

## India Country Handbook

This handbook provides basic reference information on India, including its geography, history, government, military forces, and communications and transportation networks. This information is intended to familiarize military personnel with local customs and area knowledge to assist them during their assignment to India.

The Marine Corps Intelligence Activity is the community coordinator for the Country Handbook Program. This product reflects the coordinated U.S. Defense Intelligence Community position on India.

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India

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## KEY FACTS

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**Official Country Name.** Republic of India.

**Short Form.** India.

**Head of State.** President Pratibha Patil (since 25 July 2007).

**Capital.** New Delhi.

**National Flag.** Three equal horizontal bands of subdued orange, white, and green, with a blue, 24-spoke wheel centered in the white band.

**Time Zone.** UTC+5.5.

**Telephone Country Code.** 91.

**Population.** 1,189,172,906 (July 2011 estimate).

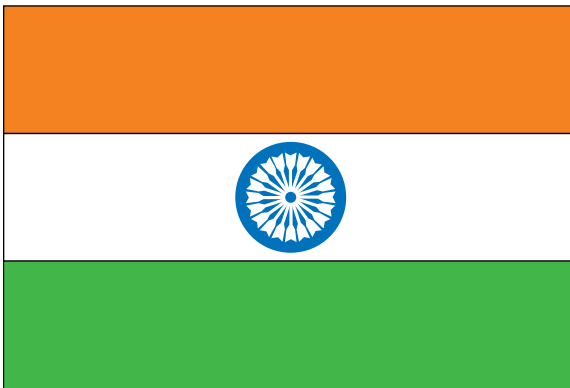
**Languages.** Hindi, English.

**Currency.** Indian Rupee (INR). 46.54 INR = 1 USD.

**Credit/Debit Card Use.** Visa, MasterCard, and American Express are widely accepted.

**ATM Availability.** ATMs are available throughout the country.

**Calendar.** Gregorian.



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**National Flag**

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## U.S. MISSION

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### U.S. Embassy

The mission of the U.S. Embassy is to represent the interests of the United States. This includes diplomatic, economic, political, and security issues, with special emphasis on opening and expanding markets for U.S. exports, halting arms proliferation, preventing and resolving conflict, countering terrorism and international crime, upholding basic human rights, and promoting international cooperation on global issues.

<i>Location</i>	Shantipath, Chanakyapuri New Delhi - 110021
<i>Telephone Number</i>	+91-11-2419-8000
<i>Fax</i>	+91-11-2419-8407
<i>E-mail</i>	ndcentral@state.gov
<i>Website</i>	<a href="http://newdelhi.usembassy.gov/">http://newdelhi.usembassy.gov/</a>
<i>Hours</i>	Monday through Friday: 0830–1730

### U.S. Consulate

The U.S. Consulate provides various citizen services, including emergency services, medical and legal assistance, registration and travel information, passports and citizenship services, notary service, and other services (e.g., voting, marriage, taxes, and adoption).

The United States has consulates in Kolkata, Chennai, Hyderabad, and Mumbai.

- The Kolkata branch is located at 5/1 Ho Chi Minh Sarani, Kolkata 700071 (E-mail: [consularkolkata@state.gov](mailto:consularkolkata@state.gov); website: [kolkatapas@state.gov](mailto:kolkatapas@state.gov)).
- The Chennai branch is located at Gemini Circle 220, Anna Salai, Chennai 600006.
- The Hyderabad branch is located at Paigah Palace, 1-8-323 Chiran Fort Lane, Begumpet, Secunderabad, Andhra Pradesh 500003.
- The Mumbai branch is located at Lincoln House, 78 Bhulabhai Desai Road, Mumbai 400026.

## **U.S. Military Facilities**

There are no U.S. military facilities in India. However, the United States had 87,300 military personnel stationed at forward operating bases in and around Afghanistan as of 31 March 2011. These bases include Bagram Air Base (3456N 06915E), Kabul International Airfield (3434N 06912E), Kandahar Airfield (3130N 06550E), and Shindand Air Base (3323N 06215E). The closest permanent installations include the Naval Support Facility in Diego Garcia (0720S 07225E) and Al Udeid Air Base (2506N 05118E) in Qatar.

## **Travel Advisories**

As of 22 December 2011, Pacific Command's force protection condition level for India is FPCON Bravo. Because of a continuing threat of terrorism throughout India, U.S. citizens traveling to or residing in India are advised to take appropriate steps to ensure personal security. Appropriate security measures include avoiding the affected areas, remaining aware of surroundings, monitoring local news reports, avoiding crowded places, and reporting unattended and suspicious packages to authorities.

Some recent terrorist attacks include the following:

- February 2010 – Explosive detonation at café in Pune, Maharashtra, killing 10 and injuring 50
- November 2008 – Coordinated terrorist attacks in Mumbai killed more than 170, including 6 U.S. citizens
- October 2008, December 2008 – Multiple bombings in markets and government offices in Guwahati, Assam
- September 2008 – Five deadly explosions in New Delhi market
- July 2008 – Thirty bombs detonated in Bangalore, Karnataka, and Ahmedabad, Gujarat. In addition, several unexploded bombs were found in Surat, Gujarat.

For current U.S. Department of State India travel advisories, please go to [http://travel.state.gov/travel/cis\\_pa\\_tw/cis/cis\\_1139.html](http://travel.state.gov/travel/cis_pa_tw/cis/cis_1139.html).

## **Entry Requirements**

U.S. citizens must have a valid passport and visa to enter India. These documents must be obtained prior to entering the country; failure to do so can lead to immediate deportation. The U.S. Embassy and consulates in India are not able to assist U.S. citizens who arrive without proper documentation.

It is recommended that U.S. citizens have up-to-date routine vaccinations—influenza, chicken pox, polio, measles/mumps/rubella (MMR), and diphtheria/pertussis/tetanus (DPT)—along with hepatitis A, hepatitis B, Japanese encephalitis, typhoid, and rabies. It is also recommended that travelers take medication to prevent malaria 4 to 6 weeks prior to visiting India. India requires anyone who arrives from or transits through sub-Saharan Africa or any place where yellow fever persists to present proof of yellow fever vaccination. Failure to do so can lead to immediate deportation or 6 days of quarantine in a yellow fever center.

## **Customs Restrictions**

The following items may be imported or exported duty-free:

- 200 cigarettes or 50 cigars or 250 grams of tobacco
- Liquor or wine up to 2 liters
- Personal effects (excluding jewelry)
- Travel souvenirs

The following items are prohibited for import and export:

- Narcotics
- Pornography
- Counterfeit or pirated goods
- Antiques

The following items are subject to import and export restrictions:

- Firearms and ammunition
- Live birds and animals
- Plants and produce
- Gold and silver, other than ornaments (import only)
- Commercial goods
- Indian and foreign currency

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## **GEOGRAPHY AND CLIMATE**

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### **Geography**

India is located in South Asia. It borders Bangladesh, Bhutan, Burma, China, Nepal, Pakistan, the Bay of Bengal, and the Arabian Sea. It is the seventh-largest country in the world and is almost one-third the size of the United States. It has four main regions: the Indo-Gangetic Plain, the Himalayas, desert, and peninsula. Its rivers are classified into four categories: Himalayan,



## India

Deccan, coastal, and inland-drainage basins. It has eight floristic regions: Andaman, Assam, Deccan, Malabar, Ganga plain, Indus plain, eastern Himalayas, and western Himalayas. It has four major soils: Indo-Gangetic alluvium, black cotton, red, and laterite. It has three major seasons: winter, summer, and monsoon.



## **Land Statistics**

<b>Total Area</b>	3,287,590 square kilometers (1,269,346 square miles)
<b>Water Area</b>	314,400 square kilometers (121,391 square miles)
<b>Coastline</b>	7,000 kilometers (4,350 miles)
<b>Area Comparative</b>	Slightly more than one-third the size of the United States
<b>Central Coordinates</b>	2000N, 77000E
<b>Land Usage</b>	Cultivated: 2.8 percent Inhabited: N/A

## **Borders**

<b>Direction</b>	<b>Country</b>	<b>Length</b>
North	China	3,380 km (2,100 mi)
East	Bangladesh	4,053 km (2,518 mi)
East	Nepal	1,690 km (1,050 mi)
East	Burma	1,463 km (910 mi)
East	Bhutan	605 km (376 mi)
West	Pakistan	2,912 km (1,809 mi)
<b>Total</b>		<b>14,103 km (8,763 mi)</b>

## **Border Disputes**

India has territorial disputes with Pakistan, China, Bangladesh, and Nepal. The border disputes between India and Pakistan date back to the partition that occurred when India gained independence from British rule in 1947. The country was divided along

religious lines between Muslim majority populations—this part of the country became Pakistan—and Hindu majority populations—this part of the country remained India. In Kashmir, the Hindu leader wanted to join India, but Pakistan argued that most of Kashmir’s population was Muslim. Since 1947, India and Pakistan have fought at least three wars regarding Kashmir, and small-scale engagements continue along the border today. Other border disputes between India and Pakistan include the Sir Creek dispute and the Siachen Glacier dispute. Because of the mutual distrust between the two countries, it is unlikely that these disputes will be settled in the near future.

The major dispute between India and China concerns Arunachal Pradesh and the Aksai Chin region of Kashmir. The Arunachal Pradesh dispute dates back to a 1914 treaty marking the border between India and Tibet. China never accepted the border and claims it owns Arunachal Pradesh. China seized Arunachal Pradesh and Aksai Chin during a border war in 1962. Pakistan also ceded a small portion of Kashmir to China in 1963. India disputes this transfer of land. China recently gave up its claim to the India state of Sikkim.

There are numerous Indian and Bangladeshi enclaves within the borders of both countries. These enclaves were established as early as 1661. The British preserved these enclaves and passed them to India and Pakistan when both countries gained independence in 1947. Bangladesh became an independent nation in 1971 and changed its name from East Pakistan. The border is still the same, but both countries dispute the size and number of enclaves they have within each other’s territory. The two countries conducted a joint survey in 2006 to settle disputed territory; however, there has been no resolution to date.

The border dispute between India and Nepal concerns Kalapani, the area where China, India, and Nepal meet. The dispute dates back to an 1816 treaty between Nepal and the British East India Company. India and Nepal disagree on how to interpret the treaty and the source of the Kalapani River.

## ***Bodies of Water***

India's rivers are classified into four categories: Himalayan, Deccan, coastal, and inland-drainage basins. Himalayan rivers result from melting snow and glaciers, and they flow year-round. They overflow during monsoon season and cause flooding. Deccan's rivers are not present throughout the year. They are rain-fed, and their volume fluctuates. Most coastal streams have short lengths and limited catchments, and are not present throughout the year. Inland-drainage basins are few in number; most last only a day or two.

Major rivers include, but are not limited to, the Brahmaputra, the Ganga (Ganges), the Godavari, and the Yamuna. The Brahmaputra River begins in southwestern Tibet and flows south into the Himalayas, Arunachal Pradesh, and Assam Valley, then through Bangladesh and into the Ganga River. It is one of the largest rivers in the world, and because of the average rainfall, has the greatest volume of water of any river in India.

The Ganga River begins in the glaciers of the central Himalayas in Uttar Pradesh between India and Tibet. It flows almost 2,500 kilometers (1,553 miles) across the plains of northern India through Bangladesh and into the Bay of Bengal. The Ganga River is the largest river in India. It is also the most populous river basin in the world.

The Godavari River is the second-largest river in India. The Godavari River begins in the state of Maharashtra, northeast of

Mumbai. It flows more than 1,400 kilometers (870 miles) south and east into the Bay of Bengal off the coast of Andhra Pradesh.

The Yamuna River flows south through the Himalayan foothills into the northern India plain and through several valleys along the border of Haryana and Uttar Pradesh into the Ganga River. The Yamuna River flows 1,370 kilometers (851 miles) through the states of Delhi, Haryana, and Uttar Pradesh. It is the largest tributary to the Ganga River.

Major lakes include, but are not limited to, the Chilka, the Dal, and the Fateh Sagar. Chilka, also known as Chilika, is the largest saltwater lake in Asia and the largest coastal lake in India. Chilka has a surface area of 1,100 square kilometers (425 square miles), a mean depth of 1.4 meters (4.6 feet), and a maximum depth of 2.4 meters (7.9 feet). Its area fluctuates between 1,165 square kilometers (450 square miles), during monsoon season, and 906 square kilometers (350 square miles), during the dry season.

Lake Dal is located in the state of Jammu and Kashmir. Lake Dal has a surface area of more than 21 square kilometers (8.2 square miles), a mean depth of 1.37 meters (4.5 feet), a maximum depth of 6 meters (19.7 feet), and a shoreline of 15.5 kilometers (9.6 miles). Lake Fateh Sagar is located in the state of Rajasthan. Lake Fateh Sagar has a surface area of 4 square kilometers (1.5 square miles), a mean depth of 5.4 meters (17.7 feet), a maximum depth of 13.4 meters (44 feet), and a shoreline of 8.5 kilometers (5.3 miles).

## ***Topography***

India has four main regions: the Indo-Gangetic Plain, the Himalayas, desert, and peninsula. The Indo-Gangetic Plain and the Himalayas are collectively known as North India, and the peninsular region is known as South India.



## Topography

The basins of three river systems form the Indo-Gangetic Plain: Indus, Ganga, and Brahmaputra. This region is almost 2,400 kilometers long (1,491 miles) and 240 to 320 kilometers (149 to 199 miles) wide. It is one of the largest stretches of flat alluvium soil in the world.

The Himalayas are three nearly parallel ranges with large plateaus and valleys in between. The mountain wall is about 2,400 kilometers (1,491 miles) long, and depths vary between 240 and 320 kilometers (149 and 199 miles). Hill ranges are much lower in the east. The Himalayas have some of the highest peaks in the world.

***Highest Elevation***            Kanchenjunga Mountain  
(8,598 meters/28,209 feet)

***Lowest Elevation***            Indian Ocean (0 meters)

The desert region consists of two parts: great desert and little desert. The great desert runs northward from the edge of the Rann of Kutch beyond the Luni River. The little desert runs from the Luni River up to the northern wastes. Between the desert regions lie huge areas of rocky land combined with limestone ridges.

The peninsular region lies between the Eastern and Western Ghats. A broad coastal strip lies between the Eastern Ghats and the Bay of Bengal. A narrow coastal strip lies between the Western Ghats and the Arabian Sea. The Nilgiri Hills form the southern tip where the Eastern and Western Ghats meet.

India has eight floristic regions: Andaman, Assam, Deccan, Malabar, Ganga plain, Indus plain, eastern Himalayas, and western Himalayas. The Andaman region is rich in evergreen, mangrove, beaches, and forests. The Assam region has evergreen forests and occasional thick clumps of bamboos and tall grasses. The Deccan region has various scrub jungles and deciduous forests. The Malabar region is rich in forest vegetation and produces key commercial crops, such as betel, cashews, coconut, coffee, pepper, rubber, and tea. The Ganga plain region is a small area that has a variety of forest types. The Indus plain region has a dry and hot climate that supports only natural vegetation. The eastern Himalayan

region has alder, birch, laurel, maple, oak, and rhododendron forests. The region also has many conifers, junipers, and dwarf willows. The western Himalayan region has forests of chir, pine, other conifers, and broad-leaved temperate trees. The region has deodar, spruce, blue pine, and silver fir forests at higher altitudes. It also has silver fir, silver birch, and junipers in the alpine zone.

India has fig trees throughout. Two types of deciduous trees found in India are the *sal* and the teak. *Sal* is found mainly in eastern India, and teak is found in the Western Ghats. Because of previous overharvesting, most of the teak trees are relatively young. India also has flowering trees (i.e., silk cotton, Indian Coral, tulip), fruit trees (i.e., mango, jackfruit, banana, papaya), and palm trees (i.e., coconut, wild date, betel nut).

India has four major soils: Indo-Gangetic alluvium, black cotton, red, and laterite. Indo-Gangetic alluvium soil is the most widespread. It is found throughout northern India. Black cotton soil is extremely fertile and is found in Maharashtra, western Madhya Pradesh, Karnataka, and some parts of Tamil Nadu. Red soil is found mainly in south Bengal, Orissa, Madhya Pradesh, eastern Andhra Pradesh, Karnataka, and large parts of Tamil Nadu. The soil is poor, thin, and gravelly in the upland regions and more fertile in the plains and valleys. Laterite soil is particular to India and other tropical climates. It is generally poor in lime, magnesium, and nitrogen. It is found in Karnataka, Kerala, Madhya Pradesh, Orissa, south Maharashtra, Malabar, Tamil Nadu, and parts of Assam. It is used to grow rice at lower elevations and tea, cinchona, rubber, and coffee at higher elevations.

### **Cross-country Movement**

India has rugged, hilly, and mountainous terrain in the Himalayas and dense tropical rain forests in the northeast and south. A sturdy

four-wheel-drive vehicle with off-road capabilities and a driver who understands the terrain are essential. Terrorists and bandits are present in certain areas in the mountains. There have been reports of attacks, kidnappings, and disappearances.

Most of the rivers throughout the country are either seasonal, last only a few days at a time, or have water levels that fluctuate. However, the Himalayas have rivers that last year-round and often overflow, causing floods during monsoon season. Roadblocks caused by rock falls and landslides are common on mountain roads during monsoons. Monsoon season lasts from June to September and October to December.

### **Urban Geography**

According to the 2001 census, India has 35 urban centers with one million people or more, accounting for nearly 28 percent of the population. Urban areas are major commercial and industrial centers. The infrastructure needs serious improvements, particularly in the areas of water and power supply, transportation, environment, and housing. Lack of planning has resulted in a mix of affluent housing and shanty settlements. Urban areas tend to be overcrowded and heavily polluted. More than 20 percent of urban housing is slums or squatter conditions.

### **Environment**

India's increasing human and livestock populations are straining its natural resources and leading to other environmental concerns such as overgrazing, soil erosion, deforestation, desertification, lack of potable water, and air and water pollution. Trees cover only about 23 percent of India. Areas affected by deforestation include Uttar Pradesh, Assam, Karnataka, Madhya Pradesh, Gujarat, Kerala, Maharashtra, Andhra Pradesh, Mizoram, Rajasthan,





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## **Mumbai Skyline**

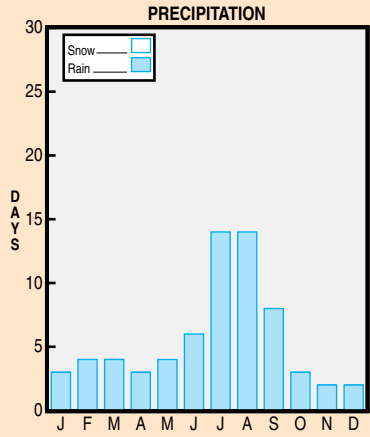
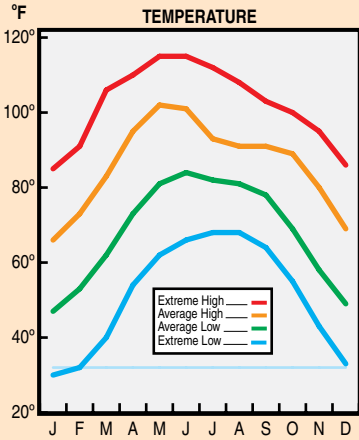
Himachal Pradesh, and Jammu and Kashmir. Industrial and vehicle emissions are responsible for air pollution. Raw sewage and runoff from agricultural pesticides are responsible for water pollution. Environmental protections include the Biological Diversity Act of 2002, The Environmental Protection Act of 1992, and the Forest (Conservation) Act of 1980.

## **Climate**

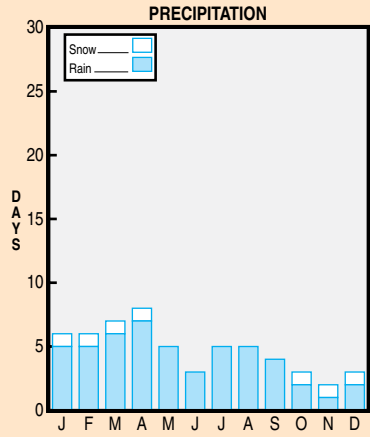
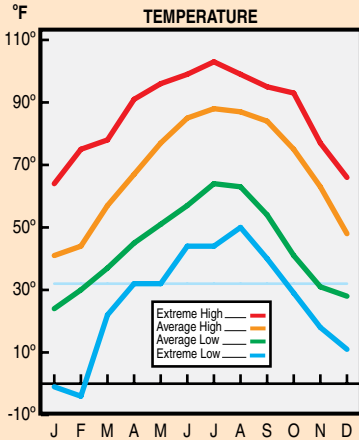
### ***Climatic Patterns***

India has three major seasons: winter, summer, and monsoon. India's climate varies based on location and time of year. Winter lasts from January to February. Temperatures are generally cool, dry, sunny, and pleasant, except in the Himalayas and northern hills, where it snows and temperatures drop considerably. Summer lasts

**NEW DELHI**  
ELEVATION: 709 FT

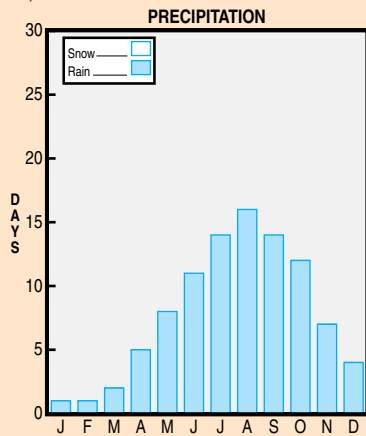
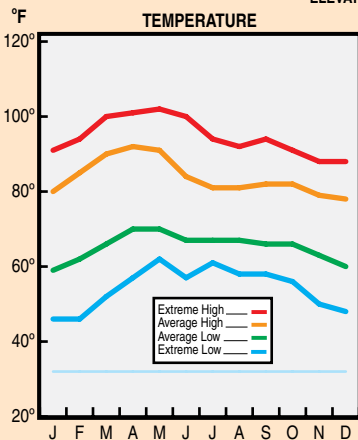


**SRINGAR**  
ELEVATION: 5,207 FT

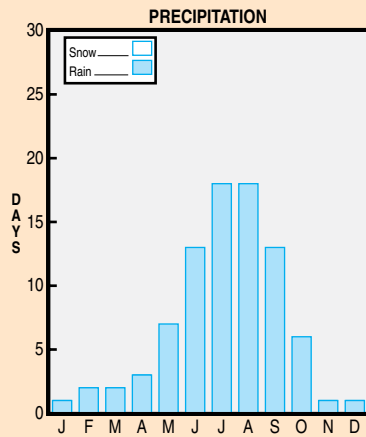
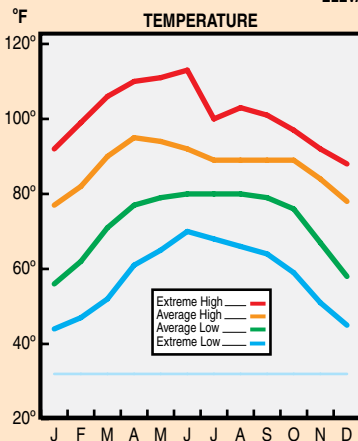


**New Delhi and Sringar Weather**

**BANGALORE**  
ELEVATION: 3,022 FT



**CALCUTTA**  
ELEVATION: 20 FT



**Bangalore and Calcutta Weather**

from March to May, with generally hot and dry temperatures; however, summer temperature extremes are based on altitude. Monsoon season lasts from June to September and October to December; India receives its heaviest rainfall during this period, bringing much-needed relief to some areas and causing floods in others.

## ***Climate Phenomena***

### **Monsoons**

Monsoons are caused by wind currents from cooler sea surface temperatures and warmer land surface temperatures. India experiences the southwest monsoon from June to September and the northeast monsoon from October to November. The southwest monsoon brings increased rainfall to the west coast, and the north-



**Flooded Street in Bangalore**

east monsoon brings increased rainfall to the east coast. The wind current from the northeast monsoon travels from land to sea, as does the wind current from the southwest monsoon.

## **Earthquakes**

More than two dozen earthquakes have occurred over the past 100 years. Some occurred during the same year (e.g., the September 1993 earthquake in Kallari, Haegoan, and Soustour and the November 1993 earthquake in the Latur area). Most seem to occur every 1 to 4 years. Some are minor, such as the November 1980 earthquake in Sikkim and the Gangtok region, in which no deaths occurred. In other cases, earthquakes are major, such as the January 2001 earthquake in Gujarat, which killed 20,000 people and affected 6.3 million.

## **Tsunamis**

Tsunamis are ocean waves caused by abrupt disturbances of the sea surface, most commonly earthquakes in marine and coastal regions. Local tsunamis can demolish coastal communities within minutes. Large tsunamis can cause destruction for thousands of miles. The 26 December 2004 tsunami killed 10,600 and affected 2.7 million in India. Affected areas were in the Andaman and Nicobar islands, the union territory of Pondicherry, and the states of Andhra Pradesh, Kerala, and Tamil Nadu.

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# **INFRASTRUCTURE**

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## **Transportation**

India's transportation system is large and diverse. It also faces the challenge of meeting the needs of more than 1.1 billion people. The system includes extensive road and rail networks, major ports, and



**Transportation Network**

a rapidly expanding air transport sector. Poor-quality transportation infrastructure is a major hindrance to development. Roads are the primary means of transportation, but most are either unable to meet demand or are in poor condition. India Railways is the largest railway in Asia and accounts for a large portion of freight and



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## **Bus Stop**

passenger transportation. India plans broad infrastructure development, but funding remains limited and progress is slow.

## ***Roads***

Roads are a vital part of India's transportation network and carry more than 80 percent of India's total passengers and nearly 70 percent of India's total freight. Road transportation accounted for 4.7 percent of the gross domestic product (GDP) in fiscal year 2005. India has 3,383,344 kilometers (2,102,312 miles) of roads, of which 1,603,705 kilometers (996,496 miles) are paved. India has more than 150 national highways; they total 65,000 kilometers (40,389 miles) and carry about 45 percent of road traffic.

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Primary roads are generally in poor condition, and secondary roads are in worse condition. Major highways are generally limited to two lanes. Average speed on highways is as low as 30 to 40 kilometers per hour (18 to 25 miles per hour) because of low lane capacity, potholes, and generally poor road maintenance resulting from lack of funding.

The rural road network is severely limited. A third of villages do not have all-weather roads, and most of the rural population is integrated into the national economy. It is difficult to bring products, particularly agricultural products, to market. India implemented a nationwide rural connectivity program, the Pradhan Mantri Gram Sadak Yojana Program, in 2000. The goals are to construct 372,000 kilometers (231,150 miles) of new roads that will provide farm-to-market connectivity and to upgrade 370,000 kilometers (229,907 miles) of existing core rural roads. More than 100,000 kilometers (62,137 miles) were built by the end of 2007. In fiscal year 2009, the Ministry of Road Transport and Highways (MRTTH) completed construction on 2,008.93 kilometers (1,248 miles) of new roads. In fiscal year 2010, MRTTH completed construction on 2,500 kilometers (1,553 miles) of new roads

India recognizes the need to upgrade the road network. The government introduced a seven-phase National Highways Development Program in 2002 that was designed to improve more than 65,000 kilometers (40,389 miles) of national highways. A key portion of the project is the expansion of more than 13,000 kilometers (8,078 miles) of highways to four-lane highways. These improved highways will link the nation's major cities and span the nation from north to south and east to west. Improvement will also aid port connectivity.

Cars, buses, and motorcycles are the primary sources of transportation in urban areas. Traditional transportation means, such as



animal-drawn carts and bicycles, are common in rural and some urban areas. Congestion from poor road conditions is a serious problem in some areas, particularly metropolitan centers such as Mumbai. Increased vehicle ownership, along with poor road quality, often reduces rush hour traffic to a standstill.

Traffic drives on the left side of the road. Driving can be dangerous, particularly at night. Dangers include poorly maintained and congested roads; lack of proper lighting; roads shared with pedestrians, carts, and cattle; poorly maintained vehicles; and dangerous driving techniques. Annual monsoons and other seasonal weather variations can affect road travel.

Buses and taxis are widely available. Buses provide inexpensive service throughout the country, including mountainous regions. They are often overcrowded, and drivers rarely are properly trained. Accidents are common. Private buses are often more expensive, but they are faster, safer, and more comfortable. Taxis are generally available, but few have working meters. Other transportation options include auto-rickshaws, cycle-rickshaws, and *longas* (horse-drawn carriages).

India has hundreds of bridges and tunnels. The 6-kilometer (3.7-mile) Sister Nivedita Bridge (Second Vivekanand Bridge) across the Hooghly River was completed in 2007. The MORTH conducts bridge inspection and regular bridge maintenance and repair.

## ***Rail***

India has 63,327 kilometers (39,350 miles) of railways, and with double and multiple tracks, the total track length is 109,966 kilometers (68,329 miles). Of this, 49,819 kilometers (30,956 miles) of track are broad gauge, 10,622 kilometers (6,600 miles) of track are standard gauge, and 2,886 kilometers (1,793 miles) of track

are narrow gauge. Broad gauge (1,676 millimeters [66 inches]) serves 99.7 percent of freight transportation and 96.6 percent of passenger transportation. The rail network continues to expand. For instance, 250 kilometers (155 miles) of new track were built in 2007; 386 kilometers (240 miles) were double lines.

India National Railways (INR) is one of the largest rail networks in the world, carrying 17 million passengers and 2 million tons of freight a day. INR is administered and managed by the Railway Board, which is part of the Ministry of Railways. It is divided into nine zones throughout the country. INR had 8,153 locomotives, 45,350 passenger service vehicles, and 5,905 other coach vehicles in service in 2007. INR operates 6,909 railway stations. INR served 6.2 billion passengers in FY2006.

Underinvestment, slow regulatory reform, and forced pricing below market value limit the rail infrastructure. Passenger transit is subsidized by higher freight charges, which has resulted in a loss of freight revenue. The liberalization of the airline industry has resulted in further losses of freight revenue. However, freight and passenger demand continue to expand. The primary industries served by freight shipment include coal, fertilizers, pig iron and steel, iron ore, and food grains.

Rail accidents are common; however, regulation and infrastructure improvements reduced accidents to a rate of 300 per year during FY2006 despite an increase in volume.

INR also operates metro systems in Kolkata. The metro railway began operating along 16.5 kilometers (10.3 miles) in 1995, with 17 stations spaced 1 kilometer (0.6 mile) apart. Planned expansion of 8.5 kilometers (5.3 miles) of additional track is underway as of 2007. Kolkata also has a circular railway of electrified light rail line that serves that city and the local airport. Metro systems

are planned for Chennai and Mumbai as well. Mumbai has a busy suburban rail network that serves more than 6 million passengers a day.

The Delhi Metro Rail Corporation operates the New Delhi metro system, a highly successful subway system that was completed ahead of schedule in 2005. Three lines of 22 kilometers (14 miles), 11 kilometers (7 miles), and 32.1 kilometers (20 miles) provide service for more than 500,000 commuters to 59 stations daily.

Mountain trains are another option. Darjeeling Himalayan Railway, which encompasses the Nilgiri Mountain Railway, was constructed in 1908. The elevation of the mountains through which the system travels ranges from 326 meters to 2,203 meters (1,070 feet to 7,228 feet).

The extensive rail network also has many bridges and tunnels. More than 80 rail-under and rail-over bridges are in use, including tunnels that are more than 2,000 meters (6,562 feet) long. Planned rail network expansion includes the construction of additional bridges and tunnels, including the 10,960-meter (35,958-foot) Pir Panjal Railway, which will link Kashmir to the rest of India.

## ***Air***

### **Primary Airfields**

<b>Airport Name Coordinates</b>	<b>Elevation meters (feet)</b>	<b>Runway</b>	
		<b>Length x Width meters (feet)</b>	<b>Remarks</b>
Ahmedabad 2304N/07238E	58 (190)	3,489 x 46 (11,447 x 151)	Concrete, Asphalt, Bitumen

<b>Airport Name Coordinates</b>	<b>Elevation meters (feet)</b>	<b>Runway</b>	
		<b>Length x Width meters (feet)</b>	<b>Remarks</b>
Bangalore 1257N/07740E	888 (2,913)	3,307 x 61 (10,850 x 200)	Asphalt
Chennai Int'l 1259N/08010E	16 (52)	3,658 x 45 (12,001 x 148)	Asphalt
		2,045 x 45 (6,709 x 148)	Concrete, Asphalt, Bitumen
Chhatrapati Shivaji Int'l 1905N/07252E	11 (36)	3,445 x 45 (11,302 x 148)	Asphalt (all)
		2,925 x 46 (9,596 x 151)	
Guwahati Int'l 2606N/09135E	49 (161)	2,743 x 46 (8,999 x 151)	Asphalt
Hyderabad 1727N/07828E	531 (1,742)	3,231 x 45 (10,600 x 148)	Asphalt
Indira Gandhi Int'l 2833N/07706E	237 (777)	2,813 x 46 (9,229 x 151)	Asphalt (all)
		3,810 x 46 (12,500 x 151)	
Kanpur 2626N/08022E	125 (411)	1,123 x 41 (3,684 x 135)	Concrete
Netaji Subhash Chandra Bose Int'l 2239N/08826E	5 (16)	3,627 x 46 (11,900 x 151)	Asphalt (all)
		2,399 x 46 (7,871 x 151)	
Surat 2106N/07244E	5 (16)	1,097 x 30 ( 3,599 x 98)	Asphalt

<b>Airport Name Coordinates</b>	<b>Elevation meters (feet)</b>	<b>Runway</b>	
		<b>Length x Width meters (feet)</b>	<b>Remarks</b>
Thiruvananthapuram Int'l 0828N/07655E	5 (16)	3,398 x 46 (11,148 x 151)	Asphalt

India has 346 airports, 250 of which have paved runways. India also has 30 heliports. The primary international airports are in Chennai, Kolkata, Mumbai, New Delhi, and Thiruvananthapuram. India has one of the fastest-growing airline industries in the world, growing at the rate of 25 to 30 percent a year. India began privatizing the airline industry in 1994, allowing a variety of private carriers to begin offering flights domestically. Privatization also included selling shares of the state-owned carriers, as well as attracting bids for new airports. Private carriers now account for more than two-thirds of domestic traffic.

India began a modernization program in 2007, with the goal of upgrading 35 non-metro airports. Work includes constructing terminal buildings. States are responsible for commercial exploitation and maintenance of terminal buildings.

In 2007, India had 14 scheduled airlines operators. The two largest public airlines, Indian and Air India, merged in 2006 to form the Aviation Company of India Ltd. (ACI), a state-controlled company. Along with ACI, there are eight private domestic operators. In addition, there are 65 charter flight companies and several helicopter charter services. The largest, Pawan Hans Helicopters, offers connectivity to otherwise inaccessible regions.

India is a member of the International Civil Aviation Organization. The U.S. Federal Aviation Administration International Aviation Safety Assessment Program ruled that India meets international safety standards. The airline industry is overseen by the Ministry of Civil Aviation, which is responsible for formulating and implementing all regulations concerning airports, flights, safety, and security. In India, airport security is stringent and includes procedures such as allowing only ticketed passengers into terminals and restricting all liquids and gels to checked baggage. All baggage is screened strictly, including x-ray examination and manual searches.

## ***Maritime***

### **Primary Ports**

<b>Port Coordinates</b>	<b>Berthing Availability</b>	<b>Depth</b>	
		<b>Anchor m (ft)</b>	<b>Pier m (ft)</b>
Chennai (Madras) 1306N/08018E	Vessels more than 152 m (500 ft) in length	18.6–19.8 (61–65)	7.9–9.1 (26–30)
Kochi 0958N/07614E	Vessels more than 152 m (500 ft) in length	12.5–13.7 (41–45)	7.9–9.1 (26–30)
Jawaharlal Nehru 1857N/07256E	Vessels more than 152 m (500 ft) in length	12.5–13.7 (41–45)	7.9–9.1 (26–30)
Kandla 2300N/07013E	Vessels more than 152 m (500 ft) in length	9.4–10.7 (31–35)	7.9–9.1 (26–30)
Kolkata 2233N/08819E	Vessels more than 152 m (500 ft) in length	9.4–10.7 (31–35)	7.9–9.1 (26–30)
Mumbai 1850N/07250E	Vessels more than 152 m (500 ft) in length	9.4–10.7 (31–35)	4.9–6.1 (16–20)

New Mangalore 1255N/07449E	Vessels more than 152 m (500 ft) in length	17.1-18.2 (56-60)	6.4-7.6 (21-25)
Paradip 2016N/08641E	Vessels more than 152 m (500 ft) in length	14-15.2 (46-50)	11-12.2 (36-40)
Tuticorin 0848N/07810E	Vessels up to 152 m (500 ft) in length	9.4-10.7 (31-35)	7.9-9.1 (26-30)
Vishakhapatnam 1741N/08318E	Vessels more than 152 m (500 ft) in length	21.6-22.9 (71-75)	9.4-10.7 (31-35)

India has 12 major seaports and almost 200 minor and intermediate ports. Seven of the major ports are on the west coast and five are on the east coast. The central government through the Port Trust of India manages the major ports, and the state governments manage the minor ports. India has opened up the ports system to private service through a framework allowing private management, concessions, or operation of port services. Plans exist to promote joint ventures between major India ports and minor foreign ports.

The major ports handle 75 percent of the traffic. Chennai, Kandla, and Vishakhapatnam handle the most tonnage, and Vishakhapatnam is the largest traffic handler. Major port capacity is 390 million tons of cargo annually. Jawaharlal Nehru Port is India's largest container port, accounting for more than half of all container traffic. Of the non-major ports, 60 handle shipping traffic. About 80 percent of port traffic was dry and liquid bulk in 2007 and 2008; the rest consisted of container traffic. The primary commodities the port system traffics are coal, petroleum products, iron ore, fertilizer and raw materials, food grains, and containerized cargo.

Ports are a major part of the transportation network and play a crucial role in facilitating international trade. The ports handle 90 percent of India's foreign trade in terms of volume. Because of inefficient management, the average turnaround time is high compared



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## Chennai Port

with that of other world-class ports systems. Lack of other transportation infrastructure connectivity hinders the unloading of cargo. These delays damage the competitiveness of India's ports system.

India has a large inland water transportation system that comprises navigable rivers, lakes, and man-made canals. There are 14,500 kilometers (9,010 miles) of navigable waterways, of which 5,600 kilometers (3,480 miles) are navigable by motorized boats. India's navigable water system has the potential to serve as cost-effective transportation, but, generally, it is used only in the states of Assam, West Bengal, Bihar, and Kerala. Inland waterways account for less than 1 percent of cargo transportation. Many waterways have navigational hazards such as shallow waters, monsoon flooding, narrow channel width during dry seasons, bank erosion, and inadequate navigational aids.

India has three national waterways: the Ganga River, the Brahmaputra River, and the West Coast Canal. National Waterway 1 travels along the Ganga river system from Allahabad to Haldia, covering 1,620 kilometers (1,007 miles). National Waterway 2 travels along the Brahmaputra River system from Sadiya to Dhubri

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for 891 kilometers (554 miles). National Waterway 3 covers 205 kilometers (127 miles) along the West Coast Canal, Champakara Canal, and Udyog-Mandal Canal. Inland waterways are regulated by the Inlands Waterways Authority of India. Three more waterways are scheduled for development.

Also of commercial importance is the tidal navigable river system in Goa, which comprises the Zuari and Mandovi rivers. The primary vessels found on navigable river systems are large cargo barges with a draft of no more than 3.2 meters (10.5 feet).

## **Communication**

### ***General Description***

India has the second-largest telecommunications sector in the world. It has one of the world's largest domestic satellite systems, which comprises six satellites. Along with fiber-optic cables, the system supports India's telecommunications network.

India's constitution provides for freedom of speech and expression, but it has no specific provision for freedom of the press. The government generally respects these rights in practice, and an independent press does exist. Foreign media operate freely in every medium except radio, and 80 percent of the news media is privately owned. Journalists regularly investigate and report on government wrongdoing.

### ***Radio***

Radio broadcasting was first opened to the private sector in 1999 when the government opened up the FM band frequencies (87.5–108 MHz). Private operators bid for 10-year licenses in 2000, and

the first private station began to broadcast in 2001. The high fee for licenses initially discouraged private radio growth.

There were 69 private FM radio stations in 2007. Nearly a quarter of the population listens to the radio every week. Radio is the primary mass communication medium in India. There are an estimated 132 million radios, and 77 stations have 100 percent penetration. Private stations provide only music and cultural programming because the government maintains a monopoly on news broadcasting. The government also maintains a monopoly on AM and shortwave radio broadcasting. Some foreign broadcasts, such as Voice of America and British Broadcasting Corporation (BBC), broadcast on shortwave.

All India Radio (AIR), the public broadcasting station, provides a variety of cultural programming and music. AIR functions as part of the Prasar Bharati (Broadcasting Corporation of India). AIR has 215 broadcasting centers and 139 FM transmitters. Including medium-wave broadcasting, there are 225 stations and 361 transmitters. AIR provides 99 percent of the population with programs in 24 languages and 146 dialects. AIR is the only station that has news coverage. The National Channel broadcasts news programs in languages such as Hindi, English, Urdu, and other regional languages. AIR also broadcasts 20 satellite radio stations.

One of the largest media conglomerates is Entertainment Network India Ltd, which holds the largest number of radio licenses. It runs Radio Mirchi, the largest private radio network in India. Radio Mirchi is the only private station to have a presence in all four major metropolitan areas. It expanded to 12 stations nationwide and has plans to expand further. Radio Mirchi built its brand by tailoring each station to local preferences. Other private stations

are owned by similar media conglomerates, some of whom also operate television channels.

### **Major Stations**

**All India Radio Rainbow** (101.3 FM Bangalore, 107.1 FM Chennai, 103 FM Coimbatore, 101.3 FM Cuttack, 102.6 FM Delhi, 102.7 FM Jalandhar, 100.5 FM Kodaikanal, 107.0 FM Kolkata, 100.7 FM Lucknow, 107.1 FM Mumbai, 105.4 FM Panaji, 102.1 FM Tiruchirapalli)

**All India Radio Gold**, (105 FM Chennai, 106.4 FM Delhi, 100.2 FM Kolkata, 100.7 FM Mumbai)

**Big FM** (92.7 FM, nationwide)

**Radio Mirchi** (98.3 FM, nationwide)

**Radio City** (91 FM, nationwide)

**Red FM** (93.5 FM, nationwide)

### **Programming**

Public station; News, Music, Talk Shows, Cultural

News, Music, Talk

Music, Entertainment

Music, Entertainment

Music, Entertainment

Music, Entertainment

## ***Television***

Television is very popular, and demand for more programming continues to increase. The government initially held a monopoly on television broadcasting, but in the early 1990s, private and foreign stations began to broadcast over satellite channels. The government monopoly on television broadcasting ended in 1995, and the broadcasting sector was deregulated. This led to rapid expansion of satellite and cable television, including the creation of the first domestic channels: Star TV, Sun TV, and Zee TV.

Television ownership has expanded rapidly. About 130 million homes have televisions, 71 million of which are cable subscribers. Digital cable is available, but it accounts for only 6 percent of cable subscribers. News broadcasts are very popular; several news channels broad-

cast around the clock. There are hundreds of channels broadcast by an increasingly diverse group of domestic and global media companies, including News Corporation, Sony Entertainment, and Walt Disney. Content includes soap operas, dramas, news, comedies, and serials.

Although a variety of channels is available, a handful of operators dominate the market. The largest India broadcasters are Zee and Sun TV, which dominate in non-Hindi-speaking southern India, and the highest ratings nationwide are for Star TV. Sony Entertainment began broadcasting in India in 1995; it operates seven channels. Foreign companies adapt material to local markets and local demographics. Time Warner has adapted *Sesame Street*, calling the show *Galli Galli Sim Sim*.

The government operates Doordarshan, one of the largest television networks in the world. Doordarshan, which has been in operation since 1959, has 25 channels: 5 are national, 11 are regional, 8 are state network services, and 1 is international. Doordarshan also offers a direct-to-home service, ensuring coverage for the entire nation. Of the national channels, DD-I is the largest terrestrial network in the world. It covers 91 percent of the country. It covers national events, official speeches, elections, and news. To compete with popular entertainment channels, Doordarshan began offering entertainment such as soap operas and musical contests.

Foreign television channels, such as BBC, are broadcast as part of domestic channels. The government allows only limited foreign ownership of terrestrial channels. Channels such as CNN and Fox News are readily available, along with specialized foreign broadcasts such as the History Channel, National Geographic, and ESPN. The Information and Broadcasting Ministry of India established the Electronic Media Monitoring Centre in 2008 to track television content. India is capable of monitoring more than 120 channels simultaneously.

## **Primary**

### **Television Station**

### **Programming**

Star TV

Movies, News

Zee TV (with Z News)

Movies, News, Talk Shows, Music

Zoom Television

Movies, News, Entertainment, Cultural

Doordarshan

News, Entertainment, Cultural

## ***Telecommunications***

In 2007, India had the third-largest telecommunications network in the world and the second largest in Asia. India had 671 million telephones in June 2010, up from 562 million in 2009. The telecommunications sector has seen rapid growth, with an average of 17.77 million connections added per month during the first half of 2010. Mobile phone services have had the highest growth, accounting for 85 percent of all phone connections. There were 635.51 million wireless phones and 36.18 million landlines in India as of June 2010.

The telecommunications sector has been increasingly deregulated and liberalized since the early 1990s. The mobile sector was opened to private operators in 1991, and mobile service began in 2004. International and national long distance were deregulated in 2000 and 2002, respectively, and the foreign direct investment limit in the telecommunications sector was increased from 49 percent in 2005 to 74 percent in 2006.

Private sector telecommunications increased from 20 percent of the market in 2003 to 72 percent in 2007. There are 13 licensed international service carriers and 20 licensed domestic service carriers. The largest operators are Reliance Communications, Bharti

Tele-Ventures, Hutchison Essar, and Tata Teleservices. Reliance Communications is an Indian business group that also provides broadband services. Vodafone, a UK-based company, purchased a controlling stake in Hutchison Essar Telecom, India's largest carrier, in May 2007. Bharti Tele-Ventures is owned by Bharti Enterprises, one of India's largest business groups.

India has two public sector telecommunications providers: Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL). BSNL is the largest, serving 68 million customers in 2007. BSNL provides most of the rural telephone connections and a range of other services, including broadband, Internet connectivity, and calling cards. MTNL provides telecommunications services for Delhi and Mumbai, including mobile phones and Internet services. MTNL is only majority publicly owned and 43 percent private. MTNL and BSNL provide the majority of fixed-line services in India.

In late 2009, India's rural teledensity was 18.97 percent, whereas the urban teledensity was 101.38 percent. The overall teledensity in India was 44.87 percent. The government intends to increase the rural teledensity percentage. To accomplish this, the government plans to offer low-cost mobile phones, and it has already lowered phone tariffs and fees. The government also plans to introduce mobile number portability into the four major metropolitan markets in order to encourage further growth. The government also subsidizes rural connectivity programs.

Telegram service is available through telecommunication providers such as BSNL and through the postal system. Telegraph and telegram services are available in all major cities and towns. Telegrams were once essential to link rural areas, but they have declined in importance as connectivity has spread.

## Telecommunication Statistics (2006)

<i>Total telephone subscribers</i>	272,870,000
<i>Telephone subscribers per 100 inhabitants</i>	23.3
<i>Main telephone lines</i>	39,250,000
<i>Main telephone lines per 100 inhabitants</i>	3.4
<i>Mobile users</i>	233,620,000
<i>Mobile telephone lines per 100 inhabitants</i>	20

## Newspapers and Magazines

India has the second-largest newspaper market in the world, with 99 million newspapers sold daily. High levels of illiteracy and poverty in India make press penetration only 45 percent in urban areas and 19 percent in rural areas. There are more than 5,500 registered print publications, but there are thousands of additional papers throughout the country that are not officially monitored. Eighteen publications had a readership of more than 5,000,000 in 2006. Daily papers are available in every language except Kashmiri.

Dailies continue to increase in popularity, reaching 25 percent of readers. The most popular non-English dailies are *Dainik Jagran*, with a readership of 55.7 million, and *Dainik Bhaskar*, with a circulation of 44.9 million. *Dainik Jagran* runs 28 different editions throughout the country and focuses on local news. *Dainik Bhaskar*, a Hindi daily, is owned by the Dainik Bhaskar media group; it operates various editions in several languages, including Hinglish (a mix of Hindi and English).

The top English dailies are the *Times of India*, with a readership of 13.3 million, *Hindustan Times*, with a circulation of 6.3 million, and *The Hindu*, with a readership of 5.2 million.

Magazine readership slightly decreased during 2006 and 2007, selling around 68 million copies. The most popular magazines are *Saras Salil*, with a circulation of 4.8 million, and *Vanitha*, with a circulation of 3.1 million.

Most international publications are available in India, in addition to the various English language dailies, weeklies, and magazines. The *International Herald Tribune*, *Asian Wall Street Journal*, and *USA Today* are printed in Singapore and available the next day.

<b>Publication</b>	<b>Lang.</b>	<b>Freq.</b>	<b>Web Address</b>
<i>Dainik Bhaskar</i>	Hindi	Daily	www.bhaskar.com
<i>Dainik Jagran</i>	Hindi	Daily	us.jagran.com
<i>Eenadu</i>	Telugu	Daily	www.eenadu.net
<i>Amar Ujala</i>	Hindi	Daily	www.amarujala.com
<i>The Economic Times</i>	English	Daily	www.economictimes.com
<i>The Financial Express</i>	English	Daily	www.financialexpress.com
<i>The Hindu</i>	English	Daily	www.thehindu.com
<i>The Hindustan Times</i>	English	Daily	www.hindustantimes.com
<i>The Times of India</i>	English	Daily	www.timesofindia.com

## **Postal Service**

India Post, the official postal service, has been in operation since India gained independence. It is responsible for providing postal services for the entire nation. It is the largest postal distribution system in the world, with a network of 155,516 post offices



throughout the country. More than 139,000 of these offices are in rural areas.

India Post has worked to implement innovations in technology to improve efficiency and reliability. India Post has computerized more than 8,000 offices to allow delivery tracking and electronic mail processing. India Post offers additional services, including financial transfers and business post. Mail delivery throughout the country is reliable but can experience unexpected delays that vary between regions and post offices. International mail can take from 3 days to 4 weeks, depending on destination; ten days for international mail is standard.

India Post, along with other domestic providers, offers international package delivery, but service is problematic; other international couriers, such as DHL and FedEx, are available.

## ***Internet***

Increased liberalization has allowed the growth of Internet services, but penetration remains low, at an estimated 7 percent in 2009. The primary means through which to access the Internet are either through one's work office or through a public access point. Cyber cafés account for a third of Internet usage, and offices account for about 40 percent; home access accounts for the remainder. Internet use has increased primarily in urban areas, where usage increased more than 20 percent from September 2008 to September 2009. People primarily use the Internet for social networking and entertainment. Personal computer ownership is low, but manufacturers have increased their presence in the market by introducing low-cost models and offering training.

There were 378 licensed Internet service providers in 2007, with 69 licensed to service all of India. There were 10 million Internet

subscribers and 3 million broadband subscribers in 2007. India has reduced the number of licenses needed for operating Internet service to one. India plans to boost broadband service. Because of connectivity issues, broadband services often do not perform at high speeds.

The government reserves the right to censor the Internet on the grounds of public morality and to limit access to the Internet for national security reasons; however, actual restrictions are rare.

<b>Internet Statistics (2007)</b>	
<i>Total Internet hosts</i>	2.3 million
<i>Hosts per 10,000 inhabitants</i>	20.3
<i>Users</i>	60,000,000
<i>Users per 100 inhabitants</i>	5.2
<i>Total number of Personal Computers</i>	27,551,902
<i>PCs per 100 inhabitants</i>	2.4
<i>Internet broadband per 100 inhabitants</i>	0.3

## **Satellites**

India owns the India National Satellite System (INSAT), which is one of the largest domestic communication satellite systems in Asia. Established with the successful launch of INSAT – 1B in August 1983, INSAT provides key services to the telecommunications sector, television broadcasting, weather forecasting, disaster warning, and search and rescue. INSAT provides television broadcast services to more than 900 million people in India.

INSAT has 11 satellites in service that were launched between 1999 and 2007, including INSAT – 2E, INSAT – 3A, INSAT – 3B, INSAT – 3C, INSAT – 3E, KAPLANA – 1, GSAT – 2, EDUSAT,

INSAT – 4A, and INSAT – 4B. EDUSAT is the first India satellite solely designated to serve the education sector, providing distance education services. KAPLANA – 1 is an exclusive meteorological satellite. INSAT supports 33,000 very small aperture terminals (VSAT). India also operates eight INTELSAT satellite earth stations and one INMARSAT satellite earth station.

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## **SOCIETY AND CULTURE**

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### **Statistics**

<i>Population</i>	1.2 million
<i>Population Growth Rate</i>	1.3 percent
<i>Birth Rate</i>	20.97 births/1,000 people
<i>Death Rate</i>	7.48 deaths/1,000 people
<i>Net Migration Rate</i>	-0.05 migrant/1,000 people
<i>Life Expectancy at Birth</i>	Total population: 66.8 years male: 65.77 years female: 67.95 years
<i>Population Age Structure</i>	0–14 years: 29.7 percent 15–64 years: 64.9 percent 65 years and older: 5.5 percent
<i>Date of the Last Census</i>	2011

### **Population Patterns**

India's overall population density is 325 persons per square kilometer. India has 35 urban areas with one million people or more. Mumbai, Kolkata, and Delhi have more than 16 million, 13 million, and 12 million people, respectively (2001 estimated). The city with the highest population density is Delhi, at 9,340 persons



### Population Density

per square kilometer. The district of North East Delhi has the highest population density among districts, at 29,468 persons per square kilometer (2001 estimated). The total rural population is more than 742 million, accounting for more than 72 percent of the population (2001 estimated).

The most populated rural areas are Uttar Pradesh, Bihar, West Bengal, Maharashtra, and Andhra Pradesh, with more than 131 million, 74 million, 57 million, 55 million, and 55 million people, respectively (2001 estimated). The percentage of urban population has steadily increased from almost 11 percent in 1901 to almost 28 percent in 2001. In 2010, estimates indicated an urban population of 30 percent. People migrate to urban areas in search of jobs.

<b>Top 10 Cities/Urban Agglomerates by Population (2010 estimated)</b>		
<b>City</b>	<b>Coordinates</b>	<b>Population</b>
Delhi	2838N 07712E	22,157,000
Mumbai	1915N 07250E	20,041,000
Kolkata	2232N 08820E	15,552,000
Chennai	1334N 08014E	7,547,000
Bangalore	1258N 07735E	7,218,000
Hyderabad	1723N 07829E	6,751,000
Ahmedabad	2322N 07234E	5,717,000
Pune	1832N 07351E	5,002,000
Surat	2111N 07249E	4,168,000
Kanpur	2627N 08019E	3,364,000

## **Ethnic Density**

It is estimated that India has more than 2,000 ethnic groups. The primary groups are Indo-Aryans, Dravidians, and Mongoloids. Indo-Aryans are concentrated in northern India and make up 72 percent of the population. Dravidians are concentrated in southern India and make up 25 percent of the population. Mongoloids are concentrated in the sub-Himalayas and make up 3 percent of the

population. Each of these groups is further divided based on tribe, caste, and religion.

## Society

Marriage, birth, and death rites are important traditions in Indian culture. Although most Hindu marriages are arranged marriages, the number of non-arranged marriages has increased, mainly in urban areas. Marriages are arranged through subtle inquiries within the community, professional matchmakers, newspapers or Internet advertisements, and family meetings. Although dowries are not legal, they are still practiced in traditional circles.

Traditional ceremonies after the birth of a child include casting the first horoscope, name giving, feeding the first solid food, and the first haircut. Hindu death rites include cremation and sprinkling the ashes into a holy body of water (such as the Ganga River) and offerings of rice cakes to ancestors on the anniversary of the death. The eldest son performs the funeral rites, and the family goes through several purification rituals before it can reintegrate into society. This process also allows the soul of the deceased to transition to the next stage.

The caste system is not as strong as it once was, but is still influential in rural areas. The caste in which one is born determines one's social standing, employment opportunities, and marriage prospects. Accepting this arrangement and doing good deeds are believed to improve one's chances of being reborn into a higher caste.

The Indo-Aryans established the caste system, with themselves at the top, based on *varna*, or color, more than 3,000 years ago because they were concerned that contact with the dark-skinned natives would result in racial impurity. This system has been outlawed, but it is still practiced in rural areas.

There are four castes in the system: Brahmin (priests and teachers), Kshatriya (warriors), Vaishya (merchants), and Shudra (laborers). Castes are divided into thousands of subcastes. Beneath the castes is a group called the Dalits, or Untouchables. They do menial work such as sweeping and cleaning restrooms. Beneath the Dalits are nearly 200 nomadic and semi-nomadic tribes.

## ***People***

Indo-Aryans arrived from central Asia around 1500 BCE and settled in the Indus region and Gangetic Plains of North India. Physical characteristics of Indo-Aryans include lighter skin, eyes, and hair than that of inhabitants of South India. Indo-Aryans established Hinduism and the caste system, or social hierarchy. There are several Indo-Aryan tribes, including the Kinnauris, Dards, Kurus, and Panchalas. There are hundreds of Indo-Aryan languages, including Sanskrit, Hindi, Marathi, Gujarati, and Panjabi.

Dravidians comprise most of South India. Their exact origin is unknown, but some historians believe the Dravidians are the original inhabitants of India who were driven south between 1500 and 300 B.C. by Indo-Aryan invaders. Physical characteristics of Dravidians include darker skin, eyes, and hair and smaller stature than that of the inhabitants of North India. There are several Dravidian tribes, including the Kurux, Malto, Kamars, and Muria. Dravidian languages include Tamil, Telugu, Kannada, Badaga, and Malayalam.

Mongoloids descended from inhabitants of Tibet and southern China. Physical characteristics of Mongoloids include yellow complexion, oblique eyes, high cheekbones, sparse hair, and medium height. Mongoloids are concentrated in the northeast and sub-Himalayas. Mongoloid tribes include the Shompen and Nicobarese.

## ***Family***

Family is the main pillar of India's society. Although the number of nuclear families is increasing, particularly in urban areas, the extended family remains the cornerstone of family life in urban and rural areas. The extended family became necessary for agricultural communities to survive socially and economically. The extended family can include three or four generations sharing one household. The extended family is patriarchal, with clear lines of authority. The oldest male is in charge; male siblings rank above female siblings of similar age; wives rank below the husband's sisters and the patriarch's wife. When a woman marries, she moves in with her husband and his family. She is expected to give them her primary loyalty. Matriarchal families used to be common in certain parts of India.

## ***Roles of Men and Women***

Although females are born at a higher rate than males, men outnumber women because of female infanticide, gender-selective abortions, and malnutrition. Women constitute 48 percent of the population, as of 2001. The birth ratio between 1985 and 2005 was 92 to 93 males per 100 females; however, during the same period, the male to female ratio in the total population was the exact opposite—92 to 93 females per 100 males.

Women have a lower social status than men do. Traditional attitudes and beliefs about gender are firmly grounded in religion and caste. Most Hindu families—in particular, poor families—prefer male children because male adults earn money to provide support in old age, continue family lineage, and perform last rites at funerals. Hindu families still provide dowries to the groom's family when their daughters marry, although the practice has been outlawed. When families are unable to pay, brides may be put to



death, by suicide, alleged suicide, or bride burnings. These deaths are typically treated as accidents and are not reported.

Although India's constitution guarantees equal rights for men and women, women still receive unequal treatment in areas such as nutrition, health, education, employment, income, and property rights.

Only 34 percent of women participate in the workforce, as opposed to 82 percent of men (2005). Women are also underrepresented in political life. They hold 45 seats in parliament's lower chamber and 26 in the upper chamber, as opposed to 500 and 216, respectively, for men. However, a woman, President Shrimati Pratibha Patil, does hold the highest public office.

*Sati*, or burning a Hindu widow alive on her husband's funeral pyre, was outlawed in the 19<sup>th</sup> century but is still practiced in some villages. It is legal for widows and divorcées to remarry, but few are able to because of the social stigma attached to both. Upper-caste widows are expected to remain unmarried and celibate for the rest of their lives. The age of majority for men is 18. The age at which one can consent to marriage is 18 for women and 21 for men.

## **Education and Literacy Rates**

In India, education is free and compulsory for children between the ages of 6 and 14. India has a two-tiered education system: pre-higher and higher. Pre-higher lasts 10 years, covers general education, and consists of primary and secondary schools. Primary is divided into two stages: lower and upper primary. Lower primary lasts 5 years, between ages 6 and 11. Upper primary lasts 3 years, between ages 11 and 14. Secondary lasts 2 years, between ages 14 and 16. Graduates receive secondary school certificates and enter senior secondary school, junior college for 2 years, or vocational secondary school for 2 to 3 years. Graduates of both receive

a higher secondary school certificate. Senior secondary schools focus on university preparation, whereas most vocational school graduates enter the workforce.

India also has a number of higher education institutions and universities that are similar in form and function to other internationally recognized institutions of higher learning. According to the 2001 census, India's overall literacy rate is 65 percent: 75 percent for men and 54 percent for women. The literacy rate is considerably higher in urban areas, at 80 percent overall, or 86 percent for men and 73 percent for women.

The literacy rate has steadily increased since 1985. Between 1985 and 1995, the adult literacy rate was 48 percent. Between 1995 and



**Students in their Classroom**

2005, the rate increased to 61 percent. Between 1985 and 1995, the youth literacy rate was 62 percent. Between 1995 and 2005, the rate improved to 76 percent.

In 2005, 74 million males and 66 million females were enrolled in primary school, 51 million males and 38 million females were enrolled in secondary school, and 71 million males and 46 million females were enrolled in tertiary schools.

India has a rich literary tradition and is famous for Sanskrit, Hindi, and English literature. Sanskrit literature includes the *Vedas* (Hindu holy texts), *Ramayana and Mahabharata* (Hindu epics), *Vaastu Shastra* (architecture text), and *Arthashastra* (political science text). Hindi literature thrived in the medieval period and British era with authors such as Devaki Nandan Khatri, Maithili Sharan Gupta, Jaishankar Prasad, Sumitranandan Pant, Mahadevi Varma, and Ramdhari Singh Dinkar. Indian literature written in English has thrived in the modern era with famous authors such as Mulk Raj Anand (*Untouchables and Coolie*), R. K. Narayan (*Swami and Friends*), and Anita Desai (*Clear Light of Day and In Custody*). Famous contemporary writers include Arundhati Roy (*God of Small Things*), Jhumpa Lahiri (*Shobha De*), Vikram Seth (*A Suitable Boy*), Allan Sealy (*The Trotter-Nama*), and Shashi Tharoor (*Show Business*).

## Religion

India has many tribal religions that have remained geographically isolated. Some, however, have mixed with mainstream religions such as Hinduism, Buddhism, Jainism, and Sikhism. These faiths originated in India. Other mainstream religions are Zoroastrianism, Judaism, Islam, and Christianity.

Hinduism is the largest religion in India; more than 80 percent of the population is Hindu. India has more than 827 million Hindus. They comprise a majority in 27 states, excluding Lakshadweep, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, Jammu and Kashmir, and Punjab. Basic Hindu beliefs are dharma, karma, and reincarnation. Dharma is the belief that one should accept one's life circumstances or social status and the duties that come with it. Karma is fate, or the belief that current circumstances are the result of good or bad deeds done in the previous life and that one's deeds in the current life will influence circumstances in the next life. Reincarnation is the belief in multiple lives.

Muslims are the second-largest religious group in India, accounting for more than 13 percent of the population. India has more than 138 million Muslims. They comprise a majority in Lakshadweep and Jammu and Kashmir. Muslims also have sizable populations in Assam (30.9 percent), Bihar (16.5 percent), Kerala (24.7 percent), Uttar Pradesh (18.5 percent), and West Bengal (25.2 percent).

India has more than 24 million Christians, which account for more than 2 percent of the population. They comprise a majority in three northeastern states: Nagaland, Meghalaya, and Mizoram. Other states with large Christian populations include the following: Goa (26.7 percent), Kerala (19 percent), Manipur (34 percent), Andaman and Nicobar islands (21.7 percent), and Arunachal Pradesh (18.7 percent).

More than 19 million Sikhs comprise less than 2 percent of India's total population. More than 75 percent of Sikhs live in Punjab. Other states with Sikh populations include Chandigarh (16.1 percent), Delhi (4 percent), Haryana (5.5 percent), Uttaranchal (2.5 percent), and Jammu and Kashmir (2 percent). These states account for almost 90 percent of India's Sikh population.

Sikhism has four stages of spiritual development: *manmukh*, *sikh*, *khalsa*, and *gurmukh*. *Manmukh* is one who is selfish, self-centered, and incompetent. *Sikh* is one who is conscious of his or her incompetence and sets out on a path of learning. *Khalsa* is one who has shed his or her ego and achieved a measure of competence and selflessness. *Gurmukh*, the highest stage, is one who has developed an inner authority and is ready to teach. Sikhism rejects rituals, fasting, pilgrimages, and omens and stresses honesty, patience, generosity, and humility. Sikhism also accepts karma but believes karma can be broken by obeying the will of God.

Buddhists account for less than 1 percent of the population. India has almost 8 million Buddhists. They comprise a majority in Maharashtra (58.3 percent), where more than 73 percent of India's Buddhist population resides. Other states that have a large Buddhist population include Mizoram (7.9 percent), Sikkim (28.1 percent), and Arunachal Pradesh (13 percent). Buddhism believes in nirvana—a state of enlightenment or bliss in which one is free



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**The Hindu Shore Temple**

of desire, pain, and suffering. Buddhism rejects rituals and castes but embraces karma.

Jains make up less than one-half of 1 percent of the population. India has more than 4 million Jains. Almost 90 percent of India's Jain population resides in Delhi, Gujarat, Karnataka, Maharashtra, Rajasthan, Madhya Pradesh, and Uttar Pradesh. The main tenet of Jainism is ahimsa—avoiding harming any living creature.

Although all religions have equal status in India and exist in relative harmony, religious violence does occur from time to time.

## Recreation

Popular sports include cricket, field hockey, volleyball, soccer, tennis, golf, polo, and horse racing. Cricket, the most popular sport in India, is played in open spaces throughout the country. Field hockey is popular in schools, colleges, and among tribal girls in Orissa. Volleyball and soccer are popular throughout the country. Tennis and golf are played mainly by the middle class. Polo is played mainly by the army. Horse racing is popular in large cities such as Kolkata, Mumbai, Delhi, Pune, Hyderabad, Mysore, Bangalore, and Ooty.

An indigenous sport called *kabaddi* is popular in North India. It consists of teams of seven players. The goal is to tag as many opposing players as possible during a single breath and continuous chant of *kabaddi* and then make it back to your side of the court without being caught. Wrestling, or *kushti*, has a small but dedicated following that is often seen exercising along river ghats in Varanasi and Kolkata.

Outdoor activities include trekking, skiing, mountaineering, caving, whitewater rafting, diving, and snorkeling. Social events take



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## Playing Cricket

place during national, state, and religious holidays and festivals. There are only four national holidays, but there are numerous state and religious holidays and festivals throughout the year.

## Customs and Courtesies

Hindi is the official language. It is spoken by more than 200 million Indians, or nearly 20 percent of the population. India's constitution recognizes 21 other official languages: Assamese, Bengali, Bodo, Dogri, Gujarati, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, Sanskrit, Santhali, Sindhi, Tamil, Telugu, and Urdu. English is used in government transactions, business, media, and higher education. India's state boundaries are drawn along ethnic and linguistic patterns.

The traditional Hindu greeting is called the *namaskar*; it is done when greeting and departing. This greeting is done by pressing one's palms together and then raising them toward one's face

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while one bends one's head slightly forward and says "*Namaste*" (pronounced namastay), which literally means "I bow to you."

The traditional Muslim greeting is "*as-salaamu alaykum*," which means "peace be upon you." The response is "*wa alaykum as-salam*," which means "and peace be upon you also." The traditional Sikh greeting and response is "*sat sri akal*," which means "truth is universal."

The suffix *ji* is added to the end of greetings, names, or titles of relatives to show respect.

Indians dress conservatively and refrain from kissing, cuddling, and other public displays of affection. Public nudity is unacceptable. Bikinis are acceptable on beaches, but swimming in shorts and a t-shirt is recommended in less touristy areas. It is inappropriate to touch an Indian's head, show an Indian the soles of your feet, or touch an Indian with the soles of your feet.

Shoes should be removed before entering holy places; socks, however, are permitted in most houses of worship. It is inappropriate to wear shorts or sleeveless tops, smoke, joke, or horseplay at temples or sacred sites. It is also inappropriate to touch an image of a deity and to direct one's soles toward a shrine or image of a deity.

When having dinner at an Indian's home, it is good manners to remove your shoes before you enter and to wash your hands before the main meal. Guests should wait to be served or for the host to invite them to serve themselves. Indians eat and perform other social acts, such as shaking hands, with the right hand; they perform unsavory acts, such as toilet duties and removing shoes, with the left hand. They also avoid contact with shared water containers by holding the container slightly above their mouth when drinking.



When eating out, do not order beef or pork. Many restaurants do not serve beef or pork because Hindus consider cows sacred and Muslims consider pork taboo. Most restaurants do not serve alcohol. Although Indians eat with their hands (specifically, the right hand), most restaurants have utensils for people who wish to use them. When one person invites another to a restaurant, it is implied that the inviter is the host and is paying the bill. Generally, at big restaurants and hotels, a 10-percent service charge is added to the bill. Tipping is discretionary and can be done either before or after services. There is no fixed percentage at smaller eateries.

Prices tend to be inflated in tourist areas, and bargaining is usually expected, except in fixed-price shops. Shoppers should be prepared to bargain, but in a polite, cheerful, respectful, and nonaggressive manner. Shoppers should have an idea of how much an item is worth or how much they are willing to pay. Half the quoted price is a good place to start negotiating. A quote too low may insult merchants and result in missing a good deal.

In India, as in the West, nodding one's head means "yes" and shaking one's head means "no"; however, Indians have a distinct head rotation or wobble that looks like the Western "no," but if one looks closely, one can see the difference. This gesture has several meanings. It means "yes" to many Indians in the south, but it also means "sure," "I agree," "I understand," "I hear you," or "maybe."

Grasping one's own ear signifies sincerity or repentance. The proper way to beckon is with palms down with fingers pulling inward. Avoid using a single finger to point; this is considered rude. Indians point with the entire hand or by jerking their chin. Avoid whistling and winking because they are considered impolite.

## Cultural Considerations

Although traditional practices are less frequently practiced among the educated population, they persist in many areas. For example, many Hindus and Muslims, particularly among upper castes, practice *purdah* (keeping women secluded in the home or dressed in veils). The purpose of *purdah* is to maintain female modesty and to protect family honor. Hence, casual interaction between opposite sexes is forbidden or heavily supervised.

The *bindi*, a dot worn on the forehead between one's eyebrows, formerly signified whether a woman was married. Applying the *bindi* to the forehead of the bride and groom is a traditional part of Hindu weddings. Traditionally, *bindis* are red; red is chosen because it is believed to bring good luck and prosperity to the woman's family and to signify her as the guardian of family honor. Today, *bindis* are fashion statements worn by women of all ages regardless of marital status. *Bindis* come in all colors and can be either powder or peel-and-stick adhesives.

India is a deeply spiritual culture, and it is important not to offend the various religions in India. Cows are sacred to Hindus; therefore, shoes, bags, and other products made from cowhide should be avoided. Pigs are taboo to Muslims; therefore, eating or touching pork or pork products should be avoided. Sikhs do not use tobacco.

It is common for Indians to ask foreigners personal questions about their family, job, salary, home, religion, marital status, and purpose of visit. This may be uncomfortable to Westerners; however, in India, it is considered polite conversation and helps Indians determine social status. Indians will not be offended if asked the same questions.

Indians' concept of personal space is different from that of Westerners. For example, when talking to someone, Indians stand much closer to the other person than Westerners are used to. It is common to see people of the same gender walking and holding hands or with arms interlocked; this has no sexual overtones.

It is inappropriate for a woman to be touched by a male other than her husband or son; therefore, a man should not shake a woman's hand unless she initiates the handshake.

Sex is not openly discussed. Politics—particularly India-Pakistan relations—and other topics that may cause embarrassment, such as poverty, dowry, dowry deaths, widow burnings, and the caste system, should also be avoided.

The belief in karma and reincarnation influences how Indians view time. Unlike Westerners, Indians are not concerned with time. Appointments and deadlines are fluid. There is no such thing as “seizing the moment” or missed opportunities. The notion that one has multiple lifetimes to complete something creates a slow-paced “go with the flow” culture. However, Indians who have experience in the global economy are more sensitive to the importance Westerners place on schedules and deadlines.

Government offices are generally open from 0930 to 1730 Monday through Friday. Shops and retail outlets are generally open from 1000 to 1730 or later, depending on location; many are closed on Sunday. Fresh produce markets sometimes stay open until late at night. Many restaurants are open from 0800 to 2200. Banks are generally open weekdays from 1000 to 1400 and Saturday from 1000 to noon. Hours for individual branches vary from one town to the next; the branches sometimes close as late as 1600 on weekdays and 1300 on Saturdays.

India has four national holidays—Republic Day (26 January), Independence Day (15 August), Gandhi’s Birthday (2 October), and Christmas Day (25 December)—and numerous religious holidays and festivals. These holidays and festivals vary from one region to the next and in some cases from one temple to the next. Communities often have their own unique way of celebrating the same occasion.

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## **MEDICAL ASSESSMENT**

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### **Disease Risks to Deployed Personnel**

The National Center for Medical Intelligence (NCMI) assesses India as **HIGH RISK** for infectious diseases, with an overall disease risk that will adversely impact mission effectiveness unless force health protection measures are implemented.

The following is a brief summary of the infectious disease risks in India. Risk varies greatly depending on location, individual exposures, and other factors. More detailed information is contained in Baseline Infectious Disease Risk Assessments, produced by the NCMI, available through the following channels:

- Unclassified internet: <http://www.afmic.osis.gov>
- SIPRNET: <http://www.ncmi.dia.smil.mil>

### ***Food- and Waterborne Diseases***

Sanitation is poor throughout the country, including major urban areas. Local food and water sources (including ice) are heavily contaminated with pathogenic bacteria, parasites, and viruses to which most U.S. service members have little or no natural immunity. Effective disease surveillance does not exist within the country. Only a small fraction of diseases are identified or reported.

If local food, water, or ice is consumed, diarrheal diseases can be expected to temporarily incapacitate a very high percentage of personnel within days. Hepatitis A, hepatitis E, and typhoid fever can cause prolonged illness in a smaller percentage. In addition, viral gastroenteritis (e.g., norovirus) and food poisoning (e.g., *Bacillus cereus*, *Clostridium perfringens*, and *Staphylococcus*) may cause significant outbreaks.

### ***Vector-borne Diseases***

The climate and ecological habitat support large populations of arthropod vectors, including mosquitoes and ticks. Disease transmission is sustained year-round, including urban areas. Serious diseases may not be recognized or reported because of the lack of surveillance and diagnostic capability. Malaria, chikungunya, and dengue fever, the major vector-borne risks in India, are capable of debilitating a high percentage of personnel for up to a week or more. High-altitude areas (above 2,000 meters) in Himachal Pradesh, Jammu and Kashmir, and Sikkim States are assessed as risk free for malaria.

Japanese encephalitis also occurs countrywide, particularly in rural, rice-growing regions. Other vector-borne diseases occur at low or unknown levels; as a group, these diseases may constitute a potentially serious operational risk. Personnel exposed to mosquitoes, ticks, sand flies, or other biting vectors are at high risk during day or night, in both urban and rural areas.

### ***Animal-associated Diseases***

Rabies risk in India is among the highest in the world; dogs are the main rabies reservoir. Personnel bitten or scratched by animals are at high risk of developing rabies in the absence of appropriate treatment. Rare cases of anthrax could occur among personnel

exposed to animals, animal products, or undercooked meat. Also, rare cases of Q fever could occur among personnel exposed to aerosols from infected animals. More cases are possible in situations where personnel have heavy exposure to barnyards or other areas where animals are housed.

### ***Sexually Transmitted and/or Blood-borne Diseases***

Hepatitis B and HIV/AIDS are reported in India, particularly in prostitutes, a high-risk group for sexually transmitted disease worldwide. Heterosexual contact is the predominant mode of transmission. Carrier rates for hepatitis B are high. The long-term health impact of these diseases on individuals is substantial. A variety of other sexually transmitted diseases (including chlamydia, gonorrhea, chancroid, herpes, syphilis, and venereal warts) may cause symptomatic infection in a high percentage of personnel who have sexual contact.

### ***Water-contact Diseases***

Operations or activities that involve extensive freshwater contact (lakes, rivers, streams, or other surface water) may result in personnel being temporarily debilitated with leptospirosis and schistosomiasis in some locations. Schistosomiasis is restricted to focal areas, and foci have been reported in Maharashtra, Andhra Pradesh, and Madhya Pradesh States. In addition, bodies of surface water are likely to be contaminated with human and animal waste. Activities such as wading or swimming may result in exposures to enteric diseases such as diarrhea and hepatitis via incidental ingestion of water. Prolonged water contact also may lead to the development of a variety of potentially debilitating skin conditions such as bacterial or fungal dermatitis.

## ***Respiratory Diseases***

Tuberculosis rates are high among the local population. Prolonged contact with the local population may result in high tuberculosis skin test conversion rates, well over the U.S. military baseline. Tuberculosis is also a threat to human health through the consumption of unpasteurized milk. In addition, U.S. personnel may be exposed to a wide variety of common respiratory infections in the local population.

## **Medical Capabilities**

The overall quality of care in India's health care system is poor. Social and economic inequality prohibits the provision of quality, accessible care to the vast majority of Indians. However, private, adequately resourced and staffed Western-style tertiary care facilities are available in major cities.

The quality of medical personnel ranges from Western-trained, English-speaking physicians who practice mostly in large for-profit urban facilities to poorly trained physicians who find it difficult to meet the population's most basic health care needs. Severe shortages of medical personnel exist overall. The quality of nursing is poor, and shortages of qualified nurses exist, especially in government hospitals.

The quality of hospitals varies greatly between the private and public sectors and between urban and rural facilities. The country's best hospitals are located in major cities.

Blood safety is an ongoing issue that contributes to chronic blood shortages and spread of infectious diseases. Most blood banks are attached to government hospitals and are poorly managed and reg-

ulated. Most private, Western-styled hospitals provide their own blood bank services and have adequate testing capabilities.

The overall quality of India's pharmaceuticals does not meet Western standards. Government regulation of pharmaceutical production, quality control, and distribution is poor, allowing many unsafe products to enter the market.

India's emergency medical care system is ineffective by Western standards. Although the numbers of ambulances and trauma facilities are limited, most private, Western-styled facilities provide their own emergency transportation. This consists of mostly emergency ground transportation, but in some cases air evacuation capabilities are available. India has a national emergency telephone number, 1066, for ground and air ambulance services.

Hindu is the national language and the primary language of 30 percent of the population; English is the language most used for national, political, and commercial communication. India has the third largest Muslim population in the world.

### ***Key Medical Facilities***

The following hospitals meet Western standards of medical practice and care.

<b><i>Facility</i></b>	<b>Chennai Apollo Hospital</b>
<b><i>Coordinates</i></b>	13-03-47N 080-15-05E
<b><i>Location</i></b>	In central Chennai on Greams Lane off of Greams Road, 12.2 kilometers (km) northeast of Chennai International Airport and 1.1 km north of the U.S. Consulate
<b><i>Phone</i></b>	044-2829-333,2829-0200
<b><i>City</i></b>	Chennai
<b><i>Type</i></b>	Private
<b><i>Beds</i></b>	610



<b>Capabilities</b>	<b>Medical</b> – cardiology, dentistry, dermatology, emergency medicine, endocrinology, gastroenterology, general internal medicine, hematology, infectious diseases, nephrology, neurology, nuclear medicine, oncology, pediatrics, physical medicine and rehabilitation, psychiatry, pulmonology, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, otorhinolaryngology (ENT), pediatric surgery, plastic surgery, urology, vascular surgery; <b>Ancillary</b> – ambulance, blood bank, emergency room, laboratory, pharmacy, physical therapy, respiratory therapy, X-ray
<b>Comments</b>	Used by U.S. Consulate personnel. Affiliated with the Apollo Hospital Group.

<b>Facility</b>	<b>Indraprastha Apollo Hospital</b>
<b>Coordinates</b>	28-32-27N 077-16-59E
<b>Location</b>	In Southeastern New Delhi, 17.6 km east of Indira Gandhi International Airport and 11.2 km southeast of the U.S. Embassy
<b>Phone</b>	2692-5801/5858/5888
<b>City</b>	New Delhi
<b>Type</b>	Private
<b>Beds</b>	695
<b>Capabilities</b>	<b>Medical</b> – allergy and immunology, cardiology, dermatology, endocrinology, gastroenterology, general internal medicine, hematology, nephrology, neurology, nuclear medicine, oncology, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology, vascular surgery; <b>Ancillary</b> – ambulance, blood bank, intensive care unit (ICU), laboratory, pharmacy, 24-hour emergency room
<b>Comments</b>	Offers a broad spectrum of specialty services. Used by U.S. Consulate.

<b>Facility</b>	<b>Army Research and Referral</b>
<b>Coordinates</b>	28-35-00N 077-09-30E
<b>Location</b>	In southwestern New Delhi, 6.6 km northeast of Indira Gandhi International Airport and 3 km southwest of the U.S. Embassy.
<b>Phone</b>	692-5801, 692-5858, 683-0917
<b>City</b>	New Delhi
<b>Type</b>	Military
<b>Beds</b>	720
<b>Capabilities</b>	<b>Medical</b> – cardiology, dermatology, emergency medicine, gastroenterology, general medicine, nephrology, oncology, pathology, radiology; <b>Surgical</b> – anesthesia, cardiovascular surgery, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, plastic surgery, thoracic surgery, vascular surgery; <b>Ancillary</b> -- emergency room
<b>Comments</b>	Modern hospital with well-trained nurses and para-medical staff.

<b>Facility</b>	<b>Mumbai Hospital</b>
<b>Coordinates</b>	18-56-27N 072-49-41E
<b>Location</b>	In southern Mumbai, 16.8 km south-southwest of Chhatrapati Shivaji International Airport and 4 km southeast of the U.S. Embassy
<b>Phone</b>	022-2067676
<b>City</b>	Mumbai
<b>Type</b>	Public
<b>Beds</b>	830
<b>Capabilities</b>	<b>Medical</b> – cardiology, dentistry, gastroenterology, general medicine, hematology, neurology, nuclear medicine, oncology, pathology, pediatrics, physical therapy and rehabilitation, radiology; <b>Surgical</b> – anesthesiology, cardiovascular surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, thoracic surgery, urology; <b>Ancillary</b> – ambulance, blood bank, ICU, pharmacy, X-ray
<b>Comments</b>	Offers multi-specialty tertiary level care.

<b>Facility</b>	<b>East West Medical Center</b>
<b>Coordinates</b>	28-35-50N 077-13-50E
<b>Location</b>	In east-central New Delhi, 12.8 km east-northeast of Indira Gandhi International Airport and 4.1 km east of the U.S. Embassy
<b>Phone</b>	469-9229,462-3738,469-0955,469-8865
<b>City</b>	New Delhi
<b>Type</b>	Private
<b>Beds</b>	16
<b>Capabilities</b>	<b>Medical</b> - general medicine; <b>Surgical</b> – general surgery, obstetrics/gynecology; <b>Ancillary</b> – ambulance, cardiac care unit (CCU), emergency room, ICU, laboratory, pharmacy, X-ray, 24-hour emergency medical services including medevac
<b>Comments</b>	Only clinic in India recognized by most international insurance companies. Used by U.S. Embassy for initial stabilization.

<b>Facility</b>	<b>Safdarjang Hospital</b>
<b>Coordinates</b>	28-34-05N 077-12-21E
<b>Location</b>	In southern New Delhi, 9.9 km east of Indira Gandhi International Airport and 3.7 km east-southeast of the U.S. Embassy at the intersection of Mahatma Gandhi Marg and Aurobindo Marg
<b>Phone</b>	6165060,6165032
<b>City</b>	New Delhi
<b>Type</b>	Public
<b>Beds</b>	1531
<b>Capabilities</b>	<b>Medical</b> – cardiology, dentistry, dermatology, general internal medicine, general medicine, neurology, pediatrics, psychiatry, pulmonology, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology, vascular surgery; <b>Ancillary</b> – ambulance, blood bank, burn unit, CCU, ICU (neonatal), laboratory, pharmacy, respiratory therapy

<b>Comments</b>	One of the largest multi-disciplinary health care institutions in the world. Provides medical care to citizens of New Delhi, neighboring states, and neighboring countries.
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<b>Facility</b>	<b>Apollo Hospital</b>
<b>Coordinates</b>	17-24-55N 078-24-45E
<b>Location</b>	In western Hyderabad, 6.7 km southwest of Hyderabad Airport and 6.5 km west-southwest of Hussain Sagar Lake
<b>Phone</b>	91-40-23608050
<b>City</b>	Hyderabad
<b>Type</b>	Private
<b>Beds</b>	350
<b>Capabilities</b>	<b>Medical</b> – cardiology, dentistry, dermatology, emergency medicine, endocrinology, gastroenterology, general internal medicine, nephrology, neurology, nuclear medicine, oncology, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology; <b>Ancillary</b> – blood bank, CCU, ICU
<b>Comments</b>	Largest multi-specialty health care facility in Hyderabad.

<b>Facility</b>	<b>Sir Ganga Ram Hospital</b>
<b>Coordinates</b>	28-38-18N 077-11-23E
<b>Location</b>	In west-central New Delhi, 11.6 km northeast of Indira Gandhi International Airport and 4.7 km north of the U.S. Embassy
<b>Phone</b>	2573-5205, 2586-1463
<b>City</b>	New Delhi
<b>Type</b>	Private
<b>Beds</b>	650

<b>Capabilities</b>	<b>Medical</b> – cardiology, dentistry, dermatology, emergency medicine, endocrinology, gastroenterology, general medicine, hematology, infectious diseases, nephrology, neurology, nuclear medicine, oncology, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, pulmonology, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, cardiovascular surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology, vascular surgery; <b>Ancillary</b> – ambulance, blood bank, emergency room, ICU (neonatal), laboratory, operating room, pharmacy
<b>Comments</b>	Hospital appears clean, well staffed, and well equipped; however, it is burdened by the number of patients. Services mostly private pay patients; 20 percent of hospital beds are devoted to impoverished patients.
<b>Facility</b>	<b>P D Hinduja National Hospital</b>
<b>Coordinates</b>	19-02-00N 072-50-19E
<b>Location</b>	In the Mahim area of northern Mumbai, 7.8 km northeast of the U.S. Consulate and 7 km southwest of Chhatrapati Shivaji International Airport
<b>Phone</b>	24449199, 24451515, 24452222
<b>City</b>	Mumbai
<b>Type</b>	Public
<b>Beds</b>	351
<b>Capabilities</b>	<b>Medical</b> – allergy and immunology, cardiology, dentistry, dermatology endocrinology, gastroenterology, general medicine, nephrology, neurology, nuclear medicine, oncology, pediatrics, psychiatry, pulmonology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology; <b>Ancillary</b> – ambulance, blood bank, CCU, ICU, laboratory-hematology, pharmacy
<b>Comments</b>	Clean, modern facility with good medical treatment; equipment in good operating condition. Quality surpasses most hospitals in India.

<b>Facility</b>	<b>Regency Hospital</b>
<b>Coordinates</b>	26-28-47N 080-18-02E
<b>Location</b>	In central Kanpur, 14 km northwest of Kanpur-Chakeri Airport and 8 km southeast of Kalyanpur Airport
<b>Phone</b>	0512-2212001-05,0512-2242201-10
<b>City</b>	Kanpur
<b>Type</b>	Public
<b>Beds</b>	133
<b>Capabilities</b>	<b>Medical</b> – cardiology, dermatology, endocrinology, gastroenterology, general medicine, hematology, nephrology, neurology, oncology, pathology, pediatrics, psychiatry, pulmonology, radiology; <b>Surgical</b> – anesthesia, cardiothoracic surgery, cardiovascular surgery, ENT, general surgery, neurosurgery, obstetrics/gynecology, ophthalmology, orthopedic surgery, pediatric surgery, plastic surgery, urology, vascular surgery; <b>Ancillary</b> – ambulance, blood bank, CCU, emergency room, ICU (neonatal and pediatric), laboratory, X-ray
<b>Comments</b>	Only super-specialty tertiary care hospital in Uttar Pradesh.

<b>Facility</b>	<b>All India Institute of Medical Sciences</b>
<b>Coordinates</b>	28-34-02N 077-12-40E
<b>Location</b>	In southern New Delhi, 10.4 km east of Indira Gandhi International Airport and 4 km southeast of the U.S. Embassy at the intersection of Mahatma Gandhi Marg and Aurobindo Marg
<b>Phone</b>	91-11-26588500, 26588700, 26589900
<b>City</b>	New Delhi
<b>Type</b>	Public
<b>Beds</b>	2,000

<i>Capabilities</i>	<p><b>Medical</b> – cardiology, dentistry, dermatology, endocrinology, gastroenterology, hematology, nephrology, nuclear medicine, pathology, pediatrics, physical medicine and rehabilitation, psychiatry, radiology;</p> <p><b>Surgical</b> – anesthesia, ENT, general surgery, neurosurgery, obstetrics/gynecology, pediatric surgery, urology;</p> <p><b>Ancillary</b> – emergency room, laboratory</p>
<i>Comments</i>	<p>Considered the best government hospital in the country, but overcrowded and unhygienic. Contains facilities for teaching, research, and patient care.</p>

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## HISTORY

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The oldest civilizations in India date to before 2500 BC. Urbanization and trade began in the Indus River Valley, where a civilization blossomed until about 1500 BC. During this time, pastoral Aryan-speaking tribes migrated from the northwest and settled in the Ganga River Valley. The Aryans brought a hierarchical society, Sanskrit, and important religious texts as they assimilated into existing peoples.

A succession of kingdoms and empires ruled ancient India. The Mauryan Empire was the first regional empire, ruling from 326 BC to 200 BC. The Gupta Empire ruled northern India from AD 320 to AD 550, during ancient India's golden age, which was the high point of Hindu culture and learning. Local autonomy continued in the south, even during the rise and fall of various kingdoms. Flourishing trade enabled Arabic culture spread throughout the region.

Arab military forces conquered territory in northern India in 711, and by the 10<sup>th</sup> and 11<sup>th</sup> centuries, Turks and Afghans had established sultanates at Delhi. Southern India remained the source of conflict between the Muslim Bahmani Sultanate and the Hindu Vijayanagara Empire. By the 17<sup>th</sup> century, most of India came under the control of the expanding Mughal Empire, led by the de-

scendants of Mongol, Turkish, and Afghan invaders. The Mughal Empire attempted to unify both northern and southern India under a stable, strong central administration.

European commercial competition for India and the lucrative spice trade began in 1510 when Portugal established an enclave at Goa. The British East India Company negotiated the establishment of the first British establishment (at Surat) in 1619. While various European powers negotiated with the Mughal Empire for trading rights, Britain eventually gained a major advantage, and by the end of the 1700s, Britain was the primary military and economic power in India.

East India Company forces defeated Mughal armies in 1765 and established control of the Bengal region. By the 1850s, Britain controlled most of India, Pakistan, Sri Lanka, and Bangladesh. Britain formed numerous alliances and used Indian assistance to establish power. British rule built resentment, leading to the Sepoy rebellion in 1857. Led by Indian soldiers of the British Indian Army, the 2-year insurrection seriously challenged British rule, leading to the abolishment of the East India Company and the establishment of direct rule by the British Crown through a governor-general (called the viceroy when acting as the direct representative of the British crown). The British viceroy administered India from Kolkata with the help of India's Civil Service, which consisted solely of Brits, and through a number of treaties with more than 500 hundred self-administered Indian princely states.

The movement toward self-government began with the appointment of Indian councilors to assist the British viceroy and to assist in establishment provincial councils with Indian members. During this time, British attitudes changed from cultural engagement to isolation and xenophobia. Various groups were gaining momen-



tum in the quest for independence. The Indian National Congress (INC) political party, founded in 1885, successfully led a boycott of British products after the unpopular partition of Bengal. Various concessions were unable to placate the entire populace.

By the 1920s, the INC party was the most prominent group pushing for independence. Led by Mohandas Gandhi and Jawaharlal Nehru, the INC party promoted nonviolence and self-sufficiency, gaining the support of both Indians and some Brits. Muslims felt threatened by the generally Hindu INC party and formed the Muslim League. Although the INC party was initially persecuted for its mass protests and civil disobedience, the British government found it easier to negotiate with the INC party than with other more militant parties.

Because of a host of social and political issues, including Britain's weak state at the end of World War II and its inability to broker an acceptable agreement between the INC party and Muslim League, Britain moved to end dominance over India's foreign affairs. India became an independent dominion within the British Commonwealth on 15 August 1947. Because of strategic political considerations and growing tension between Hindus and Muslims, Britain partitioned the territory into majority Hindu India and majority Muslim Pakistan, which initially had both an east and a west wing. The INC party ruled India under the leadership of Jawaharlal Nehru, who became the first prime minister.

Independence and the partition led to widespread conflict, as refugees fled to both sides. Individual states on the borders were given their choice of allegiances, and India successfully attracted most. Disputes over the accession of Kashmir to India led to armed conflict with Pakistan that lasted from 1947 to 1949. The dispute re-

garding Kashmir was never settled, and it continues to be a point of tension between India and Pakistan.

In the newly independent India and against the backdrop of the Kashmir issue, religious tensions were high. In 1948, a Hindu radical assassinated Mahatma Gandhi because he feared Gandhi's acceptance of Muslims. The assassination further fueled existing religious tensions. In addition to the religious divide, India also faced the challenges of dealing with limited infrastructure, an increasing population, widespread poverty, the socially divisive caste system, lack of education, and border conflicts with most of its neighbors.

Nehru led the country from 1947 until his death in 1964, first as prime minister and then as INC party president. Nehru was a strong believer in democracy and implemented various social reforms, including legal reforms intended to ensure gender equality. Under Nehru's leadership, the INC party won the first general elections, which were held in 1952. Despite attempts to peacefully improve relations with China, in 1962, India and China fought a war concerning contested border areas. India proved ill equipped for conflict, losing the war and consequently, international prestige. A demilitarized zone was established at the end of hostilities.

Lal Bahadur Shastri replaced Nehru as prime minister in 1964. A second war with Pakistan regarding Kashmir broke out in 1965, ending with a treaty in 1966 that reestablished the 1965 cease-fire line. Shastri died on 11 January 1966, the day after the treaty was signed. Nehru's daughter, Indira Gandhi, became prime minister immediately following Shastri's death. Faced with rising poverty and famine in India, Gandhi passed widespread land reform and nationalized the banking system. Her socialist policies led to conflict and a split within the INC party.

India and Pakistan went to war again in 1971 over East Pakistan's desire for independence and over the contested land in Kashmir. India prevailed in this war, and East Pakistan became Bangladesh, but the Kashmir dispute went on unresolved. Initially following the war in 1971, Indira Gandhi's popularity surged, and her faction of the INC party (R) gained a majority in parliament. However, shortly thereafter, an economic crisis reignited political tensions and led to a vote of no confidence for Indira Gandhi. She declared a state of emergency and, in June 1975, the government suspended civil liberties. During the emergency, thousands of Indira Gandhi's political opponents were jailed, and amendments absolving Indira Gandhi of any wrongdoing were pushed through parliament. In an effort to legitimize her rule, Indira Gandhi called for elections in 1977, but she lost to Morari Desai of the Janata party, a coalition of her opponents.

The Janata party restored civil liberties but failed to enact lasting reforms. Indira Gandhi returned to power in 1980. Sikh terrorists calling for self-government seized the Golden Temple in 1984, but government troops brutally defeated them. Immediately afterward, Indira Gandhi was assassinated by her Sikh bodyguards. Indira Gandhi's son Rajiv Gandhi stepped in as prime minister and deployed peacekeeping troops to Sri Lanka in 1987 to deal with the Tamil Tigers, a Sri Lankan separatist terrorist group. Scandals and allegations of corruption led to the call for early elections in 1989. Rajiv Gandhi won but was unable to form a ruling majority. Hindu nationalist Bharatiya Janata Party (BJP) and Janata Dal opposition formed a ruling alliance.

The Janata Dal party/BJP coalition fell apart in 1990, leaving the Janata Dal in power backed by the INC party. Tamil extremists assassinated Rajiv Gandhi on 27 May 1991 while he was campaigning for the INC party. The INC party won the 1991 elections under the leadership of Narasimha Rao, who liberalized India's economy.

The BJP coalition collapsed in 1999, leading to elections in September. The National Democratic Alliance, a coalition led by the BJP, took power, with Vajpayee as prime minister. This coalition served a 5-year term, bringing about a period of political stability.

Despite a February 1999 summit to improve relations, Pakistan attempted to take the Kargil region of Kashmir in a surprise attack in May 1999. The brief war ended with India defeating Pakistan's attempt.

U.S. President Bill Clinton visited India in March 2000 in a historic move intended to improve relations. The United States lifted economic sanctions a year later as a reward for India's support for the U.S.-led anti-terrorism campaign.

In May 2002, Pakistan test-fired three rockets capable of carrying nuclear warheads increasing existing tensions between India and Pakistan, and causing the United States and United Kingdom to recall their citizens because war seemed imminent. Various countries worked to defuse tensions, and both nations signed a cease-fire agreement in 2003. The National Democratic Alliance lost the May 2004 elections, and was replaced by an INC party-led coalition known as the United Progressive Alliance. Manmohan Singh became prime minister. Prime Minister Singh and President Bush concluded a U.S.-India Strategic Partnership Agreement in July 2005. President Bush visited India in March 2006 to further the initiatives in the agreement. The United States and India signed a groundbreaking nuclear agreement in December 2006 that allows India to buy U.S. nuclear reactors and fuel.

Islamic militants killed 35 Hindus in Kashmir in May 2006, days before talks between the government of India and separatists began. A seven-bomb terrorist attack killed more than 180 people on

the crowded Mumbai train system on 11 July 2006. The attack was blamed on Islamic militants.

On 20 February 2007, a bomb attack killed 68 passengers, most of whom were Pakistani, on a train from New Delhi to Lahore, Pakistan. Despite this attack, India and Pakistan continued the peace process and signed an agreement to reduce the risk of accidental nuclear war.

A mosque in the southern city of Hyderabad was bombed on 25 August 2007, killing at least 42 people. Bombings in the western city of Jaipur killed more than 60 people in Hindu temples and street markets in May 2008 as tensions remained high between Hindus and Muslims.

In November 2008, a small but organized and well-trained group of terrorists attacked multiple sites in Mumbai, killing 166 civilians and injuring more than 300. The attacks were later tied to Lashkar-e-Tayyiba, based out of Pakistan.

## Chronology of Key Events

<b>Year</b>	<b>Event</b>
<i>1858</i>	British Crown assumes direct rule of India.
<i>1885</i>	Indian National Congress party founded.
<i>1920</i>	Mahatma Gandhi launches civil disobedience campaign.
<i>1947</i>	India becomes independent; National Congress assumes power.
<i>1948</i>	Mahatma Gandhi assassinated. India and Pakistan go to war over the issue of Kashmir.

<b>1951</b>	National Congress wins first election; Jawaharlal Nehru becomes prime minister.
<b>1962</b>	India loses border war with China.
<b>1964</b>	Jawaharlal Nehru dies; Lal Bahadur Shastri becomes prime minister.
<b>1965</b>	War with Pakistan over the issue of Kashmir begins.
<b>1966</b>	Cease-fire signed with Pakistan. Indira Gandhi becomes prime minister.
<b>1971</b>	War with Pakistan; creation of Bangladesh.
<b>1974</b>	India explodes its first nuclear device in an underground test.
<b>1975</b>	Indira Gandhi declares state of emergency, and many civil liberties are suspended.
<b>1977</b>	Congress party loses election; civil liberties restored by Janata party.
<b>1980</b>	Indira Gandhi returns to power.
<b>1984</b>	Troops force Sikh militants out of Golden Temple; Indira Gandhi is assassinated.
<b>1989</b>	Rajiv Gandhi wins election; Congress coalition collapses and BJP comes to power.
<b>1991</b>	Rajiv Gandhi assassinated; Prime Minister Narasimha Rao begins economic reform program.
<b>1992</b>	Destruction of Ayodhya mosque triggers widespread violence. This militant act led to nationwide violence between Hindus and Muslims. Thousands were killed, and Hindu shrines throughout the country were destroyed
<b>1996</b>	BJP defeats Congress in elections.

<b>1998</b>	BJP forms coalition government under Prime Minister Atal Behari Vajpayee; India conducts successful nuclear tests and as a result, the United States imposes sanctions.
<b>1999</b>	India and Pakistan fight brief regarding Kashmir.
<b>2000</b>	President Bill Clinton visits India.
<b>2001</b>	India and Pakistan meet for peace summit; United States lifts sanctions.
<b>2001</b>	Tensions escalate between India and Pakistan, leading to troop buildup.
<b>2002</b>	Hindu activists die in train fire; widespread religious violence.
<b>2003</b>	India and Pakistan sign cease-fire.
<b>2004</b>	Congress wins elections; India meets with Kashmir separatists. Tidal waves cause widespread death on the southern coast of India and the surrounding islands.
<b>2005</b>	Thousands are killed in floods and landslides during the July monsoons in Mumbai and from an earthquake in Kashmir in October.
<b>2006</b>	India and the United States sign a nuclear agreement. Terrorist attacks kill hundreds in train bombings.
<b>2007</b>	India launches first commercial space rocket. Terrorist assaults on trains claim many victims.
<b>2008</b>	Terrorist attacks in Mumbai kill 166 and injure more than 300.

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## GOVERNMENT AND POLITICS

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### Government

India's government is based on the 1949 constitution and its amendments. India has a federal form of government, largely controlled by the central government. India is divided into 28 states and 7 union territories. India has a British-style parliamentary system and three separate but interrelated branches of government.

Britain began establishing outposts in India in 1619, and by 1850, Britain controlled all of India. In the 1920s, India began seeking independence, and in 1947, Britain officially ended its dominance over India's foreign policy. India published its constitution in 1950 and joined the British Commonwealth. Since then, except for the declaration of emergency rule from 1975 to 1977, India has maintained constitutional democratic rule. Although the constitution has been amended 94 times since its adoption, the basic structure has remained consistent.

The prime minister is the head of the government, which consists of executive, legislative, and judicial branches. The legislative branch has two houses: the *Rajya Sabha* (the Council of States), and the *Lok Sabha* (the House of the People). The *Rajya Sabha* has up to 250 members. State and union territory legislatures elect 238 members, and the president selects the remaining 12 members. *Lok Sabha* has more than 500 members, but the number can change from one election to the next due the India's legislative process for allocating *Lok Sabha* seats.

The judiciary has a British-style court system and a 26-member Supreme Court. The president selects all Supreme Court justices.





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## **Brihanmumbai Municipal Council Headquarters**

### ***National Level***

The central government is divided into executive, legislative, and judicial branches. Although each branch is separate, the branches constantly interact. The prime minister, who leads the executive branch, is elected by and responsible to the legislature. The law establishes greater separation of power for the judiciary branch, but, in practice, the executive branch controls it. However, the judiciary branch has acted independently in constitutional issues.

Power struggles between the branches have historically centered on amending the constitution. The constitution was designed to be a living document requiring amendments only, not revisions. The legislature has the power to amend the constitution, but the judiciary has the power to review the constitutionality of legislative

actions. The legislature has attempted several times to circumvent judicial review of amendments, most notably Amendment 46. The Supreme Court ruled this action, and all subsequent actions, to be an unconstitutional attempt to change the basic structure of the constitution.

### **Executive Branch**

The executive branch consists of a president, vice president, prime minister, and cabinet ministers. It is responsible for administering the affairs of the republic and ensuring the rights of the people. The president is elected to a 5-year term and can run for reelection. The president is the head of state and the commander in chief, although the president's duties are largely ceremonial. Executive power lies in the hands of the prime minister and the council of ministers. The prime minister is the head of the council of ministers and is appointed by the president. Traditionally, the leader of the majority party in the *Lok Sabha* is appointed prime minister. The prime minister then directs the president in selecting the remaining members of the council of ministers.

### **Legislative Branch**

The legislative branch, or parliament, consists of two houses. The lower house is called the *Lok Sabha*, or the House of the People. The upper house is called the *Rajya Sabha*, or the Council of States. Parliament is primarily responsible for passing legislation necessary for the administration and operation of the republic and for approving the annual budget. Parliament has the ability to make laws in areas such as defense, foreign affairs, currency, income tax, excise duty, railways, shipping, and other national infrastructure. Once a bill is passed by both houses, it proceeds to the president for assent. Once the president has finished making any amendments, the bill passes into law.



## **The Parliament in Delhi**

### **Judicial Branch**

The highest court in India is the Supreme Court. The Supreme Court has original, appellate, and advisory jurisdiction. It has original jurisdiction in disputes between the government and states/union territories and in disputes between states/union territories. The Supreme Court is also responsible for ensuring the fundamental rights guaranteed under the constitution. It is also the court of final appeal.

Although the original 1950 makeup of the Supreme Court called for seven justices; the number was raised to 26 justices in 1986 to accommodate increasing workloads. The president appoints all Supreme Court justices. Appointments are lifetime appointments, with mandatory retirement at age 65.

High State Courts are the next level of the judiciary. They head state judicial administrations. There are 21 High State Courts

throughout India, some of which have jurisdiction over more than one state. High State Courts have original civil jurisdiction and appellate jurisdiction and can try any case.

High State Courts consist of a chief justice and additional judges, all of whom are appointed by the president in consultation with the chief justice of India and the governor of the state. Appointments are lifetime appointments, with mandatory retirement at age 62. High State Courts have superintendence over all courts within their jurisdiction. District Courts are the final level, and judges are appointed by the governor of the state.

### ***Local Level***

There are 28 states and 7 union territories. The president appoints the governor of each state, who can assume broad powers when directed to do so by the national government. Generally, union territories are governed by governors of neighboring states. State legislatures are either unicameral or bicameral and are patterned after the national parliament. State legislatures make laws regarding issues such as education, communications, agriculture, police, public order, public health, and sales tax. Each state popularly elects all members of the state legislature. Each state also has a cabinet with a chief minister who fulfills responsibilities similar to the prime minister's duties at the national level. The chief minister and the cabinet are responsible to the legislature.

Various governing bodies exist at the local level. They are responsible for education, infrastructure, and public works. Larger urban areas have municipal corporations, smaller urban areas have municipal councils, and rural areas have *panchayats*, or traditional village councils. *Panchayats* have a three-tier system: village, block, and district. Many states are trying to increase *panchayat* participation.



## Administrative Districts

These councils also allow each member of the village to interact politically at a *gram sabha*, or village-wide assembly.

## Key Government Officials

- President: Pratibha Patil
- Vice President: Hamid Ansari

- Prime Minister: Dr. Manmohan Singh
- National Security Advisor: Shiv Shankar Menon
- Minister of Defense: A.K. Antony
- Minister of External Affairs: S.M. Krishna
- Minister of Finance: Pranab Mukherjee
- Ambassador to the United States: Nirupama Rao

## **Politics**

Elections for the *Lok Sabha* occur every 5 years, unless a no-confidence vote brings them about earlier. The last election was held in 2009, and the next is scheduled for 2014. All Indian citizens age 18 and older have the right to vote. Each political party is identified with a symbol, allowing illiterate voters to participate in the process.

Political participation is high, despite widespread illiteracy and the general isolation of many segments of the voting population. A surge in participation among members of lower socioeconomic groups began in the 1990s, and it has continued. Participation among upper castes has decreased, whereas participation among lower castes has increased. Voter turnout was as high as 60 percent in 1999 but fell to 58 percent in 2004 and rose back to 59.7 percent in 2009. The 2009 elections were conducted in five stages to accommodate the large voter turnout. Although the voter turnout was lower than the national average in some rural areas, overall, numbers increased. Political participation varies between castes and religious backgrounds.

## **Political Parties**

India has a multiparty system that allows a variety of political perspectives to have national influence. India has been a competitive, multiparty democracy since it gained independence and has a

complex system of national and state parties. Parties register with the Election Commission. A state party must operate for 5 years and gain 4 percent of a state's quota in the *Lok Sabha* before gaining recognition as a national party.

Political parties generally reflect trends and developments within Indian politics, and political parties are strongly influenced by the caste system. The rise of discrimination in favor of the Dalits (untouchables) and the Other Backwards Classes (OBC) created new political forces that found great success in the local level in the late 1980s and early 1990s with parties such as the Samajwadi Janata Party (Socialist People's Party). The success of parties focused on specific demographics forced the major parties to begin courting the lower- and middle-caste voting blocs. This caused the base of political power and preference to shift to the middle castes. Although the upper-caste elite maintain a large degree of control, political parties have found great success through appealing to both the upper and lower castes. Other factors influencing political developments include a large number of disaffected Muslim voters and upper-caste support for Hindu nationalism.

The regional success of specific parties has led to the necessity of developing coalitions in order to dominate parliament. Many minority parties at the national level are majority parties within their state legislatures.

<b>Party Name</b>	<b>Description</b>
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<b><i>Indian National Congress</i></b>	Left of center; traditionally has dominated Indian politics through coalition building; won 2004 and 2009 elections; oldest political party, led revolt against British rule
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<b><i>Bharatiya Janata Party (BJP)</i></b>	Center right; primarily draws support from upper caste elite; supports Hindu nationalism; one of the first four parties, founded in 1951; ran nuclear tests during BJP administration in 1998; one of the most successful parties; won 1999 elections
<b><i>Janata Dal</i></b>	Centrist; union of small groups; strong in Bihar state and in Karnataka state; supported by Dalits and Muslims
<b><i>Akali Dal</i></b>	Sikh party founded in 1920; primarily based in Punjab state; religious-political party
<b><i>All-India Anna DMK</i></b>	Strong state-level party in Tamil Nadu
<b><i>Bahujan Samaj Party (BSP)</i></b>	Founded by Dalit leader Kashi Ram in 1984; represents interests of the lower castes; socialist leanings; strongest in Uttar Pradesh state
<b><i>Communist Party of India</i></b>	Formed in 1964; national-level party; majority party in three state legislatures; progressive, anti-imperialist, socialist; intends to implement socialist program
<b><i>Samajwadi Party</i></b>	Socialist; based in Uttar Pradesh state; support base composed of OBCs and Muslims

## Foreign Relations

India's size, strategic location, and large population give it regional dominance in South Asia and the Indian Ocean. Its growing economic, political, and military strength give it growing influence in world politics.

India's foreign relations traditionally have been based on non-alignment and economic development. The collapse of the Soviet Union, India's ally, led India to begin strengthening bilateral relations with China, Israel, the United States, and others. India's Ministry of External Affairs is officially responsible for making foreign policy, but the prime minister exerts considerable influence.



India's primary foreign policy concern is its relations with its neighbors. It is surrounded by countries with which it has conflicts, including issues regarding borders, immigration, terrorism, and natural resources. India is a member of the South Asian Association for Regional Cooperation (along with Pakistan, Bhutan, Bangladesh, and Sri Lanka) and the Association of Southeast Asian Nations, which have worked for increased economic cooperation. India also places importance on relations with Arab Gulf countries, as they are major trading partners and host a large number of Indian expatriate workers.

India receives bilateral aid from a variety of sources, including Germany, Japan, the United Kingdom, and the United States. U.S. assistance totaled US\$99 million in 2008 and an estimated US\$102.9 million in 2009; US\$98.8 million was requested for 2010. Current U.S. aid is intended for economic development, primarily agricultural, as well as health care, poverty relief, and military assistance.

India provides bilateral foreign aid through the Indian Technical and Economic Cooperation Program, which was established in 1964. It provides assistance to more than 150 countries. It is run by the Economic Division of the Ministry of External Affairs. Specific programs include aid for disaster relief, infrastructure development, and health and education services.

India also has a variety of assistance programs that target poverty-stricken countries in South Asia and Africa. Aid provided by India averages nearly US\$150–US\$200 million a year. India provides more than 80 percent of Bhutan's foreign aid and is the largest regional donor of aid to Afghanistan, having donated more than US\$1.2 billion since 2001.

## ***United States***

India and the United States have good relations that are built on economic and security ties. India and the United States consider each other a natural partner, as both are long-standing democracies. The United States recognizes India as vital to its strategic interests in the region and recognizes that the two nations have similar interests in promoting free trade, fighting terrorism, and ensuring a stable Asia. The United States is also India's largest trading partner.

Relations grew stronger during the 1990s as India sought to broaden its international relationships after the collapse of the Soviet Union. India's unexpected nuclear tests in 1998 led to tense relations and the initiation of a nonproliferation dialogue. Sanctions were lifted in 2001, and a joint working group on counterterrorism was established between the two nations. India offered the United States full support in the aftermath of the 11 September terrorist attacks, and the two nations began high-level meetings in 2002 and 2003 in the interest of transforming their bilateral relations.

In 2004, India and the United States announced the Next Steps in Strategic Partnership. A visit in 2005 cemented cooperation on civil nuclear, civil space, high-technology commerce, disaster relief, economic cooperation, and a democracy initiative, among other agreements. In 2006, the U.S. Congress passed legislation allowing for civil nuclear commerce with India, and in 2007, the two nations completed a bilateral agreement on nuclear cooperation. Other agreements pertain to defense, aviation, science, copyrights, taxation, extradition, narcotics, and international crime.

Indians' view of Westerners is twofold. Indians view Westerners as having loose standards of morality, spirituality, and physical cleanliness. Indians also view Westerners as a wealthy class of people whose culture dominates the world. Most Indians have a

favorable view of the United States and believe the United States considers India's interests when conducting foreign policy.

## ***China***

India aims to develop greater cooperation and friendship, exploit the potential for favorable growth, and solve the border dispute with China. China continues to occupy land that India believes it has rights to. China's beneficial relationship with Pakistan has also created some tensions. China is India's second-largest trading partner.

Conflict regarding the India-China border began in 1962 and de-escalated in 1988. Since then, both countries have worked to reduce border tensions and develop economic cooperation. China and India signed a series of cooperative agreements in 1996 and opened the small Nathu la Pass for bilateral trade in 2006. India and China both recognize their mutual need for bilateral cooperation and continue to work toward that end, though ongoing suspicion of each other's regional aspirations makes a wholly cooperative relationship unachievable in the near future.

## ***Pakistan***

Relations between India and Pakistan have been strained for decades because of long-standing political disagreements and border disputes. Both nations have been involved in an escalating state of military preparedness on their shared border, including the development of nuclear weapons capabilities in both countries. A peace initiative that began in 2004 was gaining momentum in spite of separatist violence in Kashmir in 2006 and multiple terrorist bombings in 2006; however, progress was halted in late November 2008 by the terrorist attacks in Mumbai. India blamed Pakistani state-sponsored terrorists for organizing and executing the attacks, and India will not resume serious dialogue with Pakistan until it

is satisfied that Pakistan has increased its efforts to eliminate terrorism. In mid-2010, India and Pakistan attempted to rekindle the dialogues but made no progress.

Ultimately, India supports a stable Pakistan because it recognizes that a weak Pakistan will serve as a haven for insurgents and terrorists who intend to target India. India considers Pakistan's political situation to be Pakistan's internal affairs and avoids interfering.

### ***Burma (Union of Myanmar)***

India and Burma have close relations because of their shared history and culture. Their traditionally close relations are focused primarily on energy cooperation, economic interests, and counterinsurgency measures. India has been pursuing closer relations with Burma since the mid- 1990s and was not deterred by the violent crackdown on pro-democracy demonstrators in September 2007. India considers issues surrounding democracy and human rights to be internal issues for Burma, despite international pressure to suspend relations. India is one of Burma's primary investors, and the two countries have cooperated on many significant projects, including a planned natural gas pipeline. India signed an agreement to develop a port on the western coast of Burma in March 2008, signifying further economic cooperation.

### ***Nepal***

India and Nepal have good relations, and India supports the Nepalese peace process between Nepali political parties and Maoist rebels; however, relations are affected by India's concerns about border infiltration by Maoist insurgents. India and Nepal operate under the Treaty of Peace and Friendship of 1950, allowing for cross-border travel, but civil violence and Nepal's growing relationship with China have damaged relations.

## ***Bhutan***

India and Bhutan have excellent relations that primarily revolve around close economic cooperation and development. India and Bhutan have a long history of warm relations based on a Treaty of Peace and Friendship they signed in 1949, which requires Bhutan to consult India when conducting foreign relations. In practice, Bhutan exercises a great degree of political autonomy. India is the largest donor of foreign aid to Bhutan. India and Bhutan have worked together to develop mutually beneficial hydroelectricity projects and cooperated in expelling insurgents from the India-Bhutan border in 2003.

## ***Bangladesh***

Relations between India and Bangladesh typically revolve around counterterrorism issues. Although India helped create the nation-state, it believes that the governing coalition within Bangladesh is responsible for many of the numerous terrorist assaults occurring in the region. India began building a 4,023-kilometer (2,500-mile) fence in 2005 to seal its border with Bangladesh in an effort to control the terrorist threat. The fence is scheduled for completion in 2012; however, in many areas where the fence is already complete, the border remains porous. Regardless of unrest over border dispute issues, and in an effort to improve bilateral relations, India and Bangladesh had several high-level meetings in 2009 and 2010. India signed several agreements to provide aid to Bangladesh; one such agreement would provide Bangladesh with a loan for US\$1 billion. Despite these efforts, India's slow implementation of the signed agreements has resulted in increased tensions between the countries once again.

## ***Sri Lanka***

In the recent past, relations between India and Sri Lanka have been strained by the prolonged civil war in Sri Lanka. India militarily intervened in 1987, at great cost of life. After a cease-fire agreement unraveled in 2006, India refrained from engagement on any level, while insisting there was a possible military solution; however, since the end of the Sri Lankan insurgency in May 2010, relations between India and Sri Lanka have strengthened. India continues to provide disaster relief to Sri Lanka in the wake of the violent end of the insurgency, and the two countries continue to hold high-level meetings and discussions to improve bilateral relations and to help Sri Lanka rebuild infrastructure.

## ***United Kingdom***

Britain has supported Indian independence since 1947 and has maintained relations since India gained independence. Bilateral relations are strong and are based on cooperation in trade, security, and development. Britain is India's largest trading partner in Europe, and the two nations cooperate in development and investment. A large expatriate community of Indians lives in Britain.

## **International Organizations**

India participates in the following select list of international organizations:

- African Development Bank
- Asian Development Bank
- Association of Southeast Asian Nations
- Food and Agriculture Organization
- Group of 77
- International Atomic Energy Agency

- International Civil Aviation Organization
- International Federation of the Red Cross and Red Crescent Societies
- International Monetary Fund
- Interpol
- Organization of American States (observer)
- Nonaligned Movement
- United Nations
- World Trade Organization

## **Non-governmental Organizations**

Hundreds of international non-governmental organizations (NGOs) operate in India. They work in various fields, such as education, sanitation and health, urban renewal, emergency aid, and disaster relief. Prominent groups include the Red Cross, United Way, Save the Children, Care International, Christian Aid, Tearfund, Islamic Relief, YMCA, World Vision, Salvation Army, Muslim Aid, Oxfam, and Action Against Hunger. Local NGOs work with international NGOs to implement key development programs. NGOs are required to have prior permission from the Ministry of Home Affairs (MHA) to operate in India and clearance permits from any other relevant agency. This is enforced by the Ministry of External Affairs. NGOs are also subject to regulatory oversight of their fundraising, in an effort to prevent abuses; this significantly restricts NGO funds and activities.

## **Corruption**

India ranked 84 out of 180 countries (with 1 representing the least corrupt and 180 the most corrupt) in the 2010 Transparency International Corruptions Perception Index. Corruption is present at all levels of government. Corruption is also pervasive within po-

lice forces, which often act with impunity. High-ranking officials known to accept bribes rarely are challenged.

The government recognizes the need to battle corruption. The law requires harsh criminal penalties for those found guilty of corruption. The Right to Information Act, which was passed in 2005, enforces strict requirements on disclosure by government officials; this act has been effective in practice. The government launched an anti-bribery campaign in July 2006.

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## **ECONOMY**

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### **General Description**

India's economy is based on traditional village farming, modern agriculture, heavy industries, textile manufacturing, handicrafts, and services. Nearly 55 percent of the workforce is in the services industry. India has the fourth-largest economy in the world and the third largest in Asia, behind China and Japan. India was the world's sixth-largest energy consumer in 2008.

Reforms in the 1980s and 1990s included privatizing government industries, reducing tariffs and other trade and investment barriers, modernizing the financial sector, and adjusting fiscal and monetary policies. These reforms contributed to significant economic growth. The economy has had an average annual growth rate of more than 7 percent since 1997. The export of software and information technology has emerged as a significant part of this growth. Economic constraints include population growth, rural poverty, inadequate infrastructure, environmental factors, bureaucracy, and corruption.





**Fabric Store**

## **Economic Aid**

India has received billions in development assistance from the World Bank for 52 projects since 2004: US\$1.4 billion in 2004, US\$2.9 billion in 2005, US\$1.4 billion in 2006, US\$3.8 billion in 2007, and US\$2.2 billion in 2008. The projects are in the following sectors: agriculture, education, finance, transportation, energy and mining, health and social services, and public administration. India has also received trillions in development assistance from the Asia Development Bank for more than 400 projects between 1986 and 2008; the projects are in the following sectors: energy; financial; agriculture and natural resources; public administration; transportation and communications; and water supply, sanitation, and waste management.

## Banking Services

The financial sector includes the Reserve Bank of India and more than 60 public and private sector commercial banks. Public sector banks include the Central Bank of India, United Bank of India, and Union Bank of India. India has several public sector banks controlled by state governments, including the following banks: State Bank of Hyderabad, State Bank of India, State Bank of Indore, State Bank of Mysore, State Bank of Saurashtra, and State Bank of Travancore. Private sector banks include, but are not limited to, Bank of Punjab, Jammu & Kashmir Bank, and IndusInd Bank.

India also has several development banks, including the National Housing Bank, Small Industries Development Bank of India, National Bank of Agricultural and Rural Development, and Export Import Bank of India. Foreign banks include ABN-AMRO Bank, Abu Dhabi Commercial Bank, BNP Paribus Bank, Citibank, China Trust Commercial Bank, Deutsche Bank, Standard Chartered Bank, and HSBC.

## Economic Statistics (2010)

<i>GDP</i>	US\$4.06 trillion (PPP)
<i>GDP - Real Growth Rate</i>	10.4 percent
<i>GDP - Per Capita</i>	US\$3,500
<i>Inflation Rate</i>	12 percent
<i>National Debt</i>	US\$316.9 billion
<i>Unemployment Rate</i>	10 percent
<i>Total Value of Imports</i>	US\$357.7 billion
<i>Import Commodities</i>	Crude oil, precious stones, machinery, fertilizer, iron and steel, chemicals

<b><i>Import Partners</i></b>	China: 12.4 percent United Arab Emirates: 6.5 percent Saudi Arabia: 5.8 percent United States: 5.7 percent Australia: 4.5 percent
<b><i>Total Value of Exports</i></b>	US\$225.6 billion
<b><i>Export Commodities</i></b>	Petroleum products, precious stones, machinery, iron and steel, chemicals, vehicles, apparel
<b><i>Export Partners</i></b>	United States: 12.6 percent United Arab Emirates: 12.2 percent China: 8.1 percent Hong Kong: 4.1 percent

## **Resources**

India has the fourth-largest coal reserve in the world, behind the United States, Russia, and China. Eighty-seven percent of India's coal is located in the central region in the state of Chhattisgarh. Other natural resources include mica, bauxite, petroleum, chromite, natural gas, magnesite, limestone, dolomite, barites, kaolin, gypsum, apatite, phosphorite, steatite, fluorite, iron ore, manganese ore, and titanium ore.

India has significant problems with air and water pollution. Air pollution mainly results from vehicle emissions, thermal power plants, industries, and refineries. Water pollution mainly results from overpopulation, rapid urbanization, poor waste management, and agricultural runoff.

## **Industry**

Agriculture accounts for 52 percent of the labor force (2009 est.) and 18.5 percent of the GDP (2010 est.). Industry accounts for

14 percent of the labor force (2009 est.) and 26.3 percent of the GDP (2010 est.). Services account for 34 percent of the labor force (2009 est.) and 55.2 percent of the GDP (2010 est.). Industries include telecommunications, biotechnology, cement, mining, steel, energy, pharmaceuticals, and machinery. Services include media, tourism, health, education, real estate, and information technology.

Major commercial and industrial centers include, but are not limited to, Mumbai, Bangalore, and Delhi. Mumbai is a major port city, commercial and industrial center, and the hub of India's financial sector and film industry (Bollywood). Bangalore is a commercial and industrial center and the hub of India's research, science, and technology sector. Delhi is a commercial and industrial center with thriving retail, information technology, and real estate sectors.

### ***Utilities***

India has coal and lignite, combined gas and turbine, diesel and gas engine, hydroelectric, nuclear, and biomass power plants. Thermal energy (coal, gas, and oil) generates 64.6 percent of electricity in India; hydropower generates 24.7 percent; nuclear generates 3 percent; and other renewable sources, such as biomass and urban and industrial waste, generate 7.7 percent.

From 1990 to 1991, India renovated and modernized 44 thermal power stations. During the same time frame, India extended the life of four units in the Neyveli thermal power plant. From 1997 to 2002, India renovated and modernized 127 units at 29 thermal power plants and extended the life of another 25. However, from 2002 to 2007, India completed life-extension work on only 12 of 80 units; life-extension work on 5 others was in progress, and only 14 of 57 units scheduled for renovation and modernization had

been completed. From 2002 to 2007, India renovated and modernized 65 hydroelectric plants, and India plans to renovate and modernize an additional 62 between 2007 and 2012.

Electricity supply is a serious problem, particularly in rural areas. Only about half the population has access to electricity.

India has 230-volt 50 Hz C and D plug types.

## ***Water***

India needs significant improvements to its water infrastructure because much of the existing infrastructure is crumbling. Improvements are needed mostly in storage capacity, supply systems, waste management treatment plants, and hydropower. Surface water and groundwater represent 61 and 39 percent of India's water resources, respectively.

Water scarcity is a serious issue because of limited rainfall and storage capacity and environmental factors. Groundwater contamination in many parts of the country results from industrial pollution. Much of the water is highly contaminated with saline, iron, fluoride, and arsenic.

Although 86 percent of the population has access to improved water sources, only 33 percent uses improved sanitation facilities (2004). The source of drinking water for most urban areas is either nearby reservoirs or by long-distance transfer. Examples of water treatment facilities include the Tehri Dam and the Telugu Ganga Project. Water is also available from dozens of surface water river basins throughout the country.

India has provisions in the constitution that give the national government the power to regulate water resources. According to the National Water Policy of 2002, India prioritizes water allocation

in the following order: drinking, irrigation, hydropower, ecology, industry, and navigation and other uses. The policy also includes, but is not limited to, preventing overexploitation, ensuring social justice, monitoring quality, and considering effects on both the environment and human settlements during planning stages.

## ***Agriculture***

The agriculture sector comprises 52 percent of India's workforce (2009). <sup>Agricultural</sup> products include the following: sugarcane, rice, wheat, potatoes, pulses, sorghum, cotton, jute, and oilseeds. The estimated production of sugarcane, rice, wheat, oilseeds, and pulses in 2005 was 273.2 million tonnes, 89.9 million tonnes, 71.5 million tonnes, 26.7 million tonnes, and 13.9 million tonnes, respectively. The estimated production of cotton and jute was 18.9 million bales, 170 kilograms each, and 10.8 million bales, 180 kilograms each. Other agricultural products include fruit, vegetables, meat, poultry, dairy, and fish.

India has 20 agro-ecological (AER) regions and 60 AER subregions based on soil, climate, physical geography, and length of growing season. The subregions are further broken down into AERs at the district level in order to develop long-term land-use strategies. AER 1 is a cold, arid region in the western Himalayas. The major crops include millets, wheat, fodder, pulses, and barley. AER 5 is a hot, dry, semiarid region that covers the central highlands, Gujarat plains, and part of the Kathiawar Peninsula. The main crops include sorghum, oilseeds, soybean, corn, pulses, pearl millet, and pigeon pea. Wheat is grown where land is irrigated. AER 18 is a hot, subhumid to semiarid region that covers the southeastern coastal plains. The main crops include rice, coconut, pulses, and oilseeds. Brackish-water fisheries are also a significant agricultural product.

Besides irrigation, many farmers use traditional rain-fed farming. This includes plowing land during the rainy season to preserve soil moisture and then planting seeds after the rainy season. People in areas that receive little rainfall practice dry farming. *Jhum* cultivation is practiced in the eastern Himalayas. It consists of mixed cropping on steep slopes under rain-fed conditions every 3 or 4 years.

India manufactures agricultural machinery. The Bureau of Indian Standards ensures that tools and equipment manufactured meet quality standards and safety codes. The tools and equipment fall into the following categories: land development, tillage and seed preparation, sowing and planting, weeding and intercultivation, plant protection, harvesting and threshing, post-harvest and agro-processing, water-lifting devices, energy and power, horticultural, and miscellaneous.

### ***Foreign Investment***

India received US\$24.6 billion in foreign direct investment (FDI) in 2007, almost five times the amount received in 2005 (US\$5.5 billion). FDI was US\$15.7 billion in 2006 alone, nearly matching the US\$16.7 billion received from 1991 to 2000. Most FDI between April 2000 and March 2008 is in the following industries: services (22.6 percent), computer software and hardware (13 percent), telecommunications (6.8 percent), construction (5.4 percent), and real estate (4.5 percent). Most FDI comes from the following countries: Mauritius (45 percent), the United States (8.1 percent), and the United Kingdom (7.6 percent). FDI was more than 5 percent of the GDP in 2007, more than double the 2.2 percent in the early 1990s.

The following is a select list of countries that invest in India: Germany, Japan, Mauritius, the Netherlands, Singapore, the United Kingdom, and the United States.

## ***Economic Outlook***

India's economy has grown rapidly in recent years, particularly in manufacturing, information technology, and business process outsourcing. The average annual growth rate was more than 7 percent between 1997 and 2007. The growth rate exceeded 9 percent in 2005, 2006, and 2007. India saw a huge increase in FDI from US\$5.5 billion in 2005, US\$15.7 billion in 2006, to US\$24.6 billion in 2007. Poverty has also declined significantly. In 1973, the percentage of Indians living below the poverty line was 55 percent; the percentage reduced to 22 percent by 2004.

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## **THREAT**

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### **Crime**

A range of criminal activity occurs in India, particularly in major cities, where crime rates are generally higher. The states of Andhra Pradesh, Madhya Pradesh, Maharashtra, and Rajasthan have the highest crime rates, together accounting for about 40 percent of all crimes committed.

Theft and burglary are the most common crimes, particularly theft of personal property. Petty thieves are active on buses and trains, and women have reported having their bags snatched (sometimes from moving vehicles), having their bags' purse-straps cut, or having the bottom of their purses slit without their knowledge. Theft of U.S. passports is quite common, particularly in major tourist areas, on overnight trains, and at airports. Train travelers should lock their sleeping compartments and take valuables with them



when leaving berths. Air travelers should carefully watch their bags in the arrival and departure areas outside airports. Travelers are advised not to accept food or drink from strangers, as there have been reports of tourists being given drugged drinks or tainted food to make them more vulnerable to theft, particularly at train stations. Food or drink purchased from a canteen or vendor also may be tainted.

India is generally safe for foreign visitors. Violent crime, particularly that directed against foreigners, has traditionally been uncommon. In recent years, however, there has been a modest increase in such incidents, usually directed against those traveling alone. Sexual crimes against women are increasing, according to figures by Indian authorities, and rape is the fastest-growing crime in India. Although most victims have been local residents, Western women continue to report incidents of physical harassment (locally known as “Eve-teasing”) by groups of men, and recent sexual attacks against female visitors in tourist areas suggest that foreign women are also at risk and should exercise vigilance. Women should never travel alone, particularly after dark. Crimes against women have been most common in Madhya Pradesh and Uttar Pradesh. The Kashmir region should also be avoided. Among large cities, Delhi experienced the highest number of crimes against women.

Automobile theft also occurs frequently, accounting for a third of all thefts in 2006. Violent crimes, including murder, rape, and dowry deaths, accounted for only 10.2 percent of crimes in 2006. Murder accounted for 3 percent, and rape accounted for 1.7 percent. Economic crimes accounted for less than 4 percent. Financial crimes involving scams are also common and often target foreigners. For example, taxi drivers and others, including train porters, may solicit travelers with offers of cheap transportation or hotels.

Travelers accepting such offers have frequently found themselves the victims of scams, including offers to assist with “necessary” transfers to the domestic airport, disproportionately expensive hotel rooms, unwanted “tours,” unwelcome “purchases,” and even threats to their life when they try to decline to pay. Other scams have involved promises of valuables or easy wealth, and travelers should be wary of individuals selling rugs or precious stones for below market value. Other common fraud scams involve scam artists collecting a security deposit to allow the victim to transport supposedly valuable goods. Organized crime, such as smuggling, money laundering, kidnapping, and contract killings, occurs in India’s major cities. Corruption among Indian authorities hampers effective government action against crime. Current travel advisories are available at the U.S. Department of State’s website: <http://travel.state.gov/india.html>.

## **Travel Security**

Local demonstrations spurred by political, religious, or ethnic issues can begin spontaneously and escalate with little warning, disrupting transportation systems and city services and posing risks to travelers’ personal safety. Indian authorities respond to these incidents by occasionally imposing curfews and/or restricting travel. Demonstrations and rallies should be avoided because of their potential for violence, particularly immediately preceding or following elections and religious festivals (particularly when Hindu and Muslim festivals coincide). To gain the attention of Indian authorities, demonstrators have blocked roads near popular tourist sites and attacked vehicles transporting tourists. Missionary activity has also triggered strong reactions in some areas, and anti-Christian violence has seen a slight increase in recent years in certain areas of India, such as in Gujarat and Orissa, where mobs have attacked Indian and U.S. missionaries and social workers.

The U.S. Department of State recommends against traveling to other areas of instability, including Jammu and Kashmir (except for Ladakh); the India-Pakistan border; the northeastern states of Assam, Manipur, and Nagaland; and the states of Andhra Pradesh, Chhattisgarh, Bihar, Jharkhand, and West Bengal, where communist elements have been active. India's government restricts travel to the states of Mizoram, Arunachal Pradesh, and Sikkim, as well as to portions of the states of Himachal Pradesh near the India-China border, Uttaranchal near the India-China border, Rajasthan near the India-Pakistan border, the Andaman and Nicobar islands, the union territory of the Laccadives Islands (Lakshadweep), and the Tibetan colony in Mundgod, Karnataka.

## **Terrorism**

India remains one of the world's most terrorism-afflicted countries. Local terrorists affiliated with diverse religions and ethnic groups operate within the country. Several anti-Western terrorist groups (some of which are on the U.S. government's list of foreign terrorist organizations) are banned in India but may continue to be active there. These groups include Lashkar-e-Tayyiba (LeT), Jaish-e-Mohammed (JEM), Harakat ul-Mujahedeen (HUM), Harkat-ul-Jihad-i-Islami, and al Qaeda. Terrorists have struck in public places throughout India, such as markets, trains, buses, stations, and places of worship. In 2008, nationwide terrorist strikes by transnational and local Islamic terrorist groups, Hindu extremists, leftist Naxalites and Maoists, and the conflict in Jammu and Kashmir killed more than 2,300 people. Apart from the Jammu and Kashmir area and the northeastern states, hot spots in India include the states of Andhra Pradesh, Chhattisgarh, Jharkhand, Bihar, Orissa, Uttar Pradesh, West Bengal, Assam, Gujarat, Maharashtra, Karnataka, and Kerala.

Since India gained independence, periodic communal violence and insurgent activity have occurred all over India. Muslims are India's largest minority, constituting 12.4 percent of the country's population of 1.14 billion (2007), and the Hindu-Muslim conflict has been India's most significant internal security problem since independence and the partition in 1947. During the creation of Pakistan, more than 9 million Urdu-speaking Muslims migrated from India to the Sindh (West) and Bengal (East) provinces of Pakistan. Resentment and mistrust on both sides continue to not only fuel communal conflict but also complicate efforts to resolve the dispute between India and Pakistan regarding Kashmir. Diverse groups operating within Indian-administered Kashmir and beyond conduct attacks using small arms and improvised explosive devices against Indian security forces and civilians and assassinate low-level government officials and politicians. Terrorist activity in the area also has frequently raised tension between Pakistan and India, which accuses its neighbor of supporting and harboring these terrorist groups.

The most serious communal rioting occurred following the "Ram Janambhoomi-Babri Masjid" dispute at Ayodhya (in Uttar Pradesh) in the early 1990s, when mobs of Hindus demolished a mosque built over what used to be a temple dedicated to the Hindu god Ram. The destruction triggered widespread rioting by Muslims in India, as well as in neighboring Pakistan and Bangladesh. The northeastern states of Assam, Nagaland, Tripura, and Manipur host a number of ethnic insurgent groups seeking autonomy or independence. India's government is engaged in peace talks with a number of these groups, but some have launched terrorist attacks against the civilian population and engaged security forces in sporadic clashes.

India also faces a growing communist insurgency, with groups—collectively known as the Naxalites—currently exerting varying degrees of influence in 17 of the country’s 28 states. Despite the dominance of the Islamist threat, in 2007, Prime Minister Singh described the communist insurgency as “the single biggest internal security challenge facing India.” The Naxalites began expanding their activities in 2006 to include targeting infrastructure and broadening their zone of operations to include urban areas.

The long list of terrorist attacks in India in 2008 includes the 3-day rampage in Mumbai in late November that India’s government blamed on Pakistan-based terrorist elements; this attack killed at least 183 people (including 22 foreigners) and injured more than 300 people. The apparently closely coordinated attack carried out by 10 suspected LeT operatives marked the first time terrorists appeared to have specifically targeted Westerners in India. Other major terrorist attacks in recent years include a succession of bomb explosions in Bangalore, Karnataka, and Ahmedabad, in Gujarat (July 2008); a coordinated series of bombings in market and temple areas of the tourist city of Jaipur, Rajasthan (May 2008); an attack on a government paramilitary facility in Uttar Pradesh (December 2007); coordinated bomb blasts at court facilities in three cities in Uttar Pradesh (November 2007); an explosives blast in a cinema hall in Punjab (November 2007); two explosions at a popular park and restaurant in Hyderabad, Andhra Pradesh (August 2007); an explosion at the main mosque in Hyderabad, Andhra Pradesh (May 2007); the detonation of explosive devices on a train northwest of Delhi (February 2007); simultaneous attacks on Mumbai commuter trains (July 2006); simultaneous attacks on a train station and places of worship in Varanasi (March 2006); and simultaneous attacks on several markets in New Delhi (October 2005). These attacks, which killed and injured both Muslims and Hindus,

probably were conducted by extremists hoping to incite anger between the Hindu and Muslim communities.

India's counterterrorism efforts have been hampered by outdated and overburdened law enforcement and legal systems, and very few perpetrators have been arrested or prosecuted. India's court system is slow, laborious, and prone to corruption, and terrorism trials can take years to complete. Many of India's local police forces also are poorly staffed, lacking in training, and ill equipped to combat terrorism effectively. In December 2008, in the wake of the November 2008 Mumbai attacks, India's cabinet approved proposals to toughen anti-terrorism laws and to create the National Investigation Agency. The new federal agency is charged with investigating terrorist attack cases and other related crimes.

## ***Kashmir***

Since the 1980s, India's government has had difficulty containing the violent Muslim insurgency in the Kashmir region. The conflict has spilled over into other states and brought India and Pakistan to the brink of war in December 2001 after Pakistan-supported Kashmiri terrorists attacked the Indian Parliament in New Delhi. Violence has practically been a daily occurrence, with militants targeting Indian security forces, government officials, and civilians and engaging in frequent clashes with the military. Since 1989, up to 60,000 people (terrorists, security forces, and civilians) have died in the conflict. Many terrorist incidents have taken place in Jammu and Kashmir's summer capital, Srinagar, but most attacks occur in rural areas. Foreigners are particularly visible and vulnerable and are definitely at risk. Communal violence, massive strikes, and business shutdowns in summer 2008 devastated Jammu and Kashmir. In addition, there have been attacks specifically targeted at civilians. For example, in July 2007, a blast on

an out-of-state tourist bus killed six and injured 20 in Srinagar; in August 2007, terrorists threw a grenade during an Independence Day function in the Bandipora district; and in October 2007, five soldiers and two civilians died in an IED blast perpetrated by militants in the Baramulla district.

In general, however, violence has declined every year since 2003, when India and Pakistan began the ongoing peace process. In its 2007–2008 annual report, the Indian Ministry of Home Affairs (MHA) claims that the number of incidents and casualties has progressively decreased and that conditions in the area have improved significantly. The MHA cautioned, however, that the infrastructure for training terrorists across the border in Pakistan remains intact and that terrorists persist in their efforts to infiltrate India.

The U.S. Department of State recommends that U.S. citizens avoid travel to the state of Jammu and Kashmir, with the exception of visits to the Ladakh region and its capital, Leh. A number of terrorist groups operate in the state, targeting security forces present throughout the region—particularly along the line of control separating Indian- and Pakistani-controlled Kashmir—and those stationed in the primary tourist destinations in the Kashmir Valley: Srinagar, Gulmarg, and Pahalgam.

### **Major Kashmiri Islamist Groups**

**Lashkar-e-Tayyiba (LeT, Army of the Pure).** (“Lashkar-e-Toiba” and “Lashkar-e-Taiba” are alternate spellings.) LeT is a Sunni Islamic militant group founded in 1993 that operates in Jammu and Kashmir, as well as Pakistan. The group reportedly has received funding from Pakistan’s intelligence services. LeT, which aims to end India’s control of Jammu and Kashmir and spread Islam across India, has been blamed for some of the most high-profile attacks in India, including the 3-day attack in

Mumbai in November 2008 and the bombing of a commuter train in Mumbai in July 2006. LeT's core fighting force is estimated to be in the hundreds, but the group has several thousand members in Pakistan. Its main offices are in Pakistan at Muridke (near Lahore) and Muzaffarabad. It trains in camps in Azad Kashmir, Afghanistan, and certain madrassas in Pakistan. LeT's major weapons include assault rifles, light and heavy machineguns, mortars, explosives, and rocket-propelled grenades. The group has developed a well-rehearsed capability to carry out full frontal assaults on police and military outposts; many of these attacks have been staged as suicide strikes. LeT is the only Kashmiri group that has regularly (and successfully) carried out suicide bombings against Indian targets. LeT founder Professor Saeed and other LeT members have made numerous anti-U.S. statements and threats. The group has ties to al Qa'ida.

**Jaish-e-Muhammad (JEM, Army of the Prophet Muhammad).** JEM was founded by Pakistan-based politician and religious scholar Masood Azhar in February 2000. JEM's primary objective is to "liberate" Jammu and Kashmir from India, but the group also supports Sunni groups in Pakistan and the creation of a radical Islamist state there. JEM has claimed credit for several publicized attacks in Jammu and Kashmir, reportedly using suicide squads against Indian security forces. JEM renamed itself Al Furqan in response to fears over the United States declaring the group a foreign terrorist organization. In changing its name, JEM is no longer on the U.S. list of official terrorist organizations. JEM is accused of being involved in the attack on the Indian Parliament in December 2001. JEM's core membership is estimated to be in the hundreds, but the group has thousands of sympathizers. The group's known weapons include light and heavy machineguns, assault rifles, mortars, and explosives. JEM's central bases are Pakistan's Punjab province, where the group derives its core



membership and support, and Jammu and Kashmir, its primary area of operation. JEM's training camps are reportedly in Punjab, Northwest Frontier Province (Pakistan), and Azad Kashmir. Known aliases include Tehrik-ul- Furqan or Al Furqan, and alternate spellings include Jaysh-e-Muhammad, Jaish-e-Mohammed, and Jaish-i-Muhammed. Several JEM members have trained in Afghan camps. JEM's rhetoric is anti-U.S.

**Harakat-ul Mujahedeen (HUM, Movement of the Mujahedeen; Islamic Freedom Fighters Group).** HUM, another Pakistan-based Islamic militant group founded in 1985, operates as an insurgent/terrorist group in the Indian-occupied portion of Jammu and Kashmir and as an adjunct fighting force with some terrorist camps in eastern Afghanistan. The group's declared goal is the liberation of Jammu and Kashmir through jihad. The group's ideology is based on Sunni Islamic separatism. Pakistani veterans of the Afghan-Soviet War founded Harakat ul-Ansur (HUA) in 1993 to "liberate" Jammu and Kashmir from India. HUA renamed itself Harakat-ul Mujahedeen (HUM) after the United States declared the group a foreign terrorist organization in 1997. HUM's leader is Fazlur Rehman Khalil, who is reported to have links to Usama bin Ladin. In 1995, a faction of HUM/HUA named Al-Faran kidnapped six Western tourists (including two U.S. citizens) in Srinagar, Jammu and Kashmir; two of the kidnapes escaped, one was beheaded, and the rest were likely killed later. To secure the release of several jailed Kashmiri militants, in December 2009, HUM members hijacked an Indian Airlines plane originating in Kathmandu. HUM is estimated to be several thousand strong. The group is based in Muzaffarabad, Pakistan, and the group maintains an extensive support and operational infrastructure in Pakistan. It generally trains its militants in Afghanistan and Pakistan, but recruits are also trained in Jammu and Kashmir. Armed supporters are located in Azad Kashmir (Pakistan) and India's southern

Kashmir and Doda regions. Supporters are mostly Pakistanis and Kashmiris, but there are also Afghans and Arab veterans of the Afghan War. Members conduct insurgent and terrorist activities primarily in Jammu and Kashmir, although the group's operational reach extends to Pakistan, New Delhi, and northern India. HUM suffered casualties in the U.S. missile strikes on bin Ladin-associated training camps in Afghanistan in August 1998.

**Harakat-ul-Jihad-al-Islami (HUJI, Islamic War Movement).** HUJI is one of the several Pakistan-based groups that grew out of the Afghan war against Soviet occupation in the 1980s. HUJI's current focus is fighting India's control of Jammu and Kashmir. The group's primary targets are Indian security forces and government officials, but HUJI members reportedly have also been linked to the kidnapping and killing of six Western tourists near Srinagar in 1995. HUJI leaders have ties to Afghanistan's Taliban regime, Usama bin Ladin, and Harakat-ul-Jihad in Bangladesh (HUJI-B). The number of HUJI core members is estimated to be in the hundreds. HUJI members probably have trained in Afghanistan; several HUJI camps were reportedly destroyed in the 1998 U.S. cruise missile strike against Afghanistan. HUJI also has camps in Azad Kashmir. Like most Kashmiri militant groups, HUJI reportedly receives some weapons, training, and financial support from Pakistan's Intelligence Services Directorate. HUJI's weapons include assault rifles, light and heavy machineguns, mortars, and explosives. HUJI's main target continues to be India. The group's rhetoric has included anti-U.S. statements.

**Al Badar.** Militant Sunni Islamist groups formed in 1998 to liberate Indian-administered Kashmir, unite it with Pakistan, and establish a Sunni Islamic society. Al Badar is a small organization, but it is capable of inflicting serious damage on Indian targets, particularly in coordination with larger terrorist groups in the region.

## **Other Domestic Islamist Groups**

**Students Islamic Movement of India (SIMI).** SIMI was founded in April 1977 to promote education and strong Islamic values among Indian Muslim youth and students. The group became increasingly radical in the 1990s; the group's original founder, Mohammad Ahmadullah Siddiqi (who, in November 2008, was a professor of journalism at Western Illinois University), stated that the group had been "highjacked by elements in other countries" and is now "completely different" from the group he had established. SIMI reportedly reinforces LeT efforts by facilitating the terrorist group's expansion of activities in India. Government authorities also suspect that SIMI has ties to JEM and have accused SIMI of being directly or indirectly involved in a number of terrorist attacks, including bombings of commuter trains in Mumbai in July 2006; the bombings killed more than 200 people.

**Indian Mujahedeen (IM).** IM first emerged in November 2007 in the wake of bombings in Uttar Pradesh. Indian authorities suspect IM is an offshoot of SIMI and that members have received training and support from militant groups in Pakistan and Bangladesh.

**Islamic Security Force (ISF).** ISF formed in 2000, during the Bodo separatist movement, to protect Muslim settlers and interests in the Bodo-dominated district in Assam. It claimed responsibility for bombings in Assam in October 2008 that killed 77.

**Deccan Mujahedeen.** This previously unknown group first gained attention when it claimed responsibility for the November 2008 multi-day terrorist assault in Mumbai. The group has been linked to LeT.

## ***Conflict Involving Sikhs***

The June 1984 Indian Army assault on the Golden Temple to eradicate Sikh militants fighting for self-rule turned the marginal Khalistan independence movement among the Sikhs into an extremely violent movement. Several splintered and warring armed Sikh separatist groups were involved in the struggle for independence. At the peak of Sikh militancy between 1984 and 1993, about 50,000 people were killed, including then Prime Minister Indira Gandhi, who was assassinated by her Sikh bodyguards. By 1997, the Sikh separatist movement appeared to be mostly over; peaceful and successful state elections were held in Punjab, and Indian security forces surrounding the Golden Temple were withdrawn. However, remnants of the insurgent movement have launched sporadic attacks, including bomb attacks on two movie theaters in Punjab in 2007.

### **Sikh Separatist Groups**

**Babbar Khalsa International (BKI).** BKI, founded in Canada in 1981, is seeking an independent Sikh state called Khalistan. There is no information on the group's current number of members, but the group may have members in the United States, Canada, the United Kingdom, Germany, and Pakistan. Indian authorities and media sources have linked BKI to Germany-based terrorist groups, as well as Pakistan's intelligence service, LeT, and JEM. Press reports also claim that Indian police officials have evidence that implicates BKI in terrorist attacks in Punjab.

**Khalistan Commando Force.** Founded possibly in the early 1980s, the group supports the creation of the separate Sikh state of Khalistan. Although it is a small group, the Khalistan Commando Force has ties to the International Sikh Youth Federation, the Sikh Youth of America, and the Sikh Youth of Belgium, as well as a

number of sympathizers in Germany and Canada. The Khalistan Commando Force's leader reportedly has been in hiding in Pakistan to escape charges of reviving the Sikh militancy, murder, conspiracy, arms smuggling, the murder of a former Indian Army chief, and involvement in India's biggest bank robbery.

### ***Militancy in the Northeast***

India's northeastern region comprises eight states—Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura—and has about 200 ethnic groups with distinct languages, dialects, and sociocultural identities. The area also shares extensive borders with Bangladesh, Bhutan, China, and Burma. Many of the ethnic groups enjoyed a large degree of autonomy during British rule and expected to be granted independence when the British left. The northeastern region has been fraught with violence since the creation of Bangladesh; many groups have demanded independence from India, citing neglect on the part of India's government and continuing discrimination as grounds for separation.

Although most states in the region have for the most part remained peaceful, Assam and Manipur have remained areas of concern. According to the MHA, Assam saw an increase in violence between 2007 and 2008. During the same period, Manipur also continued to be affected by the activities of a large number of militant groups divided along ethnic lines and demands. Sustained counterinsurgency operations by the government resulted in a significant increase in the number of insurgents arrested or killed. India's government has been engaged in peace negotiations with a number of groups that have shown willingness to seek peaceful solutions to their causes.

## **Major Active Northeastern Groups**

**United Liberation Front of Assam (ULFA).** ULFA is the dominant insurgent group in Assam. ULFA was formed in 1979 to establish a sovereign, socialist Assam. The group, which has been accused of conducting numerous killings, extortions, and kidnappings in Assam, reportedly is also considered the “big brother” by several other smaller groups active in Assam. ULFA attacks have increasingly focused on civilians, primarily Hindi-speaking migrants, although ULFA has also attacked infrastructure and targeted large businesses for extortion. It engaged in a short-lived peace negotiation with India’s government from October 2005 to September 2006, when a series of bombings ended the peace process. A spike in violence has been noted since late 2008, after a faction favoring a cease-fire and continued talks with the government broke off from the main group. Indian authorities and press reports claim ULFA’s top leaders are based in Bangladesh.

**National Democratic Front of Bodoland (NDFB).** NDFB, which seeks a separate homeland for ethnic Bodos, entered into a cease-fire and disarmament agreement with India’s government in May 2005, after suffering considerable losses and the arrests of some key leaders. In 2005, NDFB members were living in camps protected by the Indian military. The group remains armed, however, and still poses a threat to the region if the peace process fails. A faction opposed to working with the government reportedly has continued its subversive activities, and it has been blamed for the 30 October 2008 series of bomb blasts in Assam that killed 80 persons.

## ***Naxalite (Communist) Movement***

The Naxalite movement seeks to establish a Maoist-type communist state in India through the violent overthrow of the existing

state. The movement, which draws its followers mainly from impoverished, lower caste Hindus, began in the Naxalbari district of West Bengal in 1967 when violent radicals sought an extreme alternative to the communist party that had controlled West Bengal. Calling itself the Communist Party Marxist-Leninist, the party has been banned in India for advocating the violent overthrow of the existing political system. Members of this group mainly come from the Dalit caste (formerly, the “untouchables”).

Over the past few decades, several Naxalite groups operated in certain parts of India. In 2004, two of these groups—the Peoples War Group, operating in Andhra Pradesh, and the Maoist Communist Center in Bihar and adjoining areas—merged to form the CPI-Maoist (CPI-M). Indian authorities consider this unified group the most active and strident front of Naxalism in the country.

Naxalite targets have included India’s police and paramilitary forces and government officials, but massacres between factions of Naxalites also have occurred in Bihar. In 2006, the CPI-M expanded its list of targets to include the economy, particularly infrastructure such as high-tension electricity transmission towers, the railways, and communications towers. In April 2009, a group of 250–300 rebels hijacked a train as it passed through Jharkhand state in eastern India; the hijackers held about 700 passengers hostage before releasing them 4 hours later. Although the group has not specifically targeted U.S. citizens, it has attacked symbolic targets associated with Western companies and interests. In 2007, the states of Andhra Pradesh, Orissa, Chhattisgarh, Bihar, Jharkhand, and West Bengal saw significant Naxalite activity. The movement has continued to spread, and the Naxalites are now active in more than 185 districts in 17 of India’s 28 states.

## Drug Trafficking

India is the world's largest producer of licit opium for the pharmaceutical trade; however, an undetermined quantity of opium is diverted to illicit international drug markets as well. Many of India's ports and remote areas serve as transit routes for illicit narcotics produced in neighboring countries. India also produces significant quantities of hashish and methaqualone.

The drug trade is prevalent in India and comprises a large portion of criminal activity in India. India is a major transit country for narcotics produced in neighboring countries, a major source country for several drugs, and a destination for illegal narcotics. Police corruption, along with India's generally porous borders with Bangladesh, Pakistan, Bhutan, and Burma, allow major international drug trafficking operations to take advantage of the country's extensive international transportation network and ports. The border with Pakistan is the border most vulnerable to drug trafficking. Traffickers include people from India, Afghanistan, Pakistan, Nepal, and Sri Lanka.

India's location between two regions that produce most of the world's illegal opiates makes the country a major transit point for heroin, primarily from Afghanistan, coming into India through Pakistan. India, a minor source country for heroin, has been a major producer of opiates since the 1880s, when the British Empire produced and exported opium around the world. India produces most of the world's legal opium, some of which ends up in the illegal market.

Illicit poppy cultivation covers extensive parts of rural areas, particularly near the border with Bangladesh. India's government has continuously worked to eradicate illegal opium poppy crop growing. In 2007, for example, authorities destroyed 7,753 hectares



(19,158 acres) of poppy fields, marking a significant increase from the 247 hectares (610 acres) destroyed in 2006.

India is one of the world's major producers of cannabis (known as ganja, which is Sanskrit for cannabis), yielding more than 8 percent of the world's cannabis resin totals. India produces both marijuana and hashish (a slightly harsher and stronger version of cannabis). Most of India's marijuana is intended for domestic use. India also is one of the world's largest exporters of legal ephedrine and pseudoephedrine, the ingredients used to create various amphetamines. Illegal amphetamine extraction laboratories have been discovered in India, and three were closed in 2006. India also is the world's largest producer of illicit methaqualone, a depressant known as "mandrax" that is trafficked primarily to South Africa. Amphetamines and illicit pharmaceuticals are often trafficked from India to Canada, Burma, and Malaysia through Sri Lanka. Distribution networks are complicated and often involve courier services.

Drug use is pervasive in India. Cultural use of ganja, heroin, opium, and various other narcotics is rooted in ancient tradition, and it continues to be a significant part of social interactions. Medicinal use of opiates and cannabis is also common, and remedies containing these and other narcotics are prescribed for a variety of complaints. Drug use has increased, including the abuse of pharmaceuticals. Demand reduction programs have reduced usage, but drug abuse cases increased by 47 percent between 1996 and 2006. India is the largest opiate market in Asia, with an opiate-using population of about 3 million. India's government operates extensive rehabilitation centers and works to educate the population about the dangers of drug use.

In India, possession or trafficking of illegal narcotics is a serious crime that carries harsh penalties. Sentencing is based on the amount trafficked. Conviction for possession of even a small amount of illegal substances carries a jail sentence of a minimum of 6 months, and larger amounts carry jail sentences of more than 10 years. The slow judicial process can add several years to sentencing. India's police conduct major anti-narcotic operations at transportation terminals such as airports and bus stations.

The Narcotics Control Bureau (NCB), established in 1986, is responsible for fighting illegal narcotic trafficking and for coordinating all counternarcotics activities for the various law enforcement agencies. It is part of the Ministry of Home Affairs. The NCB monitors all aspects of legal opium production. Other agencies with counterdrug responsibilities are the Central Bureau of Investigation, the Customs Commission, and the Border Security Force. India has bilateral agreements on countering drug trafficking with 13 countries, including neighboring Pakistan and Burma. India is also a signatory to various international conventions on narcotics.

## **Major Intelligence Services**

India has a complex network of intelligence services comprising military and civilian agencies. There are two major intelligence agencies, one domestic and one external, and various military, paramilitary, and law enforcement intelligence organizations. Military intelligence services are under the Ministry of Defense. Smaller paramilitary and law enforcement intelligence groups often provide operational intelligence and are under the Ministry for Home Affairs.

The National Security Council (NSC) oversees national security and intelligence. The NSC is headed by the National Security

Advisor. The NSC is responsible for analyzing national security concerns through all intelligence gathered and for coordinating intelligence and national security efforts through the Joint Intelligence Committee, which analyzes intelligence from various agencies. The NSC generally does operate efficiently—and its agencies are often reluctant to share information with each other.

The Cabinet Secretariat Research and Analysis Wing (RAW), India’s external intelligence agency, is the most powerful agency in India. RAW is a civilian intelligence service that was formed in 1968 with the mission to focus on Pakistan. RAW has a significant role in formulating domestic and foreign policy. RAW is responsible for external intelligence and works directly under the prime minister. RAW is also tasked with monitoring neighboring countries’ political and military developments that have a direct bearing on India’s national security and the formulation of India’s foreign policy. The primary civilian domestic intelligence agency is the Intelligence Bureau (IB), which is tasked with domestic intelligence. The IB, which is reputed to be the oldest intelligence agency in the world, is particularly focused on intelligence gathering in border areas. The IB has agents and officers throughout the country and monitors communications through wiretaps and intercepted mail. Limited resources and poor information-sharing hinder the IB’s effectiveness. The IB reports directly to the MHA, which is headed by a cabinet member and two ministers of state.

<b>Intelligence Agencies</b>		
<b>Name</b>	<b>Category/ Affiliation</b>	<b>Description</b>

<b><i>Defense Intelligence Agency</i></b>	Military/ Army, Navy, Air Force	Created March 2002; combines intelligence networks of all three branches of the armed forces in India; tracks foreign and domestic troop movements; monitors internal security; tracks terrorist groups; uses satellite and aerial reconnaissance; poorly staffed and funded
<b><i>Central Bureau of Investigation</i></b>	Civilian	Established April 1963; responsible for wide range of criminal and national security intelligence gathering
<b><i>Joint Cipher Bureau</i></b>	Military/ inter-services	Inter-services agency; responsible for signals intelligence (SIGINT) and cryptology; coordinates national security management
<b><i>Navy Directorate of Signals Intelligence</i></b>	Military/ Navy	Responsible for SIGINT
<b><i>Defense Security Corps</i></b>	Military/ Defense Ministry	Provides security and monitoring of nuclear sites
<b><i>Directorate of Air Intelligence</i></b>	Military/Air Force	Responsible for imagery intelligence collection; uses reconnaissance aircraft and space-based imagery capabilities
<b><i>Central Economic Intelligence Bureau</i></b>	Civilian	Collects intelligence on the black market; supports investigative efforts of agencies enforcing economic laws
<b><i>Narcotics Control Bureau</i></b>	Paramilitary and Law Enforcement	Supports counternarcotics efforts and information gathering; monitors drug trafficking

<i>Army Directorate of Military Intelligence</i>	Military/ Army	Focuses on supporting counterinsurgency; monitors field services
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## **ARMED FORCES**

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India's armed forces trace their histories to the British colonial era. All three services have been significantly influenced by British military traditions and customs. Military customs and courtesies are strictly observed and recognized. All personnel, particularly those in the army, strongly identify with their units.

India's military forces support the Indian national leadership's strategic goals of achieving a leading position in South Asia and the adjoining Indian Ocean zone. India's military forces also assist the government, if necessary, in maintaining public safety and law and order. Regular army and paramilitary units are widely employed in conducting counterinsurgency operations against Muslim terrorists in Jammu and Kashmir, Sikh separatists in Punjab, and insurgent movements in India's northeastern states.

As a result of the 2000 Strategic Defense Review, India's armed forces initiated a major reorganization to streamline defense policy formulation and implementation and improve the military's joint operations capability and strategic flexibility. The military is emerging as a modern, well-equipped force with limited but increasing power projection capabilities in multi-dimensional battlespace. India's armed forces are ranked third in the world in terms of numeric strength. They have experience in conducting modern conventional combat operations and are equipped with modern weapons and military equipment.

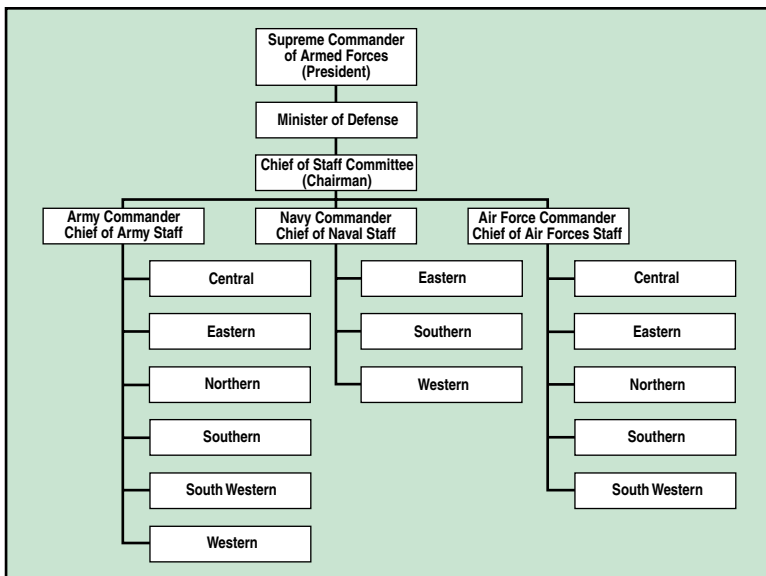
## **Roles and Missions**

India's armed forces serve in three primary roles and perform a variety of missions depending on the situation. Roles are defined as peacetime, in-war, and special assignments. In their peacetime function, the armed forces' main tasks are to organize, train, and equip land, sea, and air forces in preparation for war; assist civil government in maintaining internal security when required; and protect India's security interests. During war, the armed forces' only purpose is to cooperate and coordinate in defending the country against external aggression. In performing their special assignments role, the armed forces can be tasked to conduct a variety of missions, such as international peacekeeping, humanitarian relief operations in the wake of natural or man-made disasters, or support to national infrastructure and environmental projects such as conducting photographic and geodetic surveys.

## **Organization**

The president is the supreme commander of the armed forces; however, the responsibility for national defense rests with the cabinet. Overall defense policy is formulated by the Union Cabinet, which is headed by the prime minister. In practice, the Cabinet of Ministers Political Affairs Committee makes the most important decisions on basic domestic, foreign, and national defense policies. The Defense Planning Committee, which is part of the Cabinet of Ministers Secretariat, prepares draft decisions and implements them and analyzes the status of the armed forces and provides basic direction for their development.

The following are the major committees established to help formulate and implement defense policy:



## Armed Forces Operational Command Structure

- **National Security Council (NSC):** Oversees and coordinates India's defense and foreign policy.
- **Cabinet Defense Committee:** Makes all policy decisions.
- **Defense Minister's Committee:** Addresses matters of importance to all three services and issues concerning the military and civilian establishments. It has two subcommittees: personnel and materiel-technical support of troops.
- **Chiefs of Staff Committee:** Exercises operational command and control of the armed forces and consults on fundamental questions of organizational development and employment of the armed forces.
- **Joint Intelligence Committee:** The supreme military intelligence coordinating entity.

- **Mobilization Deployment Committee:** Plans for transfer of state management and economic system to a regime of wartime operation, as well as for mobilization deployment of armed forces and their reserve components during a period of threat or the beginning of war.

The Ministry of Defense (MoD) is the supreme administrative management entity conducting government policy in military organizational development. It addresses the armed forces' organizational development and their materiel-technical and financial support; planning and organization of research, development, training, and education; and military production and procurement of arms.

The Minister of Defense, a civilian who reports directly to the prime minister, provides operational direction to the armed forces through the chiefs of staff of each of the armed forces.

Departments, headed by corresponding MoD secretaries, are composed of directorates. Committees established under the Minister of Defense connect military and civilian state structures and the MoD and the armed forces branches. The MoD is organized into four major departments and one division:

- The Department of Defense
- The Department of Defense Production
- The Department of Defense Research and Development
- The Department of Ex-Servicemen Welfare
- The Finance Division

India's armed forces are organized into branches under the Department of Defense within the MoD. The army is the dominant service in planning and coordinating the national defense ef-



fort. The navy and air force fulfill specific missions and provide support.

## **Capabilities**

India faces a combination of threats, including continued tension with Pakistan; regional rivalry with China; regional instability; and volatile domestic political and security environments, including several active insurgencies within its borders. As a result, India's political-military leadership seeks to further strengthen the country's armed forces to ensure they are capable of conducting offensive combat operations against Pakistan and, if necessary, a simultaneous defense on the India-China border while maintaining the internal security. The armed forces' combat capabilities are increasing, specifically in the following areas:

- Improving qualitative and quantitative combat power strength and flexibility
- Upgrading the command and control system and structure of combat formations and units
- Improving effectiveness of training

India's military is developing a modern maneuver warfare doctrine that seeks to employ the full spectrum of battlefield systems to identify, locate, and strike at enemy weakness. To develop this capability, the armed forces seek innovative technological applications not only for maneuver, fire support, and logistics, but also for electronic warfare; intelligence, surveillance and reconnaissance; and information warfare.

India's armed forces are slowly moving toward a joint operations capability. The first operational joint unified command, the Andaman and Nicobar Command (ANC), was created to monitor and counter military and terrorist activities in the Bay of Bengal

and the adjoining waters. ANC became operational on 8 October 2001, and it is currently under the command of VAdm Vijay Shankar, who reports directly to the Chief of Integrated Defense Staff. India's government spent the equivalent of US\$2 billion to establish the ANC, which is crucial to its ambitions for a naval presence in the Malacca Strait and beyond. Command of the ANC will rotate among the three services. The Indian Air Force has a substantial presence in the ANC, with a fighter squadron and a helicopter unit. The army originally intended to station a full division (approximately 8,000 troops) in the ANC, but it is unknown exactly how many are currently on location, due in part to the devastation suffered during the 2004 tsunami.

## **Strategy and Doctrine**

Although India bases its foreign policy on peaceful coexistence and membership in the Non-Aligned Movement, the national leadership views developments in the international and regional environments as threatening to India's security. Military strategy, therefore, is focused regionally on deterring threats, defeating aggression, promoting stability, and securing India's vital interests. National security policy delineates the following national security objectives:

- Defend the country's borders as defined by law and the constitution.
- Protect Indians against terrorism and insurgency.
- Maintain a secure, effective, and credible minimum deterrent against the threat and use of weapons of mass destruction against India.
- Secure the country against restrictions on technology transfers that affect India's security, particularly its defense pre-

paredness. Emphasize indigenous research, development, and production to meet national requirements.

India has been studying doctrinal improvements and modernizing its military since the 1990s. The Army's Cold Start Doctrine was announced publicly on 28 April 2004; however, doctrinal elements had probably been included in war plans for approximately a year prior to the official public announcement. One of the key events that led to the introduction of the Cold Start Doctrine was Operation PARAKRAM. Operation PARAKRAM was the full mobilization of Indian armed forces to the Pakistan-India border from December 2001 through December 2002, which almost resulted in war between India and Pakistan. The operation's lengthy mobilization time and other deficiencies were the catalyst for introducing the new doctrine.

Because India has implemented little effective joint doctrine, the Army's Cold Start Doctrine (which calls for cooperation between the three services) attempts to fill this void. Additionally, the new doctrine is designed to maintain the army's status as the premier service. The Cold Start Doctrine leads the way toward India's first joint warfighting doctrine while maintaining the relevance of India's conventional military in a nuclear threat environment.

The Cold Start Doctrine is composed of the following primary elements:

- The Cold Start Doctrine envisages a conventional war under a "nuclear umbrella." Most importantly, Indian forces must avoid crossing the Pakistanis' nuclear threshold ("Red Lines"), which Pakistan keeps deliberately vague.
- The Army's Cold Start Doctrine emphasizes armor-heavy formations, mobility, and fire support. Eventually, the army will field integrated battle groups composed of armor and

mechanized infantry formations with artillery or close air support in order to have armor-heavy formations that are mobile and have the fire support needed to conduct the Cold Start Doctrine.

- The primary goal of the Cold Start Doctrine is to achieve the ability to conduct preemptive attacks after a short mobilization. The Cold Start Doctrine envisages being able to attack across the India-Pakistan border within approximately 4 days of the decision to strike.
- Operations under the Cold Start Doctrine would have limited objectives, with shallow penetration across the international border in order to avoid crossing the invisible Pakistani “Red Lines.”
- The Cold Start Doctrine also envisages the destruction of key Pakistani offensive combat units whose destruction would prevent a coordinated counterattack and the potential loss of India territory.

## **Personnel**

### ***Key Defense Personnel***

The following are the key defense personnel:

- Minister of Defense: Shri A.K. Antony
- Chief of Integrated Staff: Vice Admiral Shekhar Sinha
- Chief of Army Staff: Gen Vijay Kumar Singh
- Chief of Naval Staff: Adm Nirmal Kumar Verma
- Chief of Air Forces Staff: Air Chief Marshal Norman Anil Kumar

#### **Service**

#### **Number of Personnel**

Army

980,000 active; 300,000 reserve

Air Force	130,000 active
Navy	54,000 active
Paramilitary	2,000,000

India's 1.2-million-strong army is a proud, professional, all-volunteer force with a long history of loyal service, first to the British Empire and later to independent India. India's armed forces are apolitical, and they strictly observe constitutional subordination to civilian authority. The ethnic, religious, cultural, and social diversity of Indian society is reflected in the armed forces. The armed forces are successful at melding their diverse membership into a cohesive whole.

Military service is open to all qualified applicants who meet minimum physical and educational requirements, including women—although, women are limited to non-combat duties. The armed forces accept male recruits between the ages of 17 and 25 for combat positions. Initial enlistments vary from 10 to 15 years; maximum terms of service range from 16 to 21 years for enlisted personnel. Most officers gain their commission from the course at the Indian Military Academy after receiving their baccalaureate degree. Other paths to the commissioned ranks include the Army Cadet College, technical graduate entry for engineering students, Officer Training Schools (analogous to the U.S. military's Officer Candidate School), and direct commission for specialist fields, such as medical and veterinary.

During 1992 and 1993, the armed forces started to recruit women into the regular army, notably in the officer corps. Although there are 400 million women in India, fewer than 2,000 are serving in the army, and gender bias is an ongoing problem at all levels. More than 90 percent of female officers are in the Military Nursing

Service, with a few additional women serving as doctors in the Army Medical Corps. There may also be some women serving as dentists in the Army Dental Corps or as veterinarians in the Remount and Veterinary Corps. Females are encouraged to participate in the National Cadet Corps, which is a volunteer youth organization that provides some basic military training and familiarization to school- and college-aged youth and young adults. An estimated 100,000 young women participate, but less than 300 women gain commissions each year. Although female officers are being inducted into some arms and services duties in the Indian Army (e.g., air defense, signal corps, corps of engineers, ordnance corps), a study released in March 2007 by the Chiefs of Staff Committee recommended excluding female officers from combat duty for the present.

## ***Training***

India's armed forces have several inter-service institutions for professional development, including the National Defense College, National Defense Academy, Defense Services Staff College, National Cadet Corps, and Armed Forces Medical College.

The National Defense Academy (NDA) is a first-phase, joint-service training institution with academic and professional programs for 1,700 cadets. Students complete 3 years of study culminating in a BS or BA degree from Jawaharal Nehru University. Graduating army cadets progress to the Indian Military Academy, at Dehra Dun.

The Indian Military Academy is the final stage of the commissioning cycle begun at the NDA. Cadets who received degrees from the NDA complete a 1 1/2-year course leading to a permanent regular commission. Soldiers who complete the 3-year course

at the Army Cadet College attend an abbreviated 1-year commission cycle. Technical career field cadets receive a 1-year training cycle as well.

The Defense Services Staff College, in Wellington, is a staff-level service school that teaches joint doctrine. Classes are lectures focused on corresponding air, naval, and army education.

Prior to the adoption of the Cold Start Doctrine, field training tended to be focused on a single branch of combat arms, with rare occasions for combined-arms training. Even less frequently did field training involve one of the other services (e.g., the Indian Air Force or the Indian Navy). Since the publication of the Cold Start Doctrine, the Indian Army has gradually been integrating training exercises. Further, it is making attempts at joint exercises, although current efforts appear highly scripted, and integration has more to do with being geographically located in the same exercise area than with true cooperation and coordination.

### ***Uniforms, Ranks, and Insignia***

India's military uniforms closely resemble those of the British armed services. The principal colors are greenish-brown for the army, navy blue for the navy, and light blue for the air force. Army special operations and paramilitary units commonly wear brown and black camouflage fatigues.

The rank structure is patterned on the British model. Following the British Indian tradition, there are three junior commissioned officer (JCO) grades between enlisted and officer rank for those promoted from enlisted recruits. JCOs function in a role similar to that of U.S. Army warrant officers, but JCOs do not always possess the requisite level of experience.

Until recently, the JCO ranks were accorded to enlisted soldiers based on the amount of time they had served in the army and their interest in the role; no other qualifications appeared necessary. Currently, once a JCO application is received, the candidate must pass a written examination, screening board, and medical examination. JCOs have some of the powers and privileges of commissioned officers, and JCOs rather than lieutenants are often used as platoon commanders because of the shortage of lieutenants in the army. JCOs typically receive great respect, even from senior officers, and frequently retire as honorary commissioned officers with ranks as high as captain. Their conservative, rural origins serve to perpetuate the traditions of the army.

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## **ARMY**

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### **Mission**

The primary missions of the Indian Army are to defend India's territory, including its territorial islands, against external threats and to support internal security through counterinsurgency operations. The army is responsible for ground defense, ground-based air defense, and air support of ground operations. Additionally, it provides aid and security during natural disasters, other emergencies, and elections.

The army's current missions against Pakistan are to conduct small arms and artillery operations along the disputed line of control in Kashmir and on the Siachen Glacier. The army additionally must be ready for a war that could feature chemical and nuclear weapons. The army's mission against China is limited mainly to defending the disputed, but generally peaceful, border. The army also trains to project its forces to protect India's territorial islands. In addition, the Indian Army is tasked with providing forces for internal counterinsurgency missions, although this is not a specified mission.



<b>ENLISTED</b>						
	<b>Indian Rank</b>	<b>Lance Naik</b>	<b>Naik</b>	<b>Havildar</b>	<b>Company Quarter Master Havildar</b>	<b>Company Havildar Major</b>
	<b>U.S. Equivalent</b>	<i>Private First Class</i>	<i>Corporal</i>	<i>Sergeant</i>	<i>Staff Sergeant</i>	
	<b>Indian Rank</b>	<b>Regimental Quarter Master Havildar</b>	<b>Regimental Havildar Major</b>	<b>Naib Subedar/Naib Risaldar</b>	<b>Subedar/Risaldar</b>	<b>Subedar Major/Risaldar Major</b>
<b>U.S. Equivalent</b>	<i>Second Lieutenant</i>	<i>Lieutenant</i>	<i>Captain</i>	<i>Major</i>	<i>Lieutenant Colonel</i>	
<b>U.S. Equivalent</b>	<i>Colonel</i>	<i>Brigadier</i>	<i>Major General</i>	<i>Lieutenant General</i>	<i>General</i>	

## Army Rank Insignia

### Organization

The Indian Army's headquarters is in New Delhi. It functions under the Chief of Army Staff (COAS), who is responsible for the army's command, control, and administration.

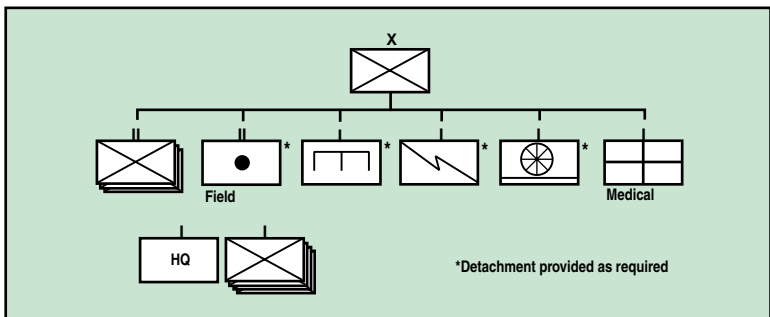
The army's headquarters is responsible for recruiting, training, and equipping the army, and strategic planning. Assisting the COAS in

his administrative duties is the Principal Staff Officers Committee (PSOC). The PSOC consists of the following positions: the Vice Chief of Army Staff (VCOAS), three Deputy Chiefs of Army Staff (DCOAS), adjutant general, master general of ordnance, engineer-in-chief, director general of medical services, and military secretary.

The Indian Army has four component forces:

- The regular army, with a total active manpower of 980,000.
- The regular army reserve, with a strength of 300,000.
- The Territorial Army (TA), an all-volunteer civilian force of 40,000 that functions much like the U.S. National Guard or state militias except it is under direct control of the local Army commander. Additionally, there are 160,000 TA troops as a second-tier reserve.
- The National Cadet Corps, which is similar in function to the U.S. military ROTC programs and national military academies.

Each of these forces is divided into three major subdivisions: headquarters, arms (“fighting” or combat arms troops), and services (logistical and support troops).



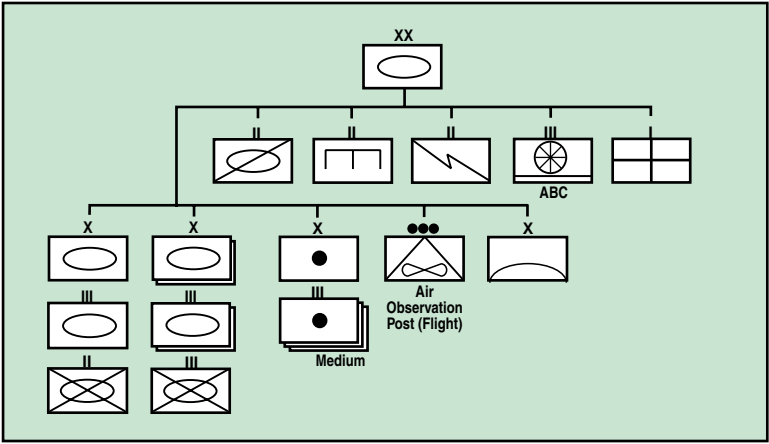
## Infantry Brigade

# Commands

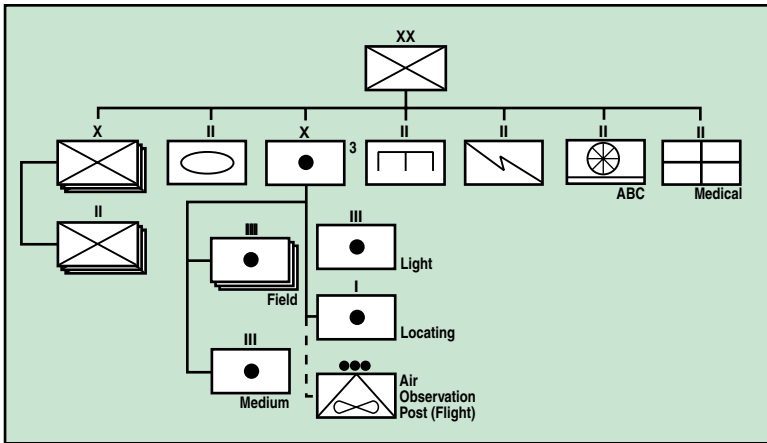
Operationally, the army is divided into six operational and one training command. Each is under the command of a lieutenant general who has an equal status to the VCOAS, working under the control of the Army's headquarters (in New Delhi).

## Operational Commands

- Northern Command, Udhampur, has five infantry divisions, two mountain infantry divisions, and five counterinsurgency force (CIF) units.
- Eastern Command, Kolkata, has seven mountain infantry divisions and two CIF units.
- Western Command, Chandimandir, has one armored division, six infantry divisions, one RAPID (Reorganized Army Plains Infantry Division), and one artillery division.
- Southern Command, Pune, has one armored division, four infantry divisions, two RAPIDs, and one artillery division.



## Armored Divisions



## Infantry Divisions

- South Western Command, Jaipur, has one armored division, three infantry divisions, and two RAPIDs.
- Central Command, Lucknow, has one mountain infantry division and one independent mountain infantry brigade.

## Training Commands

- Training Command: Army Training Command (ARTRAC): Simla (HQ). The training command develops and disseminates tactics and doctrines for the army in conventional and non-conventional spheres. Initially, the infantry and its training center had this responsibility. ARTRAC reflects the army's goal to base its tactics on multidisciplinary approaches, with equal emphasis on armored, mechanized, and infantry inputs.

In addition to the army forces operationally deployed to the six regional commands, the army is also represented at the joint, uni-

fied Fortress Command or Andaman-Nicobar Command (ANC). The army component at the ANC consists of one infantry brigade.

## **Corps**

The India Army is organized in the tradition of the British Army, with corps, divisions, brigades, regiments, and battalions. The India Army's six operational commands are an aggregate of 13 regional corps, with sub-elements of the Artillery Corps, Air Defense Corps, and the Army Aviation Corps. The 13 regional corps are the following:

- I Strike Corps - Mathura, Uttar Pradesh (Strike Corps)
- II Strike Corps - Ambala, Haryana (Strike Corps)
- III Corps - Dimapur, Nagaland
- IV Corps - Tezpur, Assam
- IX Corps - Mamun (Panthankot), Punjab
- X Corps - Bhatinda, Punjab
- XI Corps - Jalandhar, Punjab
- XII Corps - Jodhpur, Rajasthan
- XIV Corps - Leh, Ladakh
- XV Corps - Srinagar, Kashmir
- XVI Corps - Nagrota, Jammu
- XXI Strike Corps - Bhopal, Madhya Pradesh (Strike Corps)
- XXXIII Corps - Siliguri, West Bengal

Corps are task organized into field formations with subordinate infantry, armor, and mechanized elements.

## ***Artillery Corps***

Artillery units are organized on a corps and divisional basis. In an infantry division, an artillery brigade typically consists of three

field regiments, one light antiaircraft regiment, and one medium regiment. Additionally, doctrine authorizes one surveillance and target acquisition (SATA) battery per infantry division to provide information about enemy disposition, strength, movement, and activity of enemy weapons.

The artillery is now classed as a combat arm (it was previously classed as a combat support arm). Its priorities shift between direct support and counter-battery fire. Its role is to dominate the battlefield with its immense firepower so that an enemy can neither interfere with the operations nor develop its own battle plan effectively. For air and sea targets, gunners operate with air and naval forces. The Artillery Center is at Nasik, Maharashtra. Army artillery and armor regiments resemble lightly reinforced, battalion-strength units by U.S. definition.

As India continues with its plans to modernize its artillery assets, it will strive to standardize ammunition calibers and types while increasing range, accuracy, and mobility.

India employs several types of UAV platforms with a wide variety of sensors for use in operational and strategic intelligence as well as operational and tactical reconnaissance, intelligence, surveillance, and target acquisition (RISTA) activities. Although UAV troops organizationally belong to SATA units in India's Army, they provide targeting support to artillery units. The army has employed UAVs to assist in efforts to locate insurgents operating in Kashmir and along the borders with Pakistan and China for reconnaissance missions.

## ***Air Defense Corps***

The Air Defense Corps consists 6 air defense brigades, with 29 antiaircraft artillery regiments and 40 surface-to-air missile batteries

India uses a number of radar systems to provide an early warning network against approaching aircraft or ballistic missiles.

## ***Army Aviation Corps***

Developed in 1994, the Army Aviation Corps (AAC) is still undergoing organizational changes and expansion. The basic elements of army aviation are currently reconnaissance and observation (R&O) helicopters and utility helicopters. At present, attack helicopters remain India Air Force (IAF) assets placed under the Army's operational control only when necessitated by mission requirements.

The AAC is looking forward to strengthening its capabilities with plans of almost doubling the size of its helicopter fleet over the next 10 years. Current operations include 12 squadrons of Cheetah/Chetak helicopters, 3 squadrons of ALH helicopters, and 5 independent helicopter flights, for a total of approximately 300 helicopters.

As a part of its Vision 2017, the AAC plans to deploy a squadron of utility helicopters per corps, an R&O flight with each division, a squadron of attack helicopters with each offensive strike corps, and both medium-lift armed utility helicopters and indigenous light combat helicopters to a special operations and warfare squadron once it is created.

## **Combat Organizations**

Each command in the India Army is under the General Officer Commanding-in-Chief (GOC-in-C). The GOC-in-C is responsible for the efficient maintenance of the soldiers in the field and for the operational control and direction of the force as a whole. The

GOC-in-C is the commander of the demarcated geographic area and has both static and field formations under his command.

**Static Formations.** Command HQ controls all the static formations in its jurisdiction. A static formation's role is purely administrative, and its responsibilities are limited to a specified area. Internal security duties or the employment of troops during natural calamities may be allocated to a static HQ.

The primary role of a static formation is peacetime administration. Duties include construction projects like houses, waterworks, and other facilities; distributing government funds for works; controlling static supply depots; and performing other administrative units required in military stations and cantonments. The Area and Sub-Area HQ are in direct contact with state and regional civilian authorities.

**Field Formations.** Field formations are task organized, combat formations. They are designed for mobility and have transportable equipment. The major field formations are corps, divisions, and brigades:

- *Corps.* Each is commanded by a lieutenant general and has subordinate engineers, artillery, and services. A Corps HQ can shift from sector to sector or to another command zone depending on operational requirements. The army has three Strike Corps and nine Pivot Corps in active service.
- *Divisions.* Each is commanded by a major general, who is assisted by two principal staff officers. An army division is the largest striking force in the field. The four types of army divisions are Infantry/Mountain Infantry, Mechanized, Armored, and Artillery.
- *Brigades.* Each is commanded by a brigadier, who is assisted by a brigade major and staff officers. There are five types



of army brigades according to operational needs: infantry/mountain, artillery, mechanized, armored, and parachute brigades.

Smaller subordinate tactical organizations are as follows:

- *Battalions*: Commanded by a colonel, the battalion is self-contained; hence, it is the smallest fighting formation of the army. Each battalion has approximately 1,000 men.
- *Companies*: Commanded by a commissioned officer, usually a major. Each has a small headquarters and consists of three infantry platoons; its total strength is 120 soldiers.
- *Platoons*: Commanded by a JCO, usually a *subedar* and with a second-in-command, usually a *havildar*. The platoon has three sections of 33 to 36 soldiers.
- *Sections*: The basic structure on which the army is formed is the infantry section or its equivalent in other arms and services. This is the smallest unit. It is commanded by a non-commissioned officer (NCO), usually a lance *havildar* or a *havildar*. Its strength is normally at 11 *jawans*, but under adverse conditions, there may be fewer.

## Capability

In February 1999, the India Army announced plans to improve mobility, firepower, and surveillance capabilities of its 355 infantry battalions. To increase conventional and counterinsurgency operations capability, the infantry forces are equipped with locally designed and produced INSAS 5.56-mm assault rifles and light machineguns (LMGs), antitank missile launchers with thermal-imaging sights, automatic grenade launchers, and Carl Gustav M3 recoilless rifles. Other additions to battalion inventory include Russian Dragunov 7.62-mm semiautomatic sniper rifles, 7.62-mm FN MAG-58 machineguns, handheld global positioning systems

(GPSs), and locally developed mortar fire-control data computers. Lighter, commercially produced vehicles equipped with antitank missile launchers, LMGs, and surveillance radar will increase mobility. Each battalion will be equipped with five handheld GPS units, of which 500 have been imported from Belgium.

Widespread cultural resistance to change and a generally low level of technological education combine to make it difficult for the India Army to adopt the tactics required to take full advantage of modern weapons. Bureaucratic resistance to change is largely reinforced by the sizable number of older officers; however, recent modifications to doctrine have started progress in this area.

As both India and its rival Pakistan enhance their nuclear capability, India's infantry is preparing for operations in a nuclear environment. To prevent infiltration of armed guerrillas, the infantry has deployed a combination of unattended ground sensors, short-range battlefield surveillance radar, and handheld thermal imagers—all backed by secure modern communication and signal systems.

The infantry has approximately 75 Reumech OMC Casspir mine-protected armored personnel carriers for use against improvised explosive devices (IEDs) and land mines. The combat engineers additionally employ the Hydrema mine-clearing vehicle (MCV), which is capable of clearing a 3.5-meter-wide track on firm ground such as roads, runways, and other types of ground. A tank-based mine flail system has been undergoing testing since 2006 but has not yet been fielded. The Army places a high level of emphasis on this type of equipment because IEDs and mines, as opposed to other things, have killed and wounded the largest number of soldiers in Kashmir since 1989.

In a deal that India had been negotiating with Russia since 1996, the Army is acquiring 38 SMERCH launchers, transloaders, and

associated support equipment. This acquisition will equip two regiments and leave an additional two launchers for training. These SMERCH systems will provide corps commanders with much-needed precision and deep-strike capabilities. Additionally, Israel's government-owned Israel Military Industries has been contracted to improve the accuracy and range for the Pinaka, which is the Defense Research and Development Organization's indigenous multi-barrel rocket launcher, which has a range to 40 kilometers (24 miles). The Israeli-developed Trajectory Correction Module, already fielded with Israeli 227-mm MRLS rockets, and a new propellant could address both the excessive dispersion of Pinaka rockets and the range shortfall.

Since 1999, India has reportedly purchased a total of 5,000 155-mm, Krasnopol laser guided projectile. The primary purpose of the Krasnopol is for use against insurgents in the contested Kashmir region, although they have also been tested in the Thar Desert. However, since the initial purchases, there have been complaints within Indian government circles that the acquisition of the Krasnopol was ill advised and that it can only be used to engage 25–30 percent of the artillery targets in the Kargil Mountains. If it is assumed that only ground-based lasers are used to designate targets, this claim is reasonably accurate; however, this criticism largely becomes moot if the designator is mounted on an UAV, because many more targets could be designated and engaged so long as they are not in defilade from the approaching projectile.

Other new equipment includes improved ballistic helmets, cold-weather uniforms, a handheld thermal imaging system, and a handheld integrated tactical battlefield computer system. Replacing the older, heavier semiautomatic 7.62 1A1 rifle are 30,000 rifles and 20,000 LMGs (5.56 caliber), now in service.

## **Counterinsurgency**

Fighting insurgency has been a homeland problem for India since it gained independence from Britain. According to India's federal structure, fighting insurgency is a responsibility of provincial governments; however, central (federal) government agencies, such as the Army and Police Service, provide the linkage between provincial and central governments and assist in counterinsurgency operations. Repetitive counterinsurgency duty rotations, long separations from families, and poor pay compared to many civilian opportunities have caused a downturn in the number of soldiers entering combat branches of the army and also have hurt retention.

In 2001, an inter-ministerial study recommended the formation of a counterinsurgency force. Subsequently, the seven CIF units within Northern and Eastern commands were formed and staffed. At present, India's Army ranks among the world's largest counterinsurgency forces and has established a separate counterinsurgency jungle warfare school.

## **Operational and Tactical Missiles**

Although India's Prithvi program began in 1983 as part of the Integrated Guided Missile Development Program, direct Army involvement did not begin until late 1989 or early 1990. The first details concerning the army's 333d Prithvi Missile Group were released in August 1995. The group is equipped with 12 Kolos Tatra transporter-erector-launchers (TELS) subdivided into three batteries with four TELS each. In addition to the four TELS, each Prithvi battery is equipped with a missile resupply/loading vehicle, a propellant tanker, a survey vehicle, and a firing command post for target data provision prior to launch. The 333d Missile Group could have had as many as 100 Prithvi missiles available in mid-1999. The group also has an unidentified number of conventional high-

explosive pre-fragmented warheads at its disposal. Deployment of the missiles is unknown.

As of September 2006, the Army was speeding up its plan to raise a special regiment of the land-attack cruise missile (LACM) PJ-10 Brahmos. In a structure similar to other missile regiments, the new Brahmos regiment will include three batteries, each with six road-mobile autonomous launchers. The Brahmos missile currently maintains supersonic speed, up to an impressive mach 2.8, throughout its flight. The missile's shorter flight time allows quicker target engagement and limits dispersion. Operating in a wide variety of flight trajectories, the Brahmos uses a "fire and forget" operation principle.

## **Air Defense Artillery**

The Russian 2S6M1 Tunguska self-propelled air defense system (ADS) has entered service with the India Army. The latest version 2S6M1 is armed with twin, high-velocity, 30-mm cannons and eight SA-19 (Grison) surface-to-air missiles (SAMs) with four twin cannons mounted on either side of the turret. The SAMs can be used to engage targets at altitudes from 15 meters to 3,500 meters (49 feet to 11,483 feet) and from 2,400 meters to 8,000 meters (7,874 feet to 26,247 feet) in slant range. The Tunguska is equipped with two radar, capable of detecting targets up to 18 kilometers (11 miles) away and electronic countermeasures equipment. According to army officials, Tunguskas were fielded to newly formed air-defense artillery regiments that are part of the Strike Corps in Kashmir in the north and Rajasthan in the west, bordering Pakistan.

In September 2006, India agreed to take delivery of up to four Spyder SAM systems. Spyder-MR is a medium-range ADS de-

signed for protecting urban areas as well as maneuvering combat forces. This system, unlike its predecessor, is an all-weather, network-centric, multi-launch, quick-reaction ADS. As a concept, the Spyder SAM is very similar to that of the U.S. program that combines the Raytheon Advanced Medium-Range Air-to-Air Missile with the U.S. AM General High-Mobility Multipurpose Wheeled Vehicle, but with dual-type missiles and dual-type seekers.

## Training

Indian officers will be trained in Russian military institutions, according to an agreement signed in March 1999. The training program will teach Indians to operate modern, Russian-made military equipment. The two countries also signed a 10-year bilateral defense cooperation agreement covering a period until 2010 that included India's direct purchase of Russian equipment coupled with joint development and production projects.

India's Army has shortened the training period for its new officers by 6 months. Cadets graduating from the National Defense Academy after 3 years will now spend 6 months instead of 12 months at the India Military Academy (IMA) before being commissioned. Those joining the IMA directly now train for 18 months instead of 24 months.

India's Army training is centralized under the ARTRAC, headquartered at Simla in northern India. ARTRAC oversees the training and maintenance of all the training establishments in the India Army for both officers and soldiers. The following are some of the major training centers controlled by ARTRAC:

National Defense Academy  
Indian Military Academy

Khadakvasla  
Dehra Dun

Officers Training School	Madras
Infantry School	Belgaum
College of Combat	Mhow
Army Cadet College	Pune
Defense Services Staff College	Wellington
College of Military Engineering	Kirkee
Military College of Telecommunication	Mhow
Armored Corps and Center	Ahmednagar
Electrical and Mechanical Engineering School	Vadodara
High-Altitude Warfare School	Gulmarg
Army Ordnance Corps School	Jabalpur
Army Air Transport School	Bangalore
Parachute School	Bangalore
Jungle Warfare School	Variengte
Gorkha Training Center	Subathu

## Equipment

### *Infantry Vehicles*

Vijayanta (In storage)

T-55 (In storage or with infantry units)

T-72/T-72M1

T-90S

Arjun

BRDM-2

BMP-1

Sarath

OT-62/OT-64 (In storage)  
Casspir Mine Protection Vehicle

## ***Artillery***

130-mm M-46 towed  
130-mm Catapult M-46 self-propelled  
106-mm recoilless rifle  
105-mm Abbot self-propelled  
105-mm towed Indian Field Gun Mk 1 & 2  
84-mm M2 Carl Gustaf  
75-mm M48 towed (in reserve)  
40-mm L60 towed  
40-mm L70 towed  
23-mm ZSU-23-2 towed  
ZSU-23-4 Shilka air defense  
30-mm 2S6M1 Tunguska-M1  
155-mm FH-77B towed  
122-mm D-30  
105-mm pack Model 56 towed  
75-mm 75/24  
122-mm BM-21  
214-mm Pinaka  
300-mm 9K58 Smerch  
160-mm M-160  
160-mm M43  
120-mm AM-50/E1



82-mm M43  
81-mm L16/E1  
51-mm E1  
81-mm Carrier Mortar Tracked Vehicle

### ***Air Defense Artillery***

Milan II  
AT-3 SAGGER  
AT-4 SPIGOT  
AT-5A KONKURS  
SS11  
FLAME  
SA-6 GAINFUL  
SA-7b GRAIL  
SA-8b GECKO  
SA-9 GASKIN  
SA-10c GRUMBLE  
SA-11 GADFLY  
SA-13 GOPHER  
SA-14 GREMLIN  
SA-16 GIMLET  
Spyder  
AS11 (France)  
Searcher I/II  
Heron II  
HAOP27 Krishak

SA315B Cheetah observation

SA316B Chetak observation

Mi-25/35 HIND attack (Operated by Indian Army pilots, but airframes belong to the Air Force)

AS 550C3 Fennec

Lancer (India – Cheetah airframes that were upgraded to Lancer standard)

Dhruv

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## AIR FORCE

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The India Air Force (IAF) is the world's fourth-largest air force and one of the best trained and most capable. Since August 1947, when India gained independence, IAF has engaged in four conflicts and helped with rescue and relief missions during disasters and other emergencies. The IAF is the second-largest air force in Asia, behind China, and the IAF has aggressively pursued modernization by developing indigenous programs, upgrading older aircraft, and acquiring new systems. As a major recipient of military assistance from the former Soviet Union, India was one of the first countries to receive the MiG-29 FULCRUM.



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**Air Chief Marshal Fali Homi Major**

## Mission

The IAF's mission is as follows:

- Organize, train, equip, and prepare its forces to conduct offensive strike and air defense
- Provide airlift and tactical support to ground and naval forces
- Perform strategic and tactical air reconnaissance, in support of joint combat operations to protect India's borders
- Deter and defeat aggression
- Secure the nation's vital interests
- Project power for regional influence

## Organization

At Air Headquarters in New Delhi, the Chief of Air Staff is assisted by the following principal staff officers, who are assisted by the assistant chiefs of air staff. The principal staff officers are the following:

- The Vice Chief of Air Staff (VCAS) is responsible for plans, programs, project groups, financial planning, air staff requirements, training systems, and evaluation. Flying, reconnaissance, and intelligence also come under the purview of the VCAS.
- The Deputy Chief of Air Staff (DCAS) is responsible for air defense, op-



**India Air Force Crest**

erations (transport, maritime, and others), flight safety, meteorology, air staff inspections, and planning of joint operations. The Office of Air Intelligence is directly subordinate to the DCAS.

- The air officer in charge of administration
- The air officer in charge of maintenance
- The air officer in charge of personnel
- The inspector general flight safety and inspection.

The three main branches of the IAF are the executive (flying) branch, the administration branch, and the logistics and training branch. Other branches include the accounts, technical, education, meteorological, and medical and dental branches.

The IAF's five operational commands are the Western Air Command, the South Western Air Command, the Central Air Command, the Eastern Air Command, and the Southern Air Command. Each command has an air officer commander-in-chief with the rank of air marshal. There are also two additional commands: Training Command (HQ Yelahanka AFB, Bangalore (Karnataka)) and Maintenance Command (HQ Madhya Pradesh). The operational commands consist of the following:

**Western Air Command (WAC).** With its headquarters at New Delhi, WAC is the primary regional command. It controls air operations north of Jaipur, including the capital and Punjab, from Kashmir south to Rajasthan. The air operations group at the Udhampur Air Force Base is dedicated to the defense of Jammu and Kashmir, including Ladakh. It has a forward headquarters near the army's Western Command, at Chandigarh. WAC has air defense squadrons with MiG-21 and MiG-29. Ground attack squadrons have MiG-27 and Jaguar IS.

**South Western Air Command (SWAC).** With its headquarters at Gujarat, SWAC controls air operations in the southwestern air sector, which includes most of Rajasthan, and south through Gujarat to Saurashtra, and Kutch to Pune. SWAC's primary task is air defense; however, it can also be used for strike missions. SWAC has permanent air bases at Bhuj, Jaisalmer, Nalia, Jamnagar, Jodhpur, Barmer, and Poona; and forward air bases at Ahmedabad, Nal, Suratgarh, and Uttarlai. SWAC has air defense squadrons with MiG-21, MiG-29, and the multi-role Su-30MKI. SWAC also has a maritime attack squadron, which has Jaguar IM.

**Central Air Command (CAC).** With its headquarters at Allahabad (Uttar Pradesh), CAC controls air operations in all of central India, from New Delhi to Bengal. This command was reduced with the establishment of the Southern Air Command. CAC has permanent air bases at Agra, Bareilly, Gorakhpur, Allahabad, Gwalior, Nagpur, and Kanpur. It has air defense squadrons with Mirage 2000 and MiG-21. It is the main transport command with An-32, the long-range heavy lift IL-76MD, the Dornier Do-228 used in the utility role, and the IL-78MKI MIDAS aerial refueling tankers. CAC also has helicopter squadrons with Mi-8 Hip, Mi-17 Hip, and the heavy lift Mi-26 Halo.

**Eastern Air Command (EAC).** With its headquarters at Shillong (Meghalaya), EAC controls air operations in the eastern sector, including West Bengal, Assam, Mizoram, and the other eastern states bordering Bangladesh, Burma, and Tibet. EAC has permanent air bases at Chabua, Gauhati, Bagdogra, Barrackpore, Hashmira, Jorhat, Kalaikunda, and Tezpur; and forward air bases at Agartala, Kolkata, Panagarh, and Shillong. EAC has air defense squadrons with MiG-21 and ground attack squadrons with MiG-27.

**Southern Air Command (SAC).** With its headquarters at Trivandrum (Kerala), SAC controls air operations in the south-


















ern sector, which includes the southern states, the Bay of Bengal, the Andaman and Nicobar islands, and Lakshadweep. SAC has permanent air bases at Bidar, Bangalore, Begumpet, Dundigal, Hakimpet, Tambaram, Port Blair, and Car Nicobar with forward air bases at Madurai and Sullur. Some air bases also have training and support units. SAC has no combat aircraft squadrons, but it could conduct combat operations in an emergency (like the operations in the Maldives in 1987 where Mirage 2000 aircraft from Gwalior AFB in Central Air Command participated).

## **Capability**

The IAF is capable of repelling attacks from regional threats and a limited credible power projection capability outside of South Asia. Its reconnaissance mission includes using imagery and signals intelligence systems to monitor India's borders. SEARCHER I UAV and the Mirage 2000 are also used to conduct tactical reconnaissance. (Note: the Canberra and FOXBAT aircraft have been retired.) The IAF coordinates ground-based air defense with the IA and maintains 30 surface-to-air missile battalions. It also has an air-to-surface missile attack capability.

## **Personnel**

The IAF has more than 130,000 personnel assigned to a variety of career fields. It is an all-volunteer force; enlistment is open to all without regard to caste, creed, or race. There are 700,000 applicants for 5,000 enlisted openings per year, but the IAF struggles to recruit and retain quality personnel. Female officers have been placed mostly in the administration, logistics, accounts, education, and meteorological branches, but they may apply for pilot training. Seven female officers graduated from flight school in December 1995; they fly logistical aircraft.

<b>E N L I S T E D</b>						
	<i>U.S. Equivalent</i>	<i>Leading Aircraftman</i>	<i>Corporal</i>	<i>Sergeant</i>	<i>Flight Sergeant</i>	
						
<b>O F F I C E R S</b>						
	<i>Insignia Type</i>	<i>Pilot Officer</i>	<i>Flying Officer</i>	<i>Flight Lieutenant</i>	<i>Squadron Leader</i>	<i>Wing Commander</i>
	<i>U.S. Equivalent</i>	<i>Second Lieutenant</i>	<i>First Lieutenant</i>	<i>Captain</i>	<i>Major</i>	<i>Lieutenant Colonel</i>
						
	<i>Insignia Type</i>	<i>Group Captain</i>	<i>Air Commodore</i>	<i>Air Vice Marshal</i>	<i>Air Marshal</i>	<i>Air Chief Marshal</i>
<i>U.S. Equivalent</i>	<i>Colonel</i>	<i>Brigadier General</i>	<i>Major General</i>	<i>Lieutenant General</i>	<i>General</i>	

## Air Force Rank Insignia

Many officers are graduates of the National Defense Academy at Pune. Others come from among the honor graduates of various colleges. Sergeants under the age of 40 are also eligible for commissioning. Officer cadre serve in four main branches: flying,

technical, non-technical, and fighter/air traffic controller. Enlisted members serve in numerous technical and non-technical trades.

## **Training**

The Training Command, headquartered at Bangalore, supervises all IAF training facilities throughout India. It has modified its pilot training program to improve flying safety and enhance the force. This new curriculum and other related initiatives incorporate chemical warfare training and provide instruction on how to carry out missions under the threat of, or attack by, chemical weapons.

The command's institutions provide flying, technical, and non-technical training not only to IAF personnel but also to personnel from the army and the navy, as well as to personnel from allied nations.

Pilots follow a three-phase course of instruction with the third phase culminating in specialization to fighter, transport, or helicopter aircraft. Pilots receive their wings at the end of phase two.

Technical training for officers and enlisted personnel differs. Training is usually assigned according to the student's background and evaluated ability to learn a specific system. For enlisted personnel, work begins with basic technical training that is followed by specialization in one of the several trades. The trades are grouped into courses focused on maintenance (104 weeks), field operations (68 weeks), telephone and communications (48 weeks), and motor transport drivers (36 weeks). After completing the basic courses in their trade, enlisted personnel are assigned to type-specific training at one of the various Technical Type Training (TETTRA) schools throughout India. Once all training is complete, personnel are assigned to a unit and receive further training on-the-job. It is possible for enlisted personnel to convert from one trade to another; however, generally, an individual stays with





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## **Jaguars at Aero India 2009**

one trade and progresses to instructor or quality assurance status. Enlisted personnel become eligible for a supervisory position at 10 years time in service, and advanced courses are offered to sharpen personnel's skills for instructor or evaluator status.

## ***Equipment***

### **Aircraft**

#### ***Fighter/Attack***

120	MiG-21MF FISHBED (USSR)
40	MiG-21PFMA FISHBED (USSR)
100	MiG-21FL FISHBED (USSR)
200	MiG-21BIS FISHBED (USSR)
50	MiG-27ML FLOGGER (USSR)
63	MiG-29A FULCRUM (USSR)
39	Mirage 2000 (France)
45	Jaguar IS (France)

### ***Reconnaissance***

17 Jaguar 1M maritime (France)

### ***Utility/Transport***

3 Boeing 707 (U.S.)

20 Il-76 CANDID (USSR)

115 An-32 Suttlej (Cline)

16 BAe 748 Andover (Great Britain)

16 BAe 748 Andover liaison (Great Britain)

7 BAe 748 Andover communications (Great Britain)

28 Do 228 (Germany)

### ***Helicopters***

60 Mi-8 Hip transport

37 Mi-17 Hip transport

10 Mi-26 Halo heavy lift

6 AS 565M Dauphin (France)

### ***Trainers***

4 MiG-29UM FULCRUM B (USSR)

30 MiG-21UM FISHBED (USSR)

7 Mirage 2000 (France)

225 Kiran HJT16 (India)

50 HPT-32 (India)

19 HT-2 (India)

40 TS11 Iskra (Poland)

### ***Missiles***

#### ***Air-to-Air***

unk AA-2 Atol

unk AA-7 Apex

unk AA-8 Aphid  
unk R550 Magic (France)

### *Air-to-Surface*

unk AS-11 KILTER antitank (USSR)  
unk AS-7 KERRY (USSR)  
unk AS30L (France)  
unk Sea Eagle (Great Britain)

### *Surface-to-Air*

280 V75 DVINA (SA-2 GUIDELINE) (USSR)  
unk SA-3 PECHORA (GOA) (USSR)

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## **NAVY**

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India's Navy is the fifth-largest navy in the world and by far the dominant navy in the Indian Ocean. Although it is less advanced than most Western navies, the India Navy is the most sophisticated and well balanced of developing countries' navies. Its fleet includes an aircraft carrier, a modern submarine force, and numerous surface combatants. The navy aspires to be a formidable blue-water force, and India's government has allocated significant funding to the navy for continuous fleet modernization. Its long-term ambitions include acquiring nuclear-powered ballistic-missile submarines and fixed-wing aircraft carriers.

### **Mission**

The navy's primary duties are to provide defense and security to India's maritime interests and coast. The navy views sea denial and sea control to be its foremost responsibilities, though recently the navy has sought to expand its power projection and nuclear

deterrent roles as well. The navy views Pakistan as its primary threat, whereas it views China as a long-term strategic competitor.

During the Cold War, the navy did not readily participate in joint endeavors; however, to develop relations throughout the region and expand India's influence internationally, the navy now regularly participates in joint exercises and goodwill tours.

## Organization

The navy, headquartered in New Delhi, functions under the command of the Chief of Naval Staff (CNS). The CNS, a four-star admiral, is assisted by four principal staff officers: Vice Chief of Naval Staff, Chief of Personnel, Chief of Materiel, and Deputy Chief of Naval Staff. The navy is administratively organized into five branches: executive, engineering, electrical, medical, and instructor. The officers who can command seagoing ships are promoted through the executive branch. Staff members conduct general duties and are responsible for all aspects of seamanship.



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**The Naval Ensign of India**

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The navy is composed of about 55,000 personnel. This includes an estimated 7,000 in Naval Aviation and 2,000 in the Marine Commando Force. The sea cadet corps is a major source of naval candidates.

The navy is well trained and professional and maintains a high rate of operations. Morale is good, and pride in the fleet is evident.

## Commands

The navy is divided into three primary commands: the Western Command, the Eastern Command, and the Southern Command. The Western Command is in

Mumbai; the Eastern Command is in Vishakhapatnam; and the Southern Command is in Cochin. The Western Command is where the sword arm of the navy is located and is the home of the navy's aircraft carrier. The Southern Command is primarily a training command for the navy. Recently, a fourth command was established in the Andaman and Nicobar islands in the Bay of Bengal. This command is a joint command for all branches of India's armed services. Goa, located on the west coast, serves as the headquarters for the naval air force.



**Navy Logo**

## **Training**

The Southern Command is primarily responsible for training navy personnel. The navy trains and exercises at an operational tempo that is higher than that of any other nation in the region. The navy conducts several major exercises each year, constrained by the monsoon seasons. Selected personnel have been sent overseas for specialized training, particularly to the UK, Russia, and the United States. The navy also has begun joint training with some neighboring countries.

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## **MARINE COMMANDO FORCE**

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### **Mission**

The Marine Commando Force (MCF or MARCOS) was established in April 1986 in response to a perceived need for a team or quick-reaction section to respond to maritime terrorist incidents and other special operations. The unit was conceived along the lines of the U.S. Navy SEALs and the British Special Air Service and Special Boat Service. It operates in the sea, the air, and on land and handles counterterrorist as well as special operations missions.

### **Organization and Personnel**

The exact strength of the MCF is a closely guarded secret; however, the number could be close to 2,000 personnel, in 10 groups of 200 personnel each. There are three main groups detached to the three naval commands: Mumbai (West), Cochin (South), and Vizag (East). Most of the specialized training is done in Mumbai. Each of the three main groups has smaller units within, known as the Quick Reaction Sections (QRSs), which are the size of a large platoon. They are given the task of counterterrorism and specialized warfare.

## Capabilities

The MCF doubles as marine infantry, assigned to the 340<sup>th</sup> Brigade, with the characteristic flexibility of commando forces. The MCF can conduct swift amphibious raids and cooperate with airborne units, in joint assault operations. MCF members are reportedly trained to use sea mines and silent crossbows with poison darts or explosive-tipped arrows and to perform close-quarter-battle and unarmed combat. Specific weapons in their arsenal include the Heckler and Koch MP-5 submachinegun, AK-47 assault rifles, and sniper rifles. Trainees also take courses in photo interpretation, intelligence collection, explosives, and jungle warfare. The MCF is capable of parachuting into the sea with full combat load and equipment.

## Training

MCF trainees must complete a 2-year course. The first phase consists of the following:

- 5 weeks of physical training
- 8 weeks of weapons and basic demolition training
- 4 weeks of diving and underwater demolition training
- 7 weeks of hydro-reconnaissance training
- 8 weeks of airborne training with the air force

Personnel are also schooled in martial arts (primarily tae kwon do). For the next 9 months, they are taught how to use various types of weapons, conduct special warfare techniques, and gather intelligence from the enemy. The MCF also trains in operational reconnaissance training for a variety of external environments, including beach, coastal, riverine, and jungle. This part of training is conducted with other Special Forces at the Combined Commando School, Sirsawa. Personnel also undergo a parachute course and a diving course at Agra and Cochin, respectively. As with other

Indian Special Forces units, all MCF personnel attend the 4-week high-altitude commando course run by the Parvat Ghatak School in Tawang, Arunachal Pradesh. Only 10 to 25 percent of the candidates successfully complete MCF training.

## **Equipment**

India's Special Forces have access to almost any type of small arms or specialized weapons required for a mission. These range from Browning Hi-Power 9-mm pistols, AK-47/74s, 9-mm Uzi(s), 5.56-mm M-16A2s, 9-mm H&K MP5-A2/A3s, and locally manufactured 7.62-mm SLR and 5.56-mm INSAS rifles. Sniper rifles like the semi-automatic H&K 7.62-mm PSG-1 and MSG-90, the SIG 7.62-mm SSG-2000, and the bolt-action Mauser SP66/86SR are also used.

Unlike standard MCS units who are armed with weapons like the 7.62-mm assault rifle and the Sterling Mk4 submachinegun, the QRS uses AK-47 assault rifles and MP-5 submachineguns that are more suited to close-quarter engagements. Silenced pistols or crossbows with cyanide-tipped fiberglass arrows are used extensively.

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## **COAST GUARD**

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India's Coast Guard (ICG) was created in 1978. The ICG is modeled after the U.S. Coast Guard (USCG). The ICG deals primarily with maritime contraband smuggling, including commodities, consumer goods, arms, and narcotics.

## **Mission**

The ICG's primary mission is to protect India's maritime interests in its exclusive economic zone (EEZ) and inshore areas. This includes



fisheries control and policies against poaching and smuggling, environmental protection and pollution control, and assisting the navy with the protection of offshore installations and island territories. The ICG is also responsible for maritime search and rescue.

India divided its EEZ into three zones:

- The inshore zone, which extends from the coastline to 50 nautical miles seaward
- The offshore zone that extends from the outer boundary of the inshore zone to 200 nautical miles
- The open ocean zone that extends beyond the limits of the EEZ and was established in case of future international maritime law requirements

In wartime, the navy assumes operational control of the ICG and the ICG's missions expand to include port and harbor security, convoy escort, airborne maritime reconnaissance and interdiction, and control of government-chartered merchants.

## **Organization**

The Director General (U.S. Coast Guard Commandant equivalent), under the administrative control of the MoD, exercises command, direction, and control of the ICG. During hostilities or crises, the CNS assumes command, and the Director General would be re-designated as a principal staff officer under the CNS. The Director General exercises command through the Deputy Director General and three ICG regional commanders, who are responsible for all ICG activities in their respective regions. Regional commanders are responsible for liaison endeavors with state government/local authorities for meeting command requirements and other commitments such as recruitment and aid to civil government.

The ICG's headquarters is at New Delhi. The ICG has three regional commands that parallel those of the navy. The three regions cover 10 districts, one in each of the 8 coastal states on the mainland and 2 on the Andaman and Nicobar islands.

ICG aviation is organized into three squadrons:

- 1 attack helicopter squadron
- 1 cargo/transport squadron
- 1 maritime reconnaissance squadron

## **Capabilities**

ICG doctrine and tactics follow navy lines. The normal patrol duration is 1 day for inshore patrol vessels (IPV) and 3 days for offshore patrol vessels (OPV). Extended patrols are occasionally conducted by IPV and OPV and last 8 to 12 days and 2 months, respectively. ICG IPV and OPV patrols average 90 to 120 underway days per year. Units engaged in anti-smuggling and anti-poaching duties act aggressively.

## **Personnel**

The ICG has more than 5,000 personnel, including aviators. It is an all-volunteer force. Pay scales are similar to those used by the navy; however, ICG personnel have the opportunity to earn rewards for smuggling apprehension and salvage duties. Service is generally a long-term prospect. Recruitment standards differ for each specialty.

Officers generally are well educated and intelligent, and all three specialties require college degrees, including courses in math and physics. In addition, Technical Branch candidates must hold degrees in naval architecture or engineering. Most officer candidates are from the National Defense Academy, and a small percentage

is commissioned from the enlisted General Duty Branch. Age requirements vary, ranging from 19 to 30 years, depending on the specialty.

Enlisted personnel must have an engineering degree from a college to become a *yantrik* (Technical Branch). Service as a *navik* for general duty requires a high school degree, whereas service as a *navik* in the domestic branch merely requires an 8<sup>th</sup> grade education. Enlisted personnel (regardless of specialty) must enter service between their 17<sup>th</sup> and 22<sup>nd</sup> birthdays.

## **Training**

The ICG relies heavily on the navy's training facilities and programs, particularly in technical areas. Little information regarding specific ICG training programs is known. Additionally, the ICG participates in a number of exchange programs. USCG mobile training teams have conducted maritime law enforcement and search and rescue training in India. In addition, the ICG sends students to the United States to attend the International Maritime Officer Course and USCG search and rescue, marine safety, and port operations schools under the International Military Training Program.



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## APPENDIX A

### EQUIPMENT RECOGNITION

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#### INFANTRY WEAPONS

##### 7.62-mm Bren Light Machinegun



<b>Cartridge</b>	7.62 x 51 mm
<b>Cyclic Rate of Fire</b>	520 rounds per minute
<b>Operation</b>	Gas blowback, selective fire
<b>Feed Device</b>	30-round detachable box magazine
<b>Weight Unloaded</b>	8.68 kg
<b>Length Overall</b>	1,156 mm

## 7.62-mm General Purpose Machinegun FN MAG



<b>Cartridge</b>	7.62 x 51 mm NATO
<b>Effective Range</b>	1,500 m
<b>Cyclic Rate of Fire</b>	650 to 1,000 rounds/minute
<b>Method of Operation</b>	Gas, automatic
<b>Feed Device</b>	Disintegrating metal link belt
<b>Weight Loaded</b>	13.92 kg (with butt stock and bipod)
<b>Overall Length</b>	1,260 mm

## 0.50-in. (12.7-mm) Heavy Machinegun Browning M2 HB



<b>Caliber</b>	12.7 x 99 mm
<b>Ranges</b>	
<b>Effective</b>	1,500 m
<b>Maximum</b>	6,800 m
<b>Cyclic Rate of Fire</b>	450 to 600 rounds/minute
<b>Method of Operation</b>	Short recoil
<b>Feed Device</b>	Disintegrating-link belt
<b>Weight</b>	38 kg
<b>Overall Length</b>	1,651 mm

## 5.56-mm INSAS Light Machinegun



<b>Caliber</b>	5.56 x 45 mm
<b>Ranges</b>	
<b>Effective - Standard Barrel</b>	700 m
<b>Effective - Short Barrel</b>	600 m
<b>Cyclic Rate of Fire</b>	650 rounds/minute
<b>Method of Operation</b>	Gas, selective fire
<b>Feed Device</b>	Detachable plastic box magazine
<b>Weight</b>	6.73 kg (loaded)
<b>Overall Length</b>	1,005 mm



## 12.7-mm Heavy Machinegun NSV



<b>Caliber</b>	12.7 x 107 mm
<b>Effective Range</b>	2,000 m
<b>Cyclic Rate of Fire</b>	700 to 800 rounds/minute
<b>Operation</b>	Gas, automatic
<b>Feed Device</b>	50-round metallic-link belt in box
<b>Weight Unloaded</b>	50.2 kg
<b>Length Overall</b>	1,560 mm
<b>NOTE</b> shown above on ground tripod mount.	

# ARMOR

## T-55/54 Main Battle Tank



<b>Crew</b>	4
<b>Armament</b>	
<b>Main</b>	1 x 100 mm rifled D-10 (T-54) or D-10T2S (T-55) gun w/ 34 rds (T-54) & 43 rds (T-55)
<b>Auxiliary</b>	1 x 12.7mm AA Machine Gun w/500 rds (T-54only) 2 x 7.62mm Machine Gun w/3,000 rds (T-54) 1 x 7.62mm Machine Gun w/3,500 rds (T-55)
<b>Ammunition</b>	APFSDS, AP-T, APC-T, HEAT, & HE-Frag
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	720 km (T-54); 650 km (T-55)
<b>Max Road Speed</b>	50 km/h
<b>Fuel Capacity</b>	812 ltr (T-54); 960 ltr (T-55)
<b>Combat Weight</b>	36,000 kg
<b>Length x Width x Height</b>	9.0 x 3.27 x 2.4 m (T-54); 2.35 m (T-55)
<b>Fording</b>	1.4 m
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.8 m
<b>Trench</b>	2.7 m

## Bhishma T-90 Main Battle Tank



<b>Crew</b>	3
<b>Armament</b>	
<b>Main</b>	1 x 125 mm smoothbore 2A46M4 gun w/43 rds
<b>Auxiliary</b>	1 x 12.7mm AA Machine Gun w/300 rds 1 x 7.62mm Coax Machine Gun w/2,000 rds 8 x 81mm Grenade Launchers
<b>Ammunition</b>	APFSDS, HE-FRAG & SVIR GLATGM
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	550 km
<b>Max Road Speed</b>	65 km/h
<b>Fuel Capacity</b>	1,200 ltrs (w/o auxiliary); 1,600 (w/auxiliary)
<b>Combat Weight</b>	46,500 kg
<b>Length x Width x Height</b>	9.53 x 3.37 x 2.23 m
<b>Fording</b>	1.8m (w/o prep); 5.0 m (w/prep)
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.85 m
<b>Trench</b>	2.8 m

## T-72 Main Battle Tank



<b>Crew</b>	3
<b>Armament</b>	
<b>Main</b>	1 x 125 mm smoothbore 2A46M4 gun w/44 rds
<b>Auxiliary</b>	1 x 12.7mm Machine Gun w/300 rds 1 x 7.62mm Machine Gun w/2,000 rds APFSDS, HE-FRAG & SVIR GLATGM
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	550 km
<b>Max Road Speed</b>	60 km/h
<b>Fuel Capacity</b>	1,000 ltrs
<b>Combat Weight</b>	43,500 kg
<b>Length x Width x Height</b>	9.53 x 3.37 x 2.23 m
<b>Fording</b>	1.2m
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.85 m
<b>Trench</b>	2.8 m

## Arjun Mk1 Main Battle Tank



<b>Crew</b>	4
<b>Armament</b>	
<b>Main</b>	1 x 120 mm rifled gun w/39 rds
<b>Auxiliary</b>	1 x 12.7mm AA Machine Gun w/≈1,000 rds 1 x 7.62mm Coax Machine Gun w/≈3,000 rds 2 x 9 Smoke Grenade Launchers
<b>Ammunition</b>	APFSDS, HE, HEAT, HESH & Smoke
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	≈450 km
<b>Max Road Speed</b>	70 km/h
<b>Fuel Capacity</b>	1,610 ltr
<b>Combat Weight</b>	58,500 kg
<b>Length x Width x Height</b>	10.64 x 3.86 x 3.03 m
<b>Fording</b>	1.4m
<b>Gradient</b>	77 percent
<b>Vertical Obstacle</b>	0.91 m
<b>Trench</b>	2.43 m

## Vijayanta Main Battle Tank



<b>Crew</b>	4
<b>Armament</b>	
<b>Main</b>	1 x 105 mm rifled L7 gun w/ 34 rds
<b>Auxiliary</b>	1 x 12.7mm Machine Gun w/600 rds 1 x 7.62mm Machine Gun w/3,000 rds 6 x Smoke Grenade Launchers
<b>Ammunition</b>	APFSDS, APDS, HESH, & Smoke
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	480 km
<b>Max Road Speed</b>	48 km/h
<b>Fuel Capacity</b>	1,000 ltr
<b>Combat Weight</b>	38,600 kg
<b>Length x Width x Height</b>	9.73 x 3.17 x 2.64
<b>Fording</b>	1.1 m
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.9 m
<b>Trench</b>	2.44 m

## BMP-1 Infantry Fighting Vehicle



<b>Crew/Passengers</b>	3/8
<b>Armament</b>	
<b>Main</b>	1 x 73 mm 2A28 Low Velocity Gun w/40 rds
<b>Auxiliary</b>	1 x Malyutka ATGM Launcher w/1+4 rds 1 x 7.62mm PKT Machine Gun w/2,000 rds
<b>Ammunition</b>	HEAT & HE-Frag
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	600 km
<b>Max Road Speed</b>	65 km/h
<b>Fuel Capacity</b>	460 ltr
<b>Combat Weight</b>	13,500 kg
<b>Length x Width x Height</b>	6.74 x 2.94 x 2.15 m
<b>Fording</b>	Amphibious
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.8 m
<b>Trench</b>	2.2 m

## BMP-2 Infantry Fighting Vehicle (Sarath)



<b>Crew/Passengers</b>	3/7
<b>Armament</b>	
<b>Main</b>	1 x 30 mm 2A42 Cannon w/500 rds
<b>Auxiliary</b>	1 x 9K113 (Konkurs) ATGM Launcher w/4 rds 1 x 7.62mm PKT Machine Gun w/2,000 rds 2 x 3 81mm Smoke Grenade Launcher
<b>Ammunition</b>	HE, AP, & APDS
<b>Night Vision</b>	Yes
<b>NBC Capability</b>	Yes
<b>Max Road Range</b>	600 km
<b>Max Road Speed</b>	65 km/h
<b>Fuel Capacity</b>	462 ltr
<b>Combat Weight</b>	14,300 kg
<b>Length x Width x Height</b>	6.74 x 3.15 m x 2.45 (to Cdr's Sight)
<b>Fording</b>	Amphibious
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	0.7 m
<b>Trench</b>	2.5 m



## Catapult (130mm) SP Field Gun



<b>Crew</b>	8
<b>Armament</b>	1 x 130 mm Field Gun w/30 rds
<b>Ammunition</b>	HE-Frag, APHE, APC
<b>Max Range</b>	27, 150 m
<b>Rate of Fire</b>	5-6 rds/min
<b>Max Road Range</b>	~480 km
<b>Max Road Speed</b>	~48 km/h
<b>Combat Weight</b>	~33,000kg
<b>Fording</b>	1.1 m
<b>Gradient</b>	60 percent

## D-30 Howitzer



<b>Crew</b>	8
<b>Armament</b>	1 x 122 mm Howitzer
<b>Ammunition</b>	Illum, HE-Frag, HEAT, Smoke, Leaflet, Incendiary, Flechette, & RAP
<b>Rate of Fire</b>	7-8 rds/min
<b>Max Range</b>	15,400 m (Conventional); 21,900 m (RAP)
<b>Combat Weight</b>	3,150 kg (Firing Mode); 3,210 kg (Traveling Mode)
<b>Length</b>	5.4 m (Traveling Mode)
<b>Width</b>	1.95 m (Traveling Mode)
<b>Height</b>	1.66 m (Traveling Mode)
<b>Prime Mover</b>	6 x 6

## Light Field Gun



<b>Crew</b>	7
<b>Armament</b>	1 x 105 mm Howitzer
<b>Ammunition</b>	HE-Frag, HESH, Smoke, Base Ejection, & STAR)
<b>Rate of Fire</b>	4 rds/min (normal); 6 rds/min (intense); 1 rd/2 min (sustained)
<b>Max Range</b>	17,200 m
<b>Combat Weight</b>	2,380 kg (Firing Mode)
<b>Length</b>	5.05 m (Traveling Mode); 7.22 m (Firing Mode)
<b>Width</b>	1.82 m (Traveling Mode)
<b>Height</b>	1.49 m
<b>Prime Mover</b>	4 x 4

## M-46 Field Gun



<b>Crew</b>	8
<b>Armament</b>	1 x 130 mm Field Gun
<b>Ammunition</b>	HE-Frag, APHE, APC
<b>Rate of Fire</b>	5-6 rds/min
<b>Max Range</b>	27.1 km
<b>Combat Weight</b>	7,700 kg (Firing Mode); 8,450 kg (Traveling Mode)
<b>Length</b>	11.73 m (Traveling Mode)
<b>Width</b>	2.45 m
<b>Height</b>	2.55 m (Traveling Mode)
<b>Prime Mover</b>	Artillery Tractor

# ARTILLERY

## Indian 155mm Howitzer FH-77B



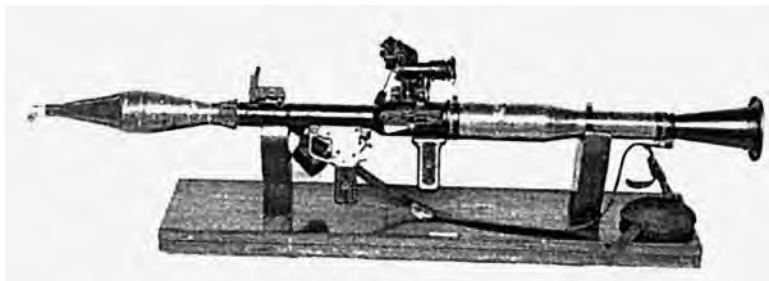
<b>Crew</b>	6
<b>Max Range</b>	24-30 km
<b>Ammunition</b>	HE-HR
<b>Rate of Fire</b>	Burst 3rds 10-12S Normal 6rds min Alternating for 20 Mins.
<b>Combat Weight</b>	11,840 kg
<b>Length Firing Mode</b>	11.8 m
<b>Width Firing Mode</b>	7.18 m
<b>Height</b>	2.8 m

## 81-mm M29, M29A1 Mortar



<b>Crew</b>	2
<b>Range</b>	72 to 4,500 m
<b>Rates of Fire</b>	
<b>Sustained</b>	4 to 8 rounds/minute
<b>Normal</b>	15 to 25 rounds/minute
<b>Burst</b>	27 to 30 rounds/minute
<b>Elevation</b>	+45 to +85 degrees
<b>Traverse</b>	5.3 degrees left and right
<b>Feed</b>	Muzzle loaded
<b>Empty Weight</b>	43 kg
<b>Barrel Length</b>	1.295 m

## RPG-7



### Launcher

Caliber	40 mm
Length	950 mm
Weight	6.7 kilograms
Sight type	Telescopic with iron backup
Sight magnification	2.5 X
Rate of fire	4-6 rds per minute
Max effective range	400 meters

### Ammunition

Caliber	40/70.5 mm
Length	950 mm
Weight	2.1 kilograms
Muzzle Velocity	142 m/s
Armor Penetration	280 mm
Packaging	6 rds in wooden box
Size	760 x 380 x 230 mm
Weight	33 kg

## BM-21 Multiple Rocket Launcher



<b>Crew</b>	6
<b>Length</b>	7.4 m
<b>Width</b>	2.7 m
<b>Height</b>	2.9 m
<b>Speed (max)</b>	75 km/hr
<b>Range</b>	405 km
<b>Combat weight</b>	13.3 metric tons
<b>Armament</b>	40 x 12-mm rockets
<b>Range</b>	20.5 km (long rockets)
<b>Round Type</b>	Smoke, HE, WP, chemical

**Recognition** Mounted on URAL-375D 6-by-6 chassis 40 tubes arranged in 4 banks of 10 tubes each. Has a distinctive rear fender design. Carries a spare tire at the rear of the cab. Troop seats forward of the rear wheels. Blast shields not fitted as on other MRLs. Exhaust and muffler mounted under front bumper. Pallet and mount tarped in transit.



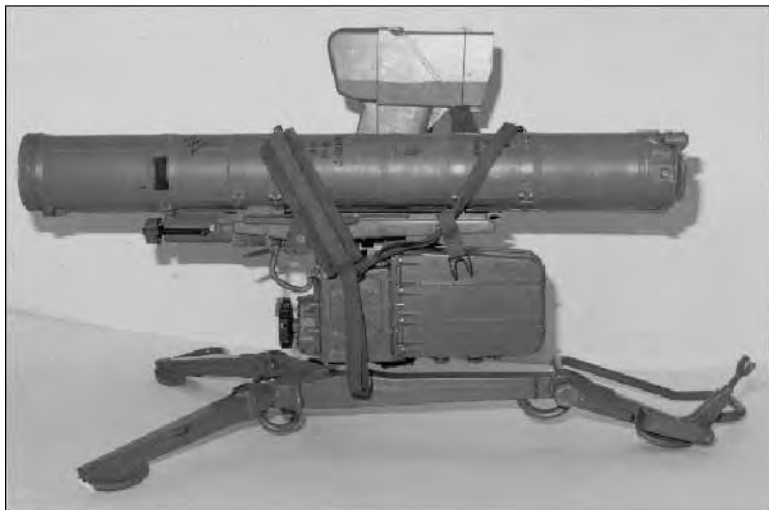
# ANTIARMOR

## MILAN Ground Launcher



<b>Guidance</b>	SACLOS
<b>Warhead Type</b>	Unitary Shape Charge
<b>Range (Effective)</b>	25-2,000 m
<b>Time of Flight</b>	To Max Range 12.5s
<b>Missile Weight</b>	7.1 kg
<b>Length</b>	893 mm
<b>Diameter Wings Folded</b>	125 mm
<b>Wingspan</b>	165 mm
<b>RHA Penetration</b>	775-850 mm

## ATGM FAGOT-M



<b>Guidance</b>	SACLOS
<b>Warhead Type</b>	Unitary Shape Charge
<b>Range (Effective)</b>	75-2,500 m
<b>Time of Flight</b>	To Max Range 14s
<b>Missile Weight</b>	7.74kg
<b>Length</b>	863 mm
<b>Wingspan</b>	368 mm
<b>RHA Penetration</b>	550 mm

## ATGM Konkurs-M (AT-5)



<b>Guidance</b>	SACLOS
<b>Warhead Type</b>	Tandem Shape Charge
<b>Range (Effective)</b>	75-4,000 m
<b>Time of Flight</b>	To Max Range 19.4s
<b>Missile Weight</b>	16.5kg
<b>Length</b>	1.275 m
<b>Wingspan</b>	468 mm
<b>RHA Penetration</b>	800 mm

## AIR DEFENSE

### 2S6M Tunguska 30-mm/SA-19 SPAAG



<b>Crew</b>	4
<b>Armament</b>	2 x 30-mm 2A38M cannon w/1,904 rds 8 x SA-19 SAM missiles Maximum Range [GUNS] 4,000 m (slant range) [ SA-19] 2,400 - 8,000 m (slant range)
<b>Maximum Speed</b>	65 km/h
<b>Maximum Range</b>	500 km
<b>Combat Weight</b>	34,000 kg
<b>Length x Width</b>	7.93 x 3.23 m
<b>Height</b>	4.021 m (radar up) 3.356 m (radar down)
<b>Fording</b>	0.8 m
<b>Gradient</b>	60 percent
<b>Vertical Obstacle</b>	1 m
<b>Trench</b>	2 m
<b>NBC</b>	yes
<b>Night Vision</b>	yes

## 23-mm Twin Anti-aircraft Gun ZU-23



<b>Crew</b>	5
<b>Caliber</b>	23.0 x 152B mm
<b>Ammunition</b>	API-T, HEI, HEI-T
<b>Ranges</b>	
<b>Tactical Antiaircraft</b>	2,500 m
<b>Maximum Vertical</b>	5,100 m
<b>Maximum Horizontal</b>	7,000 m
<b>Rate of Fire per Barrel</b>	800 to 1,000 rounds/minute
<b>Traverse Limits; Rate</b>	360 degrees; 74 degrees/second
<b>Elevation Limits; Rate</b>	-10 to +90 degrees; 54 degrees/second
<b>Weight</b>	950 kg
<b>Length x Width x Height</b>	4.60 x 1.86 x 2.07 m
<b>Platform</b>	2-wheel towed 2A13 carriage or various vehicles.

## 23-mm. Self-Propelled Quad Anti-aircraft Gun ZSU-23-4



<b>Crew</b>	4
<b>Number of Barrels</b>	4
<b>Ammunition</b>	23.0- x 152B-mm API-T, HEI, HEI-T
<b>Ranges</b>	
<b>Tactical Antiaircraft</b>	2,500 m
<b>Maximum Vertical</b>	5,000 m
<b>Maximum Horizontal</b>	7,000 m
<b>Rate of Fire per Barrel</b>	850 to 1,000 rounds/minute
<b>Traverse Limits; Rate</b>	Unlimited; 70 degrees per second
<b>Elevation Limits; Rate</b>	-4 to +85 degrees; 60 degrees per second
<b>Weight</b>	20,500 kg
<b>Length x Width x Height</b>	6.54 x 3.13 x 2.58 m
<b>Platform</b>	GM575
<b>Note</b>	Height with radar dome is 3.57 meters.

## 37-mm Towed Air Defense Artillery Gun M1939



<b>Crew</b>	8
<b>Caliber</b>	37 X 253R mm
<b>Ammunition</b>	FRAG-T, AP-T
<b>Range</b>	
<b>Tactical Antiaircraft</b>	2,500 m
<b>Maximum Vertical</b>	6,700 m
<b>Maximum Horizontal</b>	8,500 m
<b>Rate of Fire</b>	160 to 180 rounds/minute
<b>Traverse Limit; Rate</b>	Unlimited; 67 degrees per second
<b>Elevation Limits; Rate</b>	-5 to +85; 34 degrees per second
<b>Weight</b>	2,353 kg
<b>Length x Width x Height</b>	5.94 x 1.90 x 2.08 m
<b>Platform</b>	2-axle, 4-wheel, towed cruciform carriage

## 57-mm S-60 Air Defense Artillery



<b>Crew</b>	8
<b>Ranges</b>	
<b>Tactical Antiaircraft</b>	4,000-6,500 m
<b>Maximum Vertical</b>	9,400 m
<b>Maximum Horizontal</b>	12,000 m
<b>Rate of Fire</b>	105-120-rds/min
<b>Combat Weight</b>	4,763 kg
<b>Length</b>	8.84 m
<b>Width</b>	2.08 m
<b>Height</b>	2.37 m



## SA-2 Missile



<b>Length</b>	10.7 m
<b>Diameter</b>	5 m (booster), 65 m (fins)
<b>Range</b>	43-55 km
<b>Warhead</b>	190 kg, HE FRAG
<b>Guidance</b>	Command RF from FAN SONG
<b>Fuzing</b>	Proximity, command
<b>Velocity</b>	Mach 4.0
<b>Note</b>	This missile has also been used in surface-to-surface mode

## SA-3 Missile



<b>Length</b>	6.1 m
<b>Diameter</b>	.55 m (booster), 37 m (fins)
<b>Range</b>	25 km
<b>Warhead</b>	73 kg, HE FRAG
<b>Guidance</b>	Command RF from LOW BLOW
<b>Fuzing</b>	Proximity RF, command
<b>Velocity</b>	Mach 3.5

## SA-6 Air Defense Artillery



<b>Type</b>	Low to medium altitude surface to air missile
<b>Guidance</b>	Semi-active radar homing
<b>Maximum Range</b>	23,000 m
<b>Maximum Altitude</b>	4,000 m
<b>Launch Weight</b>	630 kg
<b>Length</b>	5.8 m

## SA-7 Air Defense Artillery



<b>Model</b>	SA-7 Grail (NATO), Strela (Russian)
<b>Type</b>	Low altitude solid fuel booster and sustainer
<b>Gross weight</b>	9.2 kg
<b>Length</b>	1.30 m
<b>Diameter</b>	0.072 m
<b>Max Range</b>	3.6 km (SA-7), 4.2 km (SA-7b and SA-7c)
<b>Max Effective Altitude</b>	2,000 m (SA-7), 2,300 m (SA-7b and SA-7c)
<b>Warhead</b>	1.5 kilograms HE with contact and graze fuzing
<b>Guidance</b>	Passive IR
<b>Propulsion</b>	Two-stage solid rocket
<b>Launcher weight</b>	4.17 kilograms (SA-7) or 4.95 kilograms (SA-7b and SA-7c)
<b>Note</b>	The SA-7b is an updated variant of the SA-7 with a more sophisticated seeker to exclude spurious and countermeasure heat source and an improved warhead. The SA-7c was developed in the mid-1970s and has an improved grip stock and a more sophisticated RF detector. The SA-7 is the Strela-2 or Grail Mod 0. The SA-7b is the Strela-2M or the Grail Mod 1. The SA-7c has the NATO designation Grail Mod 2 and the Russian military designation is the improved Strela-2M.

## Surface-to-Air Missile 9K31 Strela-1, Strela-1M (SA-9 GASKIN)



<b>Type</b>	Low-altitude air defense missile system
<b>Guidance</b>	Passive infrared homing seeker
<b>Warhead</b>	3-kg HE-frag. warhead with proximity fuse, (lethal radius 5 m; damage radius 7.6 m)
<b>Range</b>	500 to 4,200 m (depending on missile type)
<b>Target Altitude</b>	30 to 3,500 m (depending on missile type)
<b>Maximum Target Speed</b>	Inbound; outbound
<b>Approaching Target</b>	1,116 km/h
<b>Receding Target</b>	792 km/h
<b>Launch Weight</b>	30 to 41 kg (depending on missile type)
<b>Missile Length</b>	1.8 m

## Spyder-SR Missile Firing Unit



<b>Range</b>	15 km
<b>Ceiling</b>	9 km
<b>Guidance</b>	Data-link to active terminal
<b>Warhead</b>	11 kg HE Fragmentation, laser proximity
<b>Note</b>	Uses inertial mid-course with datalink update and active radar in terminal phase. Recognition Self-propelled, truck mounted with missiles in canisters

# AIRCRAFT

## Mi-35 HIND E



<b>Type</b>	Assault attack helicopter
<b>Max Troops</b>	8
<b>Main rotor</b>	
Diameter	17.3 m
No. of blades	5
<b>Tail Rotor</b>	
Diameter	3.9 m
No. of blades	3
<b>Engine</b>	Twin turboshaft
<b>Cruising speed</b>	145 nm
<b>Range</b>	150 nm (radius)
<b>Hover ceiling</b>	2,850 m (IGE)
<b>Length x Wingspan x Height</b>	17.5 x 6.5 x 4.5 m
<b>Basic Empty Weight</b>	8,500 kg
<b>Sling Load</b>	2,400 kg
<b>Payload</b>	1,500 kg
<b>Armament</b>	Turret-mounted 4-barrel 12.7-mm Gatling gun. 57-mm rockets, 80-mm rockets, 240-mm rockets, up to 500-kg bombs, ATGMs; AAMs, mine dispensers, and gun and grenade pods

## Mi-8T (HIP C)



<b>Type</b>	Twin-turbine transport helicopter
<b>Crew; Passengers</b>	3; 24
<b>Weapons</b>	Possibly 57-mm rockets or 500-kg bombs
<b>Maximum Dash Speed</b>	140 kn
<b>Range</b>	260 nmi
<b>Service Ceiling</b>	4,800 m
<b>Main Rotor</b>	
<b>Number of Blades</b>	5
<b>Diameter</b>	21.3 m
<b>Payload</b>	
<b>Internal</b>	4,000 kg
<b>Sling Load</b>	3,000 kg
<b>Maximum Design Takeoff Weight</b>	12,000 kg (rolling takeoff)
<b>Weight Empty</b>	6,824 kg
<b>Length x Width x Height</b>	18.22 x 2.5 x 4.75 m



## ALH Dhruv



<b>Type</b>	Light utility twin-engine helicopter
<b>Max Troops</b>	4-12
<b>Main rotor</b>	
Diameter	13.2 m
No. of blades	4
<b>Tail rotor</b>	
Diameter	2.55 m
No. of blades	4
<b>Length x Width x Height</b>	15.87 x 2.0 x 4.05 m
<b>Engines</b>	twin Shakti turboshafts
<b>Payload</b>	2,000 kg
<b>Max speed</b>	150 kn
<b>Combat Radius</b>	175 nm
<b>Service ceiling</b>	8,382 m
<b>Armament</b>	Possible ATGM, rockets, gun pod, torpedoes, depth charges and ASCM.

**Note** Indian produced helicopter designed with input from German manufactures.

## MiG-21 Fishbed



<b>Mission</b>	Air superiority fighter
<b>Wings</b>	Delta, mid-mounted with clipped tips
<b>Engine</b>	Single turbojet mounted in fuselage with nose intake
<b>Fuselage</b>	Tube-shaped with blunt nose and shock cone, dorsal spine extends aft of cockpit to vertical stabilizer; ventral fin located under rear of fuselage (single-seat)
<b>Tail</b>	Vertical stabilizer swept; horizontal stabilizer swept and mid-mounted on fuselage
<b>Armament</b>	
<b>Primary</b>	Atoll/Advanced Atoll air-air missiles, GP bombs, or air-surface rockets
<b>Secondary</b>	Twin-barrel 23 mm GSh-23 gun
<b>Performance</b>	
<b>Combat Radius</b>	400 nm (740 km)
<b>Maximum Speed</b>	Mach 1.06 at sea level
<b>Service Ceiling</b>	59,000 ft

## MiG-27 Flogger



<b>Mission</b>	Multi-purpose fighter
<b>Wings</b>	Variable geometry, high-mounted, elliptical tips, sawtooth leading edge when swept
<b>Engine</b>	Single turbojet in fuselage, large rectangular air intakes aft of cockpit.
<b>Fuselage</b>	Cigar-shaped, pointed nose; dorsal spine from canopy to large angular fairing
<b>Tail</b>	Vertical stabilizer, swept with large angular fairing; horizontal stabilizer is swept, high-mounted on fuselage
<b>Armament</b>	
<b>Primary</b>	23-mm GSh-23 twin-barrel gun
<b>Secondary</b>	Rocket packs; AA-7 Apex, AA-8 Aphid air-air missiles
<b>Performance</b>	
<b>Combat Radius</b>	650 nm (1,200 km)
<b>Maximum Speed</b>	Mach 2.3 with external stores
<b>Service Ceiling</b>	61,000 ft (18,600 m)

## MiG-29 Fulcrum A



<b>Type</b>	All-weather, counter-air fighter (FULCRUM A)
<b>Crew</b>	1
<b>Maximum Level Speed</b>	1,320 kn
<b>Range</b>	1,565 nmi
<b>Service Ceiling</b>	17,000 m
<b>Armament</b>	Various AAMs including AA-8 APHID, AA-10 ALAMO-A, AA-11 ARCHER; AA-12 ADDER; ASMs; bombs; submunitions dispensers; napalm tanks; 80-mm rocket packs; 240-mm rockets; 30-mm GSh-301 gun (in port wingroot)
<b>Maximum Payload</b>	4,000 kg
<b>Maximum Takeoff Weight</b>	19,700 kg
<b>Length x Wingspan x Height</b>	17.23 x 11.36 x 4.73 m

## C-130H, C-130HE



<b>Type</b>	Multimission transport
<b>C-130H</b>	
<b>Crew</b>	4 or 5
<b>Passengers</b>	92 troops, 64 paratroopers, or 74 litter patients with 2 attendants
<b>Maximum Cruise Speed</b>	325 kn
<b>Economy Cruise Speed</b>	300 kn
<b>Range, with reserves</b>	
<b>With Maximum Payload</b>	2,046 nmi
<b>With Standard Load, Max. Fuel</b>	4,250 nmi
<b>Service Ceiling</b>	10,060 m
<b>Maximum Payload</b>	19,356 kg
<b>Maximum Normal Takeoff Weight</b>	70,310 kg
<b>Maximum Overload Takeoff Weight</b>	79,380 kg
<b>Operating Weight Empty</b>	34,686 kg
<b>Length x Wingspan x Height</b>	29.79 x 40.41 x 11.66 m

## HERON 1 UAV



<b>Wing Span</b>	16.6m
<b>Length</b>	8.5m
<b>Max Takeoff Weight</b>	1,150 kg
<b>Max Payload Weight</b>	250 kg
<b>Operating Radius (LOS)</b>	350 km
<b>Loiter Speed</b>	110-150 km/hr
<b>Payload Options</b>	EO/IR and Synthetic Aperature Radar

## Searcher Mk2 UAV



<b>Wing Span</b>	8.55m
<b>Length</b>	5.85m
<b>Max Takeoff Weight</b>	436 kg
<b>Max Payload Weight</b>	>120kg
<b>Operating Radius (LOS)</b>	300 km
<b>Loiter Speed</b>	110-150 km/hr
<b>Payload Options</b>	EO/IR and Synthetic Aperature Radar, Comms Relay, Electronic Warfare

# SHIPS

## Modified Kiev class (Project 1143.4) Class CV



**Complement**  
**Aircraft WIng**

1,200 plus aircrew  
May include 6 helicopters (e.g. Sea King or Ka-27 Helix) and up to 24 MIG-29K or Sea Harrier jump jets

**Armament**  
**Missiles**  
**Guns**

6 x CADS-N-1 (Kortik/Kashtan) SAM.  
4-30 mm AK 630 (to be confirmed).

**Maximum Speed, Knots**

28 kts

**Displacement**

45,400 tons, full load

**Length x Beam x Draft ft (m)**

818.6 wl x 167.3 oa; 107.3 wl x 32.8

**NOTE** Vessel is currently being refitted. Expected to be operational in 2012. Bottom picture is representation of what the vessel will look like after it is refitted.



## Hermes Class CVH



<b>Complement</b>	1,350 (143 officers) (including air group) (plus 750 commandos for short periods)
<b>Aircraft WIng</b>	7 x helicopters (e.g. Sea King or Ka-27 Helix) 12 x Sea Harrier jump jets
<b>Armament</b>	2 x Short Seacat GWS. 22 quadruple SAM launchers 2 x Oerlikon 20-mm cannon
<b>Maximum Speed, Knots</b>	28 kts
<b>Displacement</b>	28,700 tons, full load
<b>Dimensions, feet (metres)</b>	744.3 x 160 x 29.5 (226.9 x 48.8 x 8.7)

## RAJPUT (KASHIN II /Project 61ME) DDG



<b>Complement</b>	324 (35 officers)
<b>Armament</b>	4 x SS-N-2D Modified Styx 2 x 76-mm guns (twin mount) 8 x 30-mm AK 230 guns (4 twin mounts) 4 x 30-mm AK 630 guns 5 x 21 in. torpedo tubes
<b>Length x Beam x Draft ft (m)</b>	480.7 x 51.8 x 16.1 (146.5 x 15.8 x 4.9)
<b>Displacement</b>	4,974 tons, full load

## DELHI (Project 15) Class DDG



<b>Complement</b>	420 (40 officers)
<b>Armament</b>	16 x Zvezda SS-N-25 SSM (4 Quad) 1 x 100-mm gun 4 x 30-mm guns 5 x PTA 21 in torpedo tubes 2 x SA-N-7 SAM
<b>Displacement</b>	6,700 tons, full load
<b>Length x Beam x Draft ft (m)</b>	535.5 x 57.1 x 22.3 (163.2 x 17 x 6.8)

## BRAHMAPUTRA (Project 16A) Class FF



<b>Complement</b>	313 (40 officers including 13 aircrew)
<b>Armament</b>	16 x SS-N-25 (4 Quad) KH-35 Uran 1 x OTO Melara 76-mm 4 x 30-mm AK 630 guns 6 x 324-mm torpedo tubes (2 triple) 1 x Trishul SAM launcher
<b>Maximum Speed, Knots</b>	27
<b>Displacement</b>	4,450 tons, full load
<b>Length x Beam x Draft ft (m)</b>	414 x 47.6 x 15 (126.5 x 14.5 x 4.5).

## LEANDER (NILGIRI) Class FF



<b>Complement</b>	250 (14 officers)
<b>Armament</b>	1 x Vickers 114-mm Mk6 gun (twin mount) 2 x Oerlikon 20-mm Mk9 cannon 1 x Seacat SAM launcher 2 x triple ILAS-3 torpedo launchers (only on last two ships completed)
<b>Displacement</b>	2,962 tons, full load
<b>Maximum Speed, Knots</b>	27 kts
<b>Dimensions, Feet (Meters)</b>	372 x 43 x 18 (113.4 x 13.1 x 5.5)

## KHUKRI II (Project 25A) Class FFL



<b>Complement</b>	134 (14 officers)
<b>Armament</b>	4 x SS-N-2D Mod 1 Styx 1 x 76-mm gun 2 x 30-mm AK 630 guns 1 x SA-N-5 SAM launcher
<b>Maximum Speed, Knots</b>	25
<b>Displacement</b>	1,350 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	298.9 x 34.4 x 14.8 (91.1 x 10.5 x 4.5)

## VEER (Project 1241RE/TARANTUL I) Class PGG



<b>Complement</b>	38 (5 officers)
<b>Armament</b>	4 x SS-N-2D Mod 1 Styx 1 x 76-mm gun 2 x 30-mm AK 630 guns
<b>Maximum Speed, Knots</b>	36
<b>Displacement</b>	455 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	184.1 x 37.7 x 8.2 (56.1 x 11.5 x 2.5)

## ABHAY (Project 1241 PE/PAUK II) Class PG



<b>Complement</b>	32 (6 officers)
<b>Armament</b>	1 x 76-mm gun 1 x 30-mm AK 630 gun 1 x SA-N-5/8 SAM (quad launcher)
<b>Maximum Speed, Knots</b>	32
<b>Displacement</b>	485 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	189 x 33.5 x 10.8 (57.6 x 10.2 x 3.3)



## SUKANYA Class PS



<b>Complement</b>	104 (12 officers)
<b>Armament</b>	3 x Bofors 40-mm/60. 4 x 12.7-mm MGs 4 x RBU 2500 16-tubed trainable launchers
<b>Maximum Speed, Knots</b>	21
<b>Displacement</b>	1,825 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	331.7 oa x 37.7 x 14.4 (96 x 11.5 x 4.4)

## Trinkat SDB Mk 3/T 60-Class



<b>Complement</b>	32
<b>Armament</b>	2 x Bofors 40-mm guns
<b>Maximum Speed, Knots</b>	30
<b>Displacement</b>	210 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	124 x 24.6 x 6.2 (37.8 x 7.5 x 1.9)

## SUPER DVORA MK II Class PB



<b>Complement</b>	11 (1 officer)
<b>Armament</b>	1 x Oerlikon 20-mm gun 2 x 12.7-mm MG
<b>Maximum Speed, Knots</b>	38
<b>Displacement</b>	60 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	83.3 x 18.4 x 5.9 (25.4 x 5.6 x 1.8)

## AUSTIN Class LPD



<b>Complement</b>	Approximately 430
<b>Armament</b>	2 x General Electric/General Dynamics 20 mm/76 1 x 6-barrelled Vulcan Phalanx Mk 15 2 x 25-mm Mk 38 8 x 12.7-mm MGs.
<b>Maximum Speed, Knots</b>	21
<b>Displacement, tons</b>	9,962 light; 17,479 full load
<b>Length x Beam x Draft, ft (m)</b>	570 x 84 x 23.3 (173.4 x 25.6 x 7.1)
<b>Max Speed</b>	21 kt
<b>Range, n miles</b>	7,700 at 20 kt
<b>Military lift</b>	930 troops 9 LCM 6s or 4 LCM 8s or 2 LCAC or 20 LVTs. 4 LCPL/LCVP

## POLNOČNY C/D (Project 773I/Project 773IM) LSM



<b>Complement</b>	60 (6 officers)
<b>Armament</b>	4 x 30-mm (2 twin) Ak 230. 2 x 140-mm 18-tubed rocket launchers.
<b>Maximum Speed</b>	16 kt
<b>Displacement, tons</b>	1,150 (C class); 1,190 (D class) full load
<b>Length x Beam x Draft, ft (m)</b>	266.7 x 31.8 x 7.9 (81.3 x 9.7 x 2.4)
<b>Range, n miles</b>	3,000 at 12 kt
<b>Military lift</b>	160 troops; 5 MBT or 5 APC or 5 AA guns or 8 trucks

## MAGAR Class LST



<b>Complement</b>	136 (16 officers)
<b>Armament</b>	2 x CRN-91 30 mm; 2 x 122-mm multibarrel rocket launchers at the bow.
<b>Displacement</b>	5,655 full load
<b>Dimensions, Feet(Meters)</b>	393.7 x 57.4 x 13.1 (120 x 17.5 x 4)
<b>Maximum Speed, Knots</b>	15
<b>Range, n miles</b>	3,000 at 14 kt
<b>Military lift</b>	10 x tanks; 11 x APCs; 500 x troops

## MK II/MK III LCU



<b>Complement</b>	167
<b>Armament</b>	2 Bofors 40 mm/60 (aft).
<b>Displacement</b>	500 full load
<b>Length x Beam x Draft, ft (m)</b>	175.9 x 26.9 x 5.6 (53.6 x 7.9 x 1.7)
<b>Speed, knots</b>	11
<b>Range, n miles</b>	1,000 at 8 kt
<b>Military lift</b>	250 tons; 2 PT 76 or 2 APC. 120 troops

## P-2000 Class Patrol Boat



<b>Complement</b>	8 (1 officer)
<b>Armament</b>	1 x 12.7-mm MG
<b>Maximum Speed, Knots</b>	25
<b>Displacement</b>	49 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	68.2 x 19 x 5.9 (20.8 x 5.8 x 1.8)



## Vikram-Class OPV



<b>Complement</b>	96 (11 officers)
<b>Armament</b>	1 x Bofors 40-mm L/60
<b>Helicopters</b>	1 x Cheetak
<b>Maximum Speed, Knots</b>	22
<b>Displacement</b>	1,224 tons, full load
<b>Length x Beam x Draft, ft (m)</b>	243.1 x 37.4 x 10.5 (74.1 x 11.4 x 3.2)

## FOXTROT (Project 641) Class SSK



<b>Complement</b>	75 (8 officers)
<b>Armament</b>	
<b>Torpedoes</b>	(22) 10 x 21 in. tubes (6 fwd; 4 aft)
<b>Mines</b>	44 in lieu of torpedoes
<b>Maximum Speeds</b>	16 kt (surfaced) 15 kt (dived)
<b>Maximum Range</b>	20,000 miles @ 8 kt surfaced; 380 miles @ 2 kt dived
<b>Displacement</b>	1,952 tons surfaced; 2,475 tons dived
<b>Dimensions, Feet (Meters)</b>	299.5 x 24.6 x 19.7 (91.3 x 7.5 x 6)

## SINDHUGHOSH/KILO (Project 877EM/8773) Class SSK



<b>Complement</b>	52 (13 officers)
<b>Armament</b>	
<b>SLCM</b>	Novator Alfa Cub SS-N-27
<b>Torpedoes</b>	6 x 21 in. tubes (combination of Type 53/65 passive-wake and TEST 71/96 active/passive homing [18 torpedoes])
<b>Mines</b>	24 x DM-1 in lieu of torpedoes
<b>Maximum Speed</b>	10 kts (surfaced) 17 kts (dived) 9 kts (snorting)
<b>Maximum Range</b>	6,000 miles @ 7 kts snorting; 400 miles @ 3 kts dived
<b>Displacement</b>	2,325 tons surfaced; 3,076 tons dived
<b>Dimensions, Feet (Meters)</b>	238.2 x 32.5 x 21.7 (72.6 x 9.9 x 6.6)

## SHISHUMAR (TYPE 209/1500) Class SSK



<b>Complement</b>	36 (8 officers)
<b>Armament</b>	
<b>Torpedoes</b>	8 x 21 in. torpedo tubes
<b>Mines</b>	Up to 24 mines
<b>Maximum Speed, Knots</b>	13 kts (surfaced) 22 kts (submerged) 4 kts (battery)
<b>Maximum Range</b>	13,000 nm @10 kts (surfaced)
<b>Displacement</b>	1,660 tons (surfaced) 1,850 tons (submerged)
<b>Dimensions, Feet (Meters)</b>	211.23 x 21.32 x 20.34 (64.4 x 6.5 x 6.2)

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## **APPENDIX B: HOLIDAYS**

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### **National Holidays**

<b>Holiday</b>	<b>Description</b>	<b>Traditional Date(s)</b>
Republic Day	Celebration of the day India's 1950 constitution came into force	26 January
Independence Day	Celebration of India's independence from Britain	15 August
Mahatma Gandhi's Birthday	Celebration of the birth of Mahatma Gandhi	2 October
Christmas Day	Celebration of the birth of Christ	25 December



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## APPENDIX C: LANGUAGE

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Hindus greet each other by saying namaste, literally, “I bow to thee” — they fold their palms together as they say it.

Muslims greet each other by saying salaam alekum, literally, “peace be on you.” The reply is either the same words, or valekum as salaam — “and also on you.”

To say “goodbye,” Hindus say namaste and Muslims say khuda hafiz, literally, “may God protect you.” Shabba khair is used for “good night.”

Many words used in Hindi/Urdu are familiar to English speakers as many words are derived from English. Urdu speakers may understand some English words.

The pronoun ap is preferable for addressing people than other, secondperson pronouns.

### LEGEND

(H) Hindu    (m) masculine    (mc) more common  
(U) Urdu    (f) feminine

#### English

My name is ...

What is your name?

Where do you come from?

I live in ...

Australia

#### Hindi/Urdu

mera nam ... hai

apka nam kya hai?

ap kahan ke rehne vale hain? (m)

ap kahan ki rehne vali hain? (f)

main ... men rehta hun (m)

main ... men rehti hun (f)

ostreliya

**English**

Canada

China

Egypt

England

Greece

Japan

Russia

USA

I am a/an ...

American

British

What is your occupation?

I am a/an ...

actor

actress

builder

doctor

journalist

lawyer

musician

student

teacher

What is your religion?

I am ...

Hindu

Muslim

Christian

Jewish

**Hindi/Urdu**

kainada

chin

misr (H)

inglaind

yunan or gris

japan

rus

amrika

main ...hun

amrikan

angrez

ap kya kam karte hain?

main ...hun

aiktar

aiktres

bildar

doktar

patrakar (H) akhbar nabis

vakil

myuzishan

parh raha hun (m)

parh rahi hun (f)

tichar

apka dharm kyd hai? (H)

apka mazhab kya hai? (U)

main ... hun

hindu

mussalman

isai

yahudi



## English

Buddhist

How's it going?

Fine/Well.

Can you help me?

I am looking for ...

How old are you?

I'm ... years old.

I don't understand.

Can you speak English?

Do you understand English?

I speak very little Hindi.

Please speak a little slower?

Where do you live?

Is there a place to stay  
(nearby)?

A good place.

Anything will do.

Are there rooms available?

Can I sleep here?

What is the rent for a day?

Do you have a cheaper room?

Is a bathroom attached?

## Hindi/Urdu

bauddh dharm ka (m)

bauddh dharm ki (f)

kaisa chal raha hai?

thik thak

kya ap meri madad kar sakte hain?

main ... ko dhundh raha hun (m)

main ... ko dhundh rahi hun (f)

apki umr kya hai?

meri umr ... sal hai

meri samajh men nahin aya

kya ap angrezi bol sakte hain? (m)

kya ap angrezi bol sakti hain? (f)

kya ap angrezi samajhte hain? (m)

kya ap angrezi samajhti hain? (f)

main bahut kam hindi janta hun (m)

main bahut kam hindi janti hun (f)

zara ahista bol sakte hain? (m)

zara ahista bol sakti hain? (f)

ap kahan rehte hain? (m)

ap kahan rehti hain? (f)

(as pas koi) rehne ki jaga hai?

koi achchhi si jaga

kuchh bhi chalega

koi kamra khali hai

kya main yahan so sakta hun? (m)

kya main yahan so sakti hun? (f)

ek din ka kya kiraya hai?

is se sasta kamra hai?

sath men bathrum hai?

**English**

Does it have hot water?

Can I see the room?

Do you have any other rooms?

Can you lower the rate?

Can you lower it further?

I/we'll stay (two nights).

Where can I wash my clothes?

Can I leave my (bag) here?

I'll return in (two weeks).

Where is the ...?

hotel

mosque

restaurant

shop

temple

Do you have a ... ?

room

bathroom

bed

ordinary room

air-conditioned room

Is there ... ?

**Hindi/Urdu**

us men garam pani hai?

kya main kamra dekh sakta hun? (m)

kya main kamra dekh sakti hun? (f)

kya ap ke pas aur koi kamra hai?

kya ap kirnya kam kar sakte hain? (m)

kya ap kirnya kam kar sokti hain? (f)

kuchh aur kam kar sakte hain?

ham (do rat) rahenge

kapre kahan dho sakta hun? (m)

kapre kahan dho sakti hun? (f)

apna (jhola) yahan chhor sakta hun?

(m)

apna (jhola) yahan chhor sakti hun? (f)

moin (do hafton) men vapis a jahunga

(m)

moin (do hafton) men vapis a jahungi

(f)

... kahan hai?

hotal

masjid

khane ki jaga or resturent

dukan

mandir (H) gurudwara (Sikh)

ap ke pas ... hai?

ek kamra

bathrum; gusalkhana

bistara or bistar

sada kamra

eyar kondishond kamra

... hai?

**English**

a telephone  
laundry service  
hot water  
breakfast  
How much is ... ?  
it per night  
a cheaper room  
the bill  
the meal  
one week's rent  
one month's  
How much?  
All these things are mine.  
This room is too big.  
This room is too small.  
Please bring it as soon as you  
can.  
accommodation  
address  
arrival  
bathe  
bedroom  
blanket  
box  
bulb  
clean  
cost (n)  
crowded (with people)  
dinner

**Hindi/Urdu**

telefon  
kapre dhone wala or dhobi  
garam pani  
nasta or subah ka nashta  
... ke kitne paise lagenge?  
ek rat  
is se saste kamre  
bil  
khane (H & U), bhojan (H)  
ek hafte  
rent ek mahine  
kitna hai?  
e sab chizen meri hain  
ye kamra bahut bara hai  
ye kamra bahut chhota hai  
zara jaldi layen  
rehne ki jaga  
pata  
ana (H & U); agaman (H)  
nahana  
sone ka kamra or bedrum  
kambal  
baks  
balb  
saf  
kimat  
(logon se) bhara hua  
rat ka khana

**English**

dirty

electric

elevator

exit (n)

fan

food

lock

mosquito net

pillow

roof/ceiling

soiled

sheet

suitcase?

Where is the ...?

station

bus stop

dining car

ticket office

airport

What ... is this?

street

city

When will the ...leave?

bus

next bus

Trains are sometimes called gari (which is also the generic term for all vehicles, including animal powered) or rel gari.

I would like ...

**Hindi/Urdu**

ganda

bijli wald

lift

bahar ka darvaza

pankha

khana

tala

mashari

sirhana or takiya

chhat

maila

chadar

sutkes; baksa

... kahan hai?

steshan

bas stap

daining kar

tikat aphis

eyarport

ye kaun si ... hai?

sarak

shehar

... kab jaegi?

bas

agli bas

main ... pasand karunga (m)

main ... pasand karungi (f)

**English**

a sleeper  
berth berth  
upper  
lower  
Two tickets to ...

**Hindi/Urdu**

slipar  
barth  
upar wald  
niche wald  
... ke liye do tikat

**Key Words****English**

bicycle  
boat  
bridge  
car  
coast  
crowd  
daily  
early (quickly)  
early in the morning  
hire (v)  
petrol  
road  
taxi  
ticket  
how far?  
right  
left  
north  
south  
east  
west

**Hindi/Urdu**

saikal  
kishti  
pul  
gari (or motar gari or kar)  
kindra (H & U); sahil (U)  
bhir  
rozana  
jaldi  
subah savere  
kiraye pe lena  
petrol (or tel)  
sarak  
taiksi  
tikat  
kitna dur?  
dahina or daen  
baen  
uttar (H) shumal (U)  
dak shin (H & U); junub (U)  
purab (H) mashriq (U)  
pashchim (H); maghrib (U)

## Key Phrases

### English

Excuse me.

(literally, 'forgive me')

How are you?

Thank you.

Thank you very much.

Very well, thank you.

You're welcome.

(literally, 'It doesn't matter')

Is someone sitting here?

Someone is sitting here.

May I/we sit here?

Can I/we (put) my/our bag here?

Can you wait for me?

How many (kilometers)?

I am looking for ...

Where are you going?

I want to go to ...

How much will it cost to go to ...

Can you wait here?

Drive slowly please.

I will get out here.

Which bus goes to ...?

Does this bus go to ...?

What's the fare?

### Hindi/Urdu

maf kijiye.

ap kaise hain?

shukriya.

bahut, bahut shukriya.

bahut achchhe shukriya.

koi bat nahin

kya yahan koi baitha hua hai?

yahan koi baitha hua hai

kya ham yahan baith sakte hain?

kya ham apna baig yahan (rakh)  
sakte hain?

ap mera inteazar kar sakte hain?

kitne (kilomitar)?

main ... ko dhundh raha hun (m)

main ... ko dhurdh rahi hun (f)

ap kahan ja rahe hain?

main ... jana chahta hun (m)

main ... jana chahti hun (f)

jane ke liye kitna paisa lagega?

kya ap yahan inteazar kar sakte  
hain?

zara ahista chalaiye

main yahan utrunga (m)

main yahan utrungi (f)

... kaun si bas jati hai?

kya ye bas ... jati hai?

kirdya kitna hai?

Where can one catch the bus to ...?	... jane wali bas kahan milegi?
When will the bus leave?	bas kab chalegi?
How many buses per day are there to ...?	... ko din men kitni basen jati hain?
What time does the bus reach ...?	bas ... kitne baje pahunchegi?
When the bus reaches ... please tell me.	jab bas ... pahunche to mujne bataiyega
Can I/we stop over in ...?	kya ham ... meri theher sakte hain?
Is ... far from here?	kya ... yahan se dur hai?
Is ... nearby?	kya ... nazdik hai?
Stop here.	yahan rukiyega?
Where is the ...?	... kahan hai?
bank	bank
barber	nai
market	bazar
church	girja ghar
How far is the ...?	... kitni dur hai?
factory	faiktari: karkhana
Indian laundry	dhobi ki dukan
western-style laundry	drai klinar
I'm looking for the ...	...main ... dhundh raha hun
museum	myuziyam or ajayab ghar
park	park or bag (gardens)
cinema	sinema
When does it open?	vo kab khulta hai?
When does it close?	vo kab band hota hai?
lawyer	vakil
beggar	bhikhari
capital	rajdhani
fortune-teller	jyotishi

map	naksha
movie	pikchar
school (western-style)	skul
shop	dukan
village	gaon
zoo	chiriya ghar
Where is the post office?	dak khana kahan hai?
What does it cost to send a ...?	ek ... bhejne ke liye kitne paise lagenge?
postcard;	aerogramme erogram
May I have ...	mujhe ... chahiye
stamps (postal)	dak tikat
envelope	lifafa
insurance	bima
receipt	rasid
This letter is going to the USA.	ye chitthi amrika ke liye hai
How much is it to send this letter to England?	is chitthi ko inglaind bhejne men kitne paise lagenge?
I would like (five) aerogrammes, please.	mujne (panch) erogram chahiye, ji
I want to send this package by airmail.	main is parsal ko eyarmel se bhejnachahta hun (m) main is parsal ko eyarmel se bhejnachahti hun (f)
I (need/want) a receipt.	mujhe rasid (ki zururat hai/chahiye)
I want to insure/register this parcel.	main is parsal ko inshor/rajistar karanachahata hun
What will it cost?	kitne paise lagenge?
I want three 50 paise stamps, please.	mujhe tin pachas paise ke tikat chahiye ji



How much per word?	har lafz (U)/shabd (H) ke liye kitna?
Have you received any mail for ...?	... ke liye koi chitthi ai hai?
Where is the bank?	bank kahan hai?
I want to change...	main ... badalna chahtahun
U.S. dollars	amirkan dolar
British pounds	angrezi paund
What is the exchange rate for ...?	... ka ikschenj ret kya hai?
German marks	jarmani ke mark
Australian dollars	ostreliya ke dolar
I need to change money.	mujhe paise badalne ki zururat hai
Can I change money here?	kya yahan paise badle ja sakte hain?
I need to cash this cheque.	main is chek ko kaish karana chahta hun
Can I exchange this bill (note) for smaller change?	kya ap is not ke badle chenj de sakte hain?
money	paise
coins	sikke
notes	not
police station	thana
thief	chor
help!	bachao!
I have been robbed.	meri chori ho gai hai.
I didn't do anything.	mainne kuchh nahin kiya.
It is not mine.	vo mera nahin hai.
weather	mausam
climate	abohava (literally, water & air)
breeze	hava: sabu (morning breeze)
dusty wind	dhul bhari hava

fog	kohra
mist	dhundh
lightning	bijli
very hot	banut garam
cool weather	thanda mausam
How's the weather?	mausam kaisa hai?
It is cold?	thanda hai?
Is it going to rain?	kya barish hogi?
The weather is nice today.	dj mausam achchha hai.
summer	garmi
winter	sardi
spring	bahar: basant
autumn	patjhar
the monsoons	sawan: barsat
meals	khana (U, mc); bhojan (H)
breakfast	nashta
lunch	dopehar ka khana
dinner	rat ka khana
I am feeling thirsty.	pyas lagi hai
I am hungry.	bhukh lagi hai
I eat rice.	main chaval khata hun (m)
	main chaval khati hun (f)
I drink tap water.	main nal ka pani pita hun (m)
	main nal ka pani piti hun (f)
I smoke cigarettes.	main sigaret pita hun (m)
	main sigaret piti hun (f)
Can I have a little ...?	mujhe thora sa ...?
boiled water	ubla pani
more	aur
Please give me ...	mujhe ... drjiyega

a meal	khana
bread	roti
I cannot eat ...	main ... nahin kha sakta (m)
	main ... nahin kha sakti (f)
spicy food	mirch wala khana
eggs	anda
I don't eat ...	main ... nahin khata (m)
	main ... nahin khati (f)
any meat	koi bhi gosht
fish	machhli
I eat only vegetarian food.	main shakahari (or vaigiteriyan)
	hun
(A table) for four.	char logon ke liye (tebal)
What do you have?	kya kya hai?
Have you eaten?	apne kha liya?
I've eaten already.	mainne kha liya
Can we order some food?	(kya ham khana) ordar kar sakte hain
We/I would like some food.	khana chahiye
Do you have drinking water?	pine ka pani hai?
I like hot and spicy food.	mujhe garam, masaledar khana pasand hai
I don't like spices and chillies.	mujhe mirch masala pasand nahin
What do you have that's special?	khas kya hai?
What does this have in it?	is men kya kya hai?
We'll have one bottle of beer.	ham ek botal biar lenge
(Enough) for four people.	char logon ke liye
I didn't order this.	mainne ye nahin manga tha
fork	kanta
spoon	chammach
knife	chhuri

plate	plet; thali (steel)
straw (drinking)	paip; strau
curry	tarkari kari
dry/without gravy	sukha/bina tari ke
without curry or spices	bina mirch masale ke
boiled	ubla hua
without chillies	bina mirch ke
without spices	bina masale ke
permitted to Muslims	halal
forbidden to Muslims	haram
roti	bread
tanduri roti	baked in the earthen Indian oven (the tandur); is thick and has many layers
nan	spade shaped; very thick and soft
parantha or parotha	fried roti; sometimes stuffed (vegetable parantha, egg parantha and in Tamil Nadu, the exquisite Ceylon parantha, which is a meal in itself with meat and other stuffing) bread
dabbal roti	western-style bread
Where is the ...?	... kahan hai?
shop	dukan
market bazar;	markit
barber	nai (H & U); hajjam (U)
chemist	davai ki dukan
book shop	kitab ki dukan
cobbler	mochi
shoeshop	juton ki dukan
cloth/clothes shop	kapron ki dukan
tailor	darzi
teastall	chay ki dukan

How much? (does it cost)	kitna?
still not enough	ab bhi kam hai
good enough	thik hai
expensive	mehenga or mainga
cheap	sasta
too expensive	bahut mehenga
Can I see that?	kya main vo dekh sakta hun? (m)
	kya main vo dekh sakti hun? (f)
Please show another kind/style.	koi aur qism/stail dikhaiye
Do you have (any) more?	ap ke pas (kuchh) aur hain?
The sleeves are too long.	bazu bahut lambe hain
How much for both?	dono ka kitna?
How much all together?	kul mila kar kitna?
good quality (stuff)	barhiya (mal)
Colors	rang
white	sufed
green	hara (m); hari (f)
pink	gulabi
black	kala (m); kali (f)
red	lal
grey	saleti
brown	bhura
(I) don't want (it).	nahin chahiye
It costs too much.	bahut zyada hai
How much will ... cost?	... ki kya kimat hai?
one (piece) ek	ek
this fruit	is phal
one kg	ek kilo
one meter	ek mitar
both	dono

How much will three (of these) cost (if bought together)?	tin len to kya kimat hogi?
Do you have ... ?	ap ke pas ... hai?
newspaper(s)	akhbar
matches	machis
mosquito repellent	machchhar marne wali dava
paper	kagaz
envelope	lifafa
shoulder bag	jhola
soap	sabun
map	naksha
Where can I buy ...	... kahan kharid sakte hain?
string	dhaga
film	film
I want ...	mujhe ... chahiye
a book	kitab
cigarettes	sigaret
shoes	jute
socks	jurab, moze
shirt	kamiz
I am looking for ...	ham ... dhundh rahe hain
cooking pot	patila
jewelry	gehne, zavar
cotton thread	sut
cotton (adj)	suti
cotton material	suti kapra
silk	resham (n); reshami (adj, silken)
wool	un (n); uni (adj,woollen)
bottle	botal
mirror	shisha

glass (or metal!)	tumblerglass
pen	kalam
I don't have much money.	mere pas zyada/bahut paise nahinhain
That's too much.	bahut zyada hai
(I will) give ... rupees. .	.. rupaye dunga (m) ... rupaye dungi (f)
How many rupees?	kitne rupaye?
Can you bring the price down?	kimat (or dam) kam kar sakte hain?
The price is too much.	kimat bahut zyada hai
(I) won't give more than ...	... se zyada nahin dunga (m) ... se zyada nahin dungi (f)
Do you have something cheaper?	is se sasta kuchh hai?
If (I) buy two ... will the price come down?	do ... len to kimat kam hogi
The quality is not good.	mal achchha nahin hai
What's your lowest price?	ap ki sab se kam kimat kya hai?
this one	ye wala
that one	vo wala
which one?	kaun sa?
too big	bahut bara
too small	bahut chhota
too long	bahut lamba
too short	bahut chhota
too tight	bahut tang
too loose/wide	bahut dhila/chaura
not enough	kafi nahin
too little	kam hai
Where is the ...?	kahan hai?
doctor	doktar
dentist	danton ka doktar

hospital	haspatal
I have a ...	
cold	zukam
fever	bukhar
My ... aches/hurts	... men dard hai
stomach	mere pet
chest	meri chhati
back	meri pith
anemia	khun ki kami
cholera	haiza
constipation	kabz
cough	khansi
cramps	maror; nas charhna
diabetes	daibitis
diarrhea	pechish
dysentery	pechish; julab (mc)
headache	sar dard
influenza flu	miyadi bukhar
malaria	maleriya
pneumonia	nimonia
rabies	kutte ki bimari; rebiz
sprain	moch
stomachache	pet dard
toothache	dant dard
venereal disease	gupt rog; kam rog (H); jinsi bimarf (U)
medication	davai
pill	goli
sleeping pill	nind ki goli
How much (money) per tablet?	ek goli ki kya kimat?



How many times a day?	din men kitni bar?
(four) times a day	din men (char) bar
I'm allergic to penicillin.	mujhe penicilin se elargi hai
I am tired.	main thaka hua hun (m)
	main thaka hui hun (f)
I need a doctor.	mujhe doktor chahiye
I have (vomited) several times.	mujhe kai bar (ulti/kai) hui hai
accident	aiksident
collision	takkar
addict	adi
addiction	lat
address	pata
allergy	elargi
bandage	patti
beware	hoshiyar
bleed	khun behna
blood	khun
bone	haddi
faint	behosh
insane	pagal
itch	khujli
lice	juen
nurse	nars
pain	dard
What time is it?	kya taim hua?
What hour is it?	kitne baje hain?
How long (will it/you take)?	kitni der hai?
Will it/you take time?	der lagegi?
the hour; referred to as literally	
2 noon; 12 in the afternoon	dopehar ke barah baje

12 midnight; 12 at night	rat ke barah baje
5 am; 5 in the morning	subah ke panch baje
5 pm; 5 in the evening	sham ke panch baje
4 am; 4 in the morning/night	subah (or rat)
4 pm; 4 in the afternoon/evening	dopehar ke char baje (or sham ke char baje)
morning	subah
afternoon	dopehar
evening	sham
night	rat
midnight	adhi rat
9 o'clock	nau baje

### Months

January	janvari	July	julai
February	farvari	August	agast
March	march	September	sitambar
April	aprail	October	aktubar
May	mai	November	navambar
June	jun	December	isambar

### Days

English	Hindi/Urdu	English	Hindi/Urdu
Monday	somvar (H & U) pir (U)	Friday	shukrvar (H) juma (U)
Tuesday	mangalvar	Saturday	shanivar
Wednesday	budhvar	Sunday	ravivar (H) itvar (U)
Thursday	brihaspativar (H) jumerat (U)		

### Present Time

today	aj	in this month	is mahine
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this evening	aj sham	all day long	sara din
tonight	aj rat		

### Past Time

The words for yesterday/tomorrow, the day before/the day after are the same. Therefore clarifying phrases have been included.

#### **English**

yesterday  
the day that has gone  
day before yesterday  
last week  
two weeks ago  
three months ago  
four years ago

#### **Hindi/Urdu**

kal  
bita hua kal  
parson (or bita hua parson)  
pichhle hafte  
do hafte pehle  
tin mahine pehle  
char sal pehle

### **Future Time**

#### **English**

tomorrow  
the day still to come  
day after tomorrow  
next week  
next month  
2 more months  
3 months later  
I will stay here for 2 months.  
  
What month is this?  
What is the date today?  
How long have you been here?  
I'm going to Hyderabad for three weeks.

#### **Hindi/Urdu**

kal  
ane wald kal  
parson (or ane wala parson)  
agle hafte  
agle mahine  
do mahine aur  
tin mahine bad  
main yahan do mahine rahunga (m)  
main yahan do mahine rahungi (f)  
ye kaun sa mahina hai?  
aj kya tarikh hai?  
ap yahan kab se hain?  
main tin hafte ke liye haidrabad ja raha hun (m)

Any time at all.

annual

before

main tin hafte ke liye haidrabad ja  
rahi hun (f)

kabhi bhi

salana

pehle

### English

century

date

dawn

day

daytime

early

### Hindi/Urdu

sadi (U, mc); shatabadi (H)

tarikh

subah; pratah (H)

din

din ka vakt

jaldi

### Ordinal Numbers

#### English

first

second

third

fourth

#### Hindi/Urdu

pehla

dusra

tisra

chautha

#### English

fifth

sixth

seventh

eighth

#### Hindi/Urdu

panchvan

chhatha

satvan

athvan

(eighth onwards: suffix -van to the number concerned)

### English

one-quarter

one-half

(the) whole

one and a quarter

one and a half

one and three-quarters

two and a quarter

two and a half

two and three-quarters

### Hindi/Urdu

ek chauthai

adha or paune ek

pura

sava (or sava ek)

derh

paune do

sava do (and so on for 3 1/4)

dhai; arhai (U)

paune tin (and so on for 3 3/4)

## Urdu Numbers

1	ek	38	aratis	75	pachhattar
2	do	39	untalis	76	chhihattar
3	tin	40	chalis	77	sathattar
4	char	41	iktalis	78	athhattar
5	panch	42	bayalis	79	unasi
6	chha	43	taintalis	80	assi
7	sat	44	chauvalis	81	ikasi
8	ath	45	paintalis	82	bayasi
9	nau	46	chhiyalis	83	terasi
10	das	47	saintalis	84	chaurasi
11	gyarah	48	artalis	85	pachasi
12	barah	49	unanchas	86	chhiyasi
13	terah	50	pachas	87	satasi
14	chaudah	51	ikkyavan	88	athasi
15	pandrah	52	bavan	89	navasi
16	solah	53	trepan	90	navve
17	satrah	54	chauvan	91	ikanave
18	aththarah	55	pachpan	92	banave
19	unnis	56	chhappan	93	teranave
20	bis	57	sattavan	94	chauranave
21	ikkis	58	athavan	95	pachanave
22	bais	59	unsath	96	chhiyanave
23	teis	60	sath	97	sattanave
24	chaubis	61	iksath	98	athanave
25	pachchis	62	basath	99	ninnanave
26	chhabbis	63	tresath	100	ek sau
27	sattais	64	chaunsath	200	do sau
28	aththais	65	painsath	300	tin sau
29	unnattis	66	chhiyasath	339	tin sau untalis

30	tis	67	sarsath	1000	ek hazar
31	ikkattis	68	arsath	10,000	das hazar
32	battis	69	unhattar	1 million	lakh; ek lakh
33	tetis; taintis	70	sattar	1 billion	karor; ek karor
34	chauntis	71	ikhattar	1 trillion	arab
35	paintis	72	bahattar		
36	chhattis	73	tehattar		
37	aintis	74	chauhattar		

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## APPENDIX D: DANGEROUS PLANTS AND ANIMALS

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### Snakes

#### *Russell's Viper*

##### **Description:**

Adult length usually 1 meter to 1.3 meters; maximum of 2 meters. Background color varies from pale grayish brown through reddish brown to dark brown. Dorsal and lateral series of black or brown, round or oval spots edged with black and white. Belly white with large black spots. Light V- or X-shaped marked on top of head.



Dorsal and lateral series of black or brown, round or oval spots edged with black and white. Belly white with large black spots. Light V- or X-shaped marked on top of head.

##### **Habitat:**

Paddy fields and other agricultural land, open, rocky, bushy, or grassy terrain up to elevations of 3,000 meters. Does not occur in dense forests.

##### **Activity and behavioral patterns:**

Predominantly nocturnal but active by day during cool weather. Terrestrial. Coils up in striking position, inflates lungs, and emits loud sustained hisses when threatened. Short-tempered and very aggressive. When disturbed, strikes with great force and speed.

##### **Venom's effects:**

Extremely potent hemotoxin. Major cause of snakebite mortality, especially among rice farmers. Symptoms may include local pain and swelling, vomiting, abdominal pain, and diarrhea. Bleeding from gums, upper gastrointestinal tract, and urinary tract may develop within hours. May develop acute renal failure.

## ***Himalayan Pit Viper***

**No Photograph Available**

### **Description:**

Adult length usually 0.7 to 0.9 meter. Background color darkish brown. Dorsal surface has series of dark longitudinal lines intersected by paler cross bands. Belly white with black and red flecks. Relatively narrow dark stripe extends from eye along side of neck.

### **Habitat:**

Forests and rocky areas in high mountains at elevations from 1,500 to 5,000 meters.

### **Activity and behavioral patterns:**

Nocturnal. Often seen close to hiding place to which it retreats when disturbed. Takes refuge under fallen timber, crevices in or under rocks, beneath boulders, ledges, stones, and fallen leaves. Sluggish and usually not readily aggressive; moves slowly from place to place.

### **Venom's effects:**

Primarily hemotoxic. Symptoms may include immediate burning pain, blood blisters, and edema. Victims generally recover within a few days. Antivenin may be effective.

## ***Northeastern Hill Krait***

**No Photograph Available**

### **Description:**

Adult length usually 1.3 to 1.5 meters. Background color black or dark brown, with white or pale yellowish transverse lines formed by series of spots across back. White line across snout and curved line on side from eyes to lips. Head markings may be indistinct.

### **Habitat:**

Various habitats at low and moderate elevations; prefers dry, open country. Rarely seen.



**Activity and behavioral patterns:**

Nocturnal, agile. When alarmed, coils loosely with body slightly flattened and head concealed; may make jerky movements and elevate tail. Somewhat lethargic during day.

**Venom's effects:**

Potent neurotoxin. Local symptoms generally minimal. Symptoms may include abdominal discomfort, headache, and giddiness. Neurotoxic symptoms include ptosis, facial paralysis, and inability to open mouth, swallow, or protrude tongue.

***Common Indian or Blue Krait*****Description:**

Adult length usually 1 meter to 1.5 meters; maximum of 1.8 meters. Background color generally black, brownish black, or bluish black, with about 40 thin white crossbars, which may be indistinct or absent anteriorly. White belly, flat head, and cylindrical body, tapering toward short, rounded tail.

**Habitat:**

Most commonly found in open country, cultivated areas, and scrub jungles up to 1,700 meters elevation. Avoids very rocky and sandy terrain. Found in termite mounds, rat holes, heaps of rubbish, and roofs of buildings. Frequently enters human dwellings. Needs ample water supply, so may be found in moist and wet areas, such as wells or water containers.

**Activity and behavioral patterns:**

Strictly nocturnal; not usually seen during day. Moves quickly. Specimens disturbed during day rarely bite, but instead will press its head against ground. At night, extremely dangerous and aggressive.

**Venom's effects:**

Potent neurotoxin. Most victims are bitten while sleeping. Bites may produce invisible or barely perceptible puncture marks. Few local symptoms; may produce mild pain or numbness with little or no local swelling. Mortality rate high without antivenin treatment.

***Branded Krait*****No Photograph Available****Description:**

Adult length usually 1 meter to 1.2 meters; maximum of 2 meters. Background color is pattern of alternating light and dark bands encircling body. Light bands pale to bright canary yellow; dark bands generally black and wider. Distinctive black spear-shaped mark beginning between eyes and extending back along neck. Prominent dorsal ridge down back and tail gives thin, emaciated appearance. Tail blunt or slightly bulbous at tip.

**Habitat:**

Most commonly found in grassy fields, meadows, and cultivated areas, often adjacent to streams, rivers, and lakes. Found at elevations up to 1,550 meters.

**Activity and behavioral patterns:**

Normally nocturnal; may prowl during day during and after rains. Unaggressive and stealthy. Hides head beneath body if molested; may twitch or writhe spasmodically but seldom attempts to bite even when irritated.

**Venom's effects:**

Potent neurotoxin. Minimal local pain, redness, or edema. Systemic symptoms develop slowly; include general achiness, paralysis, shock, and respiratory failure. Fatalities recorded.

***Indian Saw-scaled Viper or Phoorsa*****No Photograph Available****Description:**

Adult length usually 2 to 3 meters; maximum of 8 meters. Background color grayish, greenish, or yellowish brown; white belly speckled with brown or black. Series of white markings edged with black on dorsum. Distinctive cross-shaped white markings on top of head similar to imprint of bird's foot.

**Habitat:**

Found in open, dry and semi-desert areas. Also found under cover of small thorny plants, leaf litter, rocks, and in dry tracts of scrub jungle.

**Activity and behavioral patterns:**

Mainly nocturnal in hot weather; sometimes diurnal in cool weather. When alarmed, throws itself into double coil resembling figure eight and rubs sides of body together, producing violent rustling sound. Quick to strike at slightest provocation. Often climbs shrubs and low-lying trees up to 2 meters during rainy season.

**Venom's effects:**

Primarily hemotoxic. Fangs relatively large compared to size of snake. Common cause of snake bites. Local symptoms generally include pain, swelling, and enlarged tender lymph glands. After 10 to 12 hours, some victims begin to bleed from gums and later develop gastrointestinal, urinary tract, or vaginal bleeding. Fatalities recorded.

## ***Oriental Coral Snake***

### **Description:**

Adult length is 0.3 to 0.5 meter; maximum of 1.0 meter. Narrow body; diameter the size of a finger.

Background color variable;

color either russet to pink, with narrow, widely separated black crossbands and wide cream band across the base of the head, or brown to crimson, with three longitudinal black stripes from head to tail, and a narrow cream headband. Head is small, barely distinct from neck.



### **Habitat:**

Scrub jungles and monsoon forests. Often found near human habitats. Avoids dry terrain.

### **Activity and behavioral patterns:**

Nocturnal, remaining hidden during the day within humus of forest floor, or beneath logs, stones, and other debris. Occasionally active in early morning.

### **Venom's effects:**

Likely neurotoxic. Little is known of venom. Few bites recorded. One fatality reported from Nepal.

## ***Sochurek's Saw-scaled Viper***

### **No Photograph Available**

### **Description:**

Maximum length of 0.8 meter. Background color gray-beige; belly whitish, usually with dark gray spots. Series of pale, dark-edged dorsal spots, which may connect in zig-zag line. Incomplete undulating pale line along sides. Distinctive gray cross pattern on top of head.

**Habitat:**

Very adaptable. Found in sandy, rocky, and cultivated areas. Avoids wet terrain, but may enter water if necessary.

**Activity and behavioral patterns:**

Primarily nocturnal and terrestrial; but climbs low bushes and trees.

**Venom's effects:**

Potent hemotoxin. Pain and swelling start soon after bite. Systemic bleeding may start within 6 hours after bite. Other symptoms may include vomiting, abdominal pain, regional lymph node enlargement, hematuria, and shock. Deaths recorded.

***Blunt-nosed or  
Levantine Viper*****Description:**

Adult length usually 0.7 to 1 meter; maximum of 1.5 meter. Background color generally light gray, khaki, or buff, with double row of opposing or alternating spots from head to tail along back.



Belly light gray to yellow, with small dark brown spots; tail pinkish brown.

**Habitat:**

Wide variety of habitats from marshes and plains at sea level to mountainous areas at elevations up to 2,000 meters. also semi-desert areas and rocky, hilly country at moderate elevations, with scattered bushes and adequate water supply. Often near farms and grazing areas.

**Activity and behavioral patterns:**

Primarily nocturnal. Sluggish. Most active and alert at night, usually very slow-moving and almost oblivious to stimuli when

encountered during day. However, temperament unpredictable, and may strike quickly and savagely at any time.

**Venom's effects:**

Primarily hemotoxic. Bite causes sharp pain at site, followed by local swelling and necrosis. Deaths reported.

***Hump-nosed Viper***

**No Photograph Available**

**Description:**

Adult length usually 0.3 to 0.4 meter; maximum of 0.6 meter; relatively stout snake. Background color highly variable; may be grayish, brownish, yellowish, or reddish brown. Belly dark. Dorsal pattern of dark triangles with apices meeting or alternating at the vertebral line. Flat triangular shaped head, with distinctive wedge-shaped snout.

**Habitat:**

Found in plantations, forests, grasslands up to about 1,500 meters elevation.

**Activity and behavioral patterns:**

Mainly nocturnal. Terrestrial to semi-arboreal. When on ground, keeps head raised at 45-degree angle. During day, lays at base of small shrubs and grass or under logs and leaf litter. Active and fierce; strikes without hesitation. When threatened, forms body into loops with head and front of body slightly raised and retracted. Flattens itself to ground; may vibrate tail and strike rapidly.

**Venom's effects:**

Primarily hemotoxic. Fatalities rare. Local symptoms include pain and swelling. Severe systemic effects including cardiovascular, neurological, hematic, and renal manifestations reported.

## ***Indian or Spectacled Cobra***

### **Description:**

Adult length usually 1.5 to 2 meters, maximum of 2.4 meters. Heavy-bodied snake. Background color usually dark brown or black to yellowish white above and white or yellowish below. Distinctive markings include spectacle mark on expanded hood, dark spots on flanks of hood's underside, and two or more broad black cross-bands below hood.



### **Habitat:**

Found in a variety of habitats, including flat grasslands, jungles, scattered trees, rice fields and other cultivated areas, and human settlements. Found at sea level and higher elevations.

### **Activity and behavioral patterns:**

Diurnal; most active during evening and early morning. Not generally aggressive. When threatened or cornered, lifts upper body and spreads hood. When biting, holds on and chews savagely. Quick-moving and agile. Lives in holes in embankments, hollows of trees, old termite mounds, ruined buildings, and rock piles. Fond of water. Does not “spit” venom at aggressor.

### **Venom's effects:**

Potent neurotoxin with some hemotoxic properties. May cause severe local pain and swelling immediately following bite; dark discoloration, necrosis, and blistering may be apparent within 72 hours. Early systemic symptoms include headache, nausea, vomiting, dizziness, and a feeling of lassitude, drowsiness, and intoxica-

tion. Neurotoxic symptoms include ptosis, profuse viscid saliva, sagging of the jaw, and inability to open mouth. Death can occur as soon as 15 minutes after bite.

## ***Monocellate Cobra***

### **Description:**

Adult length may exceed 1.5 meters. Color and pattern varies widely. Background color yellow, yellow-tan, brown, greenish brown, olive, or black; may show alternate wide



and narrow transverse dark bands. Dorsal aspect of hood commonly has white annular marking, with black center and rim resembling an eye. May have transverse band with central “eye,” or lack marking altogether. Ventral surface of neck paler or yellowish with broad, dark band.

### **Habitat:**

Resides in virtually all habitats except dense forests; frequently found in cities and villages. Most common cobra in much of Southeast Asia. Shelters in areas such as rock piles, termite mounds, fallen logs, mammal burrows, and building foundations.

### **Activity and behavioral patterns:**

Most active at twilight, but may bask in sun during day. Does not “spit” venom at aggressor.

### **Venom’s effects:**

Potent neurotoxin and cytotoxin. Pain and swelling often followed by blistering and extensive necrosis. Neurotoxic symptoms may include ptosis, drowsiness, dysphagia, dysphonia, and generalized weakness. Reports of mortality high.



## ***Transcaspian or Oxus Cobra***

**No Photograph Available**

### **Description:**

Adult length about 1.8 meters. Background color uniform yellowish, brownish, grayish, or black; may have traces of wide dark crossbands. Belly pale, with two dark bands on neck. There are no markings on the hood.

### **Habitat:**

Prefers rocky, shrub-covered foothills. In some areas, found at elevations above 3,000 meters.

### **Activity and behavioral patterns:**

Diurnal; most active during evening and early morning. Not generally aggressive. When threatened or cornered, lifts upper body and spreads hood. When biting, holds on and chews savagely. Quick-moving and agile. Lives in holes in embankments, hollows of trees, old termite mounds, ruined buildings, and rock piles. Never far from water. Does not “spit” venom at aggressor.

### **Venom’s effects:**

Primarily neurotoxic. May cause severe local pain and swelling immediately following bite. Symptoms such as weakness, drowsiness, and paralysis of the throat may appear less than 1 hour after bite and rapidly progress to respiratory failure and death.

## ***Mountain Pit Viper***

**No Photograph Available**

### **Description:**

Adult length usually 0.6 to 0.8 meter; maximum of 1.1 meters. Relatively thick-set snake. Background color light olive, reddish, or orange-brown; one or two dorsal rows of squarish patches meeting or alternating at vertebral line. Belly pale, spotted with brown. Dark brown or black triangular head, distinct from neck.

**Habitat:**

Inhabits mountains or plateaus from coastal lowlands up to more than 2,000 meters elevation. Found in tea fields, cultivated areas, under shrubs, and among vegetation. Often found near human habitation and sometimes in homes.

**Activity and behavioral patterns:**

Semi-arboreal, but commonly found on forest floor near streams. Sluggish disposition, but ready to bite when irritated.

**Venom's effects:**

Hemotoxic. Reported symptoms include severe local bleeding and swelling, thrombocytopenia, and coagulopathy.

***King Cobra*****Description:**

World's largest venomous snake. Adult length usually 3 to 4 meters; maximum of about 5.5 meters. Background color olive, brown, or greenish yellow, becoming darker on tail. Head scales edged with black. Throat yellow or orange, sometimes with dark markings.



Head scales edged with black. Throat yellow or orange, sometimes with dark markings.

**Habitat:**

Found in open country, cultivated areas, dense or open forests, bamboo thickets, dense mangrove swamps, and hilly jungles. Often found near streams. Range extends from sea level up to 1,800 meters elevation. Species widespread but uncommon.

**Activity and behavioral patterns:**

Diurnal and very active. Primarily terrestrial, but sometimes found in trees and water. Constructs elaborate nest of dead leaves and other decaying vegetation. Unlikely to attack unless provoked. When con-

fronted, expands hood and may rise as high as 1.8 meters. When angry, gives deep resonant hiss similar to growl of small dog. Reports of aggressiveness and unprovoked attacks likely untrue.

**Venom's effects:**

Potent neurotoxin. Severe local pain and tenderness almost immediately following bite. Bites uncommon, but usually severe and may be rapidly fatal.

***False-horned Viper***

**Description:**

Adult length usually 0.5 to 0.7 meter, maximum of 0.9 meter. Background generally pale or bluish gray to khaki; gray or brown-gray blotches or crossbands on back. Alternating faint



spots on throat and body sides. Ventral side white; tail black. Head very broad; distinct from neck. Horn, composed of several overlapping scales, above each eye.

**Habitat:**

Most often found in desert bush. Also found in sandy, rocky terrain, as well as burrows and crevices in elevations of up to 2,000 meters.

**Activity and behavioral patterns:**

Nocturnal. Sluggish, placid, less likely to bite during the day. Dangerously active and aggressive at night. When disturbed, hisses loudly but not particularly vicious. Locomotion characteristically sidewinding. Frequently hides in rodent tunnels and beneath rocks.

**Venom's effects:**

Primarily neurotoxic. May produce a few local symptoms such as minor pain, mild tingling of the local area, stiffness; more serious

bite causes weakness followed by ptosis. Victim may be conscious, but be unable to respond due to paralysis.

### ***Red-necked Keelback***

#### **Description:**

Adult length usually 0.6 to 0.7 meter Background color olive, greenish gray, or greenish brown with indistinct flecks of black and yellow which may appear as a mid-dorsal stripe. Neck and forepart of body vivid red; sides of head yellow, with sub-ocular black streak.



#### **Habitat:**

Brush-covered or grassy fields adjacent to streams, ditches, and paddies.

#### **Activity and behavioral patterns:**

Primarily diurnal and terrestrial. When threatened, rears forepart of body and spreads hood.

#### **Venom's effects:**

Primarily hemotoxic. Bite may be painless with minimal local swelling. Symptoms may include headache, nausea, and vomiting.

### ***Indian Bamboo Pit Viper***

#### **No Photograph Available**

#### **Description:**

Adult length usually 0.6 to 0.8 meter; maximum of 1.1 meters. Background color may be uniform green, with irregular pattern of black flecks, or bronze green. Belly pale white, yellow, or green. Narrow, longitudinal whitish, yellowish, or bluish lateral line. Yellow eye; russet tail.

**Habitat:**

Inhabits bamboo thickets, vine tangles, and dense foliage adjacent to streams and other water sources.

**Activity and behavioral patterns:**

Nocturnal and slow-moving. Arboreal. Usually remains quiet when approached, but often strikes if touched or otherwise threatened.

**Venom's effects:**

Primarily hemotoxic. Local pain and swelling, nausea, vomiting, and fever reported. Deaths rarely, if ever, occur.

***White-lipped Green  
Pit Viper*****Description:**

Adult length usually 0.4 to 0.6 meter; maximum of 0.9 meter. Relatively long thin snake with triangular-shaped head, very distinct from neck. Background color uniformly green,



varying from yellowish green to bright grass green. May have darker crossbands on scales and interstitial skin. Belly pale yellowish white to dark green. Upper lip white or pale green. Entire side of head, below eye, white, pale yellow, or light green. Dorsal surface of tail reddish brown.

**Habitat:**

Prefers open country at low elevations. Frequently found around human habitations and in gardens.

**Activity and behavioral patterns:**

Mainly nocturnal and arboreal; rarely seen on ground except after dark. Relatively slow moving and unaggressive, except when

thoroughly annoyed. However, when defending itself, strikes and bites vigorously.

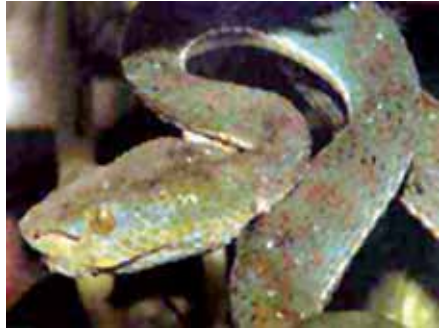
**Venom's effects:**

Primarily hemotoxic. Symptoms may include local pain, swelling, bruising, and tender enlargement of local lymph nodes. Systemic symptoms may include nausea, vomiting, diarrhea, abdominal pain, lethargy, gastrointestinal bleeding, and hematuria. Bites common. Fatalities recorded.

***Red-tailed Green  
Pit Viper***

**Description:**

Adult length usually 0.5 to 0.6 meter; maximum of 1.1 meters; relatively slender snake. Background color leaf-green; belly uniform pale green with yellow tinge. Prehensile



tail usually spotted with brown; looks dry compared to rest of body.

**Habitat:**

Found in lowlands, low hills, orchards, and plantations.

**Activity and behavioral patterns:**

Mostly arboreal; frequently comes to ground.

**Venom's effects:**

Primarily hemotoxic. Symptoms may include local pain, swelling, bruising, and tender enlargement of local lymph nodes. Systemic symptoms may include nausea, vomiting, diarrhea, abdominal pain, lethargy, gastrointestinal bleeding, and hematuria. Bites common. Fatalities recorded.

## ***Large-scaled Pit Viper***

**No Photograph Available**

### **Description:**

Maximum length about 0.6 meter. Background color bright green; belly pale green with whitish or yellowish line along most lateral scale rows.

### **Habitat:**

Found in hill country between 600 and 2,200 meters elevation.

### **Activity and behavioral patterns:**

Arboreal.

### **Venom's effects:**

Hemotoxic. Bites usually followed by intense burning pain at site with swelling extending to affected limb, persisting for 3 or 4 days. No fatalities recorded.

## ***Malabar Rock Pit Viper***

**No Photograph Available**

### **Description:**

Adult length usually 0.7 to 0.8 meter; maximum of 1 meter. Background color variable; greenish, olive-yellow, or brownish above. Darker brown or black blotches or crossbands, separate or confluent with yellowish spots along flanks. Belly yellow, pale green, or whitish.

### **Habitat:**

Found in shrubby, rocky hills at elevations from 600 and 2,200 meters.

### **Activity and behavioral patterns:**

Arboreal.

### **Venom's effects:**

Hemotoxic. Symptoms generally include pain, swelling, and local bleeding. No fatalities recorded.

## ***Chinese Bamboo Pit Viper***

### **Description:**

Adult length usually 0.6 to 0.7 meter; maximum of 1 meter; fairly stout snake. Background color uniform leaf to chartreuse green; no markings except thin white, yellowish white, or



red and white longitudinal stripe along each side of body. Belly pale green; tail rust colored. Distinctive rusty brown or brick red eye, flecked cream color.

### **Habitat:**

Bamboo thickets, bushes, and trees along water courses; found more frequently on hillsides than on level terrain.

### **Activity and behavioral patterns:**

Arboreal and nocturnal. Sluggish. Calm disposition, but strikes quickly if surprised or brushed against while in arboreal shelters. When threatened, may wind into coil and vibrate tail as warning.

### **Venom's effects:**

Primarily hemotoxic. Symptoms include severe local pain, oozing from fang marks, extensive local swelling, bruising, nausea, and vomiting. Fatalities recorded.

## ***Pope's Pit Viper***

### **No Photograph Available**

### **Description:**

Maximum length up to 1.0 meter. Background color uniform green above; lighter green or yellow below. May have indistinct white or yellow below. May have indistinct white or yellow stripe on each



side near abdomen. Tip of tail usually reddish brown. Distinctive triangular head and pointed snout.

**Habitat:**

Most abundant in hilly and mountainous country from 900 to more than 1,500 meters elevation. Commonly found on tea plantations.

**Activity and behavioral patterns:**

Arboreal and largely nocturnal. Generally not aggressive; often permits human intruder to approach closely without striking. When aroused, threatens with open mouth and strikes vigorously and quickly.

**Venom's effects:**

Likely hemotoxic. Little data available. No reliable reports of bites.

***Chinese Habu,  
Taiwanese Pit Viper***



**Description:**

Adult length usually 0.8 to 1 meter; maximum of 1.3 meters. Relatively long, thin snake. Background color light brown or grayish brown; vertebral row of large purplish brown or chocolate-colored spots sometimes edged with yellow line. Lateral row of dark circular blotches. Belly white with brown dots. Large triangular head with dark markings; thin neck. Postocular line to angle of jaw, dark with pale mark above.

**Habitat:**

Open agricultural country and forests up to 1,400 meters elevation. Bamboo forests, shrubs, stream banks, tea fields, and around human dwellings.

**Activity and behavioral patterns:**

Generally nocturnal but may be seen during day. Terrestrial. Generally slow moving. Disposition varies; some vicious and strike

when tormented, others docile and sluggish. Usually will strike when cornered.

**Venom's effects:**

Potent hemotoxin. Bites usually cause severe local pain and swelling which may involve entire affected limb with tender enlargement of regional lymph nodes. Systemic symptoms may include nausea, vomiting, epigastric pain, fever, and shock, which may cause impaired consciousness or generalized convulsions. Peripheral leucocytosis common. Fatalities recorded.

***Mangrove Pit Viper***

**Description:**

Adult length usually 0.7 to 0.8 meter; may exceed 1.0 meter. Background color purplish brown or yellowish brown; may have white line along each side of body. May have series of large brownish saddle-shaped markings with small spots on flanks. Belly whitish.



**Habitat:**

Widely distributed along coastal regions in mangrove and swampy forests. Found most often on offshore islands, but may be found in inland bamboo jungles up to 600 meters elevation.

**Activity and behavioral patterns:**

Primarily terrestrial, but commonly encountered in low bushes. Very aggressive.

**Venom's effects:**

Potent hemotoxin. Envenoming may cause severe local pain, local swelling involving entire affected limb, tender enlargement of local lymph nodes, local necrosis, and incoagulable blood. Bites common. Fatalities recorded.

## Dangerous Invertebrates

### Scorpions

Although several species of scorpions that can inflict a painful sting are present, only the following are capable of inflicting a life-threatening sting:

- *Androctonus australis*
- *Mesobuthus tamulus*

#### Fat-tailed scorpion (*androctonus australis*)

##### Habitat:

Found in dry and desert areas, usually in stony soils, cactus hedges and arid mountainous regions and high plateaus. Also found on steep slopes of drifting sand dunes. Avoids humidity. Often found near human habitations (such as in cracks in walls).



##### Venom's effects:

One of the most potent scorpion venoms in the world. Species causes several deaths each year.

### Spiders

Although there are several spider species found in the region that are capable of inflicting a painful bite, including some very large and physically imposing tarantulas, only *Latrodectus spp.* (widow spiders) are capable of inflicting a life-threatening bite.

### Insects

There is little specific information of medical importance regarding insects. However, nearly all countries have at least one spe-

cies of moth having venomous/urticating hairs and/or whose larva (caterpillar) has venomous spines. Some caterpillars are very hairy (such as puss moths and flannel moths) and almost unrecognizable as caterpillars, with long silky hairs completely covering the shorter venomous spines. Others bear prominent clumps of still, venomous spines on an otherwise smooth body. Contact with these caterpillars can be very painful. Some are brightly colored. Paederus are small (usually 4 to 7 millimeters), slender rove beetles that do not look like typical beetles and have very short wing covers that expose most of their flexible abdomens. When crushed, their body fluid contains an agent that will blister skin on contact. The lesions take about a week to heal and the area remains painful for several weeks. The substance is extremely irritating if it gets into the eyes; temporary blindness has been reported.

### ***Centipedes***

Several species of large centipedes capable of inflicting a painful bite are present, and human fatalities (not fully substantiated) attributed to envenomation by *Scolopendra spp.* have been reported.

### ***Millipedes***

Millipedes do not bite and in general are harmless to humans. However, when handled, some larger millipedes (may be more than 50 centimeters long) secrete a very noxious fluid that can cause severe blistering upon contact; some can squirt this fluid at least 2 feet.



## Dangerous Plants

### ***Yarrow***

#### **Other names:**

Milfoil, Sneezewort,  
Sneezeweed, Nosebleed.

#### **Mechanisms of toxicity:**

Drinking a tea made from the leaves can result in vesicles, bullae, and even ulcers in particularly sensitive individuals.

#### **Comments:**

As many as 85 northern temperate species are included in the genus, yarrow being the best known. Contains alkaloids and are sources of medicinals; widely cultivated as ornamentals.



Millfoil an erect perennial herb with rhizomes, white to pinkish flowers. Named for the hero of legend, Achilles, who was supposed to have used the plant to heal the wounds of his soldiers. Will cause an unpleasant flavor in milk if eaten by dairy cattle.

### ***Blistering Ammania***

#### **No Photograph Available**

#### **Mechanisms of toxicity:**

Found mostly in wet places; has an extremely acrid sap that produces intense pain and blistering on contact with skin.

#### **Comments:**

Often confused with loosestrife plants in the primrose family.

## ***Agave***

### **Common Names:**

Century plant, maguey.

### **Mechanisms of toxicity:**

American species are not edible; some contain saponins, oxalic acid, and others calcium oxalate crystals called raphides.

Sap is irritating.



### **Comments:**

Many species (family has 650 species of tropical and subtropical regions—widely cultivated, thick-stemmed plants with confusing, controversial taxonomy.) Leaves are long and narrow with spiny edges. Uses include cultured ornamentals, medicinals, food sources (cooked in tortillas; heart (bud) is edible, source of pulque (a fermented beverage) or mexal (a type of brandy), used as fiber source (papermaking).

## ***Milky Mangrove***

### **Other names:**

Blinding tree, sinugaga, blind-your-eye, scrub poison tree.

### **No Photograph Available**

### **Mechanisms of toxicity:**

Contains copious, extremely acrid, milky sap with diterpene resin, which can cause damage to the eyes, mucous membranes, and skin of those chopping or sawing its wood.

### **Comments:**

Small evergreen trees that grow to 45 feet with shiny green, leathery leaves and greenish flowers in narrow spikes; native to Indo-Malaysian, Pacific Islands, Australia. Contains large quantities of milky sap.

## ***Wood Nettle***

### **Other names:**

Moroides, stinger, gympie.

### **Mechanisms of toxicity:**

The leaf edges, stems, stalks and fruit-bearing parts have stiff, sharp, stinging hairs—frequently not conspicuous.



On contact the hair tips break and an extremely irritating liquid is injected into the skin. Light contact results in intense burning pain. Poses a serious threat to forestry workers and jungle troops. Death was reported regarding a man who contacted the dried bark.

### **Comments:**

Tends to be particularly thick in areas of regrowth or replanted forests. Chopping or slashing the bushes can produce prolonged sneezing and intense throat irritation. Light contact tends to be more painful than strong contact—described as tingling interspersed with sharp, stabbing pains accompanied by red inflammation with a large flare area.

## ***Cow Parsnip***

### **Other names:**

Wild rhubarb, Giant hogweed, Hogweed.

### **Mechanisms of toxicity:**

Many species within this genus contain furcoumarins; roots and rind have phototoxic sap resulting in acute bullous dermatitis a few hours to two days after contact if then exposed to the sun, followed by pigmentation (may take months to years to disappear).



## ***Mango***

### **Other name:**

Indica.

### **Mechanisms of toxicity:**

The leaves, stem and fruit's skin on this tree contain urushiol and other similar long-chain phenols. Other allergens are also present.



Skin inflammation can occur from eating the fruit with the skin intact. Blisters may be confined to the lips and face, or can be generalized. Climbing the tree can result in severe skin inflammation. There is also immediate hypersensitivity in some individuals. Ensuring the fruit is peeled prior to ingestion can prevent the reaction.

### **Comments:**

Genus includes 35 species, usually large trees, primarily in Indo-Malaysia. Frequently found near human dwellings. These trees grow from 40 to 100 feet, and have lance-shaped leaves. Cultivated varieties have excellent fruit (in some wild-growing plants the fruit is unpleasant) edible raw or cooked. Ground seed is used as a flour; its fruit is used in chutney, pickles, squashes, etc.

## ***Marking Nut Tree***

### **Other names:**

Tar tree, anacardium.

### **No Photograph Available**

### **Mechanisms of toxicity:**

Often occupied by biting ants. Many of the plants have reputations for causing severe contact dermatitis. Anacardium fruit may drip a black, oily resin that hardens like lacquer. The resin can also



produce a severe skin inflammation. Toxic principles are similar to mango tree or poison ivy.

**Comments:**

Tree indigenous to India; used to make a liquid used to mark laundry in India and Malaysia. Fleshy swollen basal parts of the fruits are edible.

***Velvet Bean***

**Other names:**

Cowitch, cowhage, pica-pica, ox eye bean, horse-eye bean.

**Mechanisms of toxicity:**

Many of the species' pods and flowers are covered with irritant hairs (proteolytic enzymes). Can be dangerous if they become embedded in the eye. Beans tend to be foul tasting, even after thorough boiling, so little danger of ingestion exists.



**Comments:**

Many species are widely naturalized.

***Modikka***

**No Photograph Available**

**Mechanisms of toxicity:**

The root is reported to contain prussic acid and a cyanogenic glycoside, which is destroyed by drying. It also contains a toxalbumin called modeccin, which is a protein-synthesis inhibitor. The usual poisoning scenario is that of the root being mistaken for an edible tuber, especially in situations of scarce food. Death has occurred after ingestion of the fruit. Symptoms within one day are mainly due to the hydrocyanic acid; the toxalbumin results in illness a few

days later. Used in India as a “worming” medicine; sap is very irritating. Has been used in Africa to murder.

**Comments:**

Some species have been used in Africa as medicinals (e.g., for malaria and leprosy).

***Panama Tree***

**Other names:**

Castano, tartarum.

**Mechanisms of toxicity:**

Seeds are edible, but pods have internal stiff bristles that easily penetrate skin, causing intense irritation.

**Comments:**

There are 200 tropical species.



***Fish Berry***

**Other name:**

Indian berry.

**No Photograph Available**

**Mechanisms of toxicity:**

Fruit are highly poisonous and contain picrotoxin. Used as a fish poison (the flesh of the fish may also be toxic) and in an ointment to kill lice (dangerous). Malaysian natives use it in arrow poison. Has been used in India as an adulterant to beer to increase the power of intoxication. has resulted in deaths.

**Comments:**

Fish berry has only one species. It is a woody climber native to Indo-Malaysia.

## ***Stinging Nettle***

### **Other names:**

Roman nettle, dog or small nettle.

### **Mechanisms of toxicity:**

Brushing against the plant shears off a protective cap from specialized siliceous stinging hairs, allowing skin



puncture. After puncture, an irritant liquid is released that can contain several pro-inflammatory mediators including alkaloids, histamine, acetylcholine, and 5 hydroxytryptamine. These substances cause the immediate reaction after a nettle sting. The term “urticaria,” describing the characteristic skin eruption, is derived from the genus name. Thought to be a defense against browsing animals; usually does not involve a hypersensitivity reaction. Stinging can persist at the site for more than 12 hours after clinical features of urticaria have disappeared. This persistence of symptoms is due to secondary release of inflammatory mediators, or persistence of implanted hairs.

### **Comments:**

Genus of 30 species, usually perennial, single-stalked herbs less than 0.3 meter (1 foot) in height, found mainly in northern temperate areas. The tender tips are used as a leafy vegetable in some locales; simmering in water renders the stingers ineffective.

## ***Manghas***

### **No Photograph Available**

### **Mechanisms of toxicity:**

The seed contains irritant toxins and cardiac glycosides, which can result in severe purging, even death, if eaten.

**Comments:**

Has a milky sap, formerly used in ordeal poisons and for suicide; also used as a fish poison. Green fruit used in India to kill dogs.

***Belladonna*****Other Name:**

Nightshade.

**Mechanisms of toxicity:**

Berries, leaves, and roots contain tropane alkaloids that can cause death from anticholinergic poisoning.

**Comments:**

Perennial plants to 3 feet high. Native to Eurasia and North Africa.

***Horse Chestnut*****Other name:**

Buckeye.

**Mechanisms of toxicity:**

The saponin aesculin (a hydroxy derivative of coumarin) is found in leaves, bark, and seeds. Some individuals have eaten the ripened nuts after roasting and treating them in lime water (absorption of the toxins is inefficient), but children have died after ingesting the nuts or drinking tea made



from the leaves. Bruised branches used as a fish toxin. Honey made from the flowers is toxic.

**Comments:**

There are 13 species of *Aesculus*; large trees with showy flowers and seed pods, which may be smooth and leathery, or warty. Small to medium trees or shrubs. The brown nuts are held in a spiny green capsule. Bark has been used as a yellow dye.

***Lily of the Valley*****Mechanisms of toxicity:**

Contains more than 20 cardiac glycosides (e.g., convallatoxin). Quickly fatal potential. Has caused death; children are attracted to its pretty flowers and bright berries; poisons have occurred from drinking water from a vase in which flowers were placed. Has been mistaken for wild garlic and made into soup. Used as an arrow poison in Africa.

**Comments:**

Dried roots made into many medicinals, particularly in Russia.

***Freshwater Mangrove*****Other names:**

Putat, bitung, laut.

**No Photograph Available****Mechanisms of toxicity:**

Saponins and hydrocyanide have been isolated from fruit and seeds. Used as fish poisons in many Pacific islands. Fruit contains a triterpenoid saponin, and the seeds are emetic and have been shown to induce hypoglycemia in rodents.

**Comments:**

Large tree found growing along shorelines; have large (20-38 centimeters-long, 10-15 centimeters-wide) non-toothed leaves, white to pink flowers (on individual stalks; square in cross section), and one-seeded fruits (9-13 centimeters-long; square in cross-section). Seeds are crushed and used as fish poison by Australian troops and aborigines.

**Shanshi****Mechanisms of toxicity:**

Contains a number of alkaloids. Causes hallucinogenic effects due to glycosides that have not yet been identified. Has caused death.

**Comments:**

This is a group of deciduous shrubs or small trees with red, yellow, or purple/black berry-like fruit. Has five one-seeded nutlets. Bark used for tanning, crushed fruit as a fly poison. Used in folk remedies.

**Gomboge Tree****No Photograph Available****Mechanisms of toxicity:**

The bark exudate is a drastic purgative. Can be fatal.

**Comments:**

The gum resin is called gomboge; used in lacquers, metal finishes, and watercolors in China since the 13th century. A non-toxic plant; aril is delicious; one of the best tropical fruits; only in Malaysia/Thailand.

## ***Foxglove***

### **Other names:**

Fairy bells, lady's thimbles, lion's mouth, digitalis.

### **Mechanisms of toxicity:**

Entire plant contains irritant saponins and numerous digitalis glycosides.

### **Comments:**

A tall-growing evergreen with hairy leaves and trumpet-shaped flowers. Sucking the base of the flowers for the sweet taste or drinking water from vase in which they were placed has caused many poisonings. Fatalities have also occurred from mistaking the plant for other herbs.



## ***Annual/French Mercury***

### **Other name:**

Dog's Mercury.

### **No Photograph Available**

### **Mechanisms of toxicity:**

Native to Europe; entire plant is toxic. Has been mistaken for edible greens. Emetic and purgative. Has proven fatal.

### **Comments:**

Dye source; carpeting rhizome herb often characteristic of disturbed woodland.

## ***Rattlepod***

### **Other names:**

Rattlebox, rattleweed, chillagoe, horse poison.

### **Mechanisms of toxicity:**

Contains pyrrolizidine alkaloids (monocrotaline, heliotrine, retosine); can kill. Low-level ingestions can cause lung damage; high levels will damage

the liver. Some species have caused toxicity through the contamination of flour or when incorporated in teas.

### **Comments:**

The fruits are inflated dehiscent legumes (pods) with parchment-like walls; the ripe seeds come loose within the pods and rattle when shaken. The flowers are pea-like. Found in open woods, roadsides, margins, sandy soils, and fields.



## ***Bulb Yam***

### **Other Names:**

Air potato, wild yam.

### **Mechanisms of Toxicity:**

Bulb yam, air potato, and wild yam have tubers that contain diosgenin, a steroidal saponin, the alkaloid dioscorine, and a norditerpene lactone (diosbulbine). They and some other yams are poisonous when eaten raw.





Causes gastroenteritis (nausea, bloody diarrhea). Some individuals eat them after special preparation. Has been used to commit murder. Found mainly in the lowlands.

**Comments:**

A prickly climber with a cluster of tubers just below the soil surface. Considered the chief “famine-food” of the tropical East. Poisonous unless properly prepared. Other species of this genus are good to eat with no special preparation, such as goa yam and buck yam.

***Chinaberry***

**Other names:**

White cedar, African lilac, bead tree.

**Mechanisms of toxicity:**

Yellow globose berry with three to five smooth, black, ellipsoidal seeds; has a resin; all parts have a saponin, triterpene neurotoxins, and a gastrointestinal irritant of uncertain chemical nature. Widely varying genetic variable toxicity. Has killed adults.



Widely varying genetic variable toxicity. Has killed adults.

**Comments:**

Widely cultivated.

***Snake’s Head***

**Other names:**

Guinea flower, Crown imperial.

**No Photograph Available**

**Mechanisms of toxicity:**

Many contain veratrum alkaloids, used in some areas as medicinals.

**Comments:**

This genus has 100 species from western Europe and the Mediterranean to eastern Asia, but only a few have been clearly implicated as source of skin inflammation.

***Opium Poppy*****Mechanisms of toxicity:**

Fruit is toxic. A crude milky resin exudes when unripe seed capsules are cut. Eating the unripe fruit has killed. Is the source of opium (lethal dose estimated at 0.2 grams).

**Comments:**

Large annual herbs, rarely shrubs, with milky or watery sap. Fruit is a capsule or a nut. Approximately 45 genera, 700 species, mostly distributed in the northern subtropic and temperate areas.

***Scarlet Wisteria*****Other names:**

Corkwood tree, bagpod, purple sesbane, false poinciana, rattlebush.

**Mechanisms of toxicity:**

All parts are poisonous; most poisonings due to use in herbal teas. Causes



Budd-Chiari syndrome. Seeds contain saponins. Up to 24 hours after ingestion, nausea and vomiting occur, with abdominal pain, abnormal accumulation of serous fluid in the abdominal cavity,

abnormal enlargement of the spleen, severe diarrhea, hemolysis (red blood cell destruction), respiratory failure, and death.

**Comments:**

Deciduous shrub or small tree with drooping, red-orange flowers in axillary clusters; June-September. Fruit is a legume with partitions between seeds. Native to South America.

**Coca**

**Mechanisms of toxicity:**

Natives of the Peru-Bolivia region chew the leaf for its stimulating effect. The source of cocaine.

**Comments:**

Growth is markedly affected by the environment, especially temperature. Fruit is bright red, pointed, succulent. Found in the upland soils of tropical South America, cultivated in the lowlands of various tropical areas.



**Sasswood**

**Other names:**

Ordealtree, mancona bark, ironwood, camel poison, black bean, Cooktown ironwood.

**No Photograph Available**

**Mechanisms of toxicity:**

Extremely poisonous; the two main species have similar toxicities. Alkaloids of esters and amides of cinnamic acid have been isolated. Most of the alkaloids are esters of diterpenoid carboxylic

acids including cardiotoxic alkaloids. Powerful analgesic to the mucous membranes.

**Comments:**

A fish poison.

***Black Henbane***

**Other names:**

Insane root, fetid nightshade.

**Mechanisms of toxicity:**

Old well-known medicinal and deadly poison (hyoscyamine, atropine) with many uses in many cultures. Tropicine alkaloids in the seeds (in a pod); has resulted in death; dermatitis (low risk).



**Comments:**

Erect, hairy annual with coarse, hairy stems 1-5 feet tall, native to Europe. Found in “weed communities” along roadsides on nutrient-rich sandy soils and loam. Dusky yellow flowers with violet veins. Fruits are capsules containing many black seeds (can be confused with the poppy plant seeds).

***Black Nightshade***

**Other names:**

Deadly nightshade, common nightshade, horse nettle, bit-tersweet, Jerusalem cherry, nipple fruit, quena, wild tomato, apple of Sodom, white-edged nightshade.



**Mechanisms of toxicity:**

The fruit of the Jerusalem cherry is a black berry; the fully ripe berries are eaten; unripe berries contain solanine alkaloids, which can cause gastroenteritis, weakness, circulatory depression. Can kill.

**Comments:**

Approximately 2,000 species of herbs, vines, shrubs covered with small star-shaped hairs. Perfect white, yellow, or blue flowers. Berries have dry or juicy pulp and several seeds.

***Spindle Tree*****Other names:**

Burning bush, Wahoo.

**Mechanisms of toxicity:**

Spindle tree is the most toxic member of the genus. The flowers are yellow-green; the attractive pink (or orange-red) drupes are enticing but have phyllorhodin, several cardiac glycosides, and other unknown substances as the toxic principles, which result in symptoms 10-12 hours after ingestion — bloody diarrhea, nausea and vomiting, fever, hallucinations, induces sleep, eventual coma, and seizures.

**Comments:**

Deciduous or evergreen shrubs or trees; fruit a 3 to 5-valved, brightly colored capsule dehiscent to expose bird-dispersed to scarlet to orange seeds. Until further data is available, the other species of this group should be considered toxic.

## ***Balsam Apple***

### **Other names:**

Leprosy gourd, bitter gourd, cucumber gourd.

### **Mechanisms of toxicity:**

Seeds and outer rind of ripe fruit contain a toxalbumin called momordin; the ripe fruit also has an hypoglycemic agent. Small amounts

cause headache, flushing, salivation, dilated pupils, vomiting, diarrhea, abdominal pain. Can kill.

### **Comments:**

A slender vine with small yellow flowers. Fruits have a rough outer rind, variable shape but like a gourd, usually yellowish with reddish pulp.



## ***May Apple***

### **Other name:**

American mandrake.

### **Mechanisms of toxicity:**

A dangerous plant used in many folk-remedies. The podophyllin resin is in all parts; the rootstock, leaves, and unripe fruit contain

the toxin podophylloresin (purgative), the glycoside podophyllo-toxin (a lignan), and the antimitotic peltatin. All parts are poisonous except the ripe fruit, which is edible. Ingestion results in vomiting and severe diarrhea; fatalities have resulted from repeated ingestion or topical application of an extract of the rootstock. Was used by Native Americans for suicide.



**Comments:**

Found in east Asia, the Himalayas, and North America. Historically used by many cultures as a medicinal.

**Hellebore****Other names:**

White/false hellebore, skunk cabbage, corn lily, black hellebore, American hellebore, false hellebore, Indian poke, pepper-root.

**Mechanism of toxicity:**

All plant parts are toxic, containing steroidal alkaloids. Severe systemic effects are caused by the protoverine alkaloids, teratogenic effects by jervine alkaloids. On taking a toxic dose, a burning pain is felt in the mouth followed by roughness and dryness, nausea



and severe vomiting, and a feeling of cold as body temperature drops. Severe cases cause respiratory difficulties, arrhythmias, lowered blood pressure, and collapse. Victim remains fully conscious until death, which may occur in as little as three hours.

**Comments:**

Genus includes 45 species found in wet areas in northern temperate zones, usually growing as a tall, perennial, rhizomatous herb. It is frequently cultured as an ornamental, with white, green, brown or purplish flowers.

## ***Heliotrope***

### **Other names:**

Cherry pie, scorpion's tail, Indian heliotrope.

### **Mechanisms of toxicity:**

Contains pyrrolizidine alkaloids. Cause of large epidemics (Afghanistan, India) of illness following ingestion of bread made with flour contaminated with members of this genus. The pathologic effects (Budd-Chiari syndrome) take weeks to months, and death comes slowly over years. Chronic copper poisoning has occurred associated with this plant.



### **Comments:**

A large genus of worldwide distribution (250 tropical and temperate trees and shrubs).

## ***Coffeeberry***

### **Other names:**

Alder buckthorn, common buckthorn, cascara.

### **Mechanisms of toxicity:**

The fresh bark is recognized as a particularly strong laxative. There are reports of deaths in children after ingesting buckthorn berries.





**Comments:**

Cascara bark is source of American cascara. Of low relative toxicity, requires chronic use to result in chronic diarrhea and/or melanin pigmentation of the mucous membranes of the colon. Freshly prepared cascara products contain anthrones and can lead to severe vomiting and intestinal cramping. The bark should be stored for at least a year before use or detoxified by heating (in air) to reduce the presence of anthrones.

**English Yew****Other names:**

Ground hemlock, American yew, Japanese yew.

**Mechanisms of toxicity:**

Taxine A and B, classed as steroid alkaloids, are present in all plant parts except the aril. A single chewed



seed is deadly. An hour after ingestion, nausea, dizziness, and abdominal pain begin. This is followed by reddening of the lips, dilatation of the pupils, shallow breathing, tachycardia, and coma. Then the pulse slows, blood pressure drops, and death occurs through respiratory paralysis. No proven treatment exists. Emptying the stomach hours after ingestion may be helpful as leaves may not pass through the GI tract expeditiously. Various clinical measures (circulatory stimulants, artificial respiration, cardiac pacemaker) have not prevented death in suicide cases.

**Comments:**

An evergreen shrub or small tree bearing a characteristic fleshy, red, sweet-tasting aril with a single green to black, partly exposed, hard-shelled seed within. In North America, the Japanese yew, the toxicity

of which may exceed that of the English yew, has repeatedly caused fatal animal poisonings. Was once known as the “tree of death.”

## ***Strychnine***

### **Other names:**

Nuxvomica tree,  
Snakewood tree.

### **Mechanisms of toxicity:**

The entire plant, including the seeds, contains the powerfully acting indole alkaloid strychnine, which can kill.



### **Comments:**

Genus of 190 different species of trees, shrubs and vines with berry-like fruits, found in most tropical regions. Some have the reputation of having edible fruit despite dangerous seeds. It is a source of curare obtained by stripping and macerating its bark. Curare, now used as a muscle relaxant, was formerly used as an arrow poison by South American Indians.

## ***Pokeweed***

### **Other names:**

Pokeberry, poke salet.

### **Mechanisms of toxicity:**

Mature stems, roots, and berries are poison (saponins mostly in foliage and roots). Death possible when not prepared properly.



**Comments:**

Young shoot tips, less than 6 inches, are eaten in many cultures, including Canada; requires proper preparation (boiled with water changes; water contains toxic substances—kills snails that carry bilharzia). Dye from berries used to color ink, wine, sweets.

***Burn Bean*****Other names:**

Colorines, mescal bean, red hots, necklace pod sophora, silver-bush, pagoda tree.

**No Photograph Available****Mechanisms of toxicity:**

Dark to bright red beans in woody pods are hallucinogenic; used by American Indians before peyote was discovered. Seeds and flowers are very poisonous, causing convulsions; has caused death. One seed can kill a child. Cytisine acts much like a nicotinic ganglionic stimulation agent.

**Comments:**

Fruit is source of a yellow dye. Dried flowers are sold as medicinal in Indonesia; used for bleeding problems.



















