3	0.5	2.9	7.1	6.8	4.6	0.4	0.1	0.4
Silchar	0.8	2.1	7.9	14.3	15.6	21.7	19.7	19.7	14.4	6.5	1.4	0.4

* Less than 0.05 inch

8.4 Landforms

Land area - 1,266,600 sq. miles. Greatest north-south distance 2,000 miles; east-west 1,300 miles.

Borders - Northeast border runs along crest of greater Himalayas, is shared by People's Republic of China, Nepal, Bhutan. Northeastern India borders on Burma, nearly surrounds Bangladesh. Northwestern frontier with Pakistan runs across Himalayas in Kashmir through deserts of Rajasthan and mudflats of Gujarat to Arabian sea. Peninsula of India bounded on southeast by Bay of Bengal, southwest by Arabian sea.

Regional Divisions - At foot of Himalayas lies Indo-Gangetic Plain, broad alluvial lowland built up by Ganges River and tributaries of Indus River. South of plain land rises into east-west chain of hills and low mountains broken by east-west river valleys. To northwest Aravallis separate plain from deserts of Rajasthan.

Peninsular interior, south of Tapti river, consists of Deccan Plateau in west, Orissa hills in northeast. Separated from coastal plains by eastern and western Ghats which converge at tip of peninsula. Densely wooded hills rise south of Deccan plateau in an area of heavy rainfall, many rivers.

3,500 miles of coastline, much of it flat sandy plain with few natural harbors or inlets. Two groups of offshore islands: 1) Andaman and Nicobar islands in Bay of Bengal 800 mi. east of Madras, total land area of 3,200 sq miles, 90% of which is forest. 2) Laccadive, Minicoy, and Amindivi islands (Lakshadweep) in Arabian sea off Malabar coast, 250 miles from Mangalore, are 12.5 sq miles in area.

8.5. Land Use (1970)

<u>Land Use (1970)</u>	<u>%</u>
Under forests	21
Not available for cultivation	15
Other uncultivated exc. fallow	11
Fallow	7
Under cultivation	46

Virtually all potential agricultural land already under cultivation. In 1977/78 about 27% of agricultural land irrigated.

8.6 Rivers and Canals

Indus - flows into Arabian Sea in Pakistan; major tributaries Sutlej, Beas, Ravi, Chenab, Jhelum water northwest; system's waters shared with Pakistan by agreement.

Ganges - major tributary Jumna, flows length of Gangetic plain; drains into Bay of Bengal.

Brahmaputra - tortuous course through Assam and Bangladesh, where joined by Ganges; flows into Bay of Bengal

Six major peninsular rivers: Mahanadi, Godavari, Krishna, Canvery empty into Bay of Bengal; Narbada, Tapti into Arabian Sea.

River navigation most important in Assam, Bihar, and West Bengal. Ganges and Brahmaputra heavily traveled; about half of total traffic between Assam and Calcutta moves on these rivers. Canals in Godavari and Krishna river Deltas of south seasonally important avenues of transportation, as are backwaters of Malabar coast. (Buckingham canal connecting Madras with Krishna Delta and extending 60 miles south of city is most important existing canal.) Usable inland waterways total 8,800 miles, 20% of which navigable by powered vessels.

8.7. Mountains

Himalayas - System 1,500 miles long, 150-200 miles wide, consists of 3 parallel ranges. Northernmost is great Himalayas, with average height 20,000 feet. Highest peaks are Everest, K-2 and Kanchenjunga, all over 28,000'. Lesser Himalayas average 5-12,000', with peaks up to 15,000'. Outer or southern Himalayas are foothills up to 4,000'. Source of 3 great river systems; earthquakes frequent. Important passes: Karakorum, 200 miles northeast of Srinagar; Jelep La, Natu La, both northeast of Darjeeling; Shipki La, 30 miles northeast of Kalpa.

Central Hills - Range in height from 1,500' to 4,000'. Main ranges are Arvallis, Vindhya, Satpuras in west; Mahadeo, Maikal, Bhaner in central India; Kaimur, Hazaribagh in east.

Coastal Ranges - Western Ghats run along Arabian sea coast, average elevation 3,500 feet, peaks up to 8,000 feet. Eastern Ghats parallel Bay of Bengal, average 2,000 feet. Two ranges come together in Nilgiri hills at southern tip of subcontinent; highest peak Anai Mudi, 8,841'.

9. Transportation and Logistics

9.1 Road Network

In 1974 1.2 million km of roads, about 35% paved. Many unsurfaced roads unusable by heavy motorized traffic. Many surfaced roads impassable during rainy season. Half the surfaced roads parallel railways; others connect villages with nearest rail line.

Best roads in south, especially Kerala, where railways poorly developed. Poorest in hills of Assam, Madhya Pradesh, Orissa, in the northwest, and Indo-Gangetic Plain. Lack of bridges over numerous rivers, canals, limits road use in the plain.

National highway system (28,750 km in 1974) connects state capitals, major ports, some foreign highways. Main arteries: Grand trunk road (Calcutta-Amritsar, via Varanasi, Kanpur, Agra, New Delhi); Western Deccan road (Agra-Bombay); and Great Deccan road (Varanasi-Cape-Comorin). Improved strategic roads: Hindustan-Tibet road (Ambala via Simla toward Tibetan border); road to Bomdila (western Arunchal Pradesh); Delhi-Bikaner road (to Pakistani frontier); road from Assam access road into eastern Bhutan.

Distances by road (miles)

Calcutta-Bombay, via Varanasi, Allahabad, Kanpur, Indore.....	1,433
Delhi-Bombay, via Agra, Gwalior, Indore.....	878
Madras-Bombay, via Bangalore, Poona.....	850
Hyderabad-Madras.....	434
Delhi-Calcutta, via Grand Trunk road.....	922
Delhi-Allahabad.....	383
Delhi-Varanasi.....	459

9.2 Vehicles (1976)

Private cars	799,499
Buses and coaches	121,987
Goods vehicles	415,195
Motorcycles & scooters	1,025,371
Mopeds	218,584

Source: International Road Federation, World Road Statistics, 1978.

All of above manufactured in India; spare parts readily available.

9.3 Railroads

Indian railroads directed by Indian Railway Board under Ministry of Railways. Largest RR network in Asia, fourth largest in world. Largest employer in country (in 1975/76 1.45 million regular employees, 300,000 laborers). Trackage not uniform: 50% Indian broad gauge (66"), 42% meter gauge (39.37"), remainder two types Indian narrow gauge (24" & 36"). Broad gauge system serves Indo-Gangetic plain, main cities, and ports. Meter gauge in northwest, northeast, Peninsular south. Narrow gauge in Himalayan foothills, other mountainous areas. Only three tracks cross western Ghats: 2 into Bombay, 1 into Goa. India-Bangladesh rail link via Jessore, Jammu.

Equipment and Services (1975/76)

Locomotives	11,905	Daily trains	11,000
Passenger coaches	38,818	Stations	7,506
Passenger wagons	395,250	Passengers	8.0 million
Route length	60,231 km	Freight	610,000 tons

Source: India A Reference Annual, 1977 & 1978.

Distances by Rail (miles)

Delhi-Agra	127	Delhi-Cuttack	1,150
Delhi-Ahmadabad	672	Delhi-Hyderabad	1,044
Delhi-Amritsar	288	Delhi-Jaipur	191
Delhi-Varanasi	502	Delhi-Lucknow	308
Delhi-Bhopal	437	Delhi-Madras	1,415
Delhi-Bombay	878	Delhi-Nagpur	632
Delhi-Calcutta	922	Delhi-Simla	276

9.4 Ports

Few natural harbors, best on west coast. Ten major ports can accommodate and berth ships of at least 4,000 tons: Calcutta, Madras, Port Paradip, Tuticorn, Vishakhapatnam (east); Bombay, Cochin, Kandla, Mangalore, Mormugao (west). Bombay most important port, Calcutta and Cochin next. Growing ocean and coastal trade also serviced by 190 intermediate and smaller ports. Designated major ports administered by central government, others by state governments.

Bombay

Coordinates: Lat. 18° 54' N.; long. 72° 49' E.

Approach: Fine harbor, about 22.5 km. long from N. to S., with a general width of from 6.5 to 8 km. Anchorage depth 6.70 to 9.60 m. Depth at entrance and depth in main channel 10.36 m. Tides: Spring range 3.66m., Neap range 1.45 m.

Accommodation: There are three wet docks: the Prince's (12 ha., 427 m. on sill), Victoria (10 ha., 4:88 m. on sill), and Indira Docks (24 ha., inner sill 7.01 m., outer 7.92 m., entrance lock 228.6 by 30.48 m). Total of 51 berths, varying from 121.9 m. to 152.4 m. in Princes and Victoria Docks and up to 182.9 m. in Indira Docks. Approach to Indira Dock is about 7.62 m. and Prince's and Victoria Docks 3.66m. below chart datum. Two dry docks, the Meriwether Dry Dock (160 m. long by 19.96 m. wide by 4.27 m. on sill), entered from Prince's or Victoria dock, and Hughes Dry Dock (304.8 m. long by 30.48 m. wide by 6.70 m. on sill, divided near the center so that it can be used a one or two docks), entered from the Indira Dock. Depths at quays: Ballard Pier Station dredged to 9.75 m., the new Ballard Pier Extension is deepened to 10.67 m.; Nos. 18 to 22 Indira Dock Harbor Wall deepened to 8.53 m. Depth of water available at quays inside Indira Dock is normally 9.14 to 9.75 m. but can be increased by impounding pumps to 10.36 to 10.97 m. if required. All depths are below Chart Datum and dependent on last soundings available.

Tanker

Terminals: Four oil berths. Night berthing possible. Water, bunkers, and slop facilities available.

- Bunkers:** 23 oil bunkering berths at Indira Dock, 3 at New Ferry Wharf, 14 at Prince's Dock, 14 at Victoria Dock, and 2 at Ballard Pier. Furnace oil supplied by B.P.T. pipe line. Light diesel oil and high speed diesel oil by tanker lorries from Bharat Refineries, Hindustan Petroleum, Caltex (India) Ltd., and Indian Oil Corporation Ltd.
- Development:** Satellite port is planned in Nhava-Sheva area; four berths to be constructed, two for handling bulk cargo (fertilizers, rock phosphate, sulphur, sugar, etc.) and one for containerized traffic, and one for handling coal. Limited container handling facilities planned at Indira Dock.
- Shiprepairer:** Available.

Calcutta

Coordinates: Lat. 22° 33' N.; long. 88° 20' E.

- Approach:** Tides: Bore tides of varying severity occur throughout the year, the equinoctial ones being most dangerous. Ships are frequently held at Sandheads, at the mouth of the river (205 km from Port) during these tides. Drafts of vessels lying in the river are also then restricted to 5.49 m. for vessels between 122 m. and 152.5 m. and 4.88 m. for shorter vessels (both freshwater draft), vessels over 152.5 m. are usually not allowed to remain in the river during bore tides. Largest Vessel: The size of vessel able to enter the River Hooghly is controlled by the available draft which fluctuates daily. A forecast of monthly drafts is published by the Port Authorities about two months ahead, and owners are advised to obtain prior information before arrival. The maximum draft is about 8.23 m. but this only occurs at odd times during the Monsoon period and then usually between July and September. Inward and outward drafts are divided into four speed categories, namely: over 12 knots, 10 1/2/ 12, 8 1/2/10, and under 8 1/2 respectively.

Accommodation: Moorings in the stream are laid down for 42 ocean-going vessels. Two wet docks at Kidderpore, 33.8 and 20 ha. in extent respectively, with turning basin of 4 ha. Depth 9.14 m. Lock entrance to docks, measure 176.8 by 24.38 m. 25 berths in Kidderpore Docks, including six coal berths of which one is mechanical. Netaji Subhas Docks has nine berths including one oil berth, a crane loading ore berth, a heavy lift berth fitted with a 200-ton crane, and a mechanical ore loading berth. Two graving docks also at King George's Dock, 181.6 m. by 24.328 m., and 177.1 m. by 26.51 m. respectively. Lock entrance is 213.4 m. by 27.43 m. There are five import jetties on the Calcutta side of the River Hooghly, and four jetties at Garden Reach.

Storage: Three of the Garden Reach berths are provided with double story transit sheds having a combined floor area of about 41,385 sq. m. and accommodation for about 44,500 tons of merchandise. The transit sheds are equipped with 2-ton electric travelling cranes both at the front and the rear and two of these sheds have additional end cranes, yard cranes and trolley lines, facilitating the removal of heavy material from the quay front to the stacking areas behind sheds.

Bunkers: Fuel, diesel, and gas oil at eight berths at Budge.

Airport: Dum Dum Airport, 19.2 km.

Working hours: 1st shift: 06.30 to 10.30, 11.30 to 15.30; 2nd shift: 15.30 to 19.00, 19.30 to 22.30; 3rd shift: 22.30 to 02.00; 02.30 to 06.30.

Pilotage: Compulsory. Commences at Eastern Channel Light Vessel.

Shiprepairers: Available.

Local Holidays: (Charter Party Holidays): Republic Day (January 26*), May Day (May 1), Independence Day (August 15*80), Durga Puja, Gandhi's Birthday (October 2*), Kali Puja, Christmas Day (December 25). * (On these days no work is undertaken. Work can be arranged on the remaining holidays and Sundays. Saturday is an ordinary working day.)

Cochin

Coordinates: Lat. 9° 58' N,; 76° 14' E.

Approach: A dredged channel 137 m. wide and about 7.6 km. long, buoyed on south side by black buoys and on north side by red buoys, leads from the outer roads into the inner harbor. Depth, liable to variation during S.W. monsoon; navigable at all seasons for vessels drawing up to 9.14 m.

Accommodation: Mattancherry Channel: Shelter for large number of vessels throughout year in inner harbor. 12 stream berths include one swinging berth for ships up to 172 m. and 11 stream berths for ships of varying length, 60 m. to 172 m. Mattancherry Wharf: 9.14 m. deep, 676 m. long which can take four ships of 146 m. length. Boat train pier is a multi-purpose berth used by passenger vessels, black oil tankers and vessels loading cashew shell liquid, hydrochloric acid, and reefer cargo. Arrangements exist for bunkering and water alongside or at buoys. Storage facilities: four transit sheds, five overflow sheds, three warehouses and two dangerous goods sheds.

A low wharf in Mattancherry Channel and also Fort Cochin Wharf are available for lighters and sailing vessels.

Palletization is introduced in respect of tea, cashew kernels, shrimps, etc.

Ernakulam Channel: Deep water wharf 672 m. long with four berths (Quays 5-8) for ships up to 146 m. long, maximum draft sheds, three warehouses, and one dangerous goods shed. One open berth, 244 m. long, maximum draft 9.14 m., with open storage facilities which are a continuation of Quay 8. Water and bunkers available.

Container
Handling
Facilities:

Temporary arrangements made at Quay 5, Ernakulam Wharf. Arrangements are being made at Quay 9 berth, Ernakulam wharf for permanent use.

Tanker
Terminals:

Two tanker berths operated by the Port Trust in Ernakulam Channel, with connecting jetty and pipe lines to shore installations and refinery.

- Bunkers:** Coal, diesel, and fuel oil available.
- Development:** Additional dredgers and a tug have been acquired. Fertilizer berth and container berth planned. Fishing harbor under construction.
- Shiprepairs:** Available.
- Airport:** On Willingdon Island; daily service to Madras, Bombay, and Trivandrum.
- Local Holidays:** Republic Day, May Day, Thiru Onam, Gandhi Jayanti, Independence Day. Offices are given eleven days holiday in addition to Sundays.
- Working Hours:** 08.00 to 12.00, 13.00 to 17.00. Night Shift: 18.00 to 22.00, 23.00 to 03.00.

Kandla

- Coordinates:** Lat. 23° 00' N.; long. 70° 13' E. On west bank of 763 m. wide creek of Gulf of Kutch.
- Approach:** The approach channel has depth of 4.00 m. minimum at L.W. over the bar. Night navigation of port possible. A statement showing the maximum permissible draft allowed to ships entering or leaving Kandla port for each day is issued by the Deputy Conservator quarterly.
- Accommodation:** Tidal basin, 183 m. Cargo jetty, 1,165 m. long, capable of berthing alongside six 183 m. vessels discharging or loading general cargo, packed or in bulk. Five mooring berths, one with a draft of up to 11.28 m., the other four moorings for general purpose with drafts ranging from 6.5 to 7.4 m., and with lengths up to 228.7 m. Tidal basin, 183 by 91 m. provided with transit sheds and cranes, including a 60-ton gantry crane. Adequate fleet of launches, tugs, and barges.

- Storage:** Three transit sheds with 15,000 tonnes storing capacity, two temporary transit sheds with 5,000 tonnes capacity, two transit sheds totalling 2,787 sq. m. at Bunder area, and large open storage area; four double storey warehouses with 60,000 tonnes capacity; automatic sprinkler arrangements with fire alarm system in "C" warehouse for storage of cotton and three sheds for storage of fertilizer totalling 5,800 sq. m., with a capacity of 10,000 tons; separate sheds for dangerous and inflammable goods. Open storage area 144,572 sq. m., two tanks for storing vegetable oil with 400 tonnes total capacity. Two storage tanks at Old Port (owned by M./S. distillers Trading Corp.), capacity 2,500 tonnes each for storage of liquid chemicals or soyabean oil.
- Cranes:** One 10-ton, four 6-ton, and sixteen 3-ton electric cranes; four fork lifts, one of 6 tons, three of 2 1/2 tons each; four mobile cranes; two platform trucks, two tractor trailers, and three heavy duty trailers.
- Tanker Terminals:** Two jetties, three pipelines helped by a booster pumping station.
- Bunkers:** Oil bunkers available. Bunkering by tank lorries alongside berths and by pipeline at oil berths.
- Development:** Marine Unloader with a rated capacity of 500 tons/hr. is installed at the fifth berth for handling fertilizer and raw materials in bulk.
- Shiprepairs:** Available.
- Local Holidays:** Republic Day (January 26), May Day (May 1), Independence Day (August 15), Mahatama Gandhi's Birthday (October 2), New Year's Day--Diwali (November 1). No dock work permitted on these days.
- Working Hours:** First shift: 00.00 to 04.00 and from 04.30 to 08.00.
Second shift: 08.00 to 12.00 and from 12.30 to 16.30.
Third shift: 16.30 to 20.40 and from 21.00 to 24.00.
Saturday is an ordinary working day.

Madras

- Coordinates:** Lat. 13° 46' N.; long. 80° 17' 48.5" E.
- Approach:** Width of entrance 121.9 m.; depth at entrance 12.50 m. H.W., 11.28 m. L.W.
- Accommodation:** Artificial harbor formed by two arms projecting from low sandy coast. Accommodation for 22 vessels inside harbor. 18 quay berths: five at West Quay; five at South quay; one at East Quay; six at Jawahar Dock; one at North Quay for passenger vessels. Four mooring berths, one for general cargo and three for handling petroleum; depth at mooring 9.45 to 12.19 m. Depth at quays, 7.92 to 9.45 m; Jawahar Docks 2, 4 and 6 berths 10.06 m. No restriction on overall length at West Quay and Jawahar Docks. Maximum beam restricted to 32 m. at Jawahar Docks. In order to maintain the scheduled depths in the harbor basin and approach channel, moorings and berths, four dredgers are employed.
- Storage:** Ten transit sheds available: one at North Quay; five at West Quay; one at South Quay 1; three at Jawahar Docks berths 1, 3 and 5. Total storage capacity for 63,629 tons of general or 79,499 tons of bagged cargo. There are 15 warehouses available. **Water:** All berths are provided with facilities for supply of fresh water. Two water barges are also provided to supply fresh water to ships at moorings and at the outer oil berths.
- Tanker Terminals:** Available at three mooring berths and at Bharati Dock.
- Bunkers:** Burmah-Shell, Esso, Caltex and Indian Oil Co. supply fuel, light and heavy diesel oil. Indian Oil Co. insists on rupee payment prior to effecting supply. Bunkering is done by pipelines at moorings one and two as well as all quay berths except East Quay.
- Development:** The Bharati Dock constructed just north of the existing harbor can accommodate deep draft giant vessels for its oil and ore berths; the oil berth, draft 16 m., is in operation but the ore berth is still under construction and will have a draft of 18 m., with a fully mechanized iron ore loading plant, capacity 8,000 tons/hr. Four more berths also planned. A fishing harbor is to be constructed north of the Bharati Dock. Two tugs of 22.5 tons bollard pull various diesel locomotives on order.

Shiprepairs: Available.

Towage: Available.

Pilotage: Compulsory.

Airport: Madras Airport at Meenambakkam, about 19.2 km. with services to Calcutta, 870 air miles, and Bombay, 644 air miles, and on regular international routes served by Air India International.

Working Hours: 1st Shift: 06.00 to 14.00; 2nd Shift: 14.00 to 22.00; 3rd shift: 22.00 to 06.00.

Mangalore

Old Port

Coordinates: Lat. 12° 51' N.; long. 74° 50' E. Situated on west coast of India on eastern bank of River Gurpur.

Approach: Bar situated due W. of entrance. Depth of bar 2.13 m. L.W.S.T.

Weather: During monsoon (mid-May to mid-Sept.) no communication with shore, and Port officially closed. There is an all-weather major port at Panambur, 8 km. north of roadstead.

Accommodation: Open roadstead. Steamers anchor in 7.32 m. to 10.98 m. due W. of entrance and are loaded and discharged by lighters. approx. 25 lighters available with average capacity of 45 tons each. Depth at quay 2.44 m. L.W. Four motor launches. Tides: Range of tide 1.22 to 1.52 m. Water: A steel water barge of 125 tons capacity supplies fresh water at anchorage (48 hours notice).

Bunkers: Not available.

Shiprepairers: Available.

Airport: Bajpe, 25 km.

Working Hours: Work performed on a 24 hour basis.

- New Port**
Coordinates: Lat. 12° 55' N. long. 74° 46' E. Situated midway between Cochin and Mormugao and is located at 9 km. north of Roadstead.
- Authority:** New Mangalore Port, Port Administrative Office, Panambur. Tel. 8300. Telex: Mangala MR 220. Telegram: "Harbor".
- Accommodation:** A shallow draft berth of 105 m. in length, 5.75 m. draft. Three berths of 198 m. each in length alongside 9.15 m. draft.
- Storage:** Two transit sheds, one of 5,475 sq. m. on berth No. 1, and another of 2,190 sq. m. on Berth No. 3. Another transit shed of 2,190 sq. m. is under construction. Maximum length, 183 m. Water: Water facilities available.
- Bunkers:** Available in limited quantities.
- Tanker Terminal:** One oil jetty.
- Development:** One iron ore berth equipped with mechanical loading plant is being constructed.
- Airport:** Bajpe, 25 km.
- Working Hours:** Work performed on a 24 hour basis.

Port Paradip

- Coordinates:** Lat. 20° 15' 16" N.; long. 86° 41' 7" E. In the Bay of Bengal.
- Approach:** The approach channel is 1,850 m. long with a draft of 12.25 m. and is connected to an entrance channel 300 m. long.
- Accommodation:** Plans have been made for the port to have 24 berths, comprising three ore berths to accommodate one 60,000 and two 30,000 d.w.t. ore carriers, 19 cargo berths, each 185 m. long to receive vessels up to 18,000 g.r.t., and an oil dock of two berths to handle tankers up to 100,000 d.w.t. Also provided for are tow drydocks, a slipway and sufficient area for a future Naval Dockyard. One ore berth and a mooring berth. At present there are two tugs and one dredger in operation. The length of the iron ore berth is 155 m.

- Water: Unlimited fresh water always available.
- Bunkers: Unavailable, but small quantity of diesel oil can be supplied through domestic suppliers.
- Development: A cargo berth with transit sheds is under construction.
- Towage: Available.
- Pilotage: Compulsory. First pilotage, 0600 hrs., last pilotage, 1800 hrs.
- Airport: Bhubaneswar, 120 km. distant.
- Local Holidays: Charterparty Holidays: Republic Day (Jan 26), Basant Panchami, Moharam, Sivarathri, Dola Purnima Holi, Sri Rama Navami and Orissa Day, Radha Jatra, Jammastami, Independence Day (Aug 15), Ganesh Puja, Birthday of Mahatma Gandhi (Oct 2), Idul Fitre, Durga Puja, Desahara, Kumara Poonjima, Kalipuja and Dipawali, Christmas Day (Dec 25).
- Working Hours: 10.00 to 17.00 hours, every day; round the clock labour available.

Tuticorin

- Coordinates: Lat. 8° 48' N.; long. 78° 9' E. On Gulf of Mannar, 104 km. N.E. of Cape Comorin; terminus of Southern railway. N.E. monsoon begins late October, with moderate rain, and continues until mid-November, then steady N.E. winds blow until end of January. S.W. dry monsoon begins mid-May, moderate until end of July, then light variable winds until N.E. winds begin again.
- Accommodation: Useful anchorage in front of town, about 8 km. offshore, outside Hare Island, in 9 to 11 m. Vessels of 10 ft. draft can enter. Signal station at Hare Island. V.H.F. wireless station at fore shore. Boat channel 121.9 m. wide from shore to deep water, with depth of 3.66 m. L.W. Loading/discharging by lighters of 50 to 200 tons capacity. Four piers and eight wharves available.
- Storage: Covered sheds and open space for storage.
- Provisions: Available.
- Water: Moderate water supply by Port Authorities, by barge. 100 tonnes per trip available.

Bunkers: Bunker coal available.
 Shiprepairs: No dry dock available but temporary repairs can be effected.
 Towing: Three tugs, one launch available.
 Pilotage: None available.
 Airport: 136 km.
 Working Hours: 07.00 to 18.00; 19.00 to 03.00; meals 12.00 to 13.00, 18.00 to 19.00, 24.00 to 01.00.
 Source: Ports of the World, 1979.

9.5 Airports

Four International airports: Santa Cruz-Bombay, Dum Dum-Calcutta, Palam-New Delhi, Meenambakkam-Madras. New International airport under construction at Ghaziabad, near Delhi. 80 additional airfields across country.

NB: For up-to-date information consult latest issue of weekly International Notams, International Flight Information Manual, and/or ICAO's Air Navigation Plan for appropriate region.

AHMADABAD/Ahmadabad

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>Runway Characteristics</u>				<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
		<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>		
23°04'14" 72°37'37"	55 36.3	05/23 Instr	0.076	2286	A	LCN.40	100,JX

Remarks: Alternate aerodromes: Bombay/Bombay, Delhi/Delhi, Karachi/Intl, Tehran/Mehrabad Intl.

Aids: VOR, LSA (05,23), LR, LTX, LB, MD, MC, MT, MTX, L4, L5. TVA 23 under construction. Clearway: 05 & 23-152. No telex.

AMRITSAR/Amritsar

<u>Location Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
31°42'17" N	229	16/34	0.078	2789	A	LCN30	
74°48'11" E	35.3	Instr					

Remarks: Alternate aerodromes: Delhi/Delhi, Lahore/Lahore.

Aids: LR, LTX, LB, LO, MD, MC, MTX, MO. TAV 16 planned. Stopway 16-91, 34-183. Clearway 16-126, 34-257.

BOMBAY/Bombay

<u>Location Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
19°05'27" N	8	09/27	0.185	3354/	A	LCN100H106	100,JX
72°52'00" E	30.8	PA I	0.22				
		14/32		2730		LCN 60	

Remarks: Alternate aerodromes: Ahmadabad/Ahmadabad/Colombo/Bandaranaike Intl, Delhi/Delhi, Karachi/ Intl., Madras/Madras, Nagpur/Nagpur.

Aids: ILS (27-1) VOR, VL, LPA (27-1), LSA (09), LVA (09+), LR, LTX, LB, MD, MC, MTT, MS, MFD, MTX, L4, L7, L9. F3962 under construction.. TC planned. Stopway 14 & 32-61. Clearway 27-152. No telex.

CALCUTTA/Calcutta

<u>Location Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope %</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
22°39'11" N	5	01R/19L	0.03	3627	A	LCN 70	100,JX
88°26'57" E	31.8	PA I					

Remarks: Alternate aerodromes: Bangkok/Bangkok Intl., Dacca/Dacca, Dacca/Kurmitola, Delhi/Delhi, Lucknow/Lucknow, Patna/Patna, Rangoon/Mingaladon.

Aids: ILS (19L-1) RL, LPA (01R-1), LSA (19L), LVA (01R), LR, LTX, LB, MD, MC, MT, MTD, MS, MTX, L6, L7, L9. Stopway 19L-61, Clearway 19L-152. No telex. Closed to non-scheduled flights at night.

DELHI/Delhi

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
28°34'07" N 77°06'48" E	227 36.8	10/28 PA I	0.47	3810	A	LCN95	100, JX

Remarks: Alternate aerodromes: Ahmadabad/Ahmadabad, Bombay/Bombay, Calcutta/Calcutta, Karachi/Intl., Lahore/Lahore, Lucknow/Lucknow, Rawalpindi/Islamabad, Varanasi/Varanasi.

Aids: ILS(28-1), DME, VOR, RL, LPA(28-1), LSA(10), LVA(10+), LR, LTX, LB, LO, MD, MC, MT, MTD, MS, MFD, MTX, MO, L6, L7, L9. Clearway 28-61. No telex.

LUCKNOW/Lucknow

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
26°45'46" 80°53'07"	122 36	09/27	0.036	2388	A	LCN 40	

Remarks: Alternate aerodromes: Calcutta/Calcutta, Delhi/Delhi, Kathmandu/Intl, Patna/Patna, Varanasi/Varanasi.

Aids: VOR, LR, LB, LO, MD, MC, MT, MFD, MTX, MO. TSA 27 & AV 09 planned. Clearway 09-158.

MADRAS/Madras

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
12°59'36" N 80°10'37" E	11 32.6	07/25 Instr	0.117	3063	A	LCN 60	100, JX

Remarks: Alternate aerodromes: Bombay/Bombay, Calcutta/Calcutta, Colombo/Bandaranaike, Tiruchchirappalli/Tiruchchirappalli.

Aids: ILS(07-1), RL, LSA(07), LVA(25), LR, LTX, LB, LO, MD, MC, MT, MTX, MO, L4, L5, L9. No telex.

NAGPUR/Nagpur

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
21°05'28" N 79°02'59" E	308 37.8	09/27 Instr	0.513	1957	A	LCN 15	

Remarks: Alternate aerodromes: Bombay/Bombay.

Aids: VOR, LSA(27), LR, LTX, MD, MC, MT, MTX. TVA(09) planned.

PATNA/Patna

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
25°35'34" N 85°05'33" E	51 34.4	07/25 N-Instr	0.01	1981	B	LCN 30	100, JX

Remarks: Alternate aerodromes: Biratnagar/Biratnagar, Lucknow/Lucknow.

Aids: LR, LTX, LB, LO, MD, MC, MT, MTX, MO, L4. Clearway 07 & 25-61.
No telex.

TIRUCHCHIRAPPALLI/Tiruchchirappalli

<u>Location</u> <u>Coordinates</u>	<u>Eleva- tion M/ Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/ Length M</u>	<u>CL</u>	<u>Aircraft Strength (1,000 kg)</u>	<u>Fuel/ Octane</u>
10°45'51" N 78°42'58" E	85 32	09/27 Instr	0.22	1864	B	LCN 30	

Remarks: Alternate aerodromes: Colombo/Bandaranaike, Jaffna/Kankesanturai
Madras/Madras

Aids: VOR, LSA(27), LR, LTX, LB, LO, MD, MC, MT, MTX, MO, L4, L5. No
telex.

TRIVANDRUM/Trivandrum

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
08°28'41" N 76°55'15" E	4 29.2	14/32 Instr	0.019	1829	B	LCN 30	

Remarks: Alternate aerodrome: Tiruchchirappalli/Tiruchchirappalli.

Aids: VOR, MD, MC, MT, MTX. Stopway 14-61, clearway 14-61, 32-854.

VARANASI/Varanasi

<u>Location</u> <u>Coordinates</u>	<u>Eleva-</u> <u>tion M/</u> <u>Temp C</u>	<u>NR/Type</u>	<u>Slope</u> <u>%</u>	<u>Aircraft/</u> <u>Length M</u>	<u>CL</u>	<u>Aircraft</u> <u>Strength</u> <u>(1,000 kg)</u>	<u>Fuel/</u> <u>Octane</u>
25°27'03" N 82°51'38" E	80 36.7	09/27 Instr	0.04	1792	B	LCN 30	JX

Remarks: Alternate aerodromes: Delhi/Delhi, Lucknow/Lucknow.

Aids: VOR, MD, MC, MT, MTX, L4. Clearway 09 & 27-183. No telex.

KeyAbbreviations

INSTR	Instrument Approach Runway
N-INSTR	Non-Instrument Runway
PA I	Precision Approach Runway Category I
PA II	Precision Approach Runway Category II
REG-NS	Intl Non-Scheduled Air Transport, Regular Use
REG-S	International Scheduled Air Transport, Regular Use

Radio Aids

ILS	Instrument Landing System
DME	Distance Measuring Equipment
VOR	VHF Omni-Directional Range
RL	Radio Locator

Lighting Aids

LPA	Precision Approach Lighting System
LSA	Simple Approach Lighting System
LVA	Visual Approach Slope Indicator System
LAV	Abbreviated Approach Slope Indicator System
LR	Runway Edge, Threshold & Runway End Lighting
LC	Runway Center Line Lighting
LTD	Runway Touchdown Zone Lighting
LTX	Taxiway Lighting
LB	Aerodrome or Identification Beacon
LO	Obstruction Lighting

Marking Aids

MD	Runway Designation Markings
MC	Runway Center Line Markings
MT	Runway Threshold Markings
MTD	Runway Touchdown Markings
MS	Runway Sidestripe Markings
MFD	Fixed Distance Markings
MTX	Taxiway Center Line & Holding Position Markings
MO	Obstruction Markings

Runway Surface and Length

H	Hard Surface (numbers = ft. in hundreds)
S	Non-Hard Surface (number = ft. in hundreds)

Additional Lighting

L1	Portable Runway Lights (electrical)
L2	Boundary Lights
L3	Runway Flood Lights
L4	Low Intensity Runway Lights
L5	Low Intensity Approach Lights
L6	High Intensity Runway Lights
L7	High Intensity Approach Lights
L8	Sequenced Flashing Lights
L9	Visual Approach Slope Indicator (VASI)

9.6 Personal Entry Requirements

Passport required.

Visa or landing permit required. Arrivals without visas may obtain 30 day landing permit at Delhi, Calcutta, Bombay or Madras airports provided that the visitor has not entered India within the preceding six months.

Smallpox and cholera vaccinations required when leaving for countries which impose quarantine restrictions on arrivals from India. Yellow fever immunization for arrivals from infected areas.

9.7 Aircraft Entry Requirements

Private and non-scheduled commercial flights overflying or landing, for non-commercial purposes must give at least 72 hours notice to the Director General of Civil Aviation, Ramakrishnapuram, New Delhi, 110022 (Telegraphic address: Aircivil New Delhi/Telex: none) and furnish the following information: complete route of flight, date and time of proposed flight, type of aircraft, nationality and registration marks of the aircraft, description of radio equipment carried, name of the commander of the aircraft, name, address and nationality of operator of the aircraft, number of crew and also of passengers, if any, as well as type and amount of cargo, type and amount of fuel required.

Non-scheduled commercial flights landing for commercial purposes must obtain prior permission from the Director General of Civil Aviation at least 10 days prior to departure. In addition to requirements listed above, all requests must include: nationality, number and description of passengers to embark or disembark in India, size, weight and description of cargo containers, type of flight (e.g. inclusive tour, affinity group, etc.), name and address of travel agent in India, true origin of flight, complete route itinerary, including dates and times, details of the cost to the charterer and the amount paid by each passenger; for cargo flights, the amount paid by the consignor, for traffic to be loaded in India, it must be indicated as to how the traffic was brought to India with details of the arrival of such traffic.

9.8 Special Notices

All aircraft having a gross weight of 12,500 lbs. or less shall immediately upon entry into India and, without a prior landing elsewhere in India, be flown to and landed at a) if entry is from the west, Bombay airport (aircraft entering from Ahmadabad airport subject to the conditions stipulated in paragraph 3 below. b) if the entry is from the east, Calcutta airport, Madras airport or Tiruchchirappalli airport. c) if the entry is from the south, Madras airport, or Tiruchchirappalli airport. d) if the entry is from Nepal, Calcutta airport, Delhi airport, Patna airport, or Varanasi airport.

All aircraft having a gross weight exceeding 12,500 lbs shall immediately upon entry into India, and without a prior landing elsewhere in India, be flown to and landed at a) If entry is from the west, Bombay airport, Calcutta airport, or Madras airport (aircraft entering from the west may also land at Delhi airport, subject to the conditions stipulated in paragraph 3 below. b) If entry is made from the east or south, Bombay airport, Calcutta airport, Madras airport, Tiruchchirappalli airport, Delhi airport, or Ahmadabad airport. c) If the entry is from Nepal, Calcutta airport, Delhi airport, Patna airport, Varanasi airport, Bombay airport, or Ahmadabad airport.

If the first landing in India is at Delhi airport, Ahmadabad airport, or Tiruchchirappalli airport for an aircraft entering India from the west, it shall be subject to the following conditions: a) all persons on board coming from yellow fever infected areas, as declared by the central government, shall be in possession of valid international certificates against yellow fever. b) the aircraft shall have been disinfected at the commencement of the journey. c) the pilot-in-command of the aircraft shall send a radio message three hours before arrival about the state of health of any person on board who has visited a yellow fever infected area, as declared by the central government, within the previous nine days, and who is not in possession of a valid yellow fever certificate. d) if, on inspection of the aircraft, the airport health officer detects any person or crew member suspected to be infected with yellow fever, the airport health officer may direct the pilot-in-command of the aircraft to proceed to Calcutta or Bombay or any other place as may be designated by the airport health officer, and the pilot-in-command of the aircraft shall obey such direction.

No non-scheduled commercial aircraft shall set down cargo or passengers in India except as indicated below, and unless prior permission of the Director General of the Civil Aviation has been obtained. Such traffic shall only be set down at: a) Delhi or Bombay if the entry is from the west; b) Calcutta if the entry is from the east (aircraft from Singapore may also set down traffic at Madras); c) Madras or Tiruchchirappalli if the entry is from the south; and d) Calcutta, Delhi, Patna, or Varanasi if the entry is from Nepal.

All aircraft, after landing, shall not proceed further unless the pilot has obtained a clearance certificate in writing from an officer duly authorized by the central government.

9.9 Airlines

Air India: 218 Backbay Reclamation, Nariman Point, Bombay. State corporation responsible for international flights. In 1976 services to 34 countries, including United States, United Kingdom, Europe, Middle East, Africa, Far East, Australia; flew 862,661 passengers. Fleet (1978): 6 Boeing 747; 9 Boeing 707.

Indian Airlines: Airlines House, 113 Gurudwara Rakabganj Rd., New Delhi. State corporation responsible for regional and domestic flights. In 1976 services throughout India and to Sri Lanka, Nepal, Bangladesh, Afghanistan, Pakistan, Maldives; flew 3,671,365 passengers. Fleet (1976): 3 Airbus A300; 12 Boeing 737; 5 Caravelle; 3 Viscount; 8 Fokker Friendship; 15 HS-748; 2 Dakotas.

The following airlines also serve India: Aeroflot, Air Ceylon, Air France, Alitalia, Ariana Afghan, British Airways, CSA, EAA, Egypt Air, Ethiopian Airlines, Garuda, Gulf Aviation, Iran Air, Iraqi Airways, JAL, KLM, Kuwait Airways, Lufthansa, Pan American, Qantas, Royal Nepal, Sabena, Saudia, SAS, Singapore Airlines, Swissair, Syrian Arab, Thai International, and TWA.

9.10 Air Distances

Bombay to:	Statute Miles	Calcutta to:	Statute Miles
Chicago	8037	Chittagong	218
Damascus	3459	Dacca	146
Dar es Salaam	2908	Delhi	814
Delhi	707	Geneva	4744
Frankfurt	4078	Guam	3732
Geneva	4170	Karachi	1353
Guam	4752	Kabul	1423
Honolulu	8008	London (Heathrow)	4958
Kabul	1091	Los Angeles	8142
Karachi	543	Montreal	7594
Lisbon	4978	New York	7912
London (Heathrow)	4478	Paris	4867
Los Angeles	8692	Rome	4478
Madras	643	San Francisco	7811
Manila	3189		
New York (JFK)	7781		
Paris (C.deGaulle)	4343		
Rome	3828		

10. Power and Communications

10.1 Electric Power

Capacity in 1977/78 26,000 MW; rapid growth in power sector since independence, especially rural electrification (38% of villages electrified). Poor maintenance, coordination have prevented full utilization of installed capacity. Sixth five-year plan (1979-84) stresses correction of this and addition of capacity. Demand currently exceeds supply; power supply erratic, forcing industry to maintain private generating capacity. Generation (1977/78) by utilities: hydro 39%, thermal 49%, nuclear 3%; by non-utilities 9%. Household current is 230 volts.

10.2 Telecommunications

Telephone system run by Department of Posts and Telegraphs. In 1976 5,240 exchanges, 1.9 million telephones; 13 trunk automatic exchanges; direct trunk dialing between larger cities.

External cables and calls handled by Overseas Communications Services (OCS); two earth stations (Pune and Dehra Dun) for satellite transmission. Telegraph services to all countries; telephone to 192 countries, telex to 185 countries, radio-photo to 58 countries.

10.3 Radio

Broadcasting wholly state-owned. In 1978 82 stations of All India Radio (AIR) in 5 zones, including two commercial centers. 155 transmitters (122 medium wave) cover all important cultural and linguistic regions. MV stations reach about 90% of population; shortwave throughout country. Also external services. Licensing required for receivers, but most now unlicensed. In rural areas community sets common.

10.4 Television

In 1978 television stations in Delhi, Bombay, Calcutta, Madras, Srinagar, Amritsar, Lucknow, Ahmadabad, Jullunder; also relays to Mussoorie, Pune, Kanpur. In 1975-76 Satellite Instructional Television Experiment (SITE), using American satellite, beamed educational/extension programming directly to community receivers in 2400 villages in six states. Program judged successful; until Indian satellite can be developed, transmitters at six sites provide continuing coverage to some SITE areas.

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