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Overview of the Indian Market for US Wood Products

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EXECUTIVE SUMMARY

The economic liberalization policies initiated in 1991 have led India along the path of increased economic growth and greater macroeconomic stability. Real GDP growth averaged 6% over the period 1997-2001, exceeded 8% from 2002-2005 and is projected to be about 9.2% in 2006. This rapid economic growth has been supported by a loosening of trade restrictions which have contributed to a rapid increase in both imports and exports. Between 2000 and 2005, imports increased from \$US50 billion to \$US149 billion while exports increased from \$US36 billion to \$US103 billion. Future economic growth may be tempered by rising inflation, which is projected to be almost 7% in 2006, and rapidly increasing wage rates for skilled labor. For example, food price inflation rose by 10% in 2006. In addition, poor infrastructure (especially roads, ports and electrical power distribution), restrictive labor laws and poor quality public services (especially in education and health) also pose serious challenges to continued high levels of economic growth in India. It is estimated that almost 40% of India's fruit and vegetable harvest rots before reaching market due to inadequacies in the transportation and electrical distribution infrastructure. India will continue the process of opening its economy due to the fact that it must create on the order of 15 million new jobs every year simply to provide employment for young people entering the job market. However, future economic growth is dependent on reducing (and eventually eliminating) subsidies and providing improvements in the road and electrical distribution infrastructure, particularly in the rural areas of India.

The forest cover in India is estimated to be 637,293 km²; 19.4% of the total land area. India's forests are mostly state owned; only 10% of the forests are classified as community or private forests. A recent survey by domestic and international organizations revealed a moderate increase in India's forest cover. Forest plantations play a very important role as a source of raw material to the domestic wood-based industry. Since adopting the National Forest Policy of 1988 (NFP), there has been a ban on the felling of trees in all forests located above an altitude of 1,000 meters. In addition, high priority has been given for planting fuelwood and deciduous fodder producing trees in government forests. Finally, industrial wood production was restricted to farms and wastelands. As a result, there was a drastic reduction in timber harvest volumes as a number of states stopped timber harvesting and a ban was announced on all harvest operations in the national parks and protected sanctuaries.

The NFP emphasized meeting the fuelwood, fodder and small timber needs of local communities rather than the raw material requirements of the wood-based industry. It should be noted that even before the NFP was implemented in 1988, the existing forest policy was more conservation oriented than industry oriented. The raw material crisis for the wood-based industries became more acute following the adoption of the NFP. As a result, the forest-based industries have had to increase their dependence on private forests and bamboo from natural forests (bamboo harvesting from natural forests is permitted) for their raw material supply. Though large reforestation programs were proposed in conjunction with the NFP budget, constraints prevented the forestry department from meeting the reforestation targets. To meet the community demand for fuelwood, small timber plantations were designed which provided timber products that were less useful for industry. In order to improve the availability of raw materials, the NFP proposed the liberalization of log, chips and pulp imports.

The Indian forest products industry, both the wood products sector and the paper and paperboard sector, have been constrained by severe raw materials shortages. This raw material shortage for the forest products industry has been further accentuated as a result of a Supreme Court ruling limiting the felling and movement of timber within the country. In an effort to alleviate the raw material shortage, the forest products industry is increasingly relying on imported logs, chips, wood pulp and waste paper. Hence, for the wood-based industries, imports have become a very important component of their raw material mix.

The graduated structure of tariffs applied on wood product imports clearly indicates that the Indian government encourages the import of unprocessed lumber that can be used by the wood-based industries as raw material inputs. Higher tariff rates are imposed on imported finished and value added products to protect the less efficient domestic manufacturers from international competition. In addition to the basic import tariffs, India also imposes duties such as surcharges, additional customs duties and special additional duties. Other additional levies can be imposed on imported wood products depending on the nature of the product. These additional levies include countervailing duties, anti-dumping duties and safeguard duties. Other non-tariff barriers include state taxes, which can be as high as 18% of the value of imports and various port of entry restrictions which might add up to a large mark-up on

imported items. Such tariff and non-tariff barriers by the government make imported products less competitive in India. Over the past decade the tariff rates and the non tariff barriers have been reduced dramatically and India has started importing large volumes of forest products.

Indian trade in forest products has increased tremendously over the period 1999-2005. This is in response to both the decline in the domestic timber harvest as well as the increased demand for wood products within the domestic wood processing industry. Over the period 2000-2005 Indian exports of wood products jumped from \$US30 million to \$US99 million, a 230% increase. In contrast, imports of wood products went from \$US528 million to \$US957 million, an 82% increase over the same period. As a result, India saw its balance of trade in wood products worsen from \$US498 in 2000 to \$US858 million in 2005. It is important to note that over 88% of India's wood imports were logs, primarily from Malaysia and Myanmar.

Housing has long been neglected in India's national 5-year plans. The unfulfilled demand for housing was estimated to be approximately 50 million units in 2001 and was projected to be increasing at a steady rate. This housing shortage stems from a lack of government funding and the inadequacy of financial institutions, coupled with an increase in building material, labor and land costs. In the tenth five-year plan, from 2002 – 2007 special emphasis has been given to the housing sector and some state governments have announced a target of achieving "shelter for all" by 2012. Efforts have also been made to reform the allied institutions in an attempt to provide support to the housing sector. The government is beginning to view the housing sector as a very important driver of economic expansion and increased employment. These new initiatives by the government and the huge latent demand for housing, coupled with an expanding economy, should result in higher housing starts in the country over the next decade.

The middle class population in India, which is almost the size of the US population, is becoming more exposed to the western life-style and is showing an interest in western style doors, windows and kitchen cabinets. India has a centuries old tradition of wood use, particularly for interior design and furniture. Although structural wood is rarely used for construction, outside observers have noted that India uses more interior wood than Japan. Recent estimates suggest that the market for high end imported value-added wood products is increasing steadily as a result of continuing economic prosperity in India. This represents one of the largest emerging markets for value-added wood products in the world. New residential construction, primarily multifamily units, are increasingly going to standardized sizes for doors, windows, and interior fittings. This has led to an increased demand for imported doors, windows and cabinets. The total annual demand for furniture in India is estimated to be \$US1.25 billion of which 90% is for wooden furniture. The market for branded (higher quality) wooden furniture is estimated to be \$US37 million and growing at an annual rate of 15%.

Imports of wood products into India have been growing rapidly, although the demand for wood products is heavily skewed towards raw materials such as logs, chips and pulp. While the middle class in India is growing and becoming more open towards using imported value-added wood products, much work needs to be done to take advantage of this demand. For example, India must accelerate their rationalization of import tariffs and remove those non-tariff barriers designed to protect inefficient domestic manufacturers from international competition. This will not only ensure compliance with their WTO obligations but will also force the domestic processing industry to invest in more efficient processing technologies. In addition, there remain long-term opportunities to introduce North-American wood frame construction technology in India. The combination of a severe housing shortage and interest in developing energy efficient housing both provide impetus for working to gain acceptance for wood frame construction. However, in order to achieve the successful introduction and adoption of wood frame construction it is important that the US government and industry associations work with the Indian government to develop and adopt wood frame building codes. Finally, acceptance of wood frame construction technology is dependent on increasing the familiarity and understanding of this construction technology within the architect and construction communities. A key element to gaining this acceptance could be in educating architects and residential builders on the superior environmental performance and energy efficiency of North-American wood frame construction technology.

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1. GENERAL COUNTRY INFORMATION

1.1 BACKGROUND

India's history dates back at least 5,000 years to the Indus Valley civilization, one of the oldest in the world. A meeting ground between the East and the West, India has always been an invader's paradise. Early invaders intermingling with the inhabitants in the country, along with its natural isolation, resulted in India's unique culture. The first group to invade India was a tribe known as the Aryans in about 1500 BC. The Aryans brought with them strong cultural traditions that still remain today. They spoke and wrote in a language called Sanskrit. Though warriors and conquerors, the Aryans settled alongside the Indus River, introducing the caste system and establishing the basis of the Indian religions. The second great invasion into India occurred around 500 B.C. by the Persians; followed by the Greeks led by Alexander the Great in 326 B.C. During the next 500 years major progress took place in the Hindu religion and culture, with epics like Mahabharata and Ramayana being composed. This period also experienced major advancements in the arts and literature in the areas of poetry, songs, drama and temple architecture. During this time invasions from the north by various central Asian tribes continued. Local Hindu kingdoms survived most of these depredations, living out their own sagas of conquest and collapse. All the while, these local dynasties built upon the roots of a culture well established since the time of the first invaders, the Aryans. From 711 onwards, invasions by Muslim rulers from central Asia led to the political dominance of Muslims in North India and the introduction of Persian culture and Islamic religion into South Asia. In the year 1192 Turko-Afghan chieftains established the sultanate at Delhi and dominated most of northern India. This period also witnessed the rise of the Hindu empire in the south independent of Muslim rulers. In the year 1526 the Afghan prince Babur established the Mughal (Persian for Mongol) dynasty in India. During the period of 1526 to 1858 the Mughal Empire unified the Northern and parts of Southern India under its rule. The seventeenth century also experienced the establishment of trading outposts in India by the Dutch (1609), English (1612) and French (1674). By 1700 the Mughal dynasty began showing signs of weakness and at this time the indigenous regional powers like the Sikhs in Punjab, Rajputs in Rajasthan and Marathas in West India became very powerful. By 1800 the power in the country had become more fragmented, providing a golden opportunity for the British to adopt a divide and conquer strategy based on the enmity between the rulers of neighboring kingdoms. In the late 18th century the British invaded India from the east and by the early 19th century Britain had assumed political control of virtually all India. For the next 150 years India was introduced to western culture, language, methods of government, and technology. (India Profile, Infoplease 2005)

A number of violent and nonviolent movements against British colonialism started gathering momentum at the beginning of the 20th century, posing a significant threat to the British Government in India. These separatist movements led to the subcontinent being divided into the secular state of India and the smaller Muslim state of Pakistan on the 14th of August, 1947. India gained her independence on August 15, 1947 and was declared a sovereign Republic on the January 26, 1950. The first general election was held in 1952 leading to recognition of India as the largest democracy in the world. Fundamental concerns in India include the ongoing dispute with Pakistan over Kashmir, massive overpopulation, widespread environmental degradation, extensive poverty, and ethnic and religious strife.

India is a sovereign, socialist, democratic republic. The Constitution is federal in structure and lays down the division of power between the federal government and the 28 States and 7 centrally administered Union Territories. New Delhi is the capital of the Republic. There is universal adult suffrage and the electoral process is well developed, with elections held at all levels, down to individual villages. General elections are normally held once every 5 years. The executive body of India consists of the President, Vice-President and Council of Ministers led by the Prime Minister. The President is elected indirectly by the national and State legislatures and is the head of State. The president can be elected for a maximum of two terms of five years each. As per the constitution of India the president is the executive head of the state. However, the Council of Ministers exercises functional executive power and the Prime Minister is at the helm of it. The Prime Minister is the head of Government and is elected by the Legislative system that is controlled by the parliament which consists of two houses known as Rajya Sabha (Council of States) and Lok Sabha (House of the People). India follows a parliamentary system, where the Prime Minister is the leader of the party that gain majority in Lok Sabha of the Indian Parliament. The Prime Minister is practically the most powerful person in the government of India. The President's duties being mostly ceremonial, the Prime Minister is effectively responsible for the government. The Judiciary system is independent of the executive and legislative branches of Government.

1.2 GEOGRAPHY

The Republic of India occupies most of the subcontinent of India in south Asia (Fig 1). It borders Pakistan to the west, Nepal and Bhutan to the north, China to the northeast, and Burma and Bangladesh to the east. India also includes several groups of islands—the Lakshadweep (14 islands) in the Arabian Sea, the Andaman (204 islands) and the Nicobar (19 islands) in the Bay of Bengal. India lies entirely in the northern hemisphere and the mainland extends between latitudes 8 deg. 4' and 37 deg. 6' north and longitudes 68 deg. 7' and 97 deg. 25' east. India measures about 1,997 miles (3,214 km) from north to south between the extreme latitudes and about 1,823 miles (2,933 km) from east to west between the extreme longitudes. India covers an area of 1,269,219 sq miles (3,287,263 sq km), approximately one-third of the area of the United States, and is the world's seventh largest country by area. With a border of 9,445 miles, India supports 16% of the world's population on 2.3% of the world's land area.



Figure 1: Political map of India

Source: Washington, D.C.: Central Intelligence Agency, 2001

1.2.1 General Topography

The Indian mainland is broadly divided into four geographical regions: the Northern Mountains, the Indo-Gangetic (Great) plains, the Southern (Deccan) Peninsula bounded on either side by the Western and Eastern Ghats, and the coastal plains and islands (Fig 2). From Table 1 we can see that the Deccan plateau represents 50% of India's landmass. The Great Plains, which comprise 22% of the country's landmass, is very densely populated.

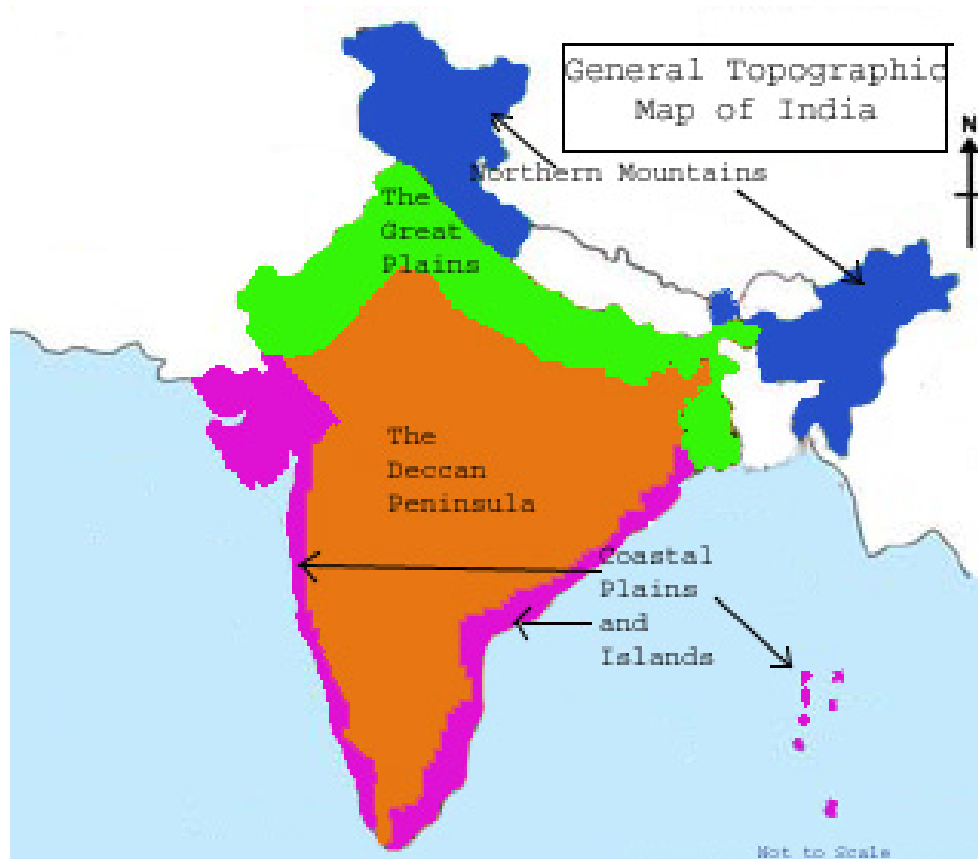


Figure 2: General topographic map of India

Table 1: Profile of the main topographical zones of India, 1991

Topographic Zone	Area	
	Sq miles	%
Northern Mountains	124,386	10.5
The Great Plains	282,223	22.2
The Deccan Plateau	588,914	49.8
The Coastal Plains & Islands	187,891	15.4

Source: Census of India, 1991

Northern Mountains

The Himalayan Range borders the entire northern part of India. The word "Himalaya" is a Sanskrit word meaning "abode of snow". Within the Himalayan range are the eleven states of Jammu and Kashmir (J&K), Himachal

Pradesh (H.P.), Uttarakhand, Sikkim, part of Assam, and the North-Eastern States of Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura and Meghalaya. The Himalayan mountain range stands as a physical barrier separating India from China and much of Asia. It is the highest mountain range in the world and the tallest peak in the Indian Himalayas is Kanchenjunga with a height of 28,208 feet. The Himalayas exert a major influence over the climate of India, acting as a barrier to the cold northern winds from China while directing the southern monsoon winds. The Himalayas contain cold arid deserts as well as fertile valleys within their confines.

The Great Plains

Just south of the Himalayas is the Indo-Gangetic Plain which lies between the Indus and Ganges rivers, often referred to as the Great Plains. The Indo-Gangetic Plain is the river basin of three distinct river systems - the Indus, the Ganga (Ganges) and the Brahmaputra. The Great Plains extend from Rajasthan in the West to the Brahmaputra valley in the East. The agricultural states located in the Great Plains are Punjab and Haryana. The Union Territory of Chandigarh and Delhi are also entirely located in the Great Plains. In addition, major parts of Uttar Pradesh, Bihar, West Bengal, and Assam also lie in the Great Plains. The Great Plains comprise one of the world's greatest stretches of flat and deep alluvium. For obvious reasons this is the most densely populated area in India and indeed in the world. On the northwestern end of the Indo-Gangetic Plains is the Thar Desert, which defines the western edge of the Great Plains. The Thar Desert, also known as the Great Indian Desert, covers an area of about 446,000 square kilometers (km²) and includes two states in Pakistan.

The Deccan Peninsula

The Deccan Peninsula with an area of 1.5 million km² comprises the largest region of India. The whole of the southern region of India is located within the Deccan Peninsula. The states that are located within the Deccan Peninsula include Tamilnadu, Karnataka, Andhra Pradesh, Chattisgarh and Kerala. In addition, substantial portions of Madhya Pradesh, Bihar, Orissa and West Bengal fall within the Deccan Peninsula. The population density is 202 persons per square kilometer and the urban population in this part of India is greater than the rural population. A series of mountain and hill ranges separate the Peninsula from the Great Plains to the north.

The Coastal Plains and Islands:

The Coastal Plains border the Deccan Peninsula on two sides and are separated from the Deccan peninsula by the Western Ghats and the Eastern Ghats. The western coastal plain faces the Arabian Sea, whereas the eastern coastal plain faces the Bay of Bengal. The Coastal Plains on the eastern side of the Deccan Peninsula are wider than those located to the west. The population density in the coastal plains is very high, especially in these areas located around the large river deltas that serve as the centers of human settlement. In the Coastal Plains, the main rains occur from October to December, and are often associated with cyclones or tropical storms that develop in the Bay of Bengal. The coastal plains are used for a variety of agricultural and forestry purposes. India also has three groups of offshore islands including the Andaman and Nicobar Islands, the Lakshadweep Islands and Sriharikota Island. The Andaman and Nicobar Islands comprise a group of 204 islands in the Bay of Bengal located about 540 km from the mainland. The length of the Andaman and Nicobar Island chain is 352 km with a land area of 6496 km². Lakshadweep is a much smaller archipelago located in the Arabian Sea southwest of India. Sriharikota is a small island off the coast of Andhrapradesh, in the Bay of Bengal, known for the Sriharikota Space Center, which is under the jurisdiction of the Indian Space Research Organization.

1.3 CLIMATE

The Himalayas isolate South Asia from the rest of Asia. South of these mountains the climate, like the terrain, is highly diverse. This region is marked by very abrupt weather conditions and intense changes in conditions, with monsoon rains, sudden flooding, rapid erosion, extremes of temperature, tropical storms, and unpredictable fluctuations in rainfall occurring. Though the seasons do not occur uniformly across India, the Indian Meteorological Service divides the year into four seasons: the relatively dry, cool winter from December through February; the dry, hot summer from March through May; the southwest monsoon from June through September when the predominant southwest maritime winds bring rains to most of the country; and the northeast (or retreating) monsoon of October and November. Though India is generally considered to be a tropical country, a broad range of climatic conditions ranging from hot deserts to cold deserts exist.

India's rainfall is dominated by the monsoons, which account for almost 80% of the total rainfall that India receives

over a normal year. The amount of rainfall varies significantly across the country. The northwest of India experiences the highest amount of rainfall, with the wettest parts receiving as much as 9,000 millimeters of rain per year. In contrast, the desert area of the northwestern region (Rajasthan) is the driest area in India receiving just 100 millimeters of rain annually (www.indiachild.com, MoEF, GoI 2002). This difference in rainfall within a single region affirms the hugely diverse nature of weather patterns that occur within India.

1.4 LAND - SOILS

The main types of soils that commonly occur in India are: red soils, laterites and lateritic soils, black soils, alluvial soils, forest and hill soils, desert soils, saline and alkaline soils and peaty and marshy soils. India's soil spectrum is locality specific. Alluvial and black soils are considered to be the two most important soil types for agriculture. The Indo-Gangetic Plain is rich in alluvial soil, comprising almost 78 million hectares (28%) of the Indo-Gangetic Plain. These soils are very good for the production of wheat, rice, pulses, oil seeds, potatoes, sugarcane, and various other cereal and cash crops.

The second most important and widely occurring soil type is black soil (also known as black cotton soil) which covers almost 19% of India's land area (51.8 million hectares). This type of soil is mostly found in the western part of India and some parts of southern India. The characteristics of black soils include high plasticity and stickiness. As the name suggests this type of soil is ideal for the cultivation of cotton. The other crops that are suitable for cultivation in black soil include cereals, pulses, oil seeds, citrus fruits and vegetables.

Another 19% of India's land surface consists of red soil. This kind of soil is found in the southern, central and the eastern part of India. Red soil is best suited for rice, millet, tobacco and vegetable cultivation. The peaty and marshy and the saline and alkaline soils are potentially arable, but are not as productive as the previously described categories of soils. The laterite, desert soils and forest and hill soils are not at all suitable for cultivation. Laterite and lateritic soils cover 12.6 million hectares of India while desert soil covers approximately 37 million hectares.

1.5 DEMOGRAPHICS

India was the second country to cross the billion population mark. As of March 1, 2001 the population of India stood at 1,027,015,247 comprising of 531,277,078 males and 495,738,169 females. The 2003-2004 officially reported population of India, as per the "National Accounts Report 2005, CSO, GoI", was 1,073 million. India added about 181 million persons between 1991 and 2001, which is more than the population of Brazil, the fifth most populous country in the world. India's share of the world population is 16.7 percent. The percentage decadal growth of the country as a whole has declined from 23.86% during 1981-1991 to 21.34% during 1991-2001 (Census of India 2003). This indicates that during the last decade the population of India has grown by 2.13% per annum. India supports the second largest population on just 2.3% of the world's land area. With India registering a population growth rate (1.9%) higher than that of China (1.4%), statisticians estimate that the Indian population will overtake China's by the year 2050.

Of the 28 Indian states, just five (Uttar Pradesh, Maharashtra, Bihar, West Bengal and Andhra Pradesh), contain half of the country's population (Table 2). Uttar Pradesh continues to be the most populous state in the country with 16.2% of India's population followed by Maharashtra (9.4%) and Bihar (8.1%). The population of Uttar Pradesh with 166.1 million people is estimated to be more than the entire population of Pakistan (Census of India 2003).

Table 2: Distributions of area, population and forest cover

India/State/Ut	Area (sq. km)	Population	Density (per sq. km)	Actual Forest Cover %
India	3,287,263	1,028,610,328	313	19.39
Andaman & Nicobar Islands	8,249	356,152	43	92.21
Andhra Pradesh	275,068	76,210,007	277	16.08
Arunachal Pradesh	83,743	1,097,968	13	82.21
Assam	78,438	26,655,528	340	30.2
Bihar*	173,877	109,944,338	632	15.23
Chandigarh	114	900,635	7900	6.14
Dadra & Nagar Haveli	491	220,490	449	41.14
Daman & Diu	112	158,204	1413	2.68
Delhi	1,483	13,850,507	9340	5.93
Goa	3,702	1,347,668	364	33.79
Gujarat	196,024	50,671,017	258	6.61
Haryana	44,212	21,144,564	478	2.18
Himachal Pradesh	55,673	6,077,900	109	23.5
Jammu & Kashmir	222,235	10,143,700	46	9.2
Karnataka	191,791	52,850,562	276	16.93
Kerala	38,863	31,841,374	819	26.56
Lakshadweep	32	60,650	1895	0
Madhya Pradesh*	443,446	81,181,826	183	29.73
Maharashtra	307,690	96,878,627	315	15.17
Manipur	22,327	2,166,788	97	77.86
Meghalaya	22,429	2,318,822	103	69.7
Mizoram	21,081	888,573	42	86.99
Nagaland	16,579	1,990,036	120	85.43
Orissa	155,707	36,804,660	236	30.21
Pondicherry	493	974,345	1976	
Punjab	50,362	24,358,999	484	2.8
Rajasthan	342,239	56,507,188	165	4.05
Sikkim	7,096	540,851	76	43.94
Tamil Nadu	130,058	62,405,679	480	13.13
Tripura	10,486	3,199,203	305	54.79
Uttar Pradesh*	294,411	174,687,270	593	11.55
West Bengal	88,752	80,176,197	903	9.42

Source: Primary Census Abstract : Census of India 2001 and Forestry Statistics of India 2001

* Population and area of newly formed states included

1.6 LAND USE

The government of India has classified India into eight land divisions based on usage. These are (i) forests, (ii) land not available for cultivation, (iii) permanent pasture & grazing land, (iv) land under miscellaneous tree crops & groves, (v) cultivable wasteland, (vi) fallow land & other than current fallows, (vii) current fallows and (viii) net area of land sown. The total area of the country is 328.7 million ha¹, although the reported area for land utilization is 304.9 million hectare. As we can see in table 3 the mainstay of approximately two-thirds of India's population is agriculture. The second most predominant land use designation is for forestry (MoEF, GoI 2000).

Table 3: Land use categories in India

Land use	Area in million ha	Percentage
Total geographic area	328.73	
Reporting Area for land utilization	304.88	100.00
Forests	68.75	22.55
Not available for cultivation	41.54	13.63
Permanent Pasture & Grazing land	11.04	3.62
Land under misc. tree crops & groves	3.57	1.17
Cultivable waste land	13.94	4.57
Fallow land & other than current fallows	9.89	3.25
Current fallows	13.32	4.37
Net area Sown	142.82	46.84

Source: Land use Statistics – At a Glance, 1996-97, Ministry of Agriculture, GoI, 2000

With the increase in population the incidence of encroachment of agriculture into forests is a persistent threat in India. Constant pressure on the forests over the last few decades, both for logs and agricultural conversion, has contributed to a consistent loss of forest land since independence. Recently, as a result of policy decisions by the government and the introduction of the joint forest management policy, the area under forest cover has begun to increase. The cultivable waste land and the fallow land are some of the opportunities that need to be utilized to address the needs of the increasing population by bringing these lands under productive uses, including agriculture and forestry. A high percentage of cultivable land remains uncultivated due to the absence of well defined property rights.

1.7 LANGUAGES

As determined in the 1991 census, 18 national languages are recognized by the Indian government and are included in the Constitution of India. The total number of scheduled and non-scheduled languages spoken across India totals 114. The major languages spoken, in order of population usage are, Hindi (22%), Bengali (8.3%), Telugu (7.9%), Marathi (7.5%), Tamil (6.3%), Urdu (5.2%), Gujarati (4.9%), Kannada (3.9%), Malayalam (3.6%), Oriya (3.4%), Punjabi (2.8%), and Assamese (1.6%). Hindi is the most widely spoken language in India. In addition to the 22% of the population who use Hindi as their mother tongue, 6.2% of the total population speaks Hindi as their second language and 2.6% of the total population speaks Hindi as their third language. Among the speakers of scheduled languages, English is spoken by 8% of the population as their second language and by 3.15% as their third language. Hindi is the official language of India. Hindi is the predominant language in North India but in the Southern part of the country very few people speak in Hindi. Adoption of Hindi as the national language is heavily opposed in the southern part of India, where there is broad support for the retention of English as the national mode of communication (Census of India 2003).

¹ This includes the 12.08 million ha of land currently occupied by China and Pakistan.

1.7.1 Role of English in India

In terms of number of English speakers India ranks third in the world, after the USA and the UK. English is recognized in India as an associate official language with Hindi as the official language. After Hindi, English is the most commonly spoken language in India and probably the most widely read and written language in the country. English is essentially the first language for many educated Indians and for many who speak more than one language, English is often the second language. English provides a linguistic foundation for the administrative cohesiveness in the country and it serves as a language of wider communication. English plays a dominant role in the media as well as being used as a medium for inter-state communication. English is more frequently used within the legal and financial communities of the country than any other language. It plays a very important role in business as the primary mode of communication and most business operations are conducted in English.

About one-third of the Indian secondary schools have English as their first language. It is the main medium of instruction at the postgraduate level and it is taught as a second language at every stage of education in all states of India.

Similar to the Americans, Australians and the British, Indians also have their own colloquial English words and phrases. There are several words that Indians use which are not used in other English speaking countries. The English press and even individuals use many words derived from Indian languages, especially Hindi. The Indian English accent is sometimes difficult for non-Indians to understand.

1.8 DOING BUSINESS IN INDIA

Indian culture has a significant influence on the business environment of the country. Culture defines fundamental beliefs about how the world works and influences the interaction and communication with others in establishing and maintaining relationships. India is a complex country and undertaking business negotiations with an Indian counterpart might prove to be very frustrating for a foreigner. Business practices in India are heavily influenced by Indian culture and understanding the Indian culture is often the key to success.

For example, aggressiveness in order to achieve efficiency and adhering to deadlines might seem normal to a business person from the US, but would likely be interpreted as disrespectful by an Indian. Indians value professional trust over efficiency and are ready to invest more time in judging the trustworthiness of a potential business partner. In order to establish a professional relationship and trust, Indians often invite potential business partners to their homes and engage in non-business conversations. Personal relationships often provide the foundation for a successful business relationship. Talking about friends and family is an important part of establishing a relationship with a potential business partner. Indians tend to be enthusiastic about discussing politics and religion.

Addressing a person by his/her first name might be considered disrespectful in Indian culture. In business relations, people usually address each other by surnames preceded by an appropriate title (Mr., Dr., etc). Indians have a very strict sense of hierarchy and protocol and business agreements often get delayed because of rigid business protocol that require approval by senior officials. Business and policy decisions are made slowly in India. Indians require time to discuss each aspect of a decision, and then often require additional time before reaching a final decision. In business impatience is often interpreted as rudeness. Decisions are made at the top of the hierarchy so it is advisable to maintain good relationships with senior managers. Senior colleagues in the Indian workplace are obeyed and respected and disagreement with a senior manager's point of view is considered disrespectful. Criticisms should be made in a positive way. In discussions and negotiations Indians might not contradict a point simply out of respect. Hence, non contradiction should not be considered as acceptance and feedback must be specifically requested in order to rule out any chance of miscommunication.

Women are treated with respect in the Indian work place. Indian society is still very conservative and accordingly women should be dressed in conventional outfits in work places. However, Indian society is changing very fast and educated women professionals are becoming more assertive and westernized. Indian organizations and individuals typically incorporate a mix of western and Indian cultural values. The degree of western influence depends on socio-economic factors and also on the educational background and orientation of the individual. Older men are usually more traditional and less open to foreign culture and customs. The nature of interaction with an Indian business partner should be decided after judging the orientation of the person or organization.

2. AN ECONOMIC OVERVIEW OF INDIA

2.1 BACKGROUND

Following independence from British rule in 1947 the Indian economy was shattered by violence during the pre-independence and the post-independence periods. Before independence India's economy was structured to supply raw materials to manufacturers in Britain. The Hindu-Muslim riots that broke out during the India-Pakistan partition caused great social and economic upheaval within the country. The once rich and prosperous nation was in a state of disarray and distress following 200 years of British rule. In the 1950's the mainstay of India's economy was agriculture, forestry and fishing, which accounted for more than 50% of GDP. The employment generated within these sectors was an even larger percentage of total employment. The jute and cotton textile industries dominated the manufacturing sector, which contributed approximately 10% of India's GDP. In the early 50's the Indian government adopted an inward focused philosophy of import substitution. As a result, high import tariffs were imposed to protect domestic industries from international competition. In addition, the heavy industries (electricity, telecommunication and transportation) were controlled by the public sector. Although these government policies initially had a positive impact on the Indian economy, this growth could not be sustained into the 1960's and 1970's. Beginning in the late 1970's and continuing through the early 1980's the Indian Government began a process of cautious privatization within the public sector. The process was slow and faced substantial criticism and opposition from the main political parties as well as the people of India. The vision behind the initial policy of import substitution had been to encourage the development of strong domestic industries that would eventually be capable of competing in global markets. Insulation from international competition led to gross inefficiency within the domestic economy which is directly attributable to the lack of competition.

India's reliance on foreign capital to help finance development goals increased substantially during the 1980's. The resulting balance of payment deficit steadily increased and as a result of the oil crisis in 1990, India was faced with a severe balance of payment crisis. To resolve this crisis the Indian government committed to a policy of economic liberalization as a condition for acquiring new foreign loans. In 1991, the Indian government embarked on a series of economic reforms in response to a severe foreign exchange crisis. The economic liberalization policies initiated in 1991 eventually contributed to increased rates of economic growth and macroeconomic stability. The reform program included liberalized foreign investment and exchange regimes, significant reductions in import tariffs and other trade barriers, reform and modernization of the financial sector, and significant adjustments in government monetary and fiscal policies. The beneficial impacts of the liberalization included higher economic growth rates, lower inflation, and significant increases in foreign investment. As can be seen in Table 4 real GDP growth showed very promising rates at 6.8% in 1998-99, up from 5% in the 1997-98 fiscal year. Due to the loosening of the trade barriers the Indian trade figures also recorded positive growth.

Table 4: Key economic indicators of India (billions of U.S. dollars unless otherwise indicated)

	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
INCOME & POPULATION							
Nominal GDP	413.2	446.3	456.8	476.0	508.7	600.6	--
Real GDP at market prices	379.3	406.0	416.0	436.1	465.7	548.3	632.6**
Real GDP Growth (%) ²	6.5	6.1	4.4	5.8	4.0	8.5	6.9**
Population (million)*	983	1001	1019	1037	1055	1073	1091**
Percentage distribution of NDP by economic activity at current prices							
Agriculture, Forestry & Fishing (%)	--	27.7	26	25.9	23.7	24	--
Mining & Quarrying (%)	--	2	2.1	2	2.6	2.3	--
Manufacturing (%)	--	13.3	14.1	13.5	13.7	13.8	--
Elect. Gas & Water Supply (%)	--	1.3	1.2	1.1	1.2	1.1	--
Construction (%)	--	6.4	6.6	6.5	6.7	6.6	--
Trade, Hotels & Restaurant (%)	--	15.2	15.6	15.8	16.1	16.3	--
Transport, Storage & Communication (%)	--	6.2	6.5	6.8	7	7.4	--
Financing, Insurance, Real Estate & Business Services (%)	--	12.6	12.6	13.1	13.9	13.6	--
Community, Social & Personal Services (%)	--	15.2	15.4	15.4	15.3	14.9	--
Domestic Consumption, Savings and Capital Formation at current prices							
Private Final Consumption Exp.	--	300.9	321.3	352.6	375.9	418.2	--
Consumption of durable goods (%)	--	2.7	2.8	2.7	2.6	2.7	--
Consumption of semi-durable goods (%)	--	6.5	6.5	5.9	6.2	6.1	--
Consumption of non-durable goods (%)	--	65.4	63.4	63.6	61.7	61.4	--
Consumption of services (%)	--	25.5	27.3	27.8	29.5	29.8	--
Rate of gross domestic saving (%)	--	24.2	23.5	23.4	26.1	28.1	--
Rate of GDCF (%)	--	25.3	23.8	22.6	24.8	26.3	--
Trade & exchange rate:							
Exports of goods and services	--	52.47	60.80	60.92	73.43	88.74	--
Imports of goods & services	--	61.23	65.04	65.17	78.48	96.49	--
Exchange Rate (Rupee/US\$ annual avg.)	42.13	43.40	45.75	47.73	48.42	45.95	44.87

Source: Bureau of Economic and Business Affairs, US department of State, February 2002, Government of India economic survey, Government of India budgets, Reserve Bank of India bulletins; National Accounts Statistics 2005, Central Statistical Organization, GOI

Note: Converted to US\$ from INR using financial year average exchange rates

* - Relates to mid financial year; ** - Advance estimates GDFC – Gross Domestic Capital Formation

² Gross Domestic Product at factor cost; percentage calculated over previous year

2.2 OVERALL MACRO-ECONOMIC SITUATION

The United Progressive Alliance (UPA) government led by Prime Minister Dr. Manmohan Singh is suffering from the pressures of coalition politics which is making the country's progress on economic reform slower than expected. The non-agricultural economy is enjoying an upturn but a subnormal monsoon in 2004 slowed GDP growth to 6.9% in fiscal year 2004/05. Inflation has been moderate in recent times; consumer price inflation rose from an average of 3.8% in 2004 to 4.3% in 2005, and is estimated to increase to 6.2% in 2006. Real GDP growth showed a very promising rate of 8.5% in 2003 - 2004 with a total GDP value of US\$548 billion and is estimated to be over US\$630 billion in 2004 - 2005. GDP growth was over 8% in 2005 and is estimated to have been 9.2% in 2006. After adjusting for "purchasing power parity" the World Bank has placed India as the fourth largest economy in the world. The Indian economy passed through a difficult phase caused by several unfavorable domestic and external developments. Domestic output and demand conditions were adversely affected by a marked decline in agricultural output in 2000 and 2001. In addition, the global economy experienced an overall deceleration. These trends were exacerbated in the aftermath of the terrorist attacks in the United States in September 2001. Consequently export growth suffered and profitability in the industrial sector has also been affected by low commodity and product prices globally. The setback proved to be temporary as the economy recovered markedly, and from 2003 – 2006 the economy appeared to be very resilient in terms of growth, inflation and balance of trade payments. The combination of high economic growth coupled with controlled inflation and favorable balance of payment situation is ideal for consolidating the growth momentum with continued macroeconomic stability. During 2002-2003, the Indian economy experienced low economic growth (3.7%) due to an unfavorable monsoon resulting in a decline in agricultural production. Economists argue the lower than average growth rate in the previous year resulted in a high growth rate in 2003 -2004. In 2004 – 2005 strong momentum in the manufacturing sector and ongoing gains in the services sector helped to offset a poor performance from agriculture. The annual growth rate posted by the manufacturing sector was appreciably higher than the overall rate of growth. Within the service sector the main driver of growth was international trade, hotels, transport and communications category. Currently investment is about 26% of GDP, although this will be insufficient to support annual GDP growth of 7-8% in the future. The relative importance of all these sectors from 1998 to 2004 is shown in Table 5.

Table 5: Gross domestic product at current prices by economic activity (in billion US dollars)

No.	Industry	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
1	Agriculture, forestry & fishing	105.0	106.5	102.4	107.0	104.9	125.2
1.1	Agriculture	96.5	97.3	92.6	97.0	94.3	113.5
1.2	Forestry & logging	4.2	4.5	4.9	4.7	5.0	5.8
1.3	Fishing	4.3	4.6	4.9	5.2	5.6	5.9
2	Mining & quarrying	8.5	9.5	9.9	10.0	12.8	13.8
3	Manufacturing	59.9	61.5	65.9	67.1	72.7	85.5
3.1	Registered	38.3	39.4	42.9	44.2	48.1	56.8
3.2	Unregistered	21.6	22.1	23.0	22.9	24.6	28.7
4	Elect. Gas & water	10.4	9.7	9.4	9.4	10.3	11.8
5	Construction	21.8	24.3	25.4	26.3	28.9	33.9
6	Trade, hotels & restaurant	52.4	56.7	59.4	63.2	68.7	81.9
6.1	Trade	48.9	52.8	55.2	58.7	64.0	76.3
6.2	Hotels & restaurants	3.5	3.9	4.2	4.5	4.7	5.7
7	Transport, storage & communication	26.7	28.6	30.8	33.0	35.8	44.0
7.1	Railways	3.3	3.6	3.6	4.1	4.6	4.9
7.2	Transport by other means	17.3	18.9	20.5	21.5	23.6	29.0
7.3	Storage	0.3	0.3	0.3	0.3	0.3	0.3
7.4	Communication	5.8	5.9	6.4	7.0	7.4	9.7
8	Financing, insurance, real estate & business services	43.0	50.8	52.2	56.6	64.0	74.0
8.1	Banking & insurance	22.7	27.4	25.9	28.0	32.7	37.1
8.2	Real estate, ownership of dwellings & business services	20.3	23.4	26.3	28.6	31.4	37.0
9	Community, social & personal services	51.6	58.4	60.6	63.6	67.6	78.2
9.1	Public administration & defense	23.6	26.9	27.0	27.7	28.9	33.4
9.2	Other services	28.0	31.5	33.5	35.9	38.7	44.8
10	Gross domestic product at factor cost (1 to 9)	379.3	406.0	416.0	436.1	465.7	548.3

Source: National Accounts Statistics 2005, Central Statistical Organization, GOI

Note: Converted to US\$ from INR using financial year average exchange rates

Government of India statistics for 2003 – 2004 estimated that the economic growth in the agricultural sector was 9.1%, 6.5% in industry and 8.4% in the service sector. The growth in the agricultural sector is a marked recovery from the negative 5.2% growth in 2002- 03. The government statistics also show that the rate of inflation (as measured by the Wholesale Price Index) was 3.8% in 2004. The manufacturing sector was the major contributor, accounting for 80% of inflation. Within the manufacturing sector the prime contributors to inflation were sugar, edible oils, textiles, leather products, basic metals and alloys and iron and steel³. The combined fiscal deficit of the central government and the states, as a proportion of GDP, was estimated at 10.1% for 2003-04 which was higher than the pre-reform level of 9.4%. The combined revenue deficit as a proportion of GDP was as high as 7.0% in 2001-02, declined to 6.4% in 2002-03 and was estimated to be 5.8% (Budget Estimate) in 2003-04. As regards revenues there are significant shortfalls in indirect taxes due to a slowdown in industrial production and significant declines in both oil and non-oil imports in 2001-02. The government reports that the external debt situation has improved significantly in recent years. The un-audited figures presented in the 2004 budget session show that the fiscal and revenue deficits, as a proportion of GDP, were estimated to be 4.6% and 3.6% in the year 2003-04. The capital account surplus increased from US\$11.0 billion in 2001-02 to US\$12.8 billion in 2002-03. The main contributors to this increase were banking capital inflows, foreign investment and “other capital” inflows. The statistics produced by the government show that the external debt-GDP ratio decreased from 28.7 % at the end of March 1991 to 22.3 % at end-March 2001 and to 17.8 % at the end of March 2004. The debt service ratio declined from a peak level of 35.3 % of current receipts in 1990-91 to 16.3% in 2000-01, and 10.4% in 2003-04. It is particularly noteworthy that in 1999 the World Bank classified India as a “less-indebted” country for the first time.

A strong balance of payment position in recent years has resulted in a steady accumulation of foreign exchange reserves. In the 2002-03 the foreign exchange reserve grew by US\$21.3 billion and increased by an additional US\$36.9 billion in 2003-04. Total foreign exchange reserves stood at US\$180 billion at the end of 2006. In addition to capital inflows and capital account surplus, valuation gains resulting from the appreciation of the major non-US dollar global currencies, like the Euro and the Pound Sterling, against the US dollar also contributed to this increase. The current account balance of payment has been in surplus since 2001-02.

2.3 TRENDS IN GDP

The economic growth recovery in 2003-04 was accompanied by continued price stability. A sectoral division of the GDP growth rate is shown in Table 6. From 1997-2004 the service industry of India experienced the highest growth with an average annual increase of 8.0%. Within the service sector, from 1997-2002, the community, social and personal services sub-sectors experienced the highest average annual rate of growth at 9.1% per annum. From 2002 onwards the trade, hotels, transport and communications sub-sectors had the highest growth rate. The manufacturing industry, which was predicted to grow at a high rate following liberalization, did not perform as well as expected. The agricultural sector on the other hand, experienced the lowest growth during this period, registering a 2.1% average annual growth during 1997-2002. This was primarily due to poor harvests caused by irregular rainfall. The low GDP growth of 4.0% in 2002-03 was mainly due to a severe drought, resulting in a negative (-5.2%) growth rate in the agriculture sector. Within the industrial sector the construction industry and the electric, gas and water supply industries grew at high rates. The construction industry, however, has recently shown weakness which some economists feel may be the result of high land and real estate prices in urban locations.

³ General economic review, Union Budget and Economic Survey, Ministry of Finance, GoI.

Table 6: Percentage change over previous year in GDP (at factor cost) of different sectors of economy at constant (1993-94) Prices

	Sector (industry)	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
1.	Agriculture	5.1	-1.1	10.1	-2.8	6.9	-0.1	-0.4	6.5	-8.0	10.3
2.	Forestry & logging	2.7	-0.6	1.4	2.1	1.5	3.7	2.4	1.5	0.9	1.4
3.	Fishing	6.3	5.4	7.8	1.9	-3.9	7.0	4.0	7.7	7.3	4.1
4.	Mining & Quarrying	9.3	5.9	0.5	9.8	2.8	3.3	2.4	2.5	9.0	6.4
5.	Manufacturing	12.0	14.9	9.7	1.5	2.7	4.0	7.4	3.6	6.5	6.9
6.	Electricity, gas and water	9.4	6.8	5.4	7.9	7.0	5.2	4.3	3.7	3.1	3.7
7.	Construction	5.5	6.2	2.1	10.2	6.2	8.0	6.7	4.0	7.3	7.0
8.	Trade, Hotels & Restaurant	10.7	14.4	7.7	7.6	7.6	7.2	4.0	8.9	8.2	8.8
9.	Railways	2.1	8.2	4.8	1.8	1.8	9.0	4.3	7.0	5.7	6.4
10	Transport by other means	10.3	9.5	8.2	5.7	5.0	6.6	6.7	3.9	6.1	11.2
11	Communication	16.8	18.5	11.6	20.8	19.9	22.0	26.8	18.8	24.6	27.2
12	Banking & Insurance	8.5	10.9	9.7	17.9	8.8	13.4	-1.2	3.5	11.4	7.5
13	Real estate, OD & BS *	3.0	5.7	4.3	5.4	5.8	7.4	9.2	5.7	5.8	6.8
14	Public administration &	1.3	6.8	4.1	14.5	10.6	13.2	2.3	2.6	1.7	5.7
15	Other services	5.0	8.8	8.1	9.5	10.2	11.4	7.7	7.0	5.6	6.0
16	Total GDP	7.3	7.3	7.8	4.8	6.5	6.1	4.4	5.8	4.0	8.5

Source: National Accounts Statistics 2005, Central Statistical Organization, GoI

The advance estimates of GDP for 2005-06, made available by the CSO, indicate a GDP growth rate of 9.25% in the current year. The higher growth is attributable to significant improvements in agriculture and allied sectors and the trade, hotels, transport and communications sectors. The core industry and infrastructure sectors are also expected to record moderately high growth rates.

Domestic demand has been the main driver of economic growth in recent years. In 2002-03, among demand categories, private final consumption was identified as the prime mover, contributing to 52.4% of GDP growth. In 2001-02 private final consumption was even higher at 69.6%. Investment contributed to 25.6% of the GDP growth followed by government consumption which contributed to 13.4% of the GDP growth in the year 2002-2003.

2.4 EMPLOYMENT

The employment situation in India remains dismal. According to the Planning Commission, overall employment is estimated to have grown by about 1% per annum during the period 1993-2000, compared with a growth rate of 2.43% per annum during the period 1987-94. The Economic Survey 2002-03 reported that during 2001-2002 employment growth was 2.07% per annum, which is an improvement over the previous years. The organized sector employment, both public and private, grew by 0.53% per annum during 1993-2000. While public sector employment experienced an absolute decline of 0.03% during 1994-2000, employment in the private sector grew by 1.87% during the period. The ongoing process of restructuring has led to a decline in public sector employment; moreover, hiring bans have been imposed on a number of government departments and organizations in an effort to reduce expenditures. In response to this situation, the government has initiated a number of rural development and poverty alleviation programs aimed at reducing unemployment in India. However, the unemployment data shows that the unemployment rate has remained more or less constant at 22.5% over recent years. The vast majority of India's work force is unorganized, with 80% of the unorganized workforce living in rural areas and 85% being self

employed or employed on casual wages. About 70% of the organized workforce (28 million workers) are employed by the government although the latter produces just one-third of the economic output and receives less than one-third of investment. In 1997-98, it was estimated that 37.6 million Indians were jobless with seven million being added to this number every year.

2.5 EXCHANGE RATE POLICIES AND DEVELOPMENTS

The central government has wide powers to control transactions in foreign exchange. Prior to 1992 all foreign investment and the repatriation of foreign capital required prior approval of the government. The Foreign-Exchange Regulation Act, which governs foreign investment, rarely allowed foreign majority holdings. The new foreign investment policy, announced in July 1991, prescribed automatic approval for foreign investment in thirty-four industries designated high priority, up to an equity limit of 51 percent. Initially the government required that a company's automatic approval must rely on matching exports and dividend repatriation, but in May 1992 this requirement was lifted, with the exception of low-priority sectors. In 1994 foreign and nonresident Indian investors were allowed to repatriate not only their profits but also their capital. Indian exporters are also free to use their export earnings in an unrestricted manner. Transfer of capital abroad by Indian nationals is only permitted in special circumstances, such as emigration. Foreign exchange is automatically made available for imports for which import licenses are issued. The following table gives a picture of how the rate of exchange of Indian Rupees to US dollar has changed over the past decade.

Table 7: Monthly average rate of Indian rupees (INR) to 1 US dollar, 1995 - 2006

Month	Year											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
January	31.37	35.81	35.90	39.39	42.55	43.59	46.61	48.35	47.96	45.46	43.62	44.20
February	31.38	36.59	35.89	39.01	42.53	43.65	46.56	48.72	47.75	45.27	43.58	44.23
March	31.59	34.49	35.88	39.57	42.52	43.64	46.65	48.77	47.68	44.97	43.59	44.34
April	31.41	34.32	35.83	39.70	42.80	43.68	46.79	48.94	47.39	43.89	43.64	44.82
May	31.42	35.03	35.82	40.47	42.86	44.08	46.95	49.02	47.11	45.18	43.41	45.20
June	31.40	35.10	35.82	42.37	43.21	44.76	47.04	48.98	46.70	45.50	43.52	45.89
July	31.39	35.67	35.75	42.61	43.36	44.84	47.18	48.79	46.22	46.06	43.43	46.37
August	31.59	35.80	36.01	42.84	43.50	45.77	47.17	48.62	45.96	46.32	43.55	46.45
September	33.31	35.87	36.48	42.58	43.60	45.97	47.75	48.46	45.85	46.05	43.85	46.01
October	34.66	35.80	36.30	42.39	43.55	46.43	48.05	48.39	45.40	45.74	44.76	45.36
November	34.71	35.84	37.29	42.43	43.46	46.82	48.04	48.29	45.55	45.03	45.63	44.73
December	34.97	35.88	39.40	42.59	43.52	46.78	47.93	48.15	45.57	43.85	45.56	44.48
Yearly Average	32.43	35.52	36.36	41.33	43.12	45.00	47.23	48.62	46.60	45.28	44.01	45.17

Source: India / U.S. Foreign Exchange Rate, Board of Governors of the Federal Reserve System, St. Louis

As foreign-exchange transactions were tightly controlled in the past Indian authorities were able to manage the exchange rate, and from 1975 to 1992 the rupee was tied to a trade-weighted basket of currencies. In February 1992, the government began moves to make the rupee convertible, and in March 1993 a single floating exchange rate was implemented. In October 2004, Rs 45.91 was worth US\$1, compared with Rs7.86 in 1980, Rs12.37 in 1985, and Rs17.50 in 1990. However, in recent years the exchange rate of the rupee against the US dollar is broadly market determined. During 1999-2000 the exchange rate market displayed reasonable stability, with the rupee depreciating by about 2.9 per cent from the annual average of Rs.42.07 per US dollar in 1998-99 to Rs.43.33 in 1999-2000. In contrast, the year 2000-2001 witnessed significant downward pressure on the rupee-dollar rate. During 2000-2001, the rupee depreciated against the US dollar by 5.15% to Rs. 45.68 per US dollar. The rupee depreciation continued until May 2002, when it reached an all time low of Rs 49.09 per US dollar (Figure 3).

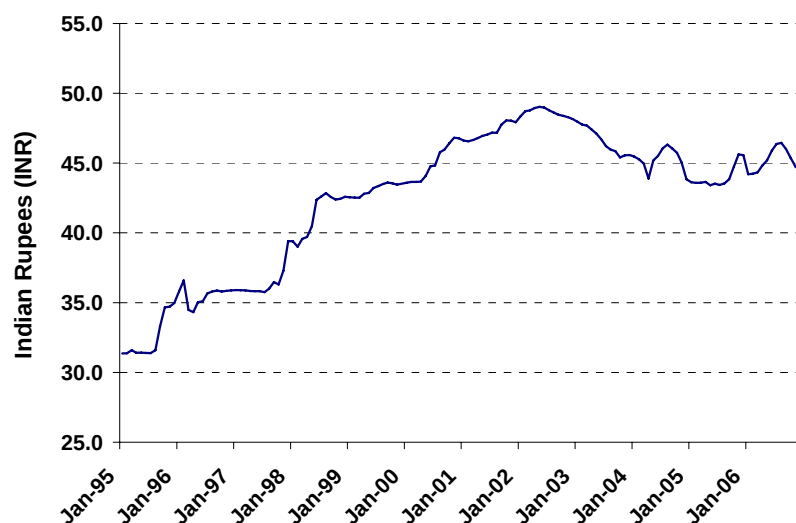


Figure 3: Indian rupees to one US dollar foreign exchange rate

In the second half of 2002, the trend reversed and the Indian rupee started strengthening in June 2002. In May 2005 the currency reached a five-year high of Rs. 43.3 to US\$ 1. The rupee has been supported by India's improving exports, developing domestic industries, rapid economic growth and capital inflows. During this time period the US-dollar has weakened in international currency markets contributing to the increased exchange rate in US dollar terms. The Reserve Bank of India is taking appropriate measures to minimize the damaging effects of currency appreciation and volatility on exporters. Capital and investment inflows, and the fate of the US dollar on international currency markets, play an important role in determining the rupee's value. India is rapidly emerging as an increasingly attractive destination for investment. The rupee is expected to rise from an average of Rs. 45.3 to US\$ 1 in 2004 to Rs. 43.6 to US\$ 1 in 2005 and Rs. 43 to US\$ 1 in 2006 (India: Country outlook, 2005).

2.6 TRADE AND EXTERNAL SECTOR

The Indian economy exhibited economic growth exceeding 6% per annum over the last decade. Continued structural reform, including trade liberalization, has been the primary reason behind this growth. Social indicators, such as poverty and infant mortality have improved during the last ten years. In order to achieve further reductions in poverty, India is currently targeting real GDP growth between 7% and 9%. The political parties and the officials in the Indian Government realize the need to continue, and even accelerate the reform process and increase competition within the economy. India's economy has traditionally been one of the most closed in the world. Thus, India's tariffs remain among the highest in the world. Recognizing the important linkages between trade and economic growth, the Government has simplified the tariff structures, eliminated quantitative restrictions on imports, and reduced export restrictions. It plans to further simplify and reduce the tariff structure. However, the level of protection provided by import tariffs remains relatively high and the anti-export bias inherent in imports and other constraints still remains. To help counteract this anti-export bias export promotion measures have gained in importance. The Government has recently announced a further expansion of these measures and plans to continue tariff reforms and tax reductions.

In 2004-2005 India's current-account balance moved into deficit, following three years of current-account surpluses. This resulted from high oil prices, strong industrial activity boosting imports and a gradual liberalization of India's trade regime with falling import tariffs leading to increased imports. A deficit of 0.6% of GDP in 2004 and 1.3% in 2005 is unlikely to harm macroeconomic stability in general or exchange-rate stability in particular. Indian companies are also growing rapidly and are increasing their investment importing a wide range of capital goods and thus widening the merchandise trade deficit. Exports of services are growing strongly as information technology and business-process outsourcing continue to lure Western companies to India. "Current transfers" is also strongly positive, driven by the robust growth in remittances from Indian workers overseas. The following table shows how the relative importance of the various sectors in the Indian economy has changed over time.

Table 8: India's external transactions at current prices (in billion US dollars)

No	Item	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Current transactions							
1	Exports of goods & services	46.35	52.47	60.80	60.92	73.43	88.74
2	Compensation of employees from the rest of the world	0.04	0.15	0.13	0.12	0.12	0.15
3	Property & entrepreneurial income from rest of the world	1.89	1.78	2.22	2.55	2.30	3.23
4	Other current transfers from the rest of the world	10.32	12.28	13.07	15.73	17.17	23.16
5	Adjustment of merchandise exports to the change of ownership basis*	1.05	0.74	0.94	0.91	1.02	0.74
6	Current receipts (6.1 to 6.5)	59.65	67.41	77.15	80.23	94.04	116.03
7	Imports of goods & services	53.34	61.23	65.04	65.17	78.48	96.49
8	Compensation of employees to the rest of the world	0.02	0.01	0.46	0.49	0.60	0.83
9	Property & entrepreneurial income to the rest of the world	5.47	5.47	5.84	5.45	4.54	5.62
10	Other current transfers to the rest of the world	0.06	0.03	0.21	0.36	0.80	0.35
11	Adjustment of merchandise imports to the change of ownership basis *	5.12	5.73	7.37	4.84	3.01	1.96
12	Surplus of the nation on current accounts	-4.36	-5.07	-1.78	3.92	6.61	10.78
13	Disposal of current receipts capital transactions	59.65	67.41	77.15	80.23	94.04	116.03
14	Surplus of the nation on current transactions (6.12)	-4.36	-5.07	-1.78	3.92	6.61	10.78
15	Capital transfers from the rest of the world	0.31	0.38	0.25	0.46	0.45	0.56
16	Net incurrence of foreign liabilities	8.05	9.49	12.40	8.63	6.09	18.27
17	Receipts	4.01	4.80	10.88	13.02	13.15	29.61
18	Purchases of intangible assets n.e.c. From the rest of the world, net	---	---	---	---	---	---
19	Net acquisition of foreign financial assets	4.01	4.80	10.88	13.02	13.15	29.61
20	Disbursements	4.01	4.80	10.88	13.02	13.15	29.61

Source: National Accounts Statistics 2005, Central Statistical Organization, GoI

2.6.1 Import Tariffs

Following the introduction of reforms in 1991, India has taken noteworthy steps in opening up the economy and creating a more open and transparent trade regime. In 2002 the average duty rate was 32% declining to 29% in 2003. While the average duty was again reduced in January 2004, India's tariffs remain among the world's highest. Though the customs duty on textiles was reduced India remains one of the most heavily protected textile markets in the world.

2.6.2 Import Licensing

While import licensing and tariff restrictions are generally declining there appears to be an increase in other import measures. India has become one of the major users of WTO anti-dumping measures, with about 250 cases initiated since 1995. Certain imports, such as automobiles and natural rubber, may enter only through specified ports. Similar restrictions relating to entry through certain ports have been removed on 300 sensitive items which were previously subjected to import restrictions; imports of these products continue to be monitored. As a result of a WTO ruling India has eliminated import licensing on most consumer goods. The cumbersome and non-transparent import regime limits market access for U.S. goods which otherwise would be competitive. India still maintains a long list of requirements to acquire import licenses for vehicles. Certain importers are eligible to import vehicles without a license, but only if offset by exports attributable to that importer. India continues to maintain a negative import list. The negative list is currently divided into three categories: (1) banned or prohibited items (e.g., tallow, fat, and oils of animal origin); (2) restricted items which require an import license (e.g., livestock products); and (3) "canalized" items importable only by government trading monopolies subject to cabinet approval regarding timing and quantity. Some pharmaceuticals and bulk grains are listed in the canalized goods category. India has also liberalized many restrictions on the importation of capital goods. The government allows imports of all second-hand capital goods by actual users without license, provided the goods have a residual life of five years.

2.6.3 Customs Procedures

Indian customs requires extensive documentation and processing delays often occur. In large part the delays are a consequence of India's complex tariff structure and multiple exemptions, which may vary according to product, user, or specific Indian export promotion program. India applies a range of sanitary and phytosanitary measures which include compulsory detention and laboratory testing of some imported food products.

Duties of customs are levied on goods imported or exported from India at the rate specified under the customs Tariff Act of 1975 as amended from time to time or any other law currently in force. For the purpose of exercising proper surveillance over imports and exports, the Central Government has the power to notify the ports and airports for the unloading of imported goods and loading of exported goods, the places for clearance of goods imported or to be exported, the routes by which above goods may pass by land or inland water into or out of India and the ports which alone shall be coastal ports. A book called "Indian Customs Tariff Guide" is made available by the Central Board of Excises Customs (CBEC) which periodically contains various tariff rulings issued by the CBEC. The Customs Tariff Act also contains detailed provisions for warehousing imported goods and manufacture of goods is also possible in warehouses. In 2003 the Ministry of Health implemented amendments under its Prevention of Food Adulteration Act (PFA) that could restrict Indian imports of some agricultural products. In addition, at the end of 2003, the Ministry of Agriculture issued a set of new regulations and quarantine requirements for imports of agricultural products.

2.6.4 Types of duties

Under the custom laws, the various types of duties leviable are (i) Basic Duties, (ii) additional or countervailing duties (CVD), (iii) Anti Dumping Duties (iv) Protective Duties and (vi) Export Duties.

Basic Duty is the basic duty levied under the Customs Act. The rate varies for different items from 5% to 40%. The Countervailing Duty (CVD) is levied under section 3 (1) of the Custom Tariff Act and is levied against imports that are subsidized by the exporting country's government. The countervailing duty is designed to offset (countervail) the effect of subsidies provided by foreign governments to goods exported to India. The standard practice adopted by the Indian government is to assign a CVD equal to excise duty levied on a like product manufactured or produced in India. This is also known as the Duty on Bounty Fed Articles in some cases. The Additional Duty (levied under section 3(3) of the Customs Act) is imposed to compensate duty on inputs used by Indian manufacturers. It can be charged on all goods by the central government to counterbalance excise duties levied on raw materials, components and other inputs similar to those used in the production of such good. Anti-dumping Duties are taxes assessed on imported goods that are sold in India at a price less than fair market value in order to unfairly capture Indian market share. Fair market value is determined as the price the product is normally sold at in the manufacturer's domestic market. In order to prevent dumping, the Central Government may levy additional duty equal to the margin of dumping on such articles, if the goods have been sold at less than fair market value. Pending determination of margin of dumping such duty may be provisionally imposed. After the exact rate of dumping duty is determined, the

Central government may vary the provisional rate of dumping duty. There are certain restrictions on imposing dumping duties in the case of countries which are signatories to the GATT or on countries given "Most Favored Nation Status". A dumping duty can be levied on imports on such countries only if the Central Government proves that imports of such goods into India are at such low prices that they result in material harm to the Indian industry. The Tariff Commission may recommend that in order to protect the interests of Indian industry, the Central Government should levy protective anti-dumping duties at the rate recommended on specified goods, a form of duty known as a Protective Duty. Protective duties may be cancelled or varied by notification. Finally, Export Duties are levied on exported goods. At present very few articles (e.g., skins and leather) are subject to an export duty. The main purpose of this duty is to restrict exports of certain goods. The Central Government has been granted emergency powers to increase import or export duties if the need so arises.

3. FORESTRY IN INDIA

3.1 FOREST COVER

The forest cover statistics published by the Forest Survey of India (FSI) in the State of Forest Report, 1999 represents the seventh assessment of forest cover of the country using satellite remote sensing technology. The period of data ranged from 1996 to 1998. A digital method of interpretation has been used for the assessment of the forest cover in 13 states, which comprise 63% of the forest cover in the country. Due to inadequate infrastructure digital interpretation of the forest cover could not be done for the whole country. The forest cover of the country was estimated to be 637,293 km², or 19.4% of the area of the country. The forest cover was subdivided into three types: dense forest, open forest and mangrove. The dense forests constitute approximately 59% of the total forest cover in the country. Open forest and mangrove forest constitutes 40% and 1%, respectively. Among the states Madhya Pradesh accounts for the largest forest cover at 20.7%, followed by Arunachal Pradesh, Orissa, Maharashtra and Andhra Pradesh. The seven Northeastern states together comprise 25.7% of the total forest cover. The Mangroves are mostly located in the delta regions of West Bengal, Gujarat and in some parts of the Andaman and Nicobar islands.

A comparison between the 1997 and 1999 FSI assessments revealed that the net forest cover has increased by 3,896 km², which is 0.07% of the existing forest cover. The rate of increase of the dense forest is much higher; it increased 10,098 km², the mangrove forest also increased marginally. However, the open forests decreased by 6,246 km².

3.2 FOREST PLANTATIONS

“Plantations in India can be categorized into four categories in terms of their ownership control, management structures and fundamental goals. They are (i) Public forest plantations of the State Forest Department that have been raised on forestlands for the purpose of supplying industrial raw materials, (ii) Social forestry plantations of the State Forest Department, which are designed to satisfy biomass needs for rural communities. (iii) Farm forest plantations raised on private property resources in different parts of India, and whose products also meet the raw material requirements of industries, and (iv) Plantations that have been raised (or regenerated) and managed through Joint Forest Management Programs.” (Damodaran, 2002)

Forest plantations play a very important role in supplying raw materials to the forest products industry. Plantation forestry was started in the late 1950's with the objectives of providing a stable timber supply to the forest based industry, promoting soil conservation and providing fuel wood and fodder for local communities. Up until 1979 most of the plantation area was targeted for the industrial supply of timber and was established within the registered forest area by removing the commercially less important species and planting timber species such as teak (*Tectona grandis*), sal (*Shorea robusta*), deodar (*Cedrus deodara*), eucalyptus and acacia. As per the Forest Survey of India, the cumulative area under plantation in 1979 was estimated at 3.3 million ha, with an annual plantation rate ranging from 11,000 to 244,000 ha per annum. From 1979 onwards, plantation activities outside the forest reserves started under the social forestry scheme. These plantations were based mainly on short rotation species. As a result, the annual rate of plantation exhibited a huge leap from 222,000 ha in 1980 to an average of 929,000 ha between 1980 and 1985. The plantation rate further increased in the years 1985 – 1990 to 1.8 million ha annually. The annual rate of plantation establishment hovered around 1.5 million ha annually from 1990 – 1999 (Figure 4).

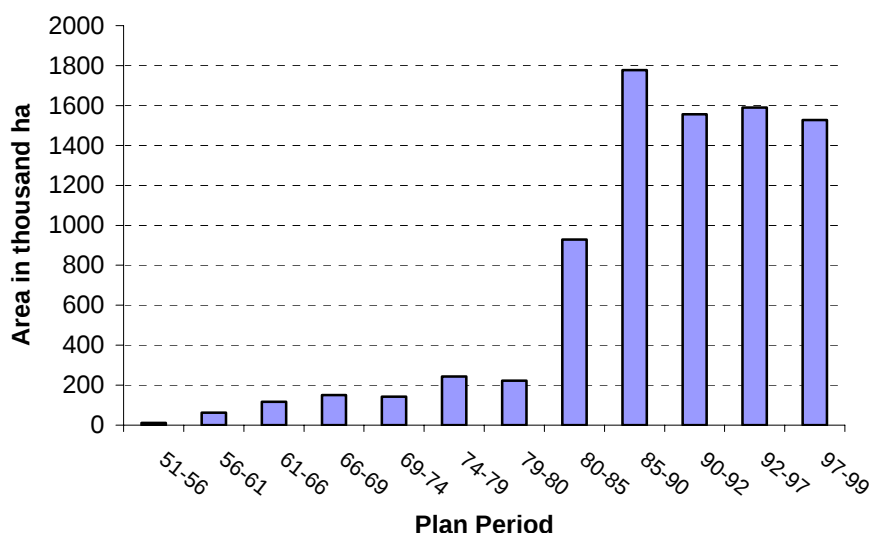


Figure 4: Annual rate of plantation establishment from 1951 to 1999

Source: State of Forest Report, Forest Survey of India, Dehradun, 1999

The species diversity within the tree plantations is very high due to the varied soil and climatic conditions encountered across India. Among the species planted, eucalyptus (*Eucalyptus* spp.) and teak (*Tectona grandis*) top the list followed by *Acacia nilotica*, *Acacia auriculiformis*, bamboo and *Pinus roxburghii*. The species diversity is not only dependent on the agro-climatic factors but also on the end-use objectives of the plantation. As a result the number of species used for plantations exceeds 100. The area under plantation for the various species is not available due to technical problems in their enumeration.

3.3 FOREST OWNERSHIP

India's forests are primarily state owned, with just 10% of the forests being owned by the community or private forests owners. As a result of weak state control over forests, considerable encroachment into the state forests has occurred by individuals and communities. The Ministry of Environment and Forests (MoEF) estimates that approximately 1.5 million ha of forestland has been illegally occupied for agriculture and other end-uses. The huge state ownership of the forests is a result of British colonial rule although most forests were privately owned until the end of the 19th century. With the introduction of the Joint Forest Management (JFM) policy in the early 90's India is attempting to return to traditional community based forest management. In the JFM approach the state remains the owner of the forests, while the communities are made partial stakeholders of the forest.

3.4 INDIA'S NATIONAL FOREST POLICY

Since independence India's forests have suffered from the extensive use of forests as revenue earning resources and also conversion of forestland into non-forest uses. These were often done without authorization and proper compensation for the loss of the forest area, in the form of necessary afforestation activities and essential environmental safeguards. Over the years the government has realized the inadequacy of its policy and in 1988 India adopted a new National Forest Policy. A ban was announced on felling of trees in all forests located above 1000 meters in altitude. High priority was given for planting fuelwood and leaf fodder producing trees in government forests. Industrial wood production was restricted to the farmlands and the wastelands. A drastic reduction in timber harvest volumes occurred as a number of states stopped timber harvesting and a ban was announced on all harvest operations in the national parks and protected sanctuaries.

Section 4.9 of the new national forest policy encouraged the forest-based industries to support farmers in growing industrial wood on farmlands. The mix of industrial raw material was to be derived from government forests, farm forests (social forestry), the open market and imports. The "open market and import" section of the mix was

proposed to comprise 60% of the total raw material mix. Emphasis was also placed on increasing farm forestry on non-forestland. A number of forestry incentives were provided by the government to farmers in the form of subsidized seedlings, extension services and monetary compensation based on the survival rate of planted trees, among others.

Based on actual field study, the provisions of section 4.9 of the National Forest Policy of 1988 were formulated as follows:

- i) As far as possible, a forest based industry should arrange for the raw material needed to meet its own requirements, preferably by the establishment of a direct relationship between forestry and the individuals who can grow the raw materials, by providing inputs including credit, technical advice and harvesting and transport services.
- ii) No forest based industries, except those at the village and cottage level, should be permitted in the future unless they have demonstrated the assured availability of raw material.
- iii) Forest based industries must not only provide employment to local people on a priority basis but also involve them fully in raising trees and raw materials.
- iv) National forests serve as a gene pool resource and help maintain an ecological balance. National forests will not be available to forest based industries for plantations or any other activities.
- v) Farmers, particularly small and marginal farmers, should be encouraged to grow, on the marginal/degraded lands available to them, the wood species required by industries. These may be grown along with fuel and fodder species on community lands not required for pasture purposes and by Forest Department/Corporations on degraded forests not earmarked for natural regeneration.
- vi) The practice of supplying raw materials to the forest-based industries at concessional prices should cease. Forest-based industries should be encouraged to use alternative raw materials. The import of wood and wood products should be liberalized.

3.4.1 Impact on the availability of the raw materials to the industries

The National Forest Policy of 1988 emphasized meeting the fuelwood, fodder and small timber needs of the community rather than the needs of the forest based industry. It should be noted that even before NFP 1988 the existing forest policy was more conservation oriented than industry oriented. The raw material crisis for the wood based industries became more acute following the adoption of the NFP 1988. As a result, the forest based industries had to depend more on the private forests and bamboo from the existing natural forests (bamboo harvesting from natural forests was permitted) for their raw material supply. Though large reforestation programs were proposed, scarce budgetary resources prevented the forestry department from meeting the target. To meet the community demand for fuelwood, small timber plantations were planned which provided timber products that were less useful to industry. Within the established plantations, the low survival rate (around 60%) of seedlings made the situation far from satisfactory.

In order to improve the availability of raw materials, the NFP 1988 proposed the following approaches:

- i) Promoting industry and farmer networks
- ii) Forest department and the forest development committees were to establish plantations in degraded forests.
- iii) Liberalization of the import of logs, wood chips and market pulp, and
- iv) Wood substitution

The intent of the plan was to have the corporate sector and farmers be responsible for establishing commercial plantations. However, this assumption was not without its limitations. The farmers grew trees on a marginal scale without much technical input. Farmers tended to grow trees with shorter rotation periods and often they were not the quality required for sawn timber and face veneer. The farmers' timber was more suitable for small saw logs and peeler logs for core veneer.

Various efforts were made in the field of agro-forestry and social forestry by the Forest Department which increased the establishment of tree plantations on private lands. The joint efforts of the Forest Department, National

Afforestation and Eco Development Board (NAEB), National Wastelands Development Board (NWDB) and the Forest Development Committees (FDCs) substantially increased the area of plantations. Poor coordination between the wood based industry and the afforestation agencies led to a non-industry oriented plantation resource. In order to address biodiversity concerns the forest department concentrated on multi-product tree plantations that were more oriented towards shorter rotation, marginal level plantations.

In this situation the policy promoting the liberalization of log and pulp imports was a relief to the industry, as it helped them to address their raw material shortage. The import dependence soon became a concern for the government as the import bill rose from US\$ 346 million in 1993-94 to US\$ 868 million in 1997-98. Economists feared that the increasing import dependence of the industry could not be sustained for two reasons: (i) most neighboring countries began to impose bans on log exports and (ii) the industry might not to be cost competitive in the international marketplace.

Wood substitution was viewed as the natural solution for the industry. The paper industry started using bagasse (the fibrous remains derived from sugar cane crushing), agricultural waste and recycled paper which now forms 45% of the raw material supply of the industry. The plywood industry started using non-traditional plantation species as core veneer, reserving valuable species for the exterior decorative layer. The construction industry also shifted from the use of wood to steel, aluminum and plastic products. Many economists and industry experts believe that this policy of wood substitution will make little difference given the ever increasing demand for wood in the future.

A critical analysis of the National Forest Policy of 1988 revealed its drawbacks and identified several areas around which a new strategy should be developed. This analysis provided several recommendations that could be implemented within the framework of the NFP 1988. The recommendations included:

- i) Develop a new strategy for the production of large dimension hardwood logs for the panel and sawmill industry through sustainable management of national forests.
- ii) Develop a strategy for supplying the needs of the pulp and paper industry using fast growing, high yield plantations and agro forestry emphasizing softwood species.
- iii) Develop a strategy for achieving a national forest policy of having one-third of the land area of India under forest/tree cover, and
- iv) Develop a central agency to integrate all these activities. The role of the central agency will be played by the State Forestry Departments (SFDs) and Ministry of Environment and Forestry (MOEF).

3.5 ROLE OF VILLAGES AND JOINT FOREST MANAGEMENT.

Many forest areas are located in close proximity to urban areas with villages at the fringe of the forest. As per the State of Forests Report, 1999, studies show that “the forest areas in the proximity of population centers/villages are reported to be degrading faster due to collection of fuelwood, cattle grazing etc. as compared to forests away from the population centers and located in inaccessible areas.” Attempts are being made to provide alternate sources of income and fuel with the objective of minimizing the villagers’ dependence on the forest. It is estimated that 200 million people in India are partially or wholly dependent on forest resources for their livelihoods.

Forest conservation priorities and policies cannot be developed in isolation from local people and the broader patterns of natural resource use. Acknowledging this factor, the Ministry of Environment and Forests issued policy guidelines for the involvement of village communities and volunteer agencies in the regeneration of degraded forestlands on June 1, 1990 under the JFM (joint forest management) program. Joint Forest Management is a program for developing partnerships between fringe forest user groups and the FD (Forest Department) on the basis of mutual trust and jointly defined roles and responsibilities with regard to forest protection and development. Under the JFM, the user (local communities) and the owner (government) manage the resource jointly and share the cost equally. India is one of the pioneers where forest management policies stress partnerships between the state and local communities. Currently, it is estimated that 10.24 million ha of forest lands are being managed under the JFM program through 36,075 committees in 22 states. As a follow-up, the Government of India issued guidelines on February 21, 2000 aimed at strengthening the JFM program. The effective and meaningful involvement of local communities in developing sustainable forest management plans are now looked upon as a significant approach to address the longstanding problems of deforestation and land degradation in India.

3.6 ECONOMIC CONTRIBUTION OF THE FORESTS

An exhaustive list of the products and services provided by the forests of India is very difficult and an issue of debate. The lack of complete data on the production of the forest makes the task of estimating the total revenue from the forests all the more daunting. A study was carried out by the Institute of Economic Growth in Delhi on the contribution of the forestry sector to GDP. The results of this study estimate that 54.2% of the gross output from the forests is obtained from fuel-wood, 9.3% is from industrial wood, 15.9% is from NTFP collection with eco-tourism and carbon sequestration contributing 13.9% and 6.8% respectively. It was estimated that as a percentage of GDP the forestry sector contributed 2.4% to the GDP of the country in 1997. As per the official estimates published in the “National Accounts Statistics, 2005” by the Government of India in the year 2003-2004, 83.8% of domestic product from forestry and logging came from firewood, whereas only 8.7% was the contribution from industrial wood and 7.6% was from minor forest products. The contribution of the various aspects of the forest products in the industry can be seen in Table 9.

Table 9: Domestic product from forestry & logging in billion US \$ (at current prices)

Item	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Industrial wood	0.66	0.55	0.46	0.53	0.49	0.56
Firewood	3.63	3.96	4.55	4.31	4.68	5.41
Minor forest products	0.42	0.49	0.44	0.43	0.43	0.49
Value of output	4.70	5.01	5.45	5.27	5.60	6.46

Source: National Accounts Statistics 2005, Central Statistical Organization, GOI

Note: Converted to US\$ from INR using financial year average exchange rates

A large volume of products extracted from the forests of India remain unreported, making the true estimation of the economic value of the forest resource very difficult to calculate. The economic value of the forest can be estimated in terms of the timber products, the non-timber forest products (NTFPs), and the fuelwood found in the forests.

A recent World Bank report states that NTFPs are an important source of livelihood for many Indian communities, particularly those located adjacent to forests. Several thousands tons of NTFPs are removed annually from India’s forests (Lele, Mitra, and Kaul 1994) providing earnings that run into billions of rupees annually. One source estimates that the income from NTFPs to the state exchequer was about US\$ 208 million in the 1990s (A.N. Chaturevedi 1994). Another source estimates the revenue contribution of NTFPs at US\$ 645 million (M.P. Shiva 1994). NTFP earnings commonly come from the collection of sal and tendu leaves, grasses, mahua flowers, sal seeds, lac, medicinal herbs, honey, gums, resins, oil seeds, tans and dyes. It should be noted that a huge share of the NTFP harvest is consumed locally or is sold through the informal economy. Moreover, a large proportion of the harvestable NTFPs remain untapped due to the absence of an established market.

The demand for fuelwood is also uncertain. Recent surveys show that of total domestic fuel use, 59.2% in rural areas and 35.5% in urban areas are being met from fuelwood. Three non-commercial energy sources – wood, animal dung and agricultural residues – still provide 95% of fuel supply in the rural areas. India is the world’s leading producer and consumer of fuelwood, the single most important product obtained from the forests. The MoEF estimated that in 1994, between 83% and 88% of the total wood demand in the country was for fuelwood (GoI 1999). The MoEF also estimates that the consumption of wood (timber and fuelwood) in the country is substantially higher than can be sustainably removed from the forests.

4. IMPORT AND EXPORT STATISTICS OF VARIOUS WOOD BASED PRODUCTS

4.1 INTRODUCTION

The Indian forest products industries, both the wood products industry and the paper and paperboard industry, are constrained by severe raw materials shortage. According to a recent report the capacity utilization of the Indian paper and paperboard industry was as low as 60%. As a result of this low capacity utilization rate, 192 out of 515 paper mills in India are either unprofitable or have closed. The state of the wood products industry is worse. According to the index of industrial production, the wood and wood products sector is in the bottom 20% of the major Indian industries which have experienced a negative growth rate in 2004-2005. The production of the Wood Products; Furniture and Fixtures industry declined by 16.7% from the year 2004 to 2005. Much of this decline can be attributed to raw material shortages. This problem of raw material shortage for the forest products industry was further accentuated as a result of the Supreme Court ruling limiting the felling and movement of timber. In order to address the shortage of raw material, the industry is increasingly relying on imported logs, lumber, wood pulp and waste paper. Hence, for the wood based industries, imports have become a very important component of their raw material mix.

In this chapter the forest product import and export statistics have been analyzed, along with the bilateral trade statistics of forest products. The data used in the analysis was acquired from the Directorate of Statistical and Commercial Intelligence, Ministry of Commerce, Government of India and the FAO Forestry Statistics. Among the forest products, this paper emphasizes trade in logs, lumber, panel board and plywood products. As Wood Pulp and Paper products comprise a large component of India's exports and imports a section in this chapter has also been devoted to this sector. More recent data collected from the Directorate of Statistical and Commercial Intelligence, Government of India and the Global Trade Atlas was used to analyze trade of timber and panel products.

4.1.1 Tariff on the Wood Based Products

India follows a policy of protecting the domestic wood based industries through the imposition of both tariffs and a number of customs duties above the basic customs duty of standard tariffs. India has imposed tariffs on 2,700 items. India is showing trends of opening up the economy to the global market, although in a planned and gradual manner. The same is true for wood products. Current tariffs on wood products range from 5.1% to 34.44%. (See Appendix B for a detailed list of tariff rates on wood products)

The graduated structure of tariffs applied on wood products clearly indicates that the Indian government encourages the import of less processed wood products so that those materials can be used by the forest-based industries as raw materials (Table 10). Higher tariff rates are imposed on finished and value added products to protect domestic manufacturers from international competition. In addition to basic tariffs India also imposes additional customs duties such as surcharges, additional duty of customs and special additional duties. Other additional levies might also be imposed on imported items depending on the nature of the goods. These levies include countervailing duties, anti-dumping duties and safeguard duties. Other non-tariff barriers include state taxes, which can be as high as 18% of the value of imports and various port of entry restrictions which might add up to a large markup on imported items. Such acts by the government make imported products less competitive in the domestic market. Over the past decade the tariff rates and the non tariff barriers have been reduced drastically and India has started importing large volumes of forest products. The new forest management policy aimed at conserving forests and reducing the timber harvest has also made the domestic wood based industry more import oriented. Finally, the Indian population has started showing increased interest in imported wood products like furniture and flooring. As a result the volume of imports of both primary and value added wood products have increased over the last decade.

Table 10: Rate of tariff on wood articles; 2005 - 2006

HS Code	Description	WTO Bound Rate	Basic Customs Duty	Effective Customs Duty	Formerly
4403	Wood in the rough (logs), stripped/treated or not of bark or sapwood, etc.	40%	5%	5.10%	9.20%
4407	Coniferous or non-coniferous lumber	40%	15%	15.30%	30.0%
4408	Veneer/sheets for plywood	40%	15%	34.44%	56.832%
4409	Wood, continuously shaped (including strips and friezes for parquet flooring, not assembled)	40%	15%	34.44%	56.832%
4410	Particleboard & OSB	40%	15%	34.44%	56.832%
4412	Laminated Wood (plywood, veneered panels)	40%	15%	34.44%	56.832%
4418	Builders' joinery and carpentry (wood panels, windows, doors, shingles)	unbound	15%	34.44%	56.832%

Source: United States Department of Agriculture, Foreign Agricultural Service

Exports of finished wooden products are allowed without any restrictions. In order to sustain the log supply to the wood-processing industry, following a series of court-ordered restrictions on domestic logging from 1994 to 1996, the Government began liberalizing wood product imports. Since 1995 India has experienced a gradual decrease in import duties on wood and wood products. Between the years 1996 to 2000, quantitative restrictions on logs, sawn lumber and several value-added products were gradually phased out. In order to ensure an adequate supply of logs to the wood-processing industry the government has been gradually reducing the tariff barriers. In the budget announced for 2005 – 2006, import duties for most wood products were further reduced. The reductions place the effective tariffs well below India's WTO bound rates for wood products which are set at 40%, with the exception of builders joinery (HS 4418), which is unbound. As per the 2005-2006 budget, logs are subject to a basic customs duty of 5%, while for lumber, veneer, plywood, fiberboard, particle board etc. it is 15%. This is a huge reduction from the previous year's 30% basic customs duties on value added wood products. The effective customs duties are higher than the basic customs duties due to additional charges imposed on the imports in forms of countervailing duties, special additional duties (SAD) etc. Prior countervailing duties imposed on logs and lumber and special additional duty imposed on all imports, including wood and wood products were also withdrawn in the 2005-2006 budget. The effective customs duty, which includes an education assessment ("cess") of 2% of the total applicable duty, decreased from the previous years 9.20% to 5.10% for logs and that on lumber decreased from 30.00% to 15.30%. The effective customs duties on all other wood articles were reduced to 34.44%. In addition to these customs duties additional duties for transporting the product within cities, known as octroi duties, might be levied on goods brought into cities like Mumbai and Calcutta. These octroi duties typically range from 2% to 8%, depending on the city. Finally, customs clearing and forwarding charges also apply to the importer and these may be in the range of 1% to 4%.

4.2 EXPORT-IMPORT POLICY

India's third five-year Export Import (Exim) Policy, 2002 - 2007 was formulated with the objective of achieving a 1% share of world exports by 2006-2007 from the 2001 – 2002 level of 0.67%. The attainment of this objective would require a compound annual growth rate of 11.9%. The previous Exim policy (1997 to 2002) was formulated with the objective of deriving maximum benefits from expanding global opportunities by accelerating the transition to a globally oriented economy. In order to stimulate the economy towards sustained economic growth industries were given access to necessary raw materials, intermediaries, and capital to expand domestic production. Making industries globally competitive through technological advancement and providing customers with affordable, good quality products were also promoted. The third and the most recent exim policy is largely a continuation of the previous policy with more specific objectives.

In formulating an export-import policy for the forest products industry, a holistic approach was adopted for the development of the industry. A balanced approach was proposed by offering a conducive environment to the

industry and also to local communities. The biodiversity preservation issue was also given due consideration. In order to make sufficient raw material available to the industry, both in the short-term and long-term, some felling restrictions were eased and plantation forestry was encouraged. The relevant section of the National Forest Policy was reviewed, exempting the wood based industries from licensing. Domestic tree growers were protected from excessive international competition. The ban on the export of plantation grown wood was rescinded and private tree growers were encouraged to export.

The production and trade statistics show that the Indian forest products industry is primarily focused on the domestic market. The volume of production in most product categories dwarfs trade volumes (Table 11).

Table 11: Exports, import and production of forest products in 2005

Product Name	Import '000 Cubic meters	Export '000 Cubic meters	Production '000 Cubic meters
Sawnwood	72	15	14,789
Roundwood	4,648	7	328,677
Wood-Based Panels	240	206	2,554
Wood Pulp	468	14	2,308
Paper and Paperboard	1,193	309	4,183
Wood Fuel	0	0	305,485
Wood Charcoal	2	5	1,728

Source: FAO data

The import and export of forest products has experienced a steady increase since 1991. Traditionally, paper and paperboard dominated Indian imports over the last decade. However, in recent years roundwood imports have increased significantly. India's wood based products exports, though small compared to imports, are dominated by paper and paperboard. The exports of wood-based panels increased in the middle part of the last decade. Since 1996 the exports of roundwood logs dropped drastically following the Supreme Court ruling banning the harvest and movement of timber. Though the paper industry was also affected by the ban, the impact was not as serious as that experienced by the timber industry. A large proportion of raw material for the paper industry is sourced from plantations and private forests, which were not much affected by the rulings. In the remainder of this chapter we will present a detailed analysis of India's trade in forest products.

4.3 BILATERAL TRADE SITUATION

India's bilateral trade received an enormous boost following the implementation of the tariff reductions. In 1998 this upsurge received a temporary setback after India declared itself a nuclear power. Recently, the trade statistics of India show continued increases in international trade. India-China bilateral trade crossed the US\$5 billion mark for the first time in 2003, with Indian exports growing by 85.3% during the first nine months of the year, as per the latest Chinese statistics. As can be observed from Table 12, the value of bilateral trade between India and Australia rose by 51.8% from the year 2003 to 2004. India is New Zealand's third most important trade partner, and one of the favorite destinations for the New Zealand's radiata pine logs. With extension of India's interest to the Pacific Island states in 2003, India became a dialogue partner of the Pacific Forum.

Table 12: India's trade April – July 2004 - 2005 (figures in million dollars)

Region/Country	Export			Import			Bilateral trade		
	US \$ million		% change	US \$ million		% change	US \$ million		% change
	2003-04	2004-05	2004-05	2003-04	2004-05	2004-05	2003-04	2004-05	2004-05
World	56,086	70,493	26	70,315	95,646	36	126,401	166,138	31
Africa	3,434	4,725	38	2,936	3,401	16	6,371	8,125	28
America	11,866	14,610	23	6,325	7,996	26	18,191	22,606	24
Asia (excl. Middle East)	17,236	21,553	25	17,980	22,750	27	35,216	44,304	26
Middle East	8,250	11,058	34	3,964	7,576	91	12,214	18,634	53
Europe	14,505	17,492	21	17,981	23,559	31	32,487	41,051	26
Oceania	637	737	16	2,471	3,480	41	3,109	4,217	36
Australia	522	621	19	2,355	3,282	39	2,877	3,903	36

Source: Federation of Indian Chambers of Commerce and Industry, <http://www.indiainbusiness.nic.in/trade-india/trade.htm>

In the financial period 2004 – 2005, India's bilateral trade in terms of value is highest with in Asia (26.7%) followed by Europe (24.7%) and the US (13.3%). The main destinations of India's exports are Asia (44%), West Europe (24%), Americas (23%) and Africa (6%), whereas, the major sources of India's imports are Asia (32%), West Europe (24%), Americas (9%), and Africa (5%). The United States of America is the largest trading partner of India and the bilateral trade value comprised of 13% of India's total trade in 2004-2005. At present, the balance of trade between the two countries is in India's favor, with India's total exports to the U.S. valued at \$14 billion and its imports from the U.S. amount to \$7 billion. As per government reports, the major items of exports in 2004 – 05 are engineering goods (20.4%), gems and jewelry (16.9%), textiles and clothing (16.4%), agricultural products (9.9%), chemicals (9.5%), ores and minerals (5.1%), and petrol and products (3%). The major import items are crude oil, (27.8%), pearls and precious stones (8.4%), gold (9.6%), electronic goods (9.2%), and chemicals (7.8%).

India is both an exporter and importer of forest products. The bilateral trade statistics has been found to vary when collected from different sources. At times cross-checking the data between the different sources becomes difficult due to the different accounting methods followed by different countries and organizations, in terms of product grouping, unit of measurement and other factors. The data used in this analysis are taken from the Global Trade Atlas from 1999-2004. Among the countries from which India imports forest products Malaysia has emerged as the number one followed by Myanmar and Nigeria. The other major countries from which India imports forest products are Indonesia, Ivory Coast, New Zealand, Gabon, and Singapore in descending order (ref. Appendix Table B1).

4.4 IMPORTS AND EXPORTS OF WOOD PRODUCTS

4.4.1 Wood Product Imports

Since 1999 the imports of wood products have displayed a positive growth trend through 2004, as can be observed in Figure 5. For the first time in Indian history the total value of imports of timber and wood based panels crossed the US \$500 million mark in 2001. The temporary slow down in imports in 2002 was a reflection of the global recession in 2001 – 2002. Indian imports of the timber and wood based panels revived in 2003 and the overall imports of timber and wood based panels almost doubled (95.2%) over the period 1999 to 2004.

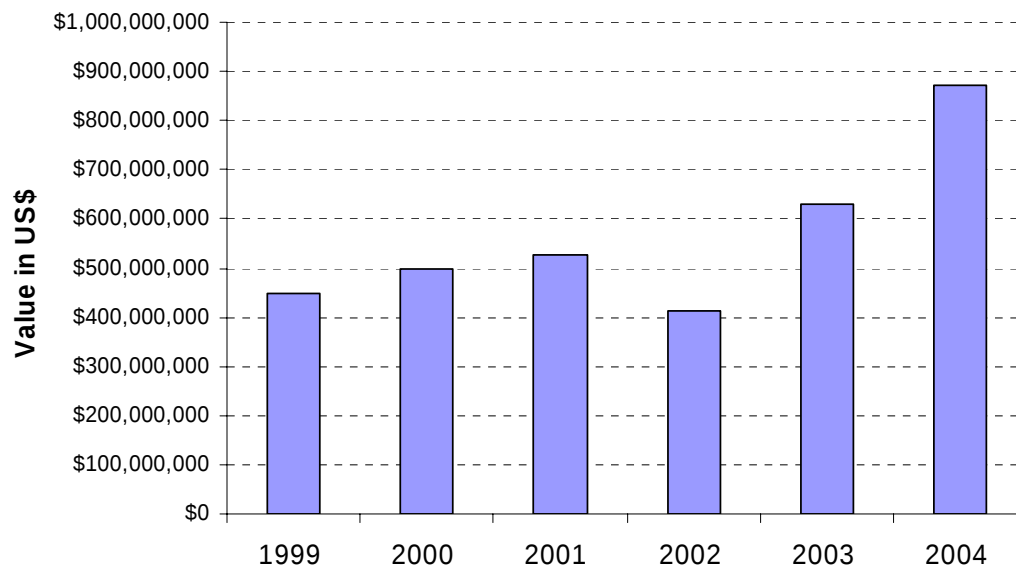


Figure 5: Imports of wood and articles of wood by India

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India imports wood based products from as many as 146 nations although the bulk of the imports are from the Asian countries. When ranked by value of wood imports Malaysia ranked first with the total value of imports in 2004 at US \$ 330 million, which is 38% of India's total wood imports. Wood product imports from Myanmar was ranked second with total value of imports at US \$ 210 million, 24% of India's total wood product imports in 2004. The other countries which were important sources of wood products imports were Ivory Coast (6.6%), Papua New Guinea (4.8%) and Gabon (3.8%). Indonesia used to be one of the major sources of India's wood products imports, but since 2001 the value of Indonesian imports to India have decreased from US\$ 69.3 million in 2001 to US\$ 1.3 million in 2004. However, the wood products imported from west African countries like Ivory Coast, Nigeria and Gabon are steadily increasing. In 2004 Asia (65%) and Africa (24%) proved to be two major regions from which almost 90% of India's wood product imports originated. India's imports of wood products from North America failed to keep pace with the overall growth in wood products imports. From 2003 to 2004 the total share of India's overall imports from USA increased by 26%, however, the total value of wood products imports dropped from US\$ 2.9 million in 2003 to US\$ 2.6 million in the year 2004. In 2003 the share of wood products in the overall imports from the US was 0.46%, which dropped to 0.3% in 2004. India's wood products imports from Canada increased by 20% from 2003 to 2004. India's overall increase in wood products imports in the same period was registered at 38.9%. As can be seen in Table 13, over the period of 1999 – 2004, logs comprised 92% of total wood products imports, reaching US\$ 802 million in 2004.

Table 13: Imports of major wood products during, 2002 to 2004

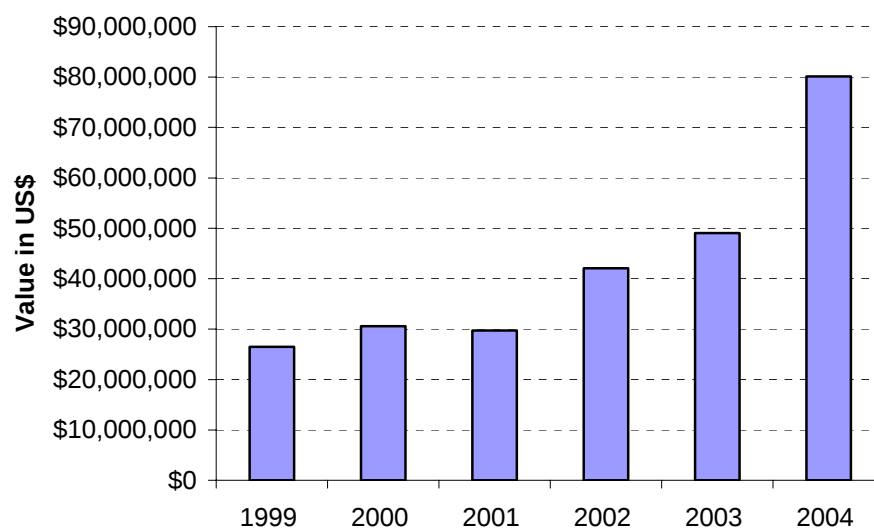
Description	Unit	2002		2003		2004	
		USD	Quantity	USD	Quantity	USD	Quantity
Total Wood Products Imports	--	\$ 413,133,810	--	\$ 628,738,708	--	\$ 873,267,343	--
Logs	M ³	\$ 375,199,637	1,650,096	\$ 581,792,794	2,688,519	\$ 802,210,642	3,329,514
Sawn Wood	M ³	\$ 8,355,879	NA ⁴	\$ 7,177,177	NA ⁴	\$ 16,696,193	88,496
Veneer Sheets	T	\$ 3,204,700	3,720	\$ 3,275,098	4,252	\$ 4,877,067	7,729
Wood, Continuously Shaped	T	\$ 1,271,857	469	\$ 2,237,667	975	\$ 2,013,929	1,200
Particle Board	T	\$ 6,417,950	12,412	\$ 11,576,639	27,532	\$ 15,312,853	22,261
Fiberboard	T	\$ 9,405,195	26,896	\$ 12,271,442	50,804	\$ 15,616,004	46,629
Plywood & Veneered Panels	M ³	\$ 3,785,445	NA ⁴	\$ 3,891,922	NA ⁴	\$ 4,671,101	69,824
Builders' Joinery	T	\$ 1,219,019	438	\$ 1,504,587	534	\$ 3,244,322	995

Source: Global Trade Atlas, Global Trade Information Services, Columbia

T = Tons, M³ = Cubic meters, NA = not available

4.4.2 Wood Exports

India's wood product exports have displayed positive growth since 1999 with a temporary slow down in the second half of 2001 (Figure 6). From 2003 to 2004 India registered a substantial 63% increase in the exports of wood products from US\$ 49 million to US\$ 80. India's major exports are plywood and other panel products, followed by veneer and sheets for plywood. India also exports a moderate amount of particleboard and fiberboard.

**Figure 6: India's exports of wood and articles of wood**

Source: Global Trade Atlas, Global Trade Information Services, Columbia

⁴ The quantity is reported partially in cubic meters and partially in metric ton units.

The following table states the total quantity and the value of the various wood based products exported by India in the past three years.

Table 14: Exports of major wood products, 2002 to 2004

Description	Unit	2002		2003		2004	
		USD	Quantity	USD	Quantity	USD	Quantity
Total Wood Products Exports	--	\$ 22,630,382	--	\$ 41,652,326	--	\$ 41,556,140	--
Charcoal	T	\$ 2,323,521	8,217	\$ 2,172,046	17,839	\$ 2,301,322	30,543
Logs	M ³	\$ 2,135,615	9,634	\$ 2,900,113	12,276	\$ 1,610,066	3,938
Sawn Wood	M ³	\$ 1,221,803	NA	\$ 1,366,066	NA	\$ 7,240,599	27,257
Veneer Sheets	T	\$ 5,700,262	3,821	\$ 6,832,806	3,268	\$ 10,703,947	11,695
Particle Board	T	\$ 3,000,638	1,892	\$ 3,004,689	1,923	\$ 5,402,668	2,356
Fiberboard	T	\$ 2,966,187	3,766	\$ 3,086,059	4,781	\$ 4,606,818	5,167
Plywood & Veneered Panels	M ³	\$ 8,283,099	NA	\$ 9,123,638	NA	\$ 17,572,723	137,655

Source: Global Trade Atlas, Global Trade Information Services, Columbia

T = Tons, M3 = Cubic meters, NA = not available

United States of America is the largest importer of Indian wood based products followed by the United Arab Emirates, the United Kingdom, Netherlands and Singapore. The total value of wood products exported by India to the USA in 2004 totaled US\$ 13.9 million, an increase of 38% over the previous year. The value of exports to the UAE in 2004 was US\$ 11.5 million, an 80% increase over 2003. Export of wood products to the United Kingdom from India in 2004 also increased by 64% to US\$ 5.5 million.

4.4.3 Logs

Logs comprise more that 92% on India's wood product imports. In 2004 the total import of logs was almost US\$ 802 million (Figure 7). In 2002 the value of log imports dropped to US\$ 375 million in response to the September 11th terrorist attacks and a domestic economic recession. The overall trend during the past six years has been one of growth. From 1999 to 2004, the total value of log imports by India almost doubled from US\$ 418 million in 1999 to US\$ 802 million in 2004.

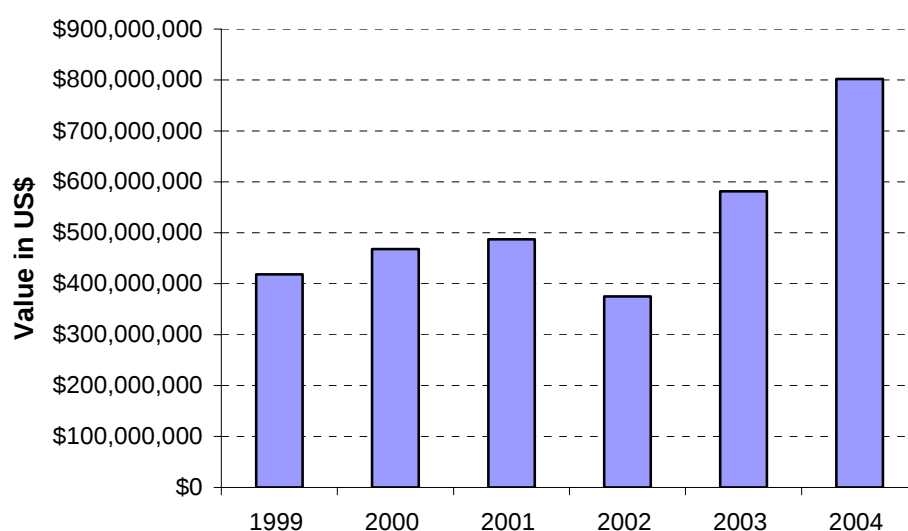


Figure 7: Imports of logs (wood in rough) from 1999 - 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

Malaysia is the largest exporter of logs to India in terms of both value and volume. Myanmar follows Malaysia very closely in terms of value. In 2004 the total volume of logs imported from Malaysia was 1.6 million cubic meters (m³) with a value of US\$ 323 million. In the same year the volume of logs imported from Myanmar was 0.53 million m³ (approximately one-third the volume imported from Malaysia), with a value US\$ 208 million. The unit cost of log imports varies by species; however, the overall unit cost of logs imported from Malaysia was far lower than from the rest of the world. Indonesia, Nigeria, Ivory Coast and New Zealand are also large exporters of logs to India (Ref Appendix: Table B.2). Most of India's log imports comprised of tropical hardwood species. However, since the beginning of 2000 Indian imports of temperate softwood species have been increasing (Table 15).

Table 15: Value of types of logs imported by India from 1999 - 2004

Art.code	Description	United States Dollars					
		1999	2000	2001	2002	2003	2004
440310	Treated Logs	\$971,308	\$7,836,586	\$1,056,722	\$323,599	\$650,875	\$17,141
440320	Untreated Coniferous Wood	\$13,280	\$151,619	\$211,056	\$113,390	\$512,067	\$256,092
440341	Red Meranti or Meranti Bakau Wood	\$0	\$0	\$550,279	\$15,771	\$422,276	\$1,233,519
440349	Other Tropical Wood	\$107,981,848	\$136,629,745	\$144,692,831	\$139,483,748	\$260,687,849	\$461,137,941
440391	Oak Wood, Untreated	\$242,678	\$76,776	\$98,641	\$89,661	\$277,367	\$986,881
440392	Beech Wood, Untreated	\$563,072	\$451,242	\$518,967	\$572,320	\$1,917,436	\$1,175,950
440399	Other Treated logs	\$308,902,056	\$322,790,611	\$340,163,428	\$234,601,147	\$317,324,925	\$337,403,119
4403	Total	\$418,674,243	\$467,936,578	\$487,291,926	\$375,199,637	\$581,792,794	\$802,210,642

Source: Global Trade Atlas, Global Trade Information Services, Columbia

The Indian market has a strong demand for teak and apart from the domestic production, large volumes of teak are imported from Myanmar, Malaysia, Nigeria and Cote d'Ivoire. In India teak is considered to be superior to all other wood for furniture, flooring, and general construction. It is also considered to be more durable and decay resistant than any other species. Apart from teak, other tropical wood species and other hardwood species are also high in demand. Softwood species are less in demand in the Indian market as neither the wood workers nor the buyers are familiar with the species and characteristics of softwood.

Andaman Padauk, also known as Vermillion wood in the USA, is imported in moderately high volume. This species is used for the manufacture of high-end cabinets and furniture; it is also used for carving and sculpting, and as an accent wood. India itself is a large producer of Sal (*Shorea robusta*). Lately India has started importing Sal since the harvest has been halted as a result of the Supreme Court rulings. Sal is used for railway sleepers, piles, beams and other load bearing parts of bridge structures, wheels and bodies of carts and other similar load carriers, including motor trucks as well as roof trusses and rafters. Imports of temperate hardwood logs, primarily oak and beech have increased rapidly since 1999. In 2004 oak log imports jumped significantly while beech log imports fell by approximately 40%.

The Indian wood products market is highly price sensitive and the wood products imported from Malaysia are cheaper compared to imports of similar wood products from the rest of the world. This has made Malaysia one of the favorite sources of India's wood product imports. Most of the lumber imported from Malaysia is sourced from plantation forests. India's lumber imports from Myanmar on the other hand, are from the natural forests, are more expensive and of better quality. Teak from Myanmar, popularly known as Burmese Teak, is highly valued in the Indian market. High-end users tend to prefer Burmese Teak over other wood species for the production of wood furnishings and floorings. The teak logs imported from Myanmar are almost 2.5 times more expensive than from Malaysia. Sal logs imported from Malaysia are cheaper than Sal logs harvested domestically. As a result, Malaysian

Sal is providing tough competition for domestically grown Sal in the Indian market.

Table 16: Import of logs from Myanmar and Malaysia

	Myanmar			Malaysia		
	Quantity (CUM)	Value (USD)	Unit Cost (US\$/CUM)	Quantity (CUM)	Value (USD)	Unit Cost (US\$/CUM)
1999	398,466	130,523,630	328	574,038	103,582,456	180
2000	470,868	142,934,010	304	541,628	88,152,872	163
2001	351,010	116,167,324	331	892,828	128,259,814	144
2002	282,705	88,520,823	313	733,287	134,561,765	184
2003	341,870	139,485,832	408	1,550,729	284,632,104	184
2004	527,560	207,804,344	394	1,608,562	323,478,302	201

Source: Global Trade Atlas, Global Trade Information Services, Columbia

Log import data from 1999 to 2004 (Table 16) shows that the imports from Myanmar has gone up substantially since 2002. It may also be observed that since 2003 average cost of imports of logs from Myanmar has gone up drastically. Over the years, Myanmar has earned a reputation as one of the world's largest exporters of top-quality teak. In 1995 the Indian government signed a trade agreement with Myanmar. Since then the imports of teak logs from Myanmar have steadily increased. One of the reasons leading to this increase in the average price of logs imported from Myanmar was massive deforestation in Myanmar over the last decade. Teak is one of the most important sources of foreign exchange for Myanmar. With wood being such an important source of income for Myanmar all previous attempts at curbing deforestation have failed. With the shrinking of the resource base and the increasing pressure from international and national environmental groups the official harvest volume has declined although a very substantial volume of illegally harvested logs are reported to be making their way to the international markets.

Since Malaysia is a lower cost supplier of logs, Indian importers have increased their imports of Malaysian logs over time (Table 16). The Indian market is not well-informed about the quality and characteristics of the wood species. Moreover, the contractors and wholesalers, who are the primary purchasers of logs, tend to push the low priced building and construction materials. Since 2002 the average costs of logs imported from Malaysia have experienced a substantial increase. This was a result of the Malaysian government policy to utilize more logs for its domestic industry and increase export of value added wooden products.

India is a major destination for Malaysian logs, and has become a major competitor for Japan and China, most of whose tropical hardwood log supply also comes from Malaysia. The economy of India, together with that of China, has been growing rapidly and both countries have been buying more and more Malaysian logs since the Indonesia log export ban. Japan used to be the main buyer of Malaysian logs but it is now third, after India and China. Japan maintains its interest in buying high quality logs and as a result most Meranti logs are exported to Japan. The relatively light and lower quality logs from species like Keruing (*Dipterocarpus spp.*) and Kapur (*Dryobalanops spp.*) are exported to India.⁵

4.4.4 Sawnwood

In India the industries identified to be major end users of sawn wood are housing and construction, packaging and furniture. India's sawn wood import is dominated by the hardwood species. Since 1994 (not shown in Figure 8) the imports of coniferous sawn wood started picking up.

⁵ Source: news article published in <http://www.indiaplyweb.com> news page, dated 3rd September 2004.

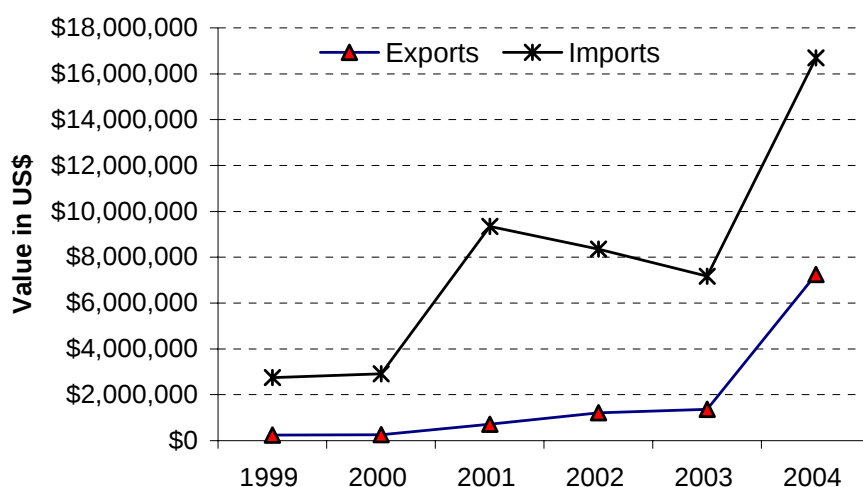


Figure 8: Imports and exports of sawnwood

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India is predominantly an exporter of hardwoods. India produces softwoods but it does not play a major role in the exports. In 2004 US\$ 3.6 million worth of sawn wood got exported to Iraq mostly for post war reconstruction activities, which is almost half of India's total lumber exports during that year. In 2004 India also exported sawn wood worth US\$ 1.6 million to Vietnam for the first time in the past decade. These factors lead to an increase in the total volume of Indian sawn wood exports in 2004.

The demand for sawn wood in India is projected to increase in the decades to come. In order to slow deforestation various state governments of India stopped renewing licenses to sawmills which primarily processed domestic logs in 2000. This resulted in a sharp fall in the production of domestic lumber in 2001. New licenses were issued only to sawmills using imported logs as their raw material. Increased demand for sawn wood is projected to be met to a large extent by imported sawn wood. Moreover, imported lumber from a number of countries is cheaper than domestically produced sawn wood, even taking into account transportation costs. The increase in India's softwood lumber imports may be seen in Table 17.

Table 17: India's softwood lumber imports from 1999 to 2004

Description	Units	1999	2000	2001	2002	2003	2004
Douglas Fir	Value in US \$	\$29,094	\$48,828	\$147,834	\$193,353	\$32,728	\$5,920
	Quantity in M ³	48	180	396	677	137	58
Pine	Value in US \$	\$49,995	\$95,484	\$3,439,269	\$778,592	\$238,629	\$5,837,275
	Quantity in M ³	171	424	42,334	11,564	2,886	54,724
Other Coniferous	Value in US \$	\$443,305	\$228,720	\$902,545	\$766,208	\$581,252	\$219,129
	Quantity in M ³	1,807	2,130	109,271	14,295	16,096	744
Total Softwood lumber	Value in US \$	\$522,395	\$373,032	\$4,489,649	\$1,738,153	\$852,609	\$6,062,324
	Quantity in M3	2,026	2,734	152,001	26,536	19,119	55,526

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India's softwood lumber imports jumped from US\$ 850,000 in 2003 to US\$ 6.06 million in 2004. Most of the softwood lumber imports prior to 2004 were radiata pine from New Zealand. However, the increase in softwood lumber imports from 2003 to 2004 resulted mostly from softwood lumber (Pine species) imports from Australia, and South Africa. The radiata pine lumber imports from New Zealand comprised almost 50% of India's softwood

lumber imports in 2001. India imports relatively smaller volumes of Douglas-fir lumber mostly from Canada and Italy. During the time period from April 1998 to March 2003, almost 80% of the imports in the “Other Coniferous Sawnwood” category came from Canada. In recent times India has started importing sizeable volumes of sawn Douglas-fir from Italy.

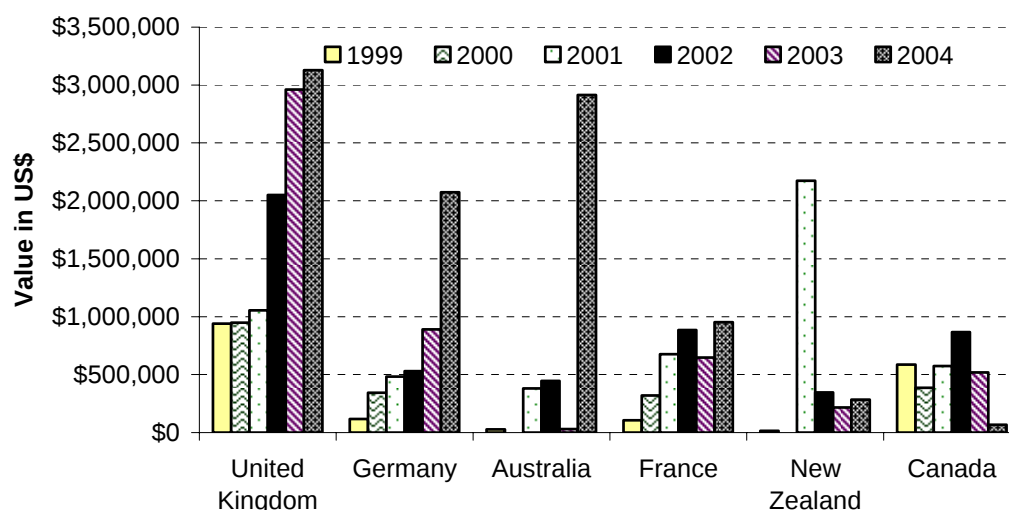


Figure 9: Top 6 countries by total value of India's sawnwood imports

Source: Global Trade Atlas, Global Trade Information Services, Columbia

From 1999 to 2004, the highest volumes of sawn wood imports were received from the United Kingdom, followed closely by Germany, Australia, France, New Zealand and Canada (Figure 9). With the exception of Australia, Canada and New Zealand, hardwood species dominated the imports of the primary lumber import sources of India in 2004. The UK is the largest hardwood lumber exporter to India and Canada used to be the largest sawn softwood exporter to India, before New Zealand and Australia made their entry into the Indian market. Willow is an important hardwood lumber imported into India with more than 98% of it originated from the United Kingdom. Prior to 1999, the United States had a fairly large share of India's imports of sawn wood. After 1999 the value of imports of sawn wood from the US decreased drastically and most of the US imports were replaced by imports from Italy, France, Germany, the UK and some African countries.

The UK and Canada have maintained a large share of India's sawn wood imports over the years. It is interesting to note that New Zealand, which had virtually zero imports of sawn wood to India in 2000, flooded the Indian market with radiata pine lumber in 2001. Australia and South Africa followed the same trend with softwood lumber in 2004. According to research results from a leading US university, radiata pine has been claimed to be comparable to Douglas fir in its overall strength and finishing characteristics. Importing from New Zealand or Australia is logistically more convenient than importing from Europe or North America. The average cost of imported radiata pine from New Zealand and Australia has been in the vicinity of US\$60 per cubic meter, whereas Douglas fir imported from Canada was priced around US\$300 – US\$400 per cubic meter. As has been mentioned previously, the Indian market is very price sensitive and a lower priced alternative to Douglas-fir was welcomed by India's wood products sector. During the later part of 2002 and into 2003, due to some quarantine measures the imports of radiata pine were temporarily restricted resulting in a steep drop in imports. At present pine lumber is well accepted in North India especially in Delhi, Gujarat and Maharashtra. Currently, it is mostly used for construction and packaging in India. It is believed by the industry that it can be used for value added products after proper treatment. The imports of pinewood are expected to exceed 1 million cubic meters by 2007.

4.4.5 Plywood and Wood Based Panels

The plywood and panel industry in India consists of four types of product categories: veneer sheets, plywood, particle board and fiberboard (compressed and non-compressed). Compressed fiberboard can be divided into hardboard and medium density fiberboard (MDF) and non-compressed fiberboard is referred to as insulating board. The Indian wood panel industry is highly domestic production oriented. However, recent trade data suggests that the

market is increasingly relying on imports in some product categories such as veneer sheets and fiberboard. Imports in these product categories comprise of a high percentage of total domestic demand. Increasing demand, coupled with a projected drop in domestic production due to a shortage of raw material, will likely result in increased imports.

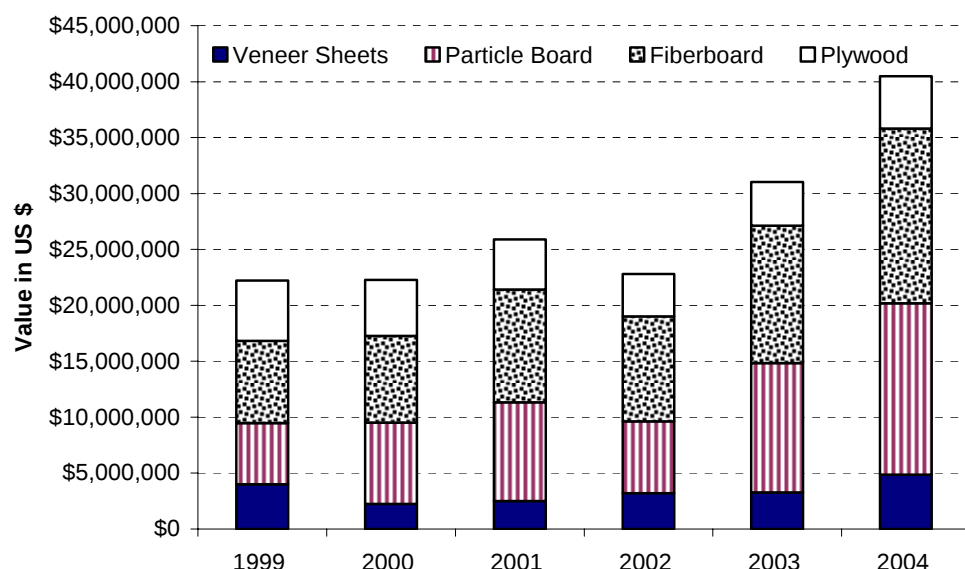


Figure 10: India's imports of wood based panels from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

As can be seen in Figure 10, the imports of wood based panels steadily increased from 1999 to 2004, with a temporary slump in 2002 resulting from the global economic recession. The rates of increase in India's imports of wood based panels have been impressive since 2003. It may be noted that fiberboard and particleboard imports have become increasingly important. Plywood and the veneer imports have remained relatively constant over the past six years.

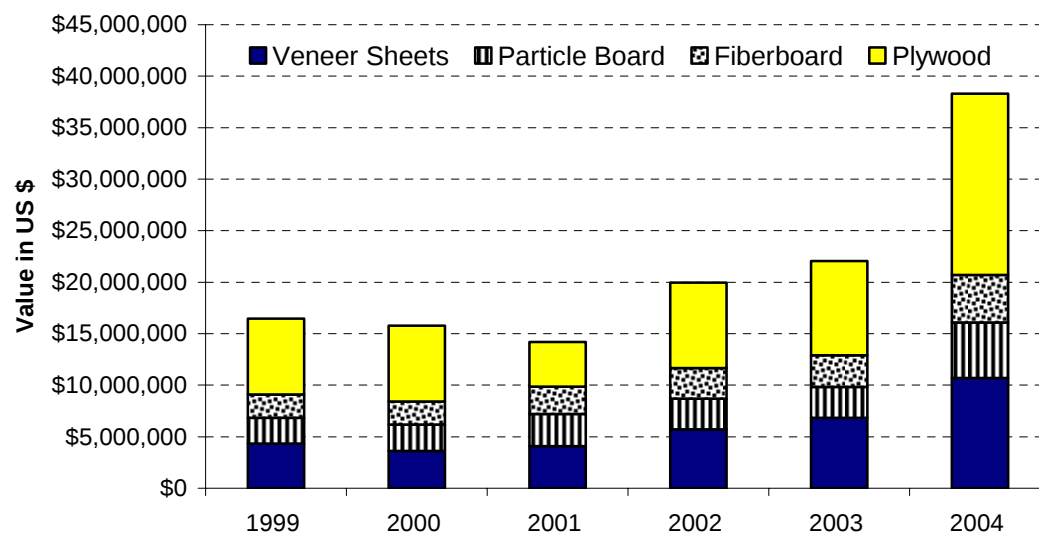


Figure 11: India's exports of wood based panels from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

The value of India's wood based panel exports has also shown an increasing trend since 2001 (Figure 11). The decline in exports from 1999 to 2001 was due to a decrease in the global prices of panel products, rather than significant lowering of the volume of imports. The exports of plywood and the veneer sheets almost doubled from 2003 to 2004. The exports of particleboard and fiberboard also steadily increased over the past six years. In the following sections imports and exports of each of these panel products are discussed in detail.

Veneer

A negligible percentage of India's veneer consumption is met by imports. While reliable data on India's production of veneer sheets and sheets for plywood is not available. It is estimated that the percentage domestic consumption of veneer met by imports is less than 1% (Jessica Mott et. al. 1998). The total value of imports of veneer sheets and sheets for plywood in 2004 totaled just US\$ 4.9 million (Table 18). Though imports of veneer have traditionally been dominated by hardwood species, the proportion of softwood veneer imports to the total veneer imports has increased over the last six years.

Table 18: Imports of veneer and sheets for plywood from 1999 – 2004

Description	1999	2000	2001	2002	2003	2004
Softwood Veneer	\$964,190	\$948,031	\$789,272	\$946,557	\$1,237,195	\$1,822,128
Hardwood Veneer	\$3,055,413	\$1,297,063	\$1,721,665	\$2,258,143	\$2,037,903	\$3,054,939
Total	\$4,019,603	\$2,245,094	\$2,510,938	\$3,204,700	\$3,275,098	\$4,877,067

Source: Global Trade Atlas, Global Trade Information Services, Columbia

As can be seen in Figure 12, in 2000, the value of veneer products imported by India dropped by almost 40%, although, the quantity of imports dropped by only by 26%. This resulted from a decline in the average price of veneer products imported by India. Italy was the major source of veneer imports in 1999 and in 2000 veneer imports from Italy were far cheaper (almost 50%) compared to the previous year. Since 2002 countries like Myanmar and Thailand have increased their imports to India. Myanmar's veneer exports to India increase from 127 metric tons in 1999 to almost 3,180 metric tons in 2004. Moreover, the average price of veneer imports from all the countries has declined over the past six years. The average price of veneer has gone down drastically from 2003 to 2004; this resulted from the increased imports of low priced veneer from Myanmar.

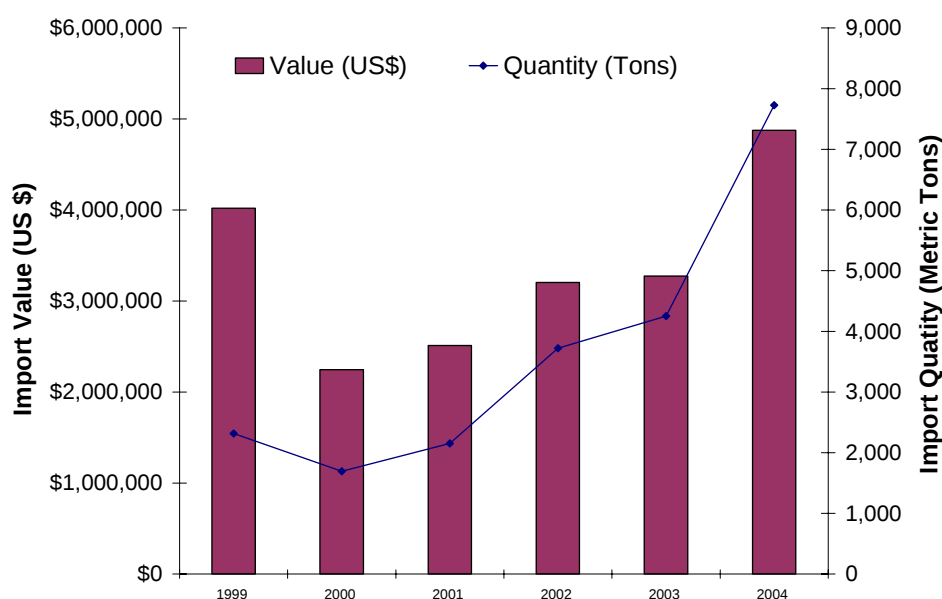


Figure 12: India's imports of veneer sheets from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

Ranking the countries by the value of veneer imports in 2004 shows that Myanmar tops the list followed by Italy, Germany and Ghana (Figure 13). It should be noted that the veneer used for the surface of plywood and other finishing works are very expensive whereas, veneer used for manufacturing of packaging and crates and match boxes are low priced and low quality. Hence, the average price of imported veneer varies greatly from country to country.

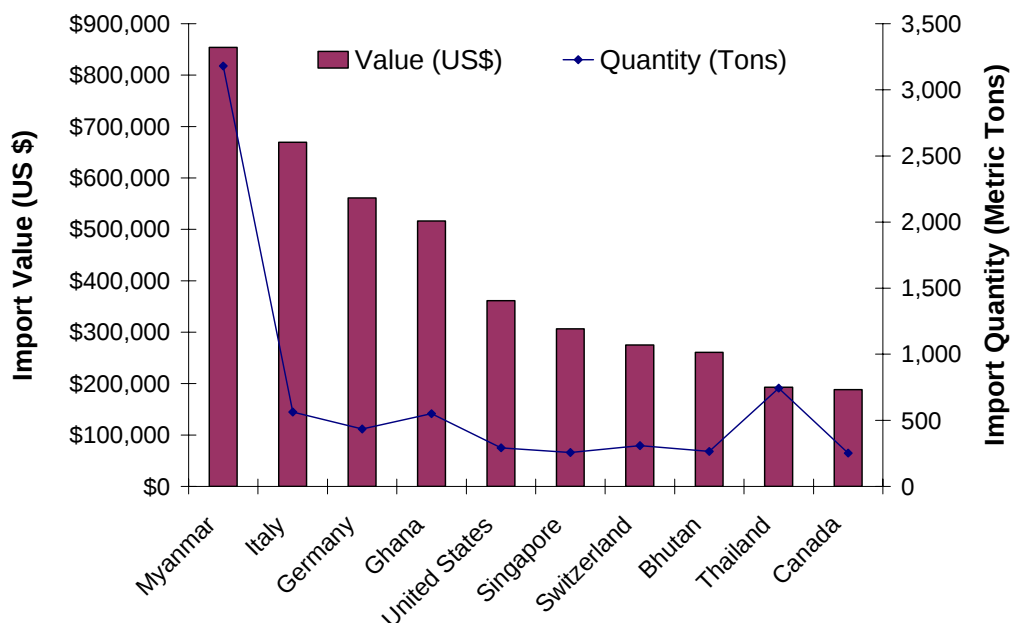


Figure 13: Top 10 country-origins of India's veneer imports in the year 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

Imports from Bhutan consisted of veneer sheets of both coniferous and non-coniferous varieties. The value of imported veneer sheets from Italy has remained more or less constant since 2000. Imports from Italy comprise both softwood and hardwood species, however, since 2000 the proportion of hardwood species, has increased relative to softwood species. India's imports of veneer from USA were comprised mainly of hardwood species. The country origins of India's imports of veneer sheets can be seen in Figure 14.

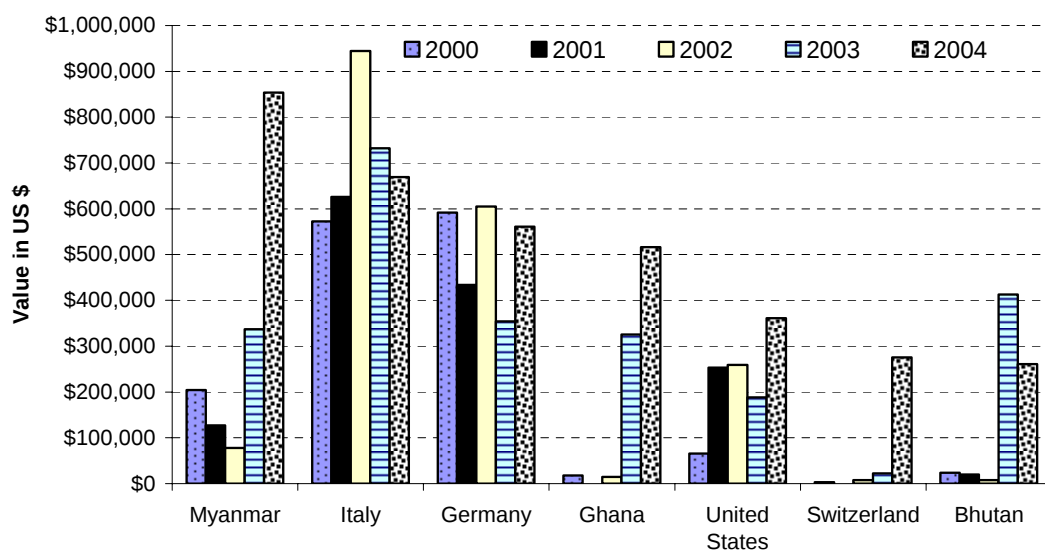


Figure 14: Important country origins of India's imports of veneer sheets from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India's veneer industry is not export oriented. Though India produces a large volume of veneer, most veneer is consumed by the domestic plywood and packaging industries. From 2003 to 2004 the volume of veneer exports increased by over 250%, although the increase in the total value of exports was only 57%. This disparity is due to an increase in the export of low cost softwood veneer to the United Arab Emirates. In 2004 more than 70% of the veneer exported by India was made from softwood logs, most of which were imported from Congo, USA, France, Gabon and Canada.⁶ The average price of the softwood veneer exported in 2004 was one-fifth the price of tropical veneer exported in 2004. The US has consistently been the favored destination for Indian veneer exports, followed by the United Arab Emirates and Nepal. Prior to 2004, India was predominantly an exporter of hardwood veneer. India's exports of veneer has steadily increase since 2000, as can be seen in Figure 15.

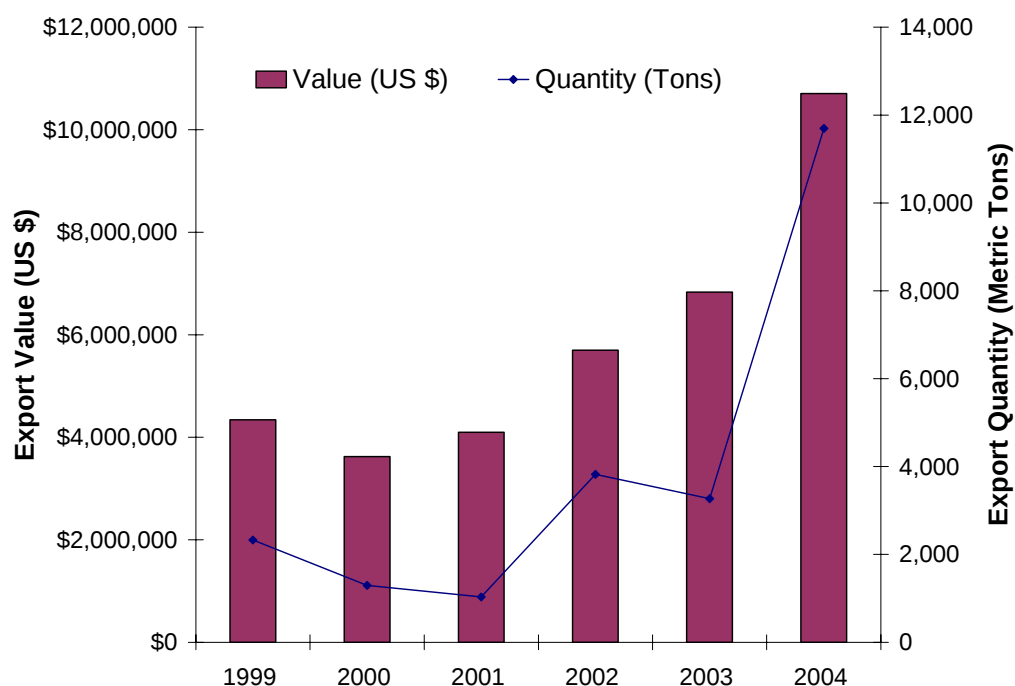


Figure 15: India's exports of veneer sheets from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

Plywood

India's plywood production can be broadly divided into three categories, as defined by the "Federation of Indian Plywood and Panel Industry" (FIPPI): commercial plywood, decorative plywood and block board & flush door. Of the total plywood production approximately 90% is commercial plywood. According to FIPPI India's annual plywood production capacity is 124 million square meters, although the industry generally produces only around 50% of capacity. India relies predominantly on domestic plywood production to meet domestic demand. Only 4% – 7% of annual consumption of plywood is met from imports. India is a net exporter of plywood. As can be seen in Figure 16, the value of plywood imports ranged from US\$ 3.7 million to US\$ 5.4 million between 1999 and 2004. Imports of plywood dropped gradually between 1999 and 2002 before increasing in 2003 and 2004.

⁶ Global Trade Atlas

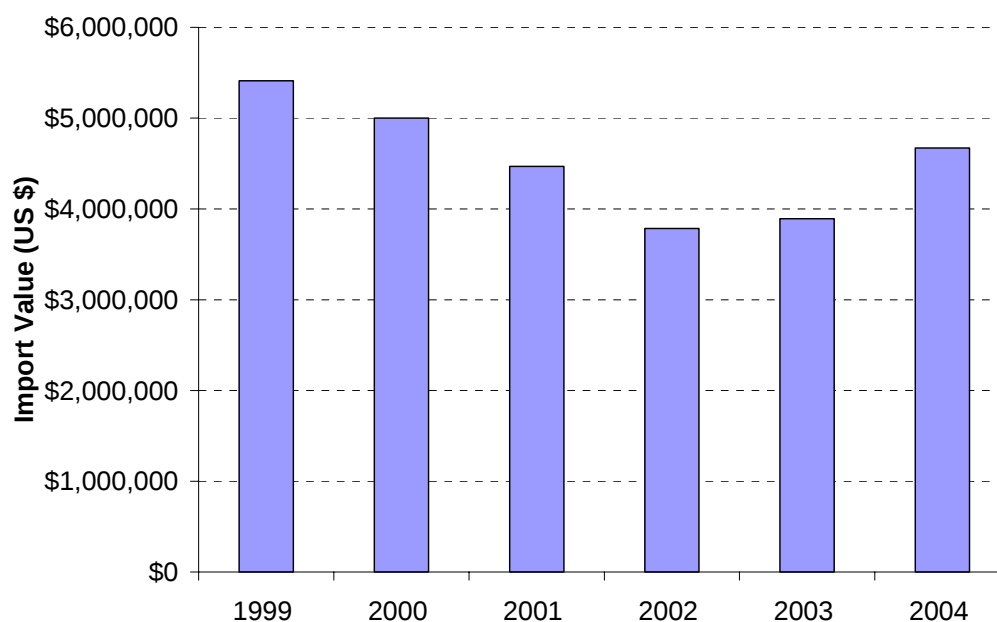


Figure 16: India's import of plywood and veneered panels from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

In 2004, the value of plywood imports from the US was less than US\$ 2,000. The annual imports from US to India have declined sharply over the last six years from US\$ 75,820 in 1999 to US\$ 1,979 in 2004. The following table gives a detailed overview on India's plywood and laminated wood imports from 1999 to 2004.

Table 19: Total imports of plywood and laminated wood during 1999 - 2004

Description	1999	2000	2001	2002	2003	2004
Plywood At Least One Outer Ply Tropical Wood	\$562,174	\$1,010,949	\$852,469	\$623,553	\$685,251	\$1,513,125
Plywood, At Least One Outer Ply Nonconiferous	\$186,726	\$45,907	\$31,023	\$43,161	\$45,209	\$277,426
Plywood, Ply Nov6Mm, Both Outer Plies Coniferous	\$1,525,482	\$1,445,040	\$1,855,196	\$1,733,679	\$1,535,612	\$1,401,791
Veneer Panel, Outer Non-coniferous ,1 Ply Tropical	\$0	\$0	\$0	\$28,037	\$41,149	\$38,789
Veneer Panel, 1 Layer of Particle Board	\$0	\$19,909	\$887	\$273,625	\$24,846	\$25,009
Plywood & Veneer Panel with 1 Outer Ply Hardwood	\$1,433,114	\$1,199,790	\$1,090,437	\$561,222	\$552,614	\$502,278
Veneered Panels, At Least 1 Ply Tropical	\$9,077	\$0	\$0	\$13,404	\$77,940	\$59,652
Plywood & Veneer Panel, Laminated Wd One Particle Bd	\$13,315	\$70,156	\$26,990	\$34,177	\$8,013	\$88,562
Plywood, Veneer Panels & Similar Laminated Wood	\$1,681,129	\$1,208,408	\$612,197	\$474,586	\$921,289	\$764,469
Total Plywood Imports	\$5,411,018	\$5,000,161	\$4,469,200	\$3,785,445	\$3,891,922	\$4,671,101

Source: Global Trade Atlas, Global Trade Information Services, Columbia

As is can be observed from Figure 17, most of the plywood with softwood outer ply used to be imported from Indonesia. Recently, large volumes of plywood are imported from China. Imports from Thailand consist mostly of plywood with an outer ply of hardwood veneer. Thailand also exports plastic laminated plywood to India. Up until 2002 Indonesia was the largest source of India's plywood imports. Since 2003 China has become the major supplier of plywood imports.

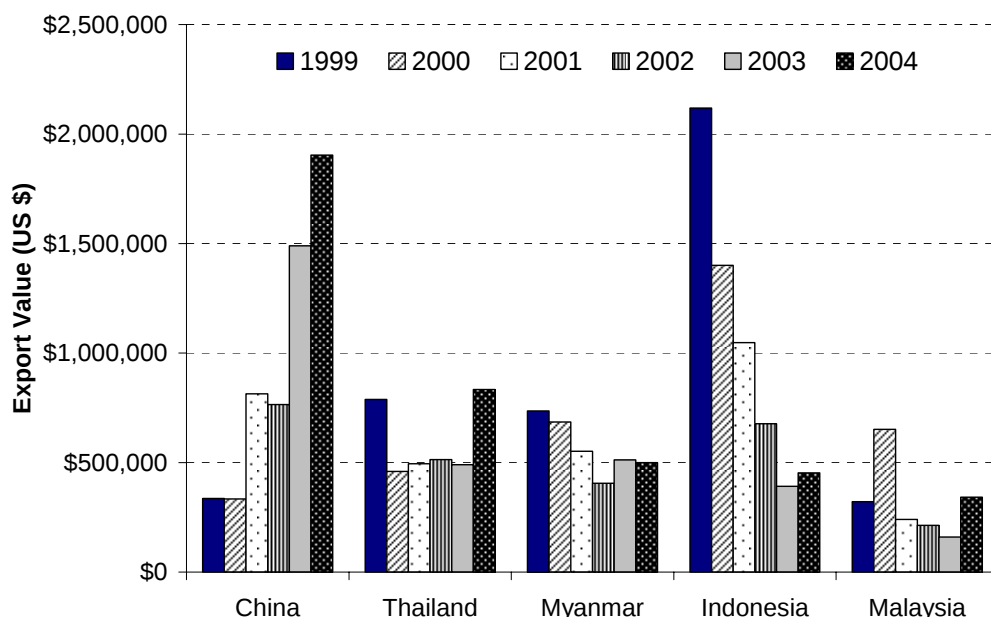


Figure 17: Important country origins of India's imports of plywood from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India's plywood imports from China have increased significantly over the last six years from US\$ 0.3 million in 1999 to US\$ 1.9 million in 2004. In the case of the other major plywood suppliers, the value of imports and has generally declined over the last six years. The price of plywood has declined over the past few years, increasing the competitiveness of Chinese plywood.

Similar to the other wood products sector, India's plywood industry is primarily domestically oriented and the volume and value of exports is relatively small. The total value of exports in 1999 was US\$ 7.3 million, increasing to US\$ 17.5 million in 2004 (Figure 18). Indian plywood exports mainly consist of plywood with at least one outer ply of tropical wood or non-coniferous wood.

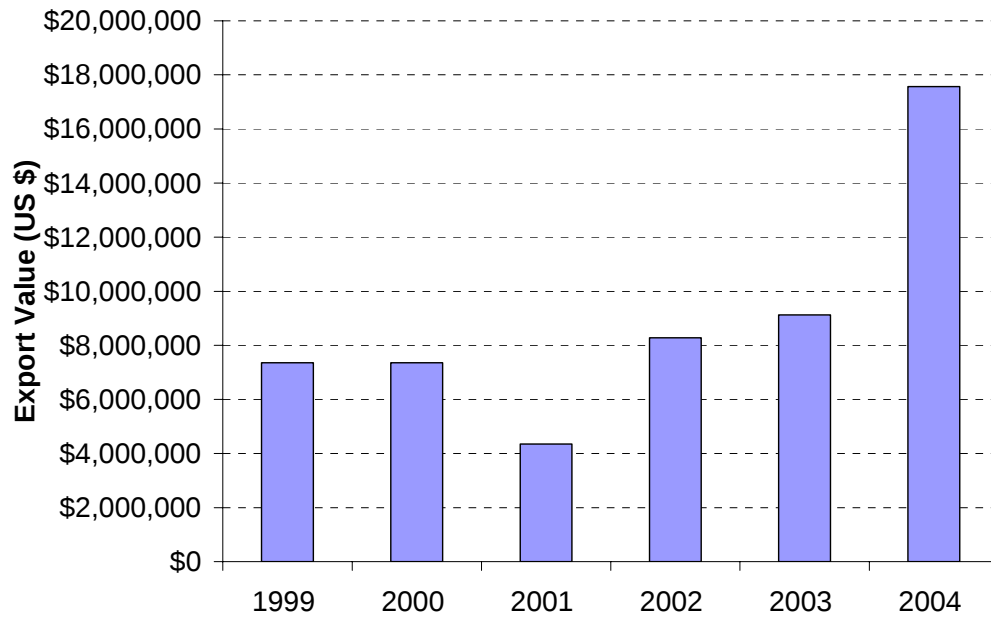


Figure 18: India's exports of plywood from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

The largest importer of Indian plywood is the United Arab Emirates, followed by the US and Singapore. Over the period 1999 – 2004 the exports of plywood to United Arab Emirates have increased from US\$ 1.5 million to US\$5.1 million. As can be seen in Figure 19, Indian plywood exports to the United Arab Emirates increased by almost 160% between 2003 and 2004. Most of this increase consisted of plywood with an outer tropical wood and was priced at approximately US\$101/m³. Exports to the US also increased to US\$ 1.8 million in 2004.

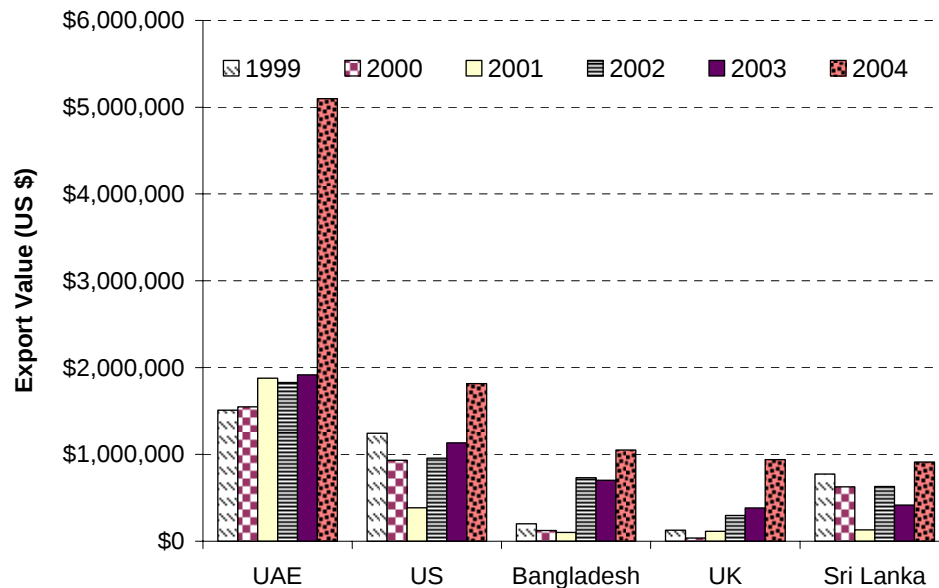


Figure 19: Important destinations of India's exports of plywood from 1999 – 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

The Indian plywood industry has been adversely affected by a shortage of domestic raw material. The 1996 Supreme Court ruling resulting in a virtual ban on timber harvest from natural forests within the country has further deteriorated the raw material situation. Lowering the import tariff on logs and easing the timber import regulations has helped the industry. The production of domestic plywood was estimated to be around 50% of industry capacity, in 2001 (FIPPI).

Particleboard

India produces most of its domestic particleboard requirements. The particleboard industry is not export oriented and India is a net importer of particle board. Table 20 details India's imports of particleboards in 2003 and 2004. In 2004 India imported a total of US\$ 15.3 million worth of particleboard and OSB while total exports in the same year were US\$ 5.4 million. Among the various types of particleboard imported by India, oriented strand board (OSB) is increasing in popularity as a promising rate. Up until 2002 India's imports of OSB were negligible. India began importing a sizable quantity of OSB in 2003. The countries from which India imports large quantities of particleboard are Nepal, Bhutan, Belgium, and Malaysia.

Table 20: Indian imports of particleboard

Description	2003		2004	
	US\$	Quantity (Tons)	US\$	Quantity (Tons)
Waferboard & Oriented Strand Board	\$4,557,272	7,057	\$6,523,052	9,556
Particle Board And Similar Boards	\$4,921,151	11,675	\$7,101,741	10,578
Particle, Similar Board of Ligneous Material	\$2,098,215	8,800	\$1,688,060	2,125
Total Particleboard and Similar Board of Wood	\$11,576,639	27,532	\$15,312,853	22,261

Source: Global Trade Atlas, Global Trade Information Services, Columbia

From Figure 20 it can be observed that though the volume of imports went down by almost 20% between 2003 and 2004, the value of the imports during the same period increased 32%. This resulted from an increase in the price of imports for both particleboard and oriented strand board over the previous year. The main countries of origin of India's particleboard imports is presented in Table 21.

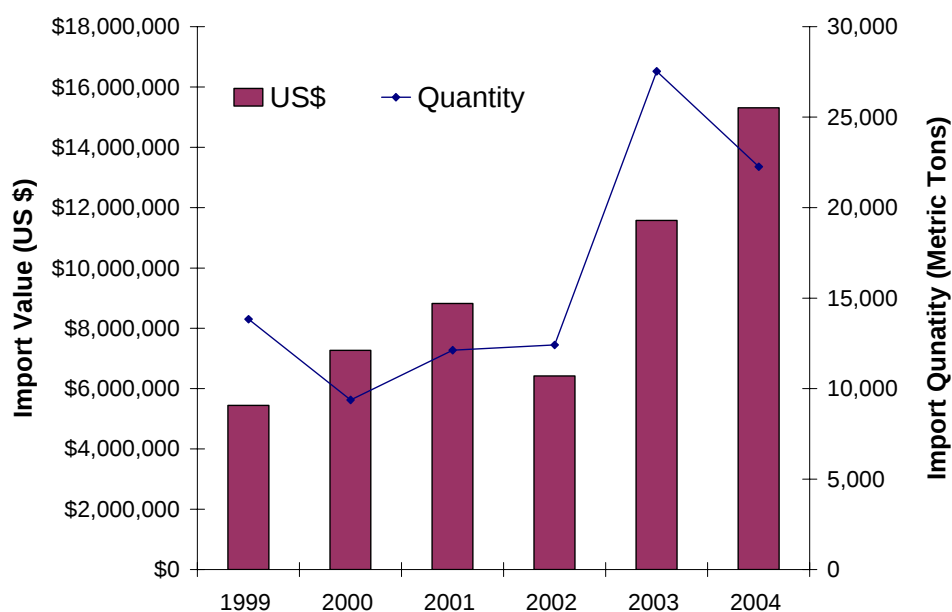


Figure 20: India's imports of particle and similar boards from 1999 – 2004

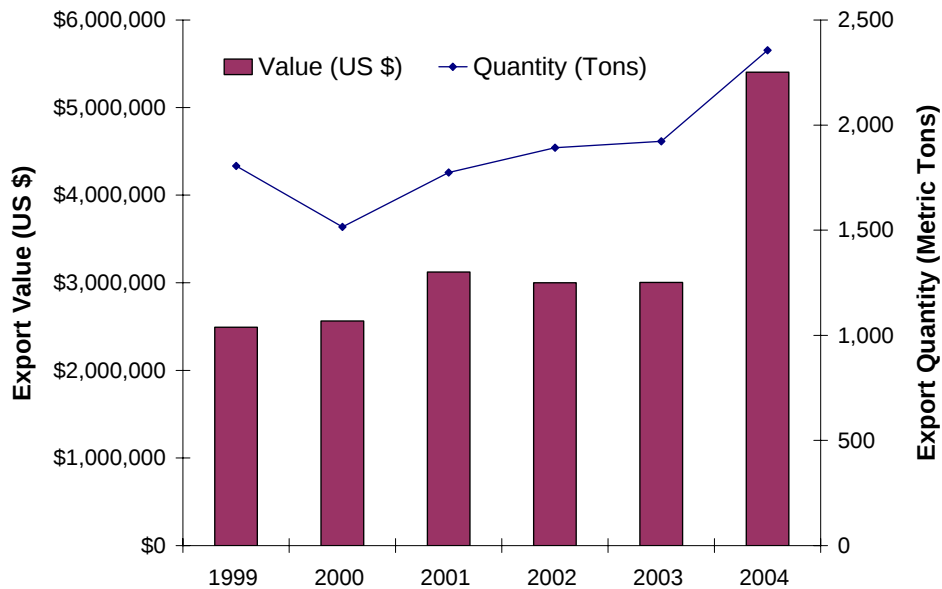
Source: Global Trade Atlas, Global Trade Information Services, Columbia

Table 21: Main sources of particle and similar boards

Sl. No.	Partner Country	2002		2003		2004	
		USD	Quantity (Tons)	USD	Quantity (Tons)	USD	Quantity (Tons)
	World	\$6,417,950	12,412	\$11,576,639	27,532	\$15,312,853	22,261
1	Nepal	\$1,965,669	2,103	\$2,196,196	8,351	\$3,936,221	2,658
2	Bhutan	\$538,032	565	\$3,485,770	3,794	\$3,638,626	2,148
3	Belgium	\$1,192,305	2,683	\$1,331,813	3,976	\$3,618,284	10,203
4	Malaysia	\$476,534	1,305	\$1,190,333	4,034	\$1,154,121	2,757
5	Sweden	\$542,142	471	\$615,988	517	\$561,651	498

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India's export of particleboard and similar boards of wood fluctuated between US\$2 to US\$5 million between 1999 and 2004, as can be seen in Figure 21. The year 2004 registered the highest value of particle board exports ever. From 1999 to 2004 Indian exports of particleboard was dominated by exports of ligneous materials, a large proportion of which consisted of plastic laminated sheets. While exports of waferboard are negligible, accounting for less than 1% of total particleboard exports, over the last six years they have increased steadily from 12,000 metric tons in 1999 to more than 75,000 metric tons in 2004.

**Figure 21: India's exports of particle and similar boards from 1999 – 2004**

Source: Global Trade Atlas, Global Trade Information Services, Columbia

The US is the largest importer of Indian particleboard, importing US\$ 1.6 million in 2004, which accounted for about 30% of India's total particleboard exports. The export of particleboard to the US has increased by over 200% since 1999. The second largest importer of particleboard, in value terms, is Singapore which imported US\$ 1.1 million.

Fiberboard

Indian imports of fiberboard are dominated by High Density Fiberboard (HDF), popularly known as 'hardboard'. In table 22 it can be seen that the total value of HDF imported by India was US\$ 7.9 million in 2004, which is almost 50% of the total value of fiberboard imported during the year. A large proportion of the hardboard imported in 2004

came from Malaysia and Thailand. Hardboard imports have doubled since 1999. Medium density fiberboard imports increased from US\$ 1.4 million in 1999 to US\$ 3.9 million in 2004. India's imports of insulation board (low density insulation board), remained relatively constant between 1999 and 2003 and increased substantially in 2004.

Table 22: Total imports of fiberboard from 1999 - 2004

Description	1999	2000	2001	2002	2003	2004
High Density Fiberboard (HDF)	\$3,903,635	\$3,259,317	\$4,587,521	\$5,503,578	\$6,944,847	\$7,876,242
Medium Density Fiberboard (MDF),	\$1,368,448	\$2,039,125	\$3,296,516	\$2,098,135	\$3,013,878	\$3,899,579
Insulation Board	\$2,077,833	\$2,457,017	\$2,205,623	\$1,803,482	\$2,312,719	\$3,840,182
Total Fiberboard	\$7,349,917	\$7,755,461	\$10,089,660	\$9,405,195	\$12,271,442	\$15,616,004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

India is a large producer of both Hardboard and MDF. In 2001, production was approximately 83 million cubic meters of hardboard and 46 million cubic meters of MDF. The production of insulating board was relatively low at 7.8 million cubic meters. As can be seen in Figure 22, India's exports of fiberboard are far below imports. In 2004 the value of fiberboard exports by India was US\$ 4.6 million, compared to imports of US\$ 15.6 million, which makes India a net importer of fiberboard.

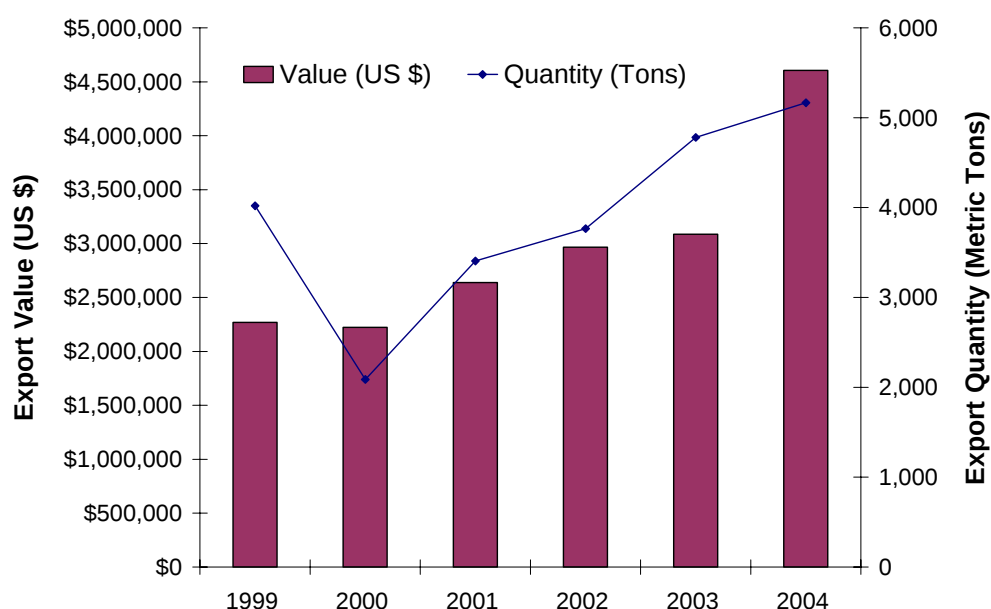


Figure 22: India's exports of fiberboard from 1999 - 2004

Source: Global Trade Atlas, Global Trade Information Services, Columbia

In 2004, India exported over 40% of its total fiberboard exports to the United Arab Emirates. Other important destinations of India's fiberboard in 2004 were Tanzania and Qatar. Over 70% of the fiberboard exported by India in the 2004 consisted of insulation board.

Summary

Historically, the Indian government has protected its large and inefficient wood processing sector through a number of trade barriers including quantitative import restrictions, import tariffs and countervailing duties. The implementation of economic liberalization policies, in conjunction with domestic timber harvest restrictions have

led to the easing of restrictions on timber imports. During the period 1996-2000 the quantitative import restrictions applied to logs, sawn lumber and several value-added products were gradually phased out. Import tariffs for all wood products have been reduced significantly. In 2005- 2006 logs were subjected to a basic customs duty of 5%. Lumber, veneer, plywood, fiberboard and particleboard are subject to a basic customs duty of 15%, a substantial reduction from previous years.

India is a timber deficient nation despite its enormous and varied forest resource. The ban on timber harvests means that India's domestic wood industry is increasingly relying on imports in order to meet rising demand. The value of log imports almost doubled between 1999 and 2004, increased from US\$418 million in 1999 to US\$802 million. Log imports represented over 90% of total wood imports by India in 2004, with almost two-thirds of log imports coming from Malaysia and Myanmar. India's log imports were primarily composed of hardwood species with teak being the dominant species. The softwood species are less in demand in the Indian market as neither wood manufacturers nor consumers are familiar with the species and characteristics of softwoods. In the past few years imports of softwood lumber has experienced a strong increase rising from less than \$2.8 million in 1999 to \$16.7 million in 2004.

Though the Indian wood panel industry is mainly domestic oriented, in most sectors it is showing signs of opening up more to the international market, predominantly as an importer. The Indian imports of veneer tripled between 1999 and 2004, with total import volume at 7.8 thousand metric tons in 2004. Approximately 50% of the veneer imported by India in 2004 was from Myanmar. Myanmar is also the main source for India's plywood imports, with 31,000 m³ imported in 2004. India's imports of plywood from China experienced a six-fold increase between 1999 and 2004, displacing Indonesia as the main source of inexpensive plywood for Indian market. The value of particleboard imports almost tripled and the value of fiberboard imports doubled between 1999 and 2004.

5. WOOD BASED INDUSTRY IN INDIA

5.1 BACKGROUND

Industrial growth picked up significantly in India from 1992 to 1996 following the trade and investment liberalizations initiated in 1991. The forest based industry also showed positive signs of growth during this period. The Indian government proposed a series of new policies, promoting investment (Foreign Direct Investment) and exports. These economic boosts were reflected in the country's performance almost instantly, reaching a growth rate of 12.1% during 1995-96. However, the high rate of growth could not be sustained. During 1996-1997, the growth rate dropped to 7.1% and dropped further during 1997-98. Over the past five years it has shown signs of revival. The reason for the slowdown in growth was partially due to the frequent policy changes of the government, the weak performance of the Indian manufacturing sector, and the Southeast Asian financial crisis.

During this period of slow growth, the wood based industry in India was hard hit. The forest based industry was one of the fastest growing industries in the country, recording a growth rate of 24% in 1995-1996. The index of industrial production of wood products increased again during 1996-1997 before it began declining. During the period 1998-2005 the value of industrial production in the wood-based industry dropped by 43% (Figure 23).

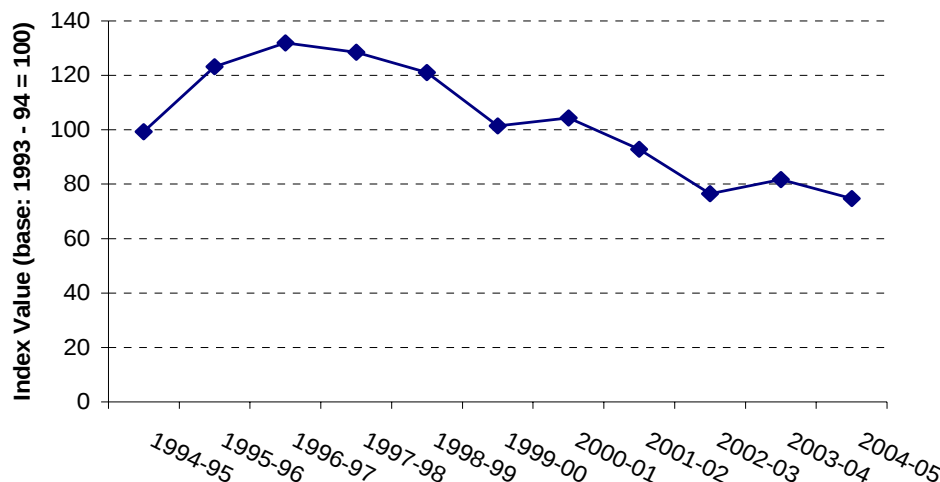


Figure 23: Index of industrial production of wood products

Since the mid-1980s private sector harvesting of trees on public lands has been banned and government harvesting is restricted to specified plan areas. In 1996 shipments of logs from the northeastern states were banned. Due to pressure on India's forest resources, all unlicensed sawmills and processing plants were closed in 2003 and issuance of new licenses was halted. There has been a rapid rise in the volume and value of wood imports into India due to the timber harvest restrictions.

5.2 INDIA'S FOREST BASED INDUSTRY

The demand for forest products in India can be categorized as fuelwood, non-timber forest products (NTFP), and industrial wood products. Raw material demand for all these industry segments is projected to increase substantially over the next two decades with the exception of fuelwood. The Forest Survey of India estimated that the demand for industrial wood in 1987 was approximately 27 million cubic meters, of which 19.61 million cubic meters is for the industrial sector and 7.93 million cubic meters from the household sector. In order to better understand the importance and performance of the main forest products sectors, each sector is discussed in more detail below.

In India logging is generally performed by contractors appointed by the government or by village worker cooperatives, who have very little knowledge of scientific logging principles. Logging contractors receive contracts through a competitive bidding process. The contracted price depends on the diameter, species, quality, logging conditions, terrain, roads and distance to the place of sale, usually vary from U.S. \$9.50 to \$47 per cubic meter (S.I.

Sjöstedt et. al). In some cases, the government gives contracts for logging operations only and the contractors deliver the wood to government timber depots where the wood is sold by public auction. Due to the lack of logger training and the nature of the logging contracts a high degree of wood waste occurs and forest destruction is prevalent. Recently the government has worked to train forest managers and officers so they can begin to plan and implement logging activities on a more scientific basis. Most of the logging to date is done manually in India. Mechanized logging is not favored because labor is cheap and the ready availability of labor for such jobs is high in most parts of the country. Timber felling is mostly done using axes or hand saws. Debarking is done manually by beating the surface of the log to loosen the bark. After felling the logs are sorted and sent to the wood industry, the pulp and paper industry or the wood panel industry. Logging residues are usually used for fuelwood.

5.2.1 Fuelwood

India is the world's leading producer and consumer of fuelwood, which is the single most important product obtained from the forests (Saigal et. al. 2002). MoEF has estimated that in 1994, between 83% and 88% of the total timber harvest was for fuelwood (GoI 1999). Currently, there are no reliable estimates of the consumption of fuelwood in India. Various estimates of fuelwood consumption vary by a factor of two. The reasons for this huge deviation in the estimates can be attributed to three factors. First, it is difficult to accurately estimate the supply of a product that is mostly collected for subsistence in regions where fuelwood is readily accessible, and the opportunity cost of rural labor is low. Secondly, there is limited availability of fuelwood substitutes in rural areas and finally the consumption of fuelwood depends on its local availability.

Wood, dung, and agricultural residue comprise 95% of the fuel supply in rural areas. The consumption of wood, both timber and fuelwood, in India is substantially higher than the sustainable harvest. Over the years there have been a number of estimates of the fuelwood consumption. The situation is complicated by the vast size of the country, high variation among the end users of fuelwood, variations in geographic and demographic conditions, easy access to (and unrecorded removal of) fuelwood from the forest, among other reasons. The most recent fuelwood consumption estimate is between 224 and 384 million metric tons. Various governmental and private agencies have estimated that in 1996, approximately 79 million metric tons of fuel wood could have been sustainably harvested, with 44 million metric tons coming from the national forests and 35 million metric tons from private forests. The huge gap between the demand and the sustainable harvest volume has been increasing over time and is hampering the sustainable management of the forests. Approximately 80% of the fuelwood demand is for domestic purposes (Table 23).

Table 23: Fuelwood consumption in India in 1996

Item	Consumption (million MT)	% of total
Household		
i. Forested rural	78	
ii. Non forested rural	74	
iii. Urban area	10	
Sub total	162	80.6
Cottage industries	25	12.4
Rituals	4	2.0
Hotels	10	5.0
Total	201	100

Source: GoI 1999

The majority of the fuelwood demand is in the rural areas, where alternate sources of energy like LPG and Biogas are not readily available. In contrast a number of alternative fuels are available in the urban areas. The forest survey of India reports that Madhya Pradesh state was the largest consumer of fuel wood in 2001 (19.1 million metric tons), followed by Orissa, Andhra Pradesh and West Bengal in that order. The Government of India estimates that in 2003-2004, firewood contributed US\$ 5.41 billion to the gross domestic product of the country, 83.8% of the country's total income from forestry and logging compared to just 8.7% for industrial wood.

5.2.2 Mechanical Wood Industry and the Sawmills

Commercial timber is mainly used for construction purposes ranging from structural lumber, poles, fences and other uses. The sawn wood sector represents the largest single category of the forest based industry. According to recent estimates the consumption of sawn timber in 2001 was 29 million cubic meters. The import volume of logs has increased considerably following the import liberalization policy. About 60% of the sawn timber volume is used in the construction sector. Sawn wood consumption is estimated to be composed of housing (62%), railroad sleepers (8%), packaging (6%), furniture (7%), shipbuilding (4%), mining (2%) and other miscellaneous uses (4%) (MoEF, GoI).

The sawmill sector has grown rapidly since independence, although very little technological development has occurred during this growth. As a result the sawmill sector is very primitive and labor intensive. A large part of sawing is still done at the felling site using handsaws. No system of registration for sawmills had been enforced by the government and as a result many small, labor-intensive sawmills have developed at the forest fringes. For the same reason, an accurate estimate of the number of sawmills is not available, although a recent report estimates that there are 41,229 sawmills in India with an annual production capacity of 29.5 million cubic meters of sawnwood (Forest Statistics of India 2000), (Table 24).

Table 24: Sawmill production capacity in India by state (As on 31-3-1998)

(Potential Capacity, Annual Log input, Annual Sawn (' 000 Cum/Year)										
State/UTs	No. of Saw Mill		Potential Capacity		No. of Employees		Annual Log Input		Annual Sawn Timber	
	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private	Govt.	Private
Andhra Pradesh	2	3094	9000	N.A.	266	7160	4820	N.A.	3101	N.A.
Bihar	67	1520	25	1334	N.A.	N.A.	22	284	1	24
Goa	1	91	600	5155	15	284	300	4625	250	8548
Gujarat	1	4179	N.A.	N.A.	N.A.	N.A.	3	641	2	503
Haryana	10	3206	13	1154	12	N.A.	1	N.A.	1	N.A.
Himachal Pradesh	2	3143	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Jammu & Kashmir	-	3553	-	296	-	10660	-	195	-	181
Karnataka	-	2421	-	631	-	9881	-	697	-	432
Madhya Pradesh	-	4365	-	2330	-	N.A.	-	780	-	690
Maharashtra	11	4180	-	-	-	-	-	-	-	-
Meghalaya	1	149	11	3246	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Nagaland	N.A.	20	N.A.	N.A.	N.A.	N.A.	N.A.	37440	N.A.	-
Orissa	1	135	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Rajasthan	5	5235	5200	-	30	-	2500	-	2080	469
Tripura	N.A.	86	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Uttar Pradesh	5	5734	25	525	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
West Bengal	4	2	11	3	178	3	7	2	7	2
Dadar & Nagar Haveli	-	6	-	6	-	36	-	6	-	4
Chandigarh	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Pondicherry	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
All India	110	41119	14884	14680	501	28024	7653	44669	5441	10851

Source : Forestry Statistics India 2000, Indian Council of Forestry Research & Education.

Statistics also show that the sawmill industry operates at around 50% of production capacity due to the domestic timber harvest restrictions. One reason why there has been very little modernization in the sawmill sector can be attributed to the unsecured supply of raw material. An integrated market for sawn wood is nonexistent in India because of the structure of the industry and most local sawmills sell their lumber to local customers.

Total sawn wood production is estimated to be 80% from hardwood species and 20% from softwood species. Among the hardwoods teak, sal, laurel, mango and benteak are the primary species cut. In the case of the conifers, deoder, kail and chir are the leading species.

Industry projections shows that the sawn wood demand will more than double over the next twenty years. The logging ban in the natural forests has resulted in an uncertain raw material availability of logs for smaller sawmills which used to function locally at the periphery of the forests. In order to address the raw material for the sawmill industry the government is promoting imports of log, which has helped the city based larger sawmills. Currently, most of the sawn timber consumed in India is first imported in the form of logs which are then sawn into various lumber dimensions. The sawmills located near the ports of entry process most of the imported logs into lumber. The production capacity of these sawmills are typically only a few cubic meters per day.

5.2.3 Paper Industry

The paper industry in India consists of 414 paper mills with Maharashtra and Gujarat being the two leading states for paper production (Directory of Indian Paper & Allied Industries 1997, Directory of Indian Pulp & Paper Technical Association 1999). Low capacity mills characterize the Indian paper industry with the average annual production capacity being 11,000 tons. Big private industrial conglomerates generally own the larger mills. Even the largest Indian paper companies are small by international standards. Similar to the sawn wood industry the paper industry has also been hard hit by raw material shortages. The total value of output of paper and paper products is approximately US\$3.9 billion. The paper industry also generates total wages and salaries of US\$241.7 million and directly employs 168,000 workers (Table 25).

Table 25: Indian paper industry statistics (in million metric tons) (except newsprint)

Year	Installed Capacity	Production	Demand	Import	Export
1996 – 1997	452.0	405.0	400.0	11.0	10.0
1997 – 1998	452.0	415.0	410.0	30.0	6.0
1998 – 1999	496.3	427.5	422.3	27.1	7.0
1999 – 2000	520.0	456.7	443.7	27.7	10.0
2000 – 2001	520.0	479.5	472.6	20.0	20.0

Source: Forestry Statistics of India – 2001, ICFRE Dehradun

From Table 25 it may be observed that Indian paper industry is more focused on the domestic market than the global market and the domestic market is primarily supplied by the domestic paper industry. The production capacity and hence the production of the paper industry grew by 15% during the period 1996 – 2001. Further expansion of the paper industry has been constrained by raw material shortages. The shortage of raw material has become more acute since the felling restrictions enacted by the Supreme Court. The opening of the economy and import liberalization has helped to ease the raw material shortage.

Table 26: Indian newsprint industry statistics (in million metric tons)

Year	Installed Capacity	Production	Demand	Import
1996 – 1997	76.9	30.2	65.0	54.7
1997 – 1998	78.3	41.0	70.0	50.0
1998 – 1999	81.6	50.0	73.5	49.6
1999 – 2000	84.0	60.0	78.0	35.0
2000 – 2001	95.0	70.0	78.0	48.7

Source: Forestry Statistics of India – 2001, ICFRE Dehradun

As can be observed from Table 26 India remains heavily dependent on imported newsprint with an average of 70% to 80% of total newsprint consumption being met from imports. Although India has sufficient newsprint capacity installed to meet domestic demand, the fact that many of these mills are functioning at 50% of their capacity has led to heavy dependence on imported newsprint (Indian Agro & Recycled Paper Mills Association).

Table 27: Raw material sources for pulp & paper industries & consumption of paper

Industry	Amount
Forest Based Industries	37%
Agro Based Industries	31%
Waste Paper Based Industries	32%
Per Capita Consumption (India)	4 Kg
Per Capita Consumption (Asia)	18 Kg

Source: Journal of the Industries Pulp & Paper Technical Association, July-Sept.,1999.

As seen in Table 27 a large proportion of the raw material supply for the paper industry comes from domestic forests and a reliable supply of wood plays a key role in the composites of the paper mills. Using pulpwood volumes for the years 1982 to 1993 and the analysis of supply sources provided by Centre for Science and Environment (CSE), the supply of pulpwood and the projected gap between demand and domestic supply is shown in Table 28.

Table 28: Projected pulp wood supply and demand-supply gap (in million cu. m)

Year	Raw Material Demand	Supply from government sources	Supply from other sources	Total supply	Gap
1998	8.04	1.7	1.6	3.3	4.74
1999	8.41	1.8	1.7	3.5	4.91
2000	8.76	2.0	1.9	3.9	4.86
2005	14.32	2.8	2.6	5.4	8.92
2010	21.92	3.9	3.6	7.5	14.42
2015	32.67	5.5	5.1	10.6	22.07
2020	45.86	7.7	7.1	14.8	31.06

Source: The role of private enterprise in the Indian forestry sector, Sushil Saigal, Hema Arora, S. S. Rizvi, March 2002

Currently, the gap between the demand and domestic supply is being partially met by imports, although the paper industry does not view this as a long-term viable option. India's growing dependence on imported fiber means that it will be increasingly vulnerable to supply dislocations in the international markets.

5.2.4 The Panel Industry

India's panel industry, manufacturing plywood, particleboard, and fiberboard, consists of over 400 mills with widely varying capacity (Table 29). In 1997 the plywood industry consisted of 62 large and medium sized mills with an annual capacity of approximately 124 million square meters (GOI 1999). The capacity utilization rate is exceptionally low at just 55%. According to FIPPI there are more than 2,000 small scale plywood manufacturing units whose production does not get recorded. The Government of India estimated that the particleboard production capacity was 113,000 ton per annum in 1997 and the average capacity utilization was 40%. In the case of MDF, the capacity was estimated to be 63,000 cubic meters per annum and the utilization rate is 51%, in the year 1997. Recently, particleboard and MDF consumption has increased in the Indian market. Some Indian companies are now importing particleboard panels for use in kitchen cabinets from Italy, Australia and New Zealand.

Table 29: Indian panel industry (1996 – 1997)

	Value
Production	0.80 million cu. m
Installed Capacity	1.75 million cu. m
Idle Capacity	0.90 million cu. m
Timber Required (as raw material) for present production	47%
Sourcing Timber	
Government Resources	0.40 million cu. m (25%)
Farm Forestry and Plantation Sources	0.47 million cu. m (29%)
Import	0.74 million cu. m (46%)

Source: GoI, 1999

Increasing demand for wood based panels is providing a boost to the domestic industry. The future demand estimated by Chemprojects (1999) projects that by 2020 the demand for wood based panels in India will increase almost 200 times. Strong demand increases were projected for plywood, veneer, particleboard and MDF.

India's panel and plywood industry is also dominated by large number of "backyard" operations that produce small volumes of low-cost, low quality plywood which gets consumed locally. However, the plywood and panel industry is somewhat better organized than the sawmill sector. Since the 1996 harvest ban the Indian plywood industry started relying almost exclusively on imported logs.

5.2.5 Non-Timber Forest Products (NTFPs)

To the Indian population living in or near forests, NTFPs play an extremely important role in their livelihood system. NTFPs are used as medicines by villagers and also for their livestock. NTFPs are also used as pesticides and fertilizers in the agricultural fields. NTFPs are often harvested and sold in local markets and only about 40% of the NTFPs harvested are recorded. Hence, it is almost impossible to assess the actual value of the NTFP harvested from India's forests. Some researchers estimate that if the total value of NTFPs extracted from the forest were converted to nominal values it would surpass the value of the timber harvested from the forests.

Quoting from a World Bank report "NTFPs are an important source of livelihood for many Indian communities, particularly those adjacent to forests. NTFP earnings commonly come from the collection of Sal and tendu leaves, grasses, mahua flowers, Sal seeds, lac, medicinal herbs, honey, gums, resins, oil seeds, tans and dyes. Several thousands tons of NTFPs are removed annually from India's forests providing earnings that run into billions of rupees each year. One source estimates the income from NTFPs to the state exchequer at about Rs 6.5 billion (US\$208) in the 1990s. Another estimates the revenue contribution of NTFPs at Rs 20 billion (US\$645 million) (M.P. Shiva 1994)" (Kumar 2000). The share of export earnings from NTFPs ranges from 5% to 15% out of the total value of India's exports during the period 1959-91. The export trade statistics for NTFPs show an increase in

the foreign exchange earnings and rate of extraction over the past four decades. In the context of total forest products exports NTFPs represent about 70% of total forest products exports (Shiva 1994).

The market for NTFPs is highly fragmented and varies from state to state and product to product. Most NTFPs do not have a defined distribution channel. The distribution channel from forest collector to urban wholesaler consists of 3 to 5 middlemen. As a result the distribution system is very inefficient and cumbersome. In most cases the village based collectors receive a very low price for the harvested product. The government generally controls the NTFP market to ensure fair prices for local collectors who are predominantly tribal. However, these state agencies are often inefficient and underfunded, undermining the market for a number of NTFPs. In some cases these underfunded state agencies have been unable to purchase NTFPs from local villages. Consequently it is not unusual for villagers to sell NTFPs to unlicensed local middlemen at a reduced price. During the past few years the government has been reviewing its policies with regard to licensing and distribution of NTFPs. With the initial success of the Joint Forest Management program the government is planning to transfer the responsibility of marketing NTFPs to local organizations. It should be noted that the laws regarding NTFP collection and sale vary broadly from state to state, as does the list of banned NTFPs.

5.3 IMPORTANCE OF THE WOOD BASED INDUSTRY IN THE INDIAN ECONOMY

The Annual Survey of Industries 2001 - 2002 reveals that on a 1000-point scale the importance weights assigned to the wood and wood products industry is 27.01 and to the paper and paper products industry is 26.52. This implies that the wood and paper product industries jointly contribute to around 5% of India's industrial production. However, it may be noted that the 'annual survey of industries' published by the government does not account for the output and income generated by the small scale industries. As a large proportion of the wood based industry is in the informal sector and operates as small scale industries, the data provided by the government underestimates the role of the industry in the overall economy.

The wood and wood products industry experienced an overall decline in production between 1997 and 2005. During the same period the annual growth rates of industrial production of India remained positive. The commercial plywood industry, one of the major contributors to the wood products industry, saw its production fall by 43% from 2000 to 2001. In the case of the paper and paper products industry, the growth rate dropped from 16.0% in 1999 to 6.3% in the 2000, the rate further dropped to -9.1% during 2001. Wood and paper product industries jointly constitute 9.1% of the factories in the country (Table 30) and provide 5.2% of the total industrial employment. The output of these two sectors jointly is around 4.1% of the total industrial sector output and the total input is around 4.2%.

Table 30: Relative importance of wood based industry with respect to overall manufacturing industry

Industry	Principal Characteristic with respect to the overall industry				
	Factories (%)	Employee (%)	Total Emoluments (%)	Total Input (%)	Total Output (%)
Wood and wood products	4.12	1.86	1.46	1.75	1.66
Paper and paper products	4.95	3.32	3.55	2.41	2.47

Source: Annual Survey of Industries 1998 – 1999 & 2001 - 2002, MoC&I, GOI,

In 2001-2002 the total output of the wood manufacturing industry, in the organized sector, was recorded at US\$ 4.1 billion. 50% of this output was generated in the rural areas (Annual Survey of Industries, C.S.O., GoI, 2001-02). Wages and salaries generated by the industry in the same year were worth US\$199.6 million, directly employing 179,000 people (Table 31).

Table 31: Industry performance indicators of 3 major forest products industries, year 2001 – 2002 (value figures are in million US dollars & others in numbers)

	Veneer sheets, plywood & products made from them	Structural wooden goods (beams, posts, doors etc.)	Containers and boxes of paper or paper board
1. Number of Factories*	3,523	1,173	2,242
2. Fixed Capital (million US\$)	11,804.0	2,454.1	363.8
3. Working Capital (million US\$)	267.5	644.3	198.8
6. Number of Workers	267,637	59,474	67,237
7. Total Persons Engaged	367,066	77,540	94,548
8. Wages to Workers (million US\$)	529.2	111.3	82.3
9. Total Emoluments (million US\$)	901.3	174.4	164.2
13. Total Inputs (million US\$)	12,509.2	2,871.0	1,272.6
14. Products & By-products (million US\$)	13,504.8	3,662.1	1,342.3
15. Value of Output (million US\$)	14,985.2	3,757.8	1,653.3
26. Gross Capital Formation (million US\$)	770.1	479.6	67.3
27. Profits (million US\$)	-889.3	358.6	78.8

Source: Annual Survey of Industries 2001-2002, MoC&I, GOI,

Note: Exchange rate 1USD = 47.73 INR (average exchange rate of 2001 - 2002);

* The number of factories includes only the registered production units with ten or more workers

India's wood products industry is one of the lowest paid industries in the country. The average wage of the workers in the wood products industry (except the furniture industry) is almost two-thirds that of the national average. However, in the case of the paper and paperboard industry, the wages to workers is at par with the national average. Due to the highly fragmented nature of the industry the returns to investment and capital formation of the industry are also among the lowest in the country. The performance of the veneer and plywood industry was dismal during 2001-2002 as they ended up incurring a loss of US\$ 889 million (Table 31) during the year. The paper and paperboard industry is three times more capital intensive than the wood and wood products industry.

5.4 THE INDIAN MARKET FOR WOOD BASED PRODUCTS

"India has a centuries old tradition of wood use, particularly for interior design and furniture. Although wood is rarely used for construction, B.C. industry observers have noted that India uses more interior wood than Japan. Most wood used in India is hardwood, particularly Teak which accounts for approximately 50% of domestic consumption" (Amarjeet S. Rattan 1999). Recent data shows that Indian customers are consuming less teak, mainly because of high prices and the lower quality of the available teak. On the other hand, engineered wood products and wood based panels are gaining in popularity among the Indian population. As can be seen in the previous chapters, both production and imports of wood panels have increased considerably during the past decade. Satellite television, increased exposure to the west, and an increase in income has led the Indian upper and middle classes to demand more western style furniture and kitchen cabinets. As a result the Indian market now imports an increasing amount of imported wooden building materials for interior uses.

According to a recent study conducted for the Canadian High Commission in New Delhi, sales of wooden building materials in the Indian construction industry amount to approximately US\$12 billion and are growing at a rate of 8% per year. The industrial wood sector in India is constrained by raw material shortage thus providing an opportunity for foreign suppliers of value added wooden materials. In light of the current atmosphere of economic liberalization, India represents a huge potential market for many forest product exporting countries. Some European, American, Australian and New Zealand companies have already established trade links with Indian companies and have made their presence felt in the market.

Lumber in India is mostly used for non structural uses like manufacturing of doors, window frames, wall panels, flooring, cabinets, moldings and furniture. Wood work in residential homes is done by local carpenters in a highly customized way. These carpenters, who typically own small woodshops, manufacture the wooden articles after receiving specific requests from residential buyers. Contrary to the North American (and most of the European) market, standard sizing of interior wood products is not prevalent in India. This is the main impediment to the mass production of interior wood products for the Indian market.

5.4.1 Future Market Outlook

The middle class population in India, which is almost the size of the population of the US, is becoming more exposed to the western life-style and is showing their interest in western style doors, windows and kitchen cabinets. Recent estimates suggest that the market for high end imported value added wood product is increasing at a steady rate as a result of continuing economic prosperity in India. This represents one of the largest emerging markets for value-added wood products in the world. The new residential constructions, mostly the multifamily units, are increasingly using standard sizes for their doors, windows, and interior fittings, leading to an increased demand for pre-fabricated doors and windows. The manufacture of pre-fabricated doors and windows is relatively new and the current market is estimated to be US\$20 million and growing at 10% per annum. The total annual market for furniture in India is estimated to be US\$ 1.25 billion of which 90% is for wooden furniture. The branded (higher quality) wooden furniture industry is estimated to be US\$37 million and growing at 15% annually. Teak has traditionally been viewed as a premium wood for furniture in India. Given the declining supply of teak India is importing a substantial volume of sitka spruce from the US as a substitute to teak.

6. HOUSING SECTOR

6.1 BACKGROUND

Housing has long been neglected in India's national 5-year plans. The unfulfilled demand for housing was estimated to be approximately 50 million units in 2001 and was projected to be increasing at a steady rate. This shortage stems from a lack of government funding and inadequacy of financial institutions, coupled with an increase in building material, labor and land costs. According to an "Accommodation Times" news report, the rate of house construction in India per 1,000 dwelling units per annum is less than four. This falls short of UN recommendation for developing countries, which is eight to ten dwelling units per 1,000 units per annum during the next 20-30 years to arrest the deterioration of the housing situation. Access to land at reasonable prices for housing is almost impossible. This has led to acute housing shortages. Land is not available for housing due to restrictions placed on the conversion of agricultural land to non-agricultural uses. The land prices in Bombay, Calcutta and Delhi are more than those in western cities such as London and Washington D.C. In fact, under the prevailing market rates for housing in Bombay, it is estimated that 97% of the total cost is for land with the remaining 3% covering the cost of building a house.

The housing and the land development laws in India can be enforced by both the state and the central governments. This has resulted in a wide variety of land development and housing policies in the states of India. The central government uses the five-year plans for making fiscal concessions and other policy enactments whereas the state governments also have the power to legislate and arrange for sources of funds. The country has a National Housing and Habitat Policy (NHHP) enacted in 1998 with some states having their own housing policy within the purview of the NHHP. The land development agencies also have the power to borrow money from various agencies for land development and housing activities. While India's housing sector cannot be categorized as having a single housing policy, commonalities exist in terms of laws, practices and functionalities across the country.

6.2 HOUSING STARTS

In India the available housing data is fragmented and comprehensive national data such as "annual housing starts" and "annual housing completions" is not available. Hence, the yearly demand for houses and the nature of new houses built is difficult to gauge. The recent census has released data on the materials used to build existing houses.

The 2001 census results conclusively show that the growth of India's urban population the past decade is higher than the rural population growth. More importantly, the population growth in the metro cities has been even higher. There are seven mega cities with populations over 4 million, approximately 40 metropolitan cities and a total of 5,161 towns in India. The largest metropolitan cities include: Mumbai (18.2 million), Calcutta (12.9 million), Delhi (11.7 million), Hyderabad (6.8 million), Chennai (6.6 million), Bangalore (5.5 million) and Ahmadabad (4.2 million). Drawing reference from other developing countries and given past trends, it is expected that with further economic liberalization and growth the rate of urbanization will continue to increase over the coming decade. As a result of such rapid urbanization, real estate development and infrastructure projects are also expected to increase at a considerable rate.

Comprehensive housing starts data for the whole country is not available. However, the housing permits issuance and housing completion data for cities with population over a million is available from 1994 to 2001. From 1994 to 2001 the number of housing completion certificates issued has increased at an average annual rate of 4.15%. Here it should be noted that data in Table 32 should be used cautiously as all the houses completed during the said period might not have been issued a completion certificate. Except Mumbai and Ahmadabad, all other cities there have been an increase in average yearly the housing completion over the past eight years.

Table 32: City-wise Number of Residential Building Completion Certificates Issued in India (1994-95 to 2000-2001)

Cities with Pop. > 1 Million	Building Completion Certificates Issued During the Years							
	1994	1995	1996	1997	1998	1999	2000	2001*
Ahmadabad	636	181	519	370	244	211	107	187
Bangalore	3,707	3,735	4,517	4,549	4,583	4,615	4,648	4,616
Bhopal	2,027	2,453	1,273	2,252	2,815	1,405	2,144	2,121
Chennai	4,333	5,380	5,986	5,941	5,760	5,485	5,573	5,606
Coimbatore	397	1,087	941	1,120	1,136	1,153	1,171	1,154
Delhi	595	834	715	1,015	1,019	916	882	939
Greater Mumbai	2,846	2,886	1,001	758	468	742	737	649
Hyderabad	4,983	5,160	5,310	5,497	5,692	5,995	6,359	6,015
Indore	607	1,530	4,223	5,562	6,208	3,831	3,083	4,374
Jaipur	837	872	1,592	1,657	1,725	1,795	1,869	1,796
Kanpur	1,418	1,453	1,966	2,013	2,060	2,110	2,159	2,109
Kochi	2,282	2,301	2,367	2,391	2,410	2,434	2,458	2,435
Kolkata	2,604	2,680	4,011	4,128	4,249	4,372	4,499	4,373
Lucknow	1,413	1,500	2,104	2,232	2,368	2,513	2,663	2,515
Ludhiana	1,029	717	850	1,712	1,805	1,907	2,013	1,908
Madurai	952	962	645	1,281	1,299	1,317	1,335	1,318
Nagpur	268	277	676	696	716	737	759	738
Patna	731	743	784	797	811	825	839	826
Pune	1,092	1,116	1,047	1,273	1,201	1,174	1,216	1,197
Surat	102	1,574	1,682	1,796	1,917	682	618	1,072
Vadodara	1,322	1,135	864	1,244	1,613	2,610	2,655	2,293
Varanasi	714	1,243	1,416	1,448	1,295	1,081	1,110	1,162
Visakhapatnam	1,233	1,268	1,297	1,335	1,374	1,649	1,644	1,556
TOTAL	36,128	41,087	45,786	51,067	52,768	49,559	50,541	50,959

Source: Metropolitan Housing Statistics 2002 Ministry of Urban Development & Poverty Alleviation, Government of India. (through indiastat.com)

Note : Above data include estimated figures also. * Projections

In the 10th five-year plan from 2002 – 2007, special emphasis has been given to the housing sector and some state governments have announced a target of achieving ‘shelter for all’ by 2012. Efforts have also been made to reform the allied institutions in an attempt to provide support to the housing sector. The government is beginning to view the housing sector as a very important driver of economic expansion and increased employment. These new initiatives by the government, and the huge latent demand for housing, coupled with an expanding economy, should result in higher housing starts in the country over the next decade.

6.3 ROLE OF HOUSING IN INDIA’S ECONOMY

The 10th five-year plan proposed by the government in 2001 clearly showed that the government has identified the housing sector as an important engine of economic growth and employment. Empirical data shows that the housing sector in India has an employment elasticity of unity. This implies that a certain percentage increase in investment in the housing sector results in an identical percentage increase in employment in the housing sector. The investment in the housing sector, as a proportion of total investments has hovered between 3% and 10% over the past two decades. This level of investment has been shown to be grossly inadequate and has resulted in acute imbalances between

housing supply and demand. The Gross Fixed Capital Formation (GFCF) in housing, as a proportion of Gross Domestic Product, was estimated to be 3.2% in 1980-1981, and 2.6% in 1990-1991. The share of income from housing in GDP also declined from 5.9% in 1980-1981 to 4.7% in 1990-1991. Efforts were taken to increase investment in the housing sector beginning with the 8th five-year plan.

A recent study shows that the labor productivity in the Indian housing sector is around 8% of US levels. The labor productivity of the Indian housing construction industry lags behind other developing countries. Indian Brick Construction productivity, both for Multi-Family Homes (MFH) and Single-Family Homes (SFH), is around 15% of US levels. There is a marked absence of price-based competition in the Indian housing industry. The reasons for this are the scarcity of available land for construction and lack of clarity on the ownership of large areas of land in urban areas, coupled with a severe shortage of developed water and sewage services in the city suburbs (Mackenzie, India Housing Construction Sector Report).

6.4 HOUSING CONSTRUCTION SECTOR

Housing construction work constitutes all work done at the building site and includes: excavation, building foundation, structure building, masonry or plastering and finally painting and finishing. The construction sector consists of numerous small sized firms. The various players in the housing sector include developers, who are typically small landowners, who start the construction process by commissioning construction work to primary contractors. Developers devote most of their efforts to procuring land and obtaining building permits, working their way through multiple layers of red tape. Primary contractors are mostly small companies who are responsible for overseeing the construction work at the site. After receiving the contract from the developer, primary contractors typically subcontract all construction work and concentrate on project management and material procurement. Labor subcontractors are mostly individuals or non-registered companies, who engage workers for the project. Labor subcontractors often recruit workers directly from villages. The government and big corporations account for only a small share of housing construction as they tend to focus on developing large, of multi-storied projects. In the case of single family, the contractor's function is typically undertaken by the house-owner.

Multi-family homes (MFH) are composed of all apartment buildings located in urban areas or semi urban areas. Recent research undertaken on Indian housing found that the MFH sector comprises approximately 8% of total housing. This sector of the housing industry is growing at a rapid rate, fuelled mainly by the increase in demand for urban housing. Single-family housing (SFH) can be further categorized into two segments: modern urban housing and rural housing. Modern urban housing consists of detached single family houses built using brick and mortar or other modern construction materials (e.g., wood). SFH-brick comprises of 49% of total dwellings and are mostly found in the urban areas (Mackenzie Global Institute Report). Large scale SFH projects are less prevalent in India, however, lately some these types of construction projects have started in the towns/cities neighboring big metropolitan cities, also known as satellite towns. Typically, the SFH construction in India is undertaken directly by the owner. There is absolutely no price competition in the SFH market as everything starting from designing to purchase of materials is done by the owner. In most of the cases the owners are not well informed about the market and the industry and base their decisions on feedback from subcontractors and local references. Such a process makes the process extremely inefficient and in most cases substandard. In addition to these the construction industry labor force is highly skilled only in the traditional building materials and there is a general apprehension about any new technology or building materials in the industry (Mackenzie, India Housing Construction Sector Report).

6.5 HOUSE STOCK

The 2001 census data shows that there are a total of 250 million houses in India, of which 71.3% are located in rural areas. Around 76.8% of these houses are used solely for residential purposes; another 3.4% are used jointly for residential and some other purpose, 5.7% of these houses are used as shops or offices, 0.6% are used as schools or educational buildings, 0.9% were used as factories, workshop etc. The data also reveals that the use of houses in economic activities is much higher in urban areas than in rural areas. Out of all residential houses, 5.5% are in dilapidated condition, but still inhabited by residents. Of all the inhabited houses, 3.1% had no exclusive rooms, 38.5% have a single room, 30% have two rooms, 14.3% have three rooms and the remaining 14.1% have four or more rooms (India Census Report 2001).

Mud is the predominant material for floors in the rural areas (54.9%), whereas cement is the predominant flooring material in the urban areas (49.6%). As flooring material, wood and bamboo are used in only 0.9% of all households. Besides cement and mud as flooring materials, floor tiles and mosaic are popular materials used in

houses. Burnt bricks are the most popular material for walls (44.9%), unburnt bricks along with mud is also frequently used as a wall material (29.6%), although mostly in the rural areas. Only 1.3% of existing house walls are made of wood. In the urban areas most of the roof structures are concrete (44.4%) while tiles are a popular choice in the rural areas (30.3%). The other materials also used for roofing are metal or asbestos sheets, grass, thatch, bamboo, wood, and mud (India Census Report 2001).

6.6 WOOD USAGE SPECIFICATIONS

The Bureau of Indian Standards (BIS), Government of India, has a set of specifications for uses of structural timber, structural plywood, wood fence and posts, and the construction of timber ceilings in buildings. These standards and the codes of practice are intended to serve as a guide for construction work. However, these are not mandatory codes of practice and the builder or the architect may or may not choose to follow these specifications. All public sector construction does follow these specifications and most of the commercial buildings also try to abide by these specifications.

6.6.1 Specifications for structural timber in building

Specifications for structural timber in building, published by BIS, Government of India, provides recommendations for building both permanent and temporary timber structures. Based on permissible defects and cut sizes, structural timbers are classified into three groups: Grade 1, Grade 2 and Grade 3 (also known as select grade, standard grade and common grade). Grade 3 (or common) timber is considered not suitable for structural purposes. The durability of timbers is also classified into three classes. Class I timbers consist of naturally durable heartwood timbers having an average life span of 120 months or more (also known as high durability timber). Naturally durable heartwood timber having an average life span of between 60 months and 120 months is categorized as Class II timber (or moderate durability timber). Finally, timbers with an average life span of less than 60 months are considered to be Class III (or low durability timber).

Preservative treatment of timber is also addressed in the specifications handbook. The following species are recommended to be properly chemically treated before being used in permanent structures. They are:

- Heartwood of all species of timber of moderate and low durability
- Heartwood of all species of timber of high durability containing more than 15% sapwood, and
- Sapwood of all species of timber of any class or durability.

Treatability

Treatable timbers are classified in order to indicate the degree of resistance offered by the heartwood of a particular species to the penetration of a preservative solution under a hydraulic pressure of 1.05 N/mm². The treatability of the heartwood of different species is categorized into five different grades, Grade A to E, based on their ease of treatability: Grade A being the easiest to treat and Grade E being the most difficult to treat.

Suitability

The suitability of structural timber for a given purpose is based on: i) Durability and treatability of the species, ii) Strength characteristics of the species and iii) Timber grade. A list of indicators is also provided to identify the suitability of the structural timber with respect to durability and treatability for permanent structures. The species of timber recommended for structural purposes are classified into three groups on the basis of their strength properties (i.e., modulus of elasticity (E) and extreme fiber stress in bending and tension allow the grain (f_t)) (Table 33).

Table 33: Grouping of structural timber based on strength properties

Groups	Modulus of elasticity (E) N/mm ²	Limit (f _t) N/mm ²
A	Above 12,600	18.0
B	Above 9,800 and up to 12,600	12.0
C	Above 5,600 and up to 9,800	8.5

Source: India Standard Specification for structural timber in building (1998)

A detailed list of species with their botanical (Latin) and local names suitable for various structural purposes is listed in a table in the book of standards with further specifications. For further details on these specifications refer to the “Specification for Structural Timber in Building” (IS: 3629-1986), by Bureau of Indian Standards.

6.6.2 Specification for structural plywood

The Bureau of Indian Standards has also documented specifications for structural plywood. Structural plywood is said to be specialty plywood characterized by the use of high-grade ‘Boiling Water Resistant’ (BWR) and ‘Boiling Water Proof’ (BWP) adhesives and special emphasis is given to the species of timber to be used, veneer quality and the construction details to be observed in the manufacturing process. The standard covers the general properties of structural plywood, its construction details for strength and dimensional stability. It also covers testing and quality control procedures. The end-uses specified for structural plywood identified in the manual include stressed skin panels, plywood web beams, sheathing, silos and rail and ship containers.

In the manufacturing specifications the use of veneer dried to a moisture content of less than 6% has been recommended. The glued veneers are to be assembled with grain direction in right angles to each other and hot pressed under controlled conditions of temperature, pressure and time. The two face veneers shall run in the same direction and shall be balanced along the central line of the plywood cross-section. The thickness of all individual veneers should be uniform within a tolerance of $\pm 5\%$. The veneers are also recommended to be straight grained within a tolerance of $\pm 10^\circ$. Core gaps, overlaps and wrap are not permitted. The quality requirements of the veneers used in manufacture of plywood for structural purposes are also detailed in the Indian Standards (Table 34).

Table 34: Quality requirements of veneers used in manufacture of structural plywood

Sl. No.	Defect	Requirement	
		Face	Core
i	Blister	Nil	Nil
ii	Checks	Nil	No restriction
iii	Discoloration	3% of the area if it will not impair to the board properties	6% of the area if it will not impair the board properties
iv	Dote	Nil	5 cm/m ²
v	Insect Holes	Nil	No restriction
vi	Knots (dead)	Nil	2 up to 12 mm dia/m ²
	Pin Knots (dead)	Nil	2/ m ²
	Pin Knots (live)	Permitted provided they do not mar the appearance	No restriction
	Knots (tight)	3 up to 25 mm dia/m ²	6 up to 25 mm dia/m ²
vii	Split on each Panel	One split not more than 0.8mm wide and length 50mm provided it is filled with suitable filler	Two splits not more than 6mm wide and length 200mm provided it is filled with suitable filler
viii	Swirl	Up to 4/ m ² provided they do not mar the appearance	No restriction

Source: Indian Standard: Specification of Structural Plywood: IS: 10701-1983

Specifications are also made on the thickness of plywood panels depending of the number of plies. Comments are made on the workmanship and finish of the plywood. Sampling techniques and testing are also recommended in the standards manual for structural plywood. Minimum strength requirements for structural plywood are provided in Table 35.

Table 35: Minimum strength requirements of plywood for structural purposes

Sl. No.	Property	Strength Requirement N/mm ²
i	Ultimate tensile strength:	
	Along the Grain	54
	Across the Grain	34
ii	Comprehensive strength:	
	Along the Grain	34
	Across the Grain	29
iii	Modulus of rupture:	
	Along the Grain	49
	Across the Grain	29
iv	Modulus of elasticity:	
	Along the Grain	7355
	Across the Grain	3923
v	Panel shear strength	125
vi	Modulus of rigidity	588
vii	Rolling shear strength	3

Source: Indian Standard: Specification of Structural Plywood: IS: 10701-1983

The standards manual also specifies that each plywood panel should be legibly and indelibly marked or stamped with the manufacturer's name, initials or recognized trademark, and the year of manufacture. The plywood grade and type should also be marked.

6.7 INDUSTRY OUTLOOK

According to a report published by Mackenzie Global Institute the housing construction sector could witness a significant growth over the next decade. This growth is attributed to an increase in the number of dwellings and also from the improvement in the quality of dwellings. The report also has indicated that the housing increase will be mostly in the urban areas due to the projected increase in the population in these areas attributable to the urbanization process.

The housing construction sector in India is small and inefficient and produces only 1% of the country's GDP. Competition among existing players in the housing construction industry in India is largely based on factors other than construction cost. Hence, material use in construction is often ignored, resulting in low productivity. As a result, less competitive companies can continue doing business. High industry fragmentation limits the competitive pressure and improved efficiency thereby increasing the importance of promoting competition within the domestic market. Absence of standard sizing and designs of construction materials are the main impediments to mass production of housing materials resulting in cost inefficiency (Mackenzie Global Institute report). Neither the labor force nor the contractors and the subcontractors are open to the idea of introducing efficiency in the construction process.

There is also lack of enforcement of building codes in the residential construction sector. The information about wood as a construction material is not prevalent among the general population. Traditionally, wood is seen as a lower quality construction material relative to concrete in terms of strength and longevity, especially for structural purposes. Most engineers and architects are not trained in wood frame construction. However, for the high end market, wood is a desired material primarily for non-structural applications like interior walls, false ceilings, flooring and interior decoration. The suggested code of practice for usage of structural timber in building lacks information on North American species.

7. CONCLUSION

India has a current population of one billion and is projected to be the most populous country in the world by 2020. With continued liberalization of the economy and increases in income for the middle class population, the demand for wood products is expected to increase substantially. Various estimates suggest that the size of the Indian market with both an income and interest in wood products could be as high as 150 million people. India has already emerged as a major log buyer, importing significant volumes of hardwood logs from Pacific Rim countries as well as from Africa and Latin America. India's softwood log imports have also significantly increased since 1999.

Following harvesting restrictions in the natural forests, the mainstay of the domestic supply of logs to the Indian wood based industry have been plantation forests. However, the majority of the plantation forests in India cater to the community demand for fuelwood and small timber rather than targeting the raw material demand for the domestic wood based industry. Low survival rates (typically around 60%) in the existing plantations have made the situation far from satisfactory. Participatory forest management programs in India are showing improvements in the enhancement of the growing stock of timber. According to a recent study by the International Tropical Timber Organization, India's forest cover is increasing steadily and is currently ranked second only to Indonesia among the tropical Asia Pacific countries. However, after centuries of deforestation, experts believe that Indian forests will not be in a position to supply the domestic wood based industry to any large extent in foreseeable future.

While India's wood manufacturing industry is dominated by small and inefficient processors, the demand for wood products in the Indian market is huge and steadily growing. The domestic supply of timber has been dramatically reduced over the past few years and the wood products industry is now, and will continue to be, heavily dependent on imported timber. In recognition of this, the Indian government is continuing to adopt policies to encourage timber imports. Tariff reductions on imports of logs and wood chips have eased, compensating for some of the shortage in raw materials that the Indian wood-based industry was facing. India's imports of wood and wood-based products doubled between 1999 and 2005, nearing US\$ 1 billion in 2005. India currently is importing mostly commodity products as raw materials to supply the wood based industry. Import statistics show that over 90% of India's forest product imports are logs. The plethora of import duties, taxes, tariffs and fees, continue to represent a significant barrier to exporters of wood products, particularly value-added wood products. However, despite the high tariff rates, the imports of engineered wood products tripled between 2000 and 2005.

India has a traditional culture of wood and consumers have a preference for teak based on its durability, beauty and resistance to termite attack. Concerns regarding the high price and declining quality of teak have provided an opportunity to introduce new products and species into India. The Indian market is gradually becoming exposed to North American wood species and value added wood products. Knowledge of the characteristics of softwood lumber in general and North American softwood species in particular, is extremely limited within the industry and the market, suggesting that promotion and education programs are needed to increase awareness of North American species. The Indian wood products market has an established demand for high priced, high quality traditional hardwood lumber, although the market is highly price sensitive to non-traditional wood species.

US forest products exporters continue to face challenges in the Indian market, including the price sensitivity of buyers, lack of knowledge of US wood species (especially softwood species), and a regressive tariff structure designed to discriminate against the import of value-added wood products. At present, limited knowledge regarding North American wood species both within the industry and the market poses a significant barrier to entry for US exporters. Despite this, the size and nature of the Indian market suggests that this is a market that the US forest products industry would do well to investigate more closely. Steady increases in awareness regarding North American softwood species coupled with concerns regarding the high price and lower quality of teak will provide an opportunity to introduce new products and species into India. Potential market opportunities include treated lumber and naturally durable wood species used in exterior applications (e.g., western red cedar, redwood, cypress, and Alaska yellow cedar), value-added wood products and engineered wood products. There are also good opportunities for Douglas-fir lumber to be used in the manufacture of doors, windows and casework. At present the Indian market lacks sufficient information on the physical attributes and workability of North American softwood species in general and US species in particular, suggesting that a promotion/awareness campaign on the properties and end-uses of US wood species is necessary in order to gain better acceptance of US wood species in India. With rising

incomes, a continued opening to global trade, a substantial wood deficit, and attempts to increase knowledge of North American wood species, India should prove to be a profitable market for the US wood products industry in the future.

In addition, there remain long-term opportunities to introduce North-American wood frame construction technology in India. The combination of a severe housing shortage and interest in developing energy efficient housing, both provide impetus for working to gain acceptance for wood frame construction. It is estimated that there are between 750,000 and 1,000,000 people in India with assets of \$100,000 or more. Many of these wealthy Indians look to invest in housing, which increasingly means a detached single family home. However, in order to achieve the successful introduction and adoption of wood frame construction, it is important that the US government and industry associations work with the Indian government and industry associations to develop and adopt wood frame building codes. Finally, acceptance of wood frame construction technology is dependent on increasing the familiarity and understanding of this construction technology within the architect and construction communities. A key to gaining this acceptance could be in educating architects and residential builders on the superior environmental performance and energy efficiency of North-American wood frame construction technology.

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APPENDICES

APPENDIX A

Table A.1: Distribution of geographical area and actual forest cover

State/U.T.	Geographical Area(sq.km.)	Actual Forest cover(sq. km.)	Actual Forest Cover as % of Geographical area
Andhra Pradesh	275,068	43,290	15.74
Arunachal Pradesh	83,743	68,602	81.92
Assam	78,438	23,824	30.37
Bihar	173,877	26,524	15.25
Goa,Daman&Diu	3,814	1,255	32.91
Gujarat	196,024	12,578	6.42
Haryana	44,212	604	1.37
Himachal Pradesh	55,673	12,521	22.49
Jammu & Kashmir	222,235	20,440	9.20
Karnataka	191,791	32,403	16.89
Kerala	38,863	10,334	26.59
Madhya Pradesh	443,446	131,195	29.59
Maharashtra	307,690	46,143	15.00
Manipur	22,327	17,418	78.01
Meghalaya	22,429	15,657	69.81
Mizoram	21,081	18,775	89.06
Nagaland	16,579	14,221	85.78
Orissa	155,707	46,941	30.15
Punjab	50,362	1,387	2.75
Rajasthan	342,239	13,353	3.90
Sikkim	7,096	3,129	44.10
Tamilnadu	130,058	17,064	13.12
Tripura	10,486	5,546	52.89
Uttar Pradesh	294,411	33,994	11.55
West Bengal	88,752	8,349	9.41
A & N Islands	8,249	7,613	92.29
Chandigarh	114	7	6.14
D & N Haveli	491	204	41.55
Delhi	1,483	26	1.75
Lakshadweep	32	-	-
Pondicherry	493	-	-
All India	3,287,263	633,397	19.27

Source : SFR, 1997, F.S.I., India Forestry Statistics 2000, ICFRE

APPENDIX B

Table B.1: Tariff rate for wood and wood articles (2005 – 2006)

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4401	Fuel wood, in logs, in billets, in twigs, in faggots Or in similar forms; wood in chips or particles; Sawdust and wood waste and scrap, whether or Not agglomerated in logs, briquettes, pellets or Similar forms			
4401 10	Fuel wood, in logs, in billets, in twigs, in Faggots or in similar forms:			
4401 10 10	In logs	mt	5%	5.10%
4401 10 90	Other wood in chips or particles	mt	5%	5.10%
4401 21 00	Coniferous	mt	5%	5.10%
4401 22 00	Non- coniferous	mt	5%	5.10%
4401 30 00	Sawdust and wood waste and scrap, whether Or not agglomerated in logs, briquettes, Pellets or similar forms	mt	5%	5.10%
4402	Wood charcoal (including shell or nut Charcoal), whether or not agglomerated			5.10%
4402 00	Wood charcoal (including shell or nut Charcoal), whether or not agglomerated:			5.10%
4402 00 10	Of coconut shell	mt	5%	5.10%
4402 00 90	Other	mt	5%	5.10%
4403	Wood in the rough, whether or not stripped Of bark or sapwood, or roughly squared			5.10%
4403 10 00	Treated with paint, stains, creosote or other Preservatives	m3	5%	5.10%
4403 20	Other, coniferous:			5.10%
4403 20 10	Saw logs and veneer logs	m3	5%	5.10%
4403 20 20	Poles, pilling and posts	m3	5%	5.10%
4403 20 90	Other	m3	5%	5.10%
4403 41 00	Dark Red Meranti, Light Red Meranti and Meranti Bakau	m3	5%	5.10%
4403 49	Other:			5.10%
4403 49 10	Teak wood in rough	m3	5%	5.10%
4403 49 90	Other	m3	5%	5.10%
4403 91 00	Of oak (Quercus Spp.)	m3	5%	5.10%
4403 92 00	Of beech (Fagus Spp.)	m3	5%	5.10%
4403 99	Other: andaman padauk (pterocarous dalbaergiodes) bonsum (phoebe goalparensis) gurgan (dipterocarpus alatus) khair (acacia catechu) lampati (duabanga grandiflora) laurel (terminalia alata) paliwood (palaquium ellipticum) and red sanders (pterocar pus sautaninus) and rose wood (dalbergia latifolia):			
4403 99 11	Andaman Padauk (Pterocarous dalbaergiodes)	m3	5%	5.10%
4403 99 12	Bonsum (Phoebe goalparensis)	m3	5%	5.10%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4403 99 13	Gurgan (Dipterocarpus alatus)	m3	5%	5.10%
4403 99 14	Khair (acacia catechu)	m3	5%	5.10%
4403 99 15	Lampati (Duabanga grandiflora)	m3	5%	5.10%
4403 99 16	Laurel (Terminalia alata)	m3	5%	5.10%
4403 99 17	Paliwood (palaquium ellipticum)	m3	5%	5.10%
4403 99 18	Red Sanders(Pterocar pus Sautatinus)	m3	5%	5.10%
4403 99 19	Rose wood (dalbergea latifolio), sal (chorea robusta) sandal wood (santalum albur) semul (bombax ceiba) Walnut wood (juglans binata) anjam (hardwickia binata) birch (betula spp.) Sissoo (dalbergia sisso) and white cedar (dysozylum) and the like:	m3	5%	5.10%
4403 99 21	Sal (Chorea robusta)	m3	5%	5.10%
4403 99 22	Sandal wood (Santalum alburn)	m3	5%	5.10%
4403 99 23	Semul (Bombax ceiba)	m3	5%	5.10%
4403 99 24	Walnut wood (Juglans binata)	m3	5%	5.10%
4403 99 25	Anjam (Hardwickia binata)	m3	5%	5.10%
4403 99 26	Birch (betula spp.)	m3	5%	5.10%
4403 99 27	Sissoo (Dalbergia sisso)	m3	5%	5.10%
4403 99 28	White cedar (Dysozylum malabaricum)	m3	5%	5.10%
4403 99 29	Other	m3	5%	5.10%
4404	Hoop wood; split poles; piles, pickets and stakes Of wood, pointed but not sawn lengthwise; Wooden sticks, roughly trimmed but not turned, Bent or otherwise worked, suitable for the Manufacture of walking sticks, umbrellas, tool Handles or the like; chip wood and the like			
4404 10 00	Coniferous	kg	15%	15.30%
4404 20	Non - coniferous :			
4404 20 10	Wooden sticks, roughly trimmed but not Turned, bent or otherwise worked, suitable For the manufacture of walking sticks, tool Handles, split poles, piles, pickets, stakes And the like	kg	15%	15.30%
4404 20 20	Drawn wood	kg	15%	15.30%
4404 20 90	Other	kg	15%	15.30%
4405 00 00	Wood wool; wood flour	kg	15%	15.30%
4406	Railway or tramway sleepers (cross ties) of wood			
4406 10 00	Not impregnated	m3	15%	34.44%
4406 90 00	Other	m3	15%	34.44%
4407	Wood sawn or chipped lengthwise, sliced or Peeled, whether or not planed, sanded or endjointed, Of a thickness exceeding 6 mm			
4407 10	Coniferous:			
4407 10 10	Doglas fir (Pscudotsuga Menziesie)	m3	15%	15.30%
4407 10 20	Pine (pinus spp.)	m3	15%	15.30%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4407 10 90	Other	m3	15%	15.30%
4407 24 00	Virola, mahogany (swietenia spp.) Imbuia And balsa	m3	15%	15.30%
4407 25 00	Dark Red Meranti, Light Red Meranti and Meranti Bakau	m3	15%	15.30%
4407 26 00	White lauan, white meranti, white seraya, Yellow meranti and alan	m3	15%	15.30%
4407 29	Other :		15%	15.30%
4407 29 10	Teak wood	m3	15%	15.30%
4407 29 90	Other	m3	15%	15.30%
4407 91 00	Of oak (Quercus Spp.)	m3	15%	15.30%
4407 92 00	Of beech (Fagus Spp.)	m3	15%	15.30%
4407 99	Other:		15%	15.30%
4407 99 10	Of birch (betula spp.)	m3	15%	15.30%
4407 99 20	Willow	m3	15%	15.30%
4407 99 90	Other	m3	15%	15.30%
4408	Sheets for veneering (including those obtained By slicing laminated wood), for plywood or for Other similar laminated wood and other wood, Sawn lengthwise, sliced or peeled, whether or Not planed, sanded, spliced or end thickness not exceeding 6 mm		15%	
4408 10	Coniferous:			
4408 10 10	Sheets for plywood	kg	15%	34.44%
4408 10 20	Oak wood veneer	kg	15%	34.44%
4408 10 30	Veneer sheets, for match boxes and Match splints	kg	15%	NA
4408 10 90	Other	kg	15%	15.30%
4408 31	Of Dark Red Meranti, Light Red Meranti and Meranti Bakau:		15%	34.44%
4408 31 10	Sheets for plywood	kg	15%	34.44%
4408 31 20	Veneer sheets (of Rose wood)	kg	15%	34.44%
4408 31 30	Veneer sheets, for match boxes and match Splints	kg	15%	15.30%
4408 31 90	Other	kg	15%	34.44%
4408 39	Other:		15%	34.44%
4408 39 10	Sheets for plywoods	kg	15%	34.44%
4408 39 20	Veneer sheets (of Rose wood)	kg	15%	34.44%
4408 39 30	Veneer sheets, for match boxes and match Splints	kg	15%	15.30%
4408 39 90	Other	kg	15%	34.44%
4408 90	Other:		15%	34.44%
4408 90 10	Sheets for plywoods	kg	15%	34.44%
4408 90 20	Veneer sheets, for match boxes and match Splints	kg	15%	15.30%
4408 90 90	Other	kg	15%	34.44%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4409	Wood (including strips and friezes for Parquet flooring, not assembled) continuously Shaped (tongued, grooved, rebated, chamfered, V-jointed, beaded, molded, rounded or the like) Along any of its edges or faces, whether or not Planed, sanded or end-jointed			
4409 10	Coniferous:			
4409 10 10	Planed, tongued, grooved, rebated, Chamfered, V-jointed, and the like but not Further molded	kg	15%	34.44%
4409 10 20	Beadings, and moldings (including Molded, skirting and other molded boards)	kg	15%	34.44%
4409 10 90	Other	kg	15%	34.44%
4409 20	Non- coniferous		15%	34.44%
4409 20 10	Planed, tongued, grooved, rebated, Chamfered, V-jointed, and the like but not Further molded	kg	15%	34.44%
4409 20 20	Beadings and moldings (including molded Skirting and other molded boards)	kg	15%	34.44%
4409 20 90	Other	kg	15%	34.44%
4410	Particle board and similar board (for example, Oriented strand board and wafer board) of wood Or other ligneous materials, whether or not Agglomerated with resins or other organic binding Substances, oriented strand board and wafer board, Of wood:			
4410 21 00	Un-worked or not further worked than sanded	kg	15%	34.44%
4410 29 00	Other	kg	15%	34.44%
4410 31	Un-worked or not further worked than sanded:			
4410 31 10	Plain particle boards	kg	15%	34.44%
4410 31 20	Insulation board and hardboard	kg	15%	34.44%
4410 31 30	Veneered particle board, not having Decorative veneers on any face	kg	15%	34.44%
4410 31 90	Other	kg	15%	34.44%
4410 32	Surface covered with melamine Impregnated paper:		15%	34.44%
4410 32 10	Plain particle boards	kg	15%	34.44%
4410 32 20	Insulation board and hardboard	kg	15%	34.44%
4410 32 30	Veneered particle board, not having Decorative veneers on any face	kg	15%	34.44%
4410 32 90	Other	kg	15%	34.44%
4410 33	Surface covered with decorative laminates Of plastics:		15%	34.44%
4410 33 10	Plain particle boards	kg	15%	34.44%
4410 33 20	Insulation board and hardboard	kg	15%	34.44%
4410 33 30	Veneered particle board, not having Decorative veneers on any face	kg	15%	34.44%
4410 33 90	Other	kg	15%	34.44%
4410 39	Other:		15%	34.44%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4410 39 10	Plain particle boards	kg	15%	34.44%
4410 39 20	Insulation board and hardboard	kg	15%	34.44%
4410 39 30	Veneered particle board, not having Decorative veneers on any face	kg	15%	34.44%
4410 39 90	Other	kg	15%	34.44%
4410 90	Other:		15%	34.44%
	Plastic laminated sheets:		15%	34.44%
4410 90 11	Insulation board and hardboard	kg	15%	34.44%
4410 90 12	Veneered particle board, not having Decorative veneers of any face	kg	15%	34.44%
4410 90 19	Other	kg	15%	34.44%
	Other :		15%	34.44%
4410 90 91	Plain particle boards	kg	15%	34.44%
4410 90 92	Insulation board and hardboard	kg	15%	34.44%
4410 90 93	Veneered particle board, not having Decorative veneers of any face	kg	15%	34.44%
4410 90 99	Other	kg	15%	34.44%
4411	Fibreboard of wood or other ligneous materials, Whether or not bonded with resins or other Organic substances			
4411 11	Fibreboard of a density exceeding 0.8 g/cm3 :Not mechanically worked or surface covered			
4411 11 10	Hardboard	kg	15%	34.44%
4411 11 90	Other	kg	15%	34.44%
4411 19	Other:		15%	34.44%
4411 19 10	Hardboard	kg	15%	34.44%
4411 19 90	Other fibreboard of a density exceeding 0.5 g/ Cm3 but not exceeding 0.8 g/cm3:	kg	15%	34.44%
4411 21	Not mechanically worked or surface covered:		15%	34.44%
4411 21 10	Insulation board	kg	15%	34.44%
4411 21 90	Other	kg	15%	34.44%
4411 29	Other:		15%	34.44%
4411 29 10	Insulation board	kg	15%	34.44%
4411 29 90	Other	kg	15%	34.44%
4411 31	Fibreboard of a density exceeding 0.35 g/ Cm3 but not exceeding 0.5 g/ cm3: Not mechanically worked or surface covered:			
4411 31 10	Insulation board	kg	15%	34.44%
4411 31 90	Other	kg	15%	34.44%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4411 39	Other:		15%	34.44%
4411 39 10	Insulation board	kg	15%	34.44%
4411 39 90	Other	kg	15%	34.44%
4411 91	Other : Not mechanically worked or surface covered:		15%	34.44%
4411 91 10	Insulation board (homogeneous)	kg	15%	34.44%
4411 91 20	Acoustic insulation board	kg	15%	34.44%
4411 91 30	Other insulation board	kg	15%	34.44%
4411 91 90	Other	kg	15%	34.44%
4411 99	Other:		15%	34.44%
4411 99 10	Insulation Board (homogenous)	kg	15%	34.44%
4411 99 20	Acoustic insulation board	kg	15%	34.44%
4411 99 30	Other insulation board	kg	15%	34.44%
4411 99 90	Other	kg	15%	34.44%
4412	Plywood, veneered panels and similar laminated Wood			
4412 13	Plywood, consisting solely of sheets of wood, Each ply not exceeding 6 mm thickness: With at least one outer ply of tropical wood			
4412 13 10	Decorative plywood	m3	15%	34.44%
4412 13 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 13 30	Other tea chest panels	m3	15%	34.44%
4412 13 40	Marine and aircraft plywood	m3	15%	34.44%
4412 13 50	Cuttings and trimmings of plywood of Width not exceeding 5 centimeters	m3	15%	34.44%
4412 13 90	Other	m3	15%	34.44%
4412 14	Other, with at least one outer ply of Non-coniferous wood :		15%	34.44%
4412 14 10	Decorative plywood	m3	15%	34.44%
4412 14 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 14 30	Marine and aircraft plywood	m3	15%	34.44%
4412 14 40	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 14 90	Other	m3	15%	34.44%
4412 19	Other :		15%	34.44%
4412 19 10	Decorative plywood	m3	15%	34.44%
4412 19 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 19 30	Marine and aircraft plywood	m3	15%	34.44%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4412 19 40	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 19 90	Other Other, with at least one outer ply of non-coniferous wood:	m3	15%	34.44%
4412 22	With at least one ply of tropical wood		15%	34.44%
4412 22 10	Decorative plywood	m3	15%	34.44%
4412 22 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 22 30	Marine and aircraft plywood	m3	15%	34.44%
4412 22 40	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 22 90	Other	m3	15%	34.44%
4412 23	Other, containing at least one layer of Particle board:		15%	34.44%
4412 23 10	Decorative plywood	m3	15%	34.44%
4412 23 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 23 30	Marine and aircraft plywood	m3	15%	34.44%
4412 23 40	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 23 90	Other	m3	15%	34.44%
4412 29	Other:			
4412 29 10	Elastic laminated plywood	m3	15%	34.44%
4412 29 20	Decorative plywood	m3	15%	34.44%
4412 29 30	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 29 40	Marine and aircraft plywood	m3	15%	34.44%
4412 29 50	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 29 90	Other	m3	15%	34.44%
4412 92	Other: With at least one ply of tropical wood specified		15%	34.44%
4412 92 10	Elastic laminated plywood	m3	15%	34.44%
4412 92 20	Decorative plywood	m3	15%	34.44%
4412 92 30	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 92 40	Marine and aircraft plywood	m3	15%	34.44%
4412 92 50	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 92 90	Other	m3	15%	34.44%
4412 93	Other, containing at least one layer of Particle board:		15%	34.44%
4412 93 10	Decorative plywood	m3	15%	34.44%
4412 93 20	Tea chest panels or shook, packed in sets	m3	15%	34.44%

ITC (HC) Code	Description of goods	Unit	Basic Duty	Effective Duty
4412 93 30	Marine and aircraft plywood	m3	15%	34.44%
4412 93 40	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 93 90	Other	m3	15%	34.44%
4412 99	Other:		15%	34.44%
4412 99 10	Plastic laminated plywood	m3	15%	34.44%
4412 99 20	Decorative plywood	m3	15%	34.44%
4412 99 30	Tea chest panels or shook, packed in sets	m3	15%	34.44%
4412 99 40	Marine and aircraft plywood	m3	15%	34.44%
4412 99 50	Cuttings and trimmings of plywood of width Not exceeding 5 cm	m3	15%	34.44%
4412 99 90	Other	m3	15%	34.44%

Source: Big's easy reference customs tariff 2005-2006 – 24th budget edition, 2005

APPENDIX C

Table C.1: Imports of forest products from first 90 countries ranked by value of imports during 1999 - 2003

Rank	Country	Value (USD)
1	Malaysia	600,337,155
2	Myanmar	546,220,714
3	Nigeria	224,819,152
4	Indonesia	183,795,495
5	Ivory Coast	131,330,460
6	New Zealand	77,299,186
7	Gabon	56,732,476
8	Singapore	37,354,666
9	Ghana	28,827,632
10	South Africa	25,713,793
11	Cote D' Ivoire	23,687,621
12	Togo	21,263,416
13	Ecuador	17,341,401
14	Solomon Is	17,080,448
15	Bhutan	15,557,316
16	Thailand	14,614,022
17	Italy	14,525,016
18	Nepal	13,358,271
19	German F Rep	12,358,189
20	Colombia	11,681,798
21	France	11,474,105
22	Belgium	10,481,412
23	Cameroon	10,040,641
24	U S A	9,350,379
25	U K	8,994,584
26	Australia	8,694,734
27	Hong Kong	7,513,559
28	Guyana	7,460,221
29	Benin	7,396,320
30	Canada	6,103,211
31	Costa Rica	5,641,485
32	Venezuela	4,901,125
33	China P Republic	4,705,991
34	Argentina	3,686,089
35	Papua N Gna	3,656,025
36	Panama Republic	3,468,640
37	Brazil	3,267,112
38	Sweden	3,225,583
39	U Arab Emts	2,691,103
40	Chile	2,281,412
41	Cambodia	2,240,958
42	Tanzania Rep	2,199,554
43	Sri Lanka	2,144,986
44	Guinea	2,061,047
45	Korea Republic	1,787,814

Rank	Country	Value (USD)
46	Denmark	1,525,733
47	Romania	1,395,728
48	Russia	1,152,343
49	El Salvador	1,130,373
50	Liberia	1,043,740
51	Japan	927,051
52	Vietnam Soc Rep	918,076
53	Spain	851,237
54	Mali	828,263
55	Switzerland	772,837
56	Chinese Taipei	739,772
57	Nicaragua	639,759
58	Zambia	625,385
59	Austria	623,931
60	Netherlands	573,250
61	Finland	380,896
62	Saudi Arab	341,484
63	Congo P Rep	323,690
64	Mongolia	279,111
65	Guatemala	277,528
66	Portugal	261,563
67	Paraguay	225,714
68	Mauritius	222,615
69	Taiwan	221,045
70	Slovenia	201,682
71	Panama Republic	178,623
72	Turkey	177,878
73	Zimbabwe	152,900
74	Algeria	143,482
75	Egypt A Republic	127,056
76	Poland	123,104
77	Sierra Leone	115,612
78	Afghanistan	115,540
79	Ukraine	107,881
80	Panama Republic	107,166
81	Cyprus	106,112
82	Malagasy Republic	104,825
83	Yemen Republic	100,017
84	Mexico	85,749
85	Mauritius	82,303
86	Morocco	76,126
87	C Afri Rep	75,217
88	Yugoslavia Frp	74,061
89	Philippines	70,148
90	Madagascar	69,091

Table C.2: Total imports of wood in rough during the 1999 to 2003 from top 30 countries

Rank by Import Value	Country	Quantity (CUM)	Value (USD)
1	MALAYSIA	3,480,638	580,691,065
2	MAYANMAR	1,720,183	541,913,938
3	NIGERIA	840,933	221,103,360
4	INDONESIA	931,850	171,019,382
5	IVORY COAST	454,061	131,259,424
6	NEW ZEALAND	763,083	70,348,159
7	GABON	269,711	56,617,004
8	SINGAPORE	180,744	35,243,064
9	GHANA	84,488	27,359,503
10	SOUTH AFRICA	133,131	25,645,575
11	COTE D' IVOIRE	68,898	23,685,775
12	TOGO	72,209	21,263,416
13	ECUADOR	69,600	17,219,120
14	SOLOMON IS	109,701	17,080,448
15	COLOMBIA	34,639	11,627,761
16	CAMEROON	51,776	9,686,093
17	FRANCE	69,179	8,288,215
18	BENIN	24,981	7,386,738
19	GUYANA	38,760	7,378,460
20	HONG KONG	32,523	7,084,180
21	U S A	27,132	6,017,668
22	COSTA RICA	25,412	5,639,050
23	AUSTRALIA	55,376	5,287,720
24	VENEZUELA	17,581	4,901,125
25	ARGENTINA	8,006	3,686,089
26	PAPUA N GNA	17,464	3,644,098
27	PANAMA REPUBLIC	12,039	3,468,640
28	BRAZIL	12,936	3,214,572
29	GERMAN F REP	30,447	3,002,058
30	BHUTAN	15,056	2,401,844

Table C.3: Total imports of sawnwood from UK, USA, New Zealand and Canada during 1999 - 2003

Country	ITC (HC)	Description	Quantity (CUM)	Value (USD)	Rate \$/m ³
U K	44072901	Sawn/chipped teak wood	60	12,959	215.99
	44079100	Sawn/chipped wood of oak	10	1,375	137.55
	44079200	Sawn/chipped wood of beech	619	254,361	410.92
	44079902	Sawn/chipped wood of willow	44079902	4,876,156	9.25
	44079909	Others	182,612	638,023	3.49
U S A	44072901	Sawn/chipped teak wood	19	9,424	496.03
	44072909	Other tropical woods sawn or chipped	127	56,403	444.12
	44079100	Sawn/chipped wood of oak	30	294	9.80
	44079200	Sawn/chipped wood of beech	30	9,869	328.96
	44079902	Sawn/chipped wood of willow	5,440	50,391	9.26
	44079909	Others	316,191	395,440	1.25
New Zealand	44071002	Pine (pinus spp)	63,677	4,051,659	63.63
	44072909	Other tropical woods sawn or chipped	113	14,303	126.57
	44079200	Sawn/chipped wood of beech	20	25,885	1,294.25
Canada	44071001	Douglas fir (psudotsuga menziesie)	723	267,511	370.00
	44071002	Pine (pinus spp)	953	257,525	270.23
	44071009	Other coniferous wood articles	21,027	2,300,650	109.41
	44072909	Other tropical woods sawn or chipped	83	52,847	636.71
	44079909	Others	326,421	206,919	0.63

Table C.4: Total exports of sawnwood to Top 10 countries ranked by the value of exports during 1999-2003

Countries	Quantity	Value (USD)
U ARAB EMTS	2,597	879,440
LEBANON	3,395	798,664
QATAR	848	254,132
KUWAIT	380	160,579
U S A	2,476	144,432
OMAN	424	117,777
AUSTRALIA	600	102,317
ITALY	294	84,417
SWEDEN	1,303	73,859

Table C.5: Total exports of veneer and sheets for plywood during 1999 to 2003 from the top 15 countries ranked by value of exports

Countries	Quantity	Value (USD)
U S A Total	1,129,711	6,095,994
SWEDEN Total	568,173	1,960,637
SPAIN Total	265,456	1,529,730
CANADA Total	198,849	1,208,466
U ARAB EMTS Total	1,620,277	1,134,874
JAPAN Total	255,028	1,089,621
ITALY Total	406,096	942,970
KOREA RP Total	395,499	926,359
FRANCE Total	95,596	776,290

Table C.6: Total imports of plywood and laminated wood during 1999 – 2003 from Malaysia

Art. code	Description	Sub-type	Quantity	Value (USD)	Per unit Rate (USD)
44121301	Plywood consisting only sheets of wood thickness <=6mm each & at least one outer ply of tropical wood	Decorative Plywood	521	313,343	601.43
44121309		Others	488	223,864	458.74
44121901	Other plywood consisting only sheets of wood of thickness of each sheet not exceeding 6 mm	Decorative Plywood	5,458	1,207,091	221.16
44121909		Others	89,100	3,118,942	35.00
44122901	Other plywood with at least one outer ply of non-coniferous wood (excl one layer of particle board)	Plastic Laminated Plywood	1,413	329,359	233.09
44122909		Others	4,351	1,449,033	333.03
44129200	Other plywood with at least one ply of tropical wood		9,000	11,895	1.32
44129901	Other plywood, veneered panel and laminated wood	Plastic Laminated Plywood	1,292,905	720,403	0.56
44129909		Others	3,151,320	1,767,952	

Table C.7: Total imports of plywood and laminated wood during 1999 – 2003 from USA

Art. code	Description	Sub-type	Quantity	Value (USD)	Per unit Rate (USD)
44121301	Plywood consisting only sheets of wood thickness ≤6mm each & at least one outer ply of tropical wood	Decorative Plywood	0	0	NA
44121309		Others	35	11,960	341.73
44121901	Other plywood consisting only sheets of wood of thickness of each sheet not exceeding 6 mm	Decorative Plywood	39	17,737	454.81
44121909		Others	11	793	72.15
44122200	Other plywood with at least one outer ply of non-coniferous wood		0	0	NA
44122901	Other plywood with at least one outer ply of non-coniferous wood (excl one layer of particle board)	Plastic Laminated Plywood	19	4,937	259.86
44122909		Others	18	5,464	303.57
44129200	Other plywood with at least one ply of tropical wood		0	0	NA
44129901	Other plywood, veneered panel and laminated wood	Plastic Laminated Plywood	33,939	27,935	0.82
44129909		Others	67,339	66,089	0.98

Table C.8: Total exports of plywood and laminated wood during 1999 – 2003

Article code	Description	Sub-type	Unit	Quantity	Value(USD)
44121301	Plywood consisting only sheets of wood thickness ≤6mm each & at least one outer ply of tropical wood	Decorative Plywood	CUM	23,160	4,471,520
44121309		Others	CUM	170,447	6,709,942
44121901	Other plywood consisting only sheets of wood of thickness of each sheet not exceeding 6 mm	Decorative Plywood	CUM	13,628	2,262,542
44121909		Others	CUM	38,160	3,768,979
44122200	Other plywood with at least one outer ply of non-coniferous wood		-	0	0
44122901	Other plywood with at least one outer ply of non-coniferous wood (excl one layer of particle board)	Plastic Laminated Plywood	CUM	3,822	609,508
44122909		Others	CUM	117,181	2,466,759
44129200	Other plywood with at least one ply of tropical wood		KG	31,906	32,701
44129901	Other plywood, veneered panel and laminated wood	Plastic Laminated Plywood	-	NA*	3,634,500
44129909		Others	-	NA*	3,620,698

Table C.9: Total imports of particle board & similar boards during the 1999 to 2003 from top 10 countries

Rank by Import Value	Country	Quantity (KG)	Value (USD)
1	NEPAL Total	10,488,210	11,010,937
2	BELGIUM Total	13,082,939	4,755,556
3	BHUTAN Total	1,651,544	3,839,881
4	MALAYSIA Total	9,170,307	2,957,687
5	ITALY Total	6,530,415	2,274,529
6	SWEDEN Total	2,145,005	2,253,149
7	THAILAND Total	7,863,364	1,954,176
8	INDONESIA Total	6,176,127	1,571,624
9	GERMANY Total	2,815,655	1,314,262
10	FRANCE Total	493,971	375,454

Table C.10: Exports of particle board & similar boards during 1999 - 2003

Art.code	Description	Year	Quantity (KG)	Value (USD)
44101100	Wafer board including oriented strand board	1999	12,200	2,392
		2000	14,907	8,949
		2001	24,885	3,069
		2002	12,640	19,563
		2003	75,470	45,820
44101100 Total			140,102	79,792
44101900	Other particle or similar board of wood	1999	118,662	88,155
		2000	53,766	34,876
		2001	300	152
		2002	217,030	223,364
		2003	95,462	73,488
44101900 Total			485,220	420,034
44109001	Plastic laminated sheets	1999	1,058,296	1,812,808
		2000	1,702,010	2,574,337
		2001	1,064,322	1,749,317
		2002	1,470,562	2,574,216
		2003	1,400,813	2,569,762
44109001 Total			6,696,003	11,280,439
44109009	Others (including sheets block or the like)	1999	94,436	147,939
		2000	337,329	339,036
		2001	39,107	243,157
		2002	82,074	155,249
		2003	419,054	718,824
44109009 Total			972,000	1,604,204

Table C.11: Total imports of fibreboard during the 1999 to 2003 from top 10 countries

Rank by Import Value	Country	Quantity (KG)	Value(INR)
1	MALAYSIA Total	43,971,778	567,983,871
2	THAILAND Total	31,554,224	389,729,240
3	ITALY Total	12,049,344	179,833,095
4	NEW ZEALAND Total	10,044,261	127,443,185
5	BELGIUM Total	8,115,135	122,597,964
6	GERMANY Total	5,556,668	108,318,343
7	BHUTAN Total	1,624,784	78,538,347
8	AUSTRALIA Total	6,464,375	68,477,906
9	U S A Total	2,589,013	65,108,363
10	INDONESIA Total	3,406,074	44,243,673