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Chapter- I:
Introduction

The power-loom sector of Maharashtra has an important place in the Indian economy and occupies a leading position in the world textile exports. The power-loom industry of Maharashtra contributes to about fifty-seven per cent of the total power-loom cloth production in the country and sixty per cent of the country's total power-loom export earnings. Around forty-four lakh people are directly and indirectly depending for employment on the power-looms of Maharashtra. It is the second largest employment provider after agriculture sector in the Mumbai and Pune divisions of Maharashtra. Readymade garments and home textile sectors are largely dependent on the power-loom sector to meet their fabric requirements. In 2011-12, approximately 5.20 lakh power-loom units were registered in India including approximately 2.87 lakh units in Maharashtra. The powerloom sector in the country has registered employment of 57.46 lakh people of India which includes 29.43 lakh people of Maharashtra in 2011-12. There were approximately 27.01 lakh power-looms registered as on 31st October 2017. Of these, only 1.5 lakh are shuttle-less power-loom and remaining are obsolete and out-dated. The power-loom industries which are concentrated in clusters across Bhiwandi, Ichalkaranji, Malegaon, Nagpur, Sangli, and Solapur, among others, produced 37,445 million square meters of fabrics in 2011-12 and 38,038 million squares meters in 2012-13 at an annual growth rate of about 1.5 per cent. The US and the EU markets account for about two thirds of India's textile exports. During April 2017 to August 2017 India's power-loom production was 16,119 million square meters. Power-looms in Maharashtra recorded a higher growth rate than all-India until 2010-11.

These unorganized power-looms avoid regulation of taxes and duties, licensing, factory acts and other labour laws. In most of the registered power-loom units many extra powerlooms operate without permission, licenses and registration. Many power-loom workers are paid subsistence wages. Most of the power-looms are operated in tiny houses and crowded workshops in Maharashtra. Power-loom sector is highly competitive when compared to handloom sector. Its main challenges are out-dated technology, poor working conditions, and exploitation of labour and high cost of production. Lack of quality production on out-dated looms and asymmetric market information leads to exploitation of power-loom owners by the middlemen. The other problems of this sector include high cost of production because of high yarn prices and high charges of electricity which reduces their profit margin. While the needs of modernization call for huge investments, low profitability and formalities of financial institutions force them to continue production with out-dated power-looms. Lower price for their low-quality product and high cost of production reduces profit margin of owners to adjust this and to earn basic minimum profit they exploit workers by forcing them to work hard at low wage rate under poor working conditions. Thus, the power-loom sector, in spite of its importance in the economy, faces a multitude of problems.

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The present article studies those related to the conditions of the workers employed in the power-loom sector and propose to provide some policy prescriptions to improve their living standards. Section two provides a review of literature. The third section states the key problems facing the power-loom units in the six clusters of Maharashtra. Sections four and five discuss the objectives of the study and the research method employed in the present study. Section VI provides the key findings and observations on the basis of the study. Sections seven and eight provide limitations of the study and recommendations. Section nine concludes. The Powerloom Sector is one of the most important segments of the Textile Industry in terms of fabric production and employment generation. This decentralised Sector provides employment to 60.86 lakh persons and contributes 58.26 per cent of total cloth production in the Country. More than 60per cent of fabric meant for export is sourced from Powerloom Sector. The readymade garments and home textile sectors are heavily dependent on this sector to meet their fabric requirement. There are approximately 5.38 lakh Powerloom Units with 24.34 lakh Powerlooms as on 30.11.2014. The technology level of this Sector varies from plain loom to high tech shuttle

eless looms. It is estimated that more than 75 per cent of the Shuttle looms are obsolete and outdated and have virtually no process or quality control devices/attachments. However, there has been significant up-gradation in the technology level of the powerloom sector during the last 7-8 years. 43 Powerloom Service Centres (PSCs) have been modernised with modern machines and equipment such as shuttleless looms of type Projectile, Rapier, Air jet, Automatic Cop Changing Looms, Drop Box Looms, Pirn Winders, Cone Winders, Sectional Warping Machine, DG Sets etc. Recently, one PSC at Nagpur (Maharashtra) and another at Varanasi (UP) have also started functioning.

The role of the Bhiwandi powerloom sector in relation to the mass and cheap cloth production and massive employment especially of the medium to low qualified people cannot be ruled out. It is one of the oldest decentralised powerloom sectors in India. Being nearer to the Bombay textile market and port, it has gained its importance and fame. Today 40 per cent of the powerlooms are closed and there is very much uncertainty is prevailing. GST, demonetisation, etc. are added fuel to their ever-lasting crisis. Old machinery, lack in technical knowhow and commercial knowledge, hunger for the loans and subsidies, fluctuating yarn prices are the root causes to swell out the crisis in larger way. On the other hand, those who are quality producers having Auto looms are not unhappy except that of high-power tariff and poor infrastructures.

Brief history of Bhiwandi and its present:

Bhiwandi, known for its power looms is situated at about 30 kilometres away from Mumbai in Maharashtra state. The city is a key textile centre of western India having approximately 7 lakhs power looms. This 33% of country's total power looms. Turnover of this segment is projected to be around Rs. 10,000 Crore annually. With approximately 1.6 lakh customers this industry is spread across 700 sq. km of area. Bhiwandi power looms support family of about 15 lakh workers; most of them being migrants from Uttar Pradesh,

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Andhra Pradesh, Tamilnadu and Bihar. Nearly 40 % of the national production from the power loom sector is contributed by this township. In the late 19th century, Bhiwandi developed as a textile producing centre. After the 1857 revolt, several weavers in the northern state of Uttar Pradesh, who had fought the British unarmed, were repressed. They fled south, and some settled in Bhiwandi, Later, as it developed into a handloom centre, traditional weavers from Andhra Pradesh in the south were attracted to the town. With mechanization, power looms were introduced (Karve).

What is loom? A Loomis a device used to weave cloth. The basic purpose of any loom is to hold the warp threads under tension to facilitate the interweaving of the weft threads. The precise shape of the loom and its mechanics may vary, but the basic function is the same (Collier, Ann M 1970). The weaving is a process of formation of fabric with interlacement of two or more sets of yarns using a stable machine called loom.

Growth of the Powerloom Sector: In the process of the growth of the textile industry, power looms on a fairly large scale, came last, the handloom sector is as old as the civilization itself, there are official records indicating the inception of the mill sector but unfortunately there are no authentic records indicating the birth of powerloom sector in country. According to the Powerloom Inquiry Committee (1960) the introduction of the power loom in the decentralized sector dates back to 1904.Earliest powerloom installation was at Ichalkaranji now in Maharashtra state (Then one of the Princely states). The First World War brought prosperity to the decentralized sector which attracted many to the powerlooms. In the early thirties many entrepreneurs purchased looms discarded by the mills in Bombay and Ahmadabad and converted them into powerlooms.

Textile strike in Bombay composite sector followed by the closure of mills on large scale in Bombay and the fall out of this phenomenon in Ahmadabad may helped the power loom sector in western India to grow the extent of such growth is not known what has certainly happened is that the sector has helped itself to cashing on the benefits of the prevailing market conditions (PPII-1984).

Powerloom Industry: The power loom industry in divided into two parts one is Mill Sector and other is decentralized sector. The decentralized sector occupies the major share in power loom industry. The formation of power loom sector in India is because conversion of Handloom industry into power loom industry. Many handloom weaving clusters, concentrated geographically at various places, gradually switched over to power driven looms, because of achieving higher productivity and earning better livelihood. Handloom weavers in various clusters like Bhiwandi, Malegaon Surat etc. started installation of power looms. With the closure of textile Mills in 1970s and after serious labour turbulence and strike in 1980-1981 in Mumbai the organized mill sector started losing ground and the power loom sector came into existence with a big leap.

Profiles of Powerloom Owners: Majority of owners are between 30-65 age group. They are emigrants from states like Uttar Pradesh, Andhra Pradesh, Rajasthan, and Gujarat. They are Hindu, Muslim, Gujarati and Sindhi, as they have come from different provinces they communicate in different languages like Hindi, Marathi, Gujarati, Kacchi, Bihari, and

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Sindhi. They are in this business for around 5 years to 50 years. Before started their own power looms some of them were power loom workers, while some others inherited their family business.

Employment in Powerloom: The decentralized power loom sector is the lifeline of Indian Textile Industry. This Sector plays a pivotal role in meeting the clothing needs of the country. The power looms industry produces a wide variety of cloth, both Gray as well as, processed. Production of cloth, as well as, generation of employment has been rapidly increasing in the power looms sector. As on January 31, 2008, there were 20.83 lakh powerlooms in the country distributed over approximately 4.64 lakh units. This is about 60.39% of the total looms in the world. The power looms sector contributes about 62% of the total looms in the world. The power looms sector contributes about 62% of the total cloth production of the country, and provides employment to about 49.75 lakhs persons, which is around 18.5% (excluding Handicrafts and Jute) of the total employment in textiles sector (GOI-Annual report 2007- 200 8). Bhishi (Mess): Bhishi is the outstanding feature of the Bhiwandi because majority of workers takes their daily meal hears. Most of the workers are migrants and bachelor who prefer to eat at Bhishi after their daily exhaustive work. It is a very horrible and unhygienic place where dogs, pigs and rats wonder. The place which is very dark uncolored broken benches unclean glasses and dishes are arranged, floor of the Bhishi is very dirty and slippery. Boring or well water is used for cooking.

Housing:

The housing area of workers is around one to two kilometers from the place where they work few houses are not properly constructed. They are congested with no proper ventilation, kaccha path ways. The public toilets are not cleaned common taps to fetch water or boring water or sometime well water is used for cooking bathing and cleaning purpose, filth and debris are around the roads and chawls with absence of sanitation facilities. Many houses are constructed near the big nala (Gutter) of the area. The bachelors stay in the rented common room of 10 by10’s area, about five to ten of them sharing a single room. Workers contribute towards rent every month. The married ones live in rented kaccha or pakka rooms of the local villagers.

Profile of powerloom workers: Power loom workers play Key role in the power loom units of the Bhiwandi. In my study I found that they come from the different states of the country and they are from agricultural background. Around 91% of the workers are emigrants from the states like Bihar, Uttar Pradesh, Rajasthan, Andhra Pradesh, Tamilnadu, West Bengal, Gujarat, Karnataka, Haryana, Maharashtra (Districts Sholapur, Nasik, Thane, Usmanabad, Ahamadnagar, Aurangabad, Bid, Usmanabad, Dhule, Jalgaon, and Bhusawal) and also from neighboring country like Nepal There are many reasons for their migration which are mentioned below

Main causes of the migration I found are acute poverty, landlessness, caste conflict in the village, low education, unemployment, attraction towards city, conflict within the kinship (conflict with brother, uncle or their children) natural calamities like flood, and earthquake

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some are affected due to Mumbai Textile mill strike of 1980's, some made crime in native place settled over here (Mr. X). The problems which workers face at the work place such as accidents, division of labor in the shed, working conditions, addiction among workers, education of workers and their family members, loan taking habits and its utilization and from whom they take loan, when do they visit to native place?, expenditure of the workers, duration of the work, marital status of the workers, entertainments, saving and workers endure from STD and HIV etc.

Wage structure:

According to Minimum wage Act of 1948, Government of Maharashtra fixed wage structure to the Bhiwandi power loom industry, but according to study it is found workers are not paid as per above mentioned law, they are paid meter wise how much meters they produce in 12 hours (rates of the cloth are depending on the type of the cloth). In the powerloom industry salary is made daily, weekly, fortnightly and monthly.

New Technology and power loom workers of Bhiwandi:

In Bhiwandi, the power loom industry introduced new technology which is very effective in terms of production, five time faster than present power looms like Japani, Rutty, Jacquards, Dobby, Rapier, etc. these loom gives fifty to sixty meters production for per hour but the wage of the workers is remain same and some workers are not having knowledge of operation of Automatic power looms consequently either they are jobless or they remain depends on the old power looms or search for new job. Sociological study of powerloom workers of Bhiwandi was made on the basis of questionnaire, observation and interviews of the powerloom workers, powerloom owners, govt. officers (labour department concern) Trade Unionist and Local people (land owners) after visiting to 60 powerloom units (powerloom-shed), 200 powerloom workers and 50 powerloom owners, 27 govt. officers,19 living places of powerloom workers, more than 200 local people of Bhiwandi and 9 trade unionist and on this ground following conclusion is made. According to observation I found powerloom workers where they work and live those both places are very different from the other industry and these factors might be affected on mental and physical health of the workers the explanation is given below

Standard of living:

I found due to migration in the powerloom industry of Bhiwandi standard of living of workers move up, they get good money compared to earlier employment they are happy with their present working situation but they have no voice against their inhuman working condition.

Working place:

Wherever I visited the power loom units, I had not seen any name plate or name board of the power loom unit. According to Akbar (U.P.) a power loom worker and my observation of workplace, there was no proper cleanliness everywhere things were lying no proper place

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to seat. Ventilation was not proper in the light of two tube lights, there were six looms running sun light could not come inside because of congestion people could not hear each other because of rampant noise pollution, there is no first aid box in case any injury take place. There was no drinking water, when asked about drinking water worker replied generally, they drink boring water outside the unit. In many places I found uncovered Working electric wires and cables (according to observation).

Powerloom owners run Powerloom Shed on the rent or contract basis:

According to Mr. Karve in the powerloom industry of Bhiwandi many powerloom owners run powerloom shed on the rent basis for it they have to pay Rs.1200/- to Rs.1500/- (depends on the condition of the powerlooms, for ten powerlooms they have to pay Rs.12000/- to Rs.15000/-per month to the main owner and money is to be paid number of powerloom he takes) rent to the main owner of the powerloom before taking possession of the powerloom shed there is 11 months agreement is made between them, after agreement get over the main owner is having right of re-agreement or he can run the powerloom shed his own. According to Mr. Shaikh in the powerloom industry of Bhiwandi maximum owners run their powerloom shed for production of cloths on the job work for it they take powerloom shed on the rent or contract basis.

No Bargaining powers:

I found there is no bargaining power among workers, whenever issues come of bonus, salary hike, holiday, or compensation of accident workers accept consequence silently some time they are humiliated by owners and they pocket the insult, fear of losing the job and low education they don't raise voice and the owners take undue advantage of the same.

Health of the workers:

Due to long hours of working workers and that work is continuously standing workers suffer with body pain problem, unhygienic condition at work place due it workers suffer with respiratory problem because at the time of work many macroscopic pieces of cotton goes to nose and mouth of the workers and the suffer with respiratory disease , nature of work of power industry is related to eyesight because at the time of work workers have to concentrate on the production because there is fear of breaking of thread and it will spoil the cloth and after that Mehta would shout and deduct the money of faulty cloths from the salary, and found there is loud noise of working powerloom due to this noise many workers suffer with listening problems after few years many workplaces of powerloom I found there is poor ventilation or not proper light and due to this reason many workers suffer with eyesight problem also, as above mentioned unhygienic and poor quality of food of Bhishi, many workers suffer with the diseases like jaundice, appendix, typhoid and tuberculosis.

Accident at workplace: I found due to unsafe working condition many workers come across with accident like electric shock because some places of work there is uncovered working electric wires/cables some time workers by mistake touch it and he get electric shock, heating of dhota (shuttle), twisting in a beam, fall beam on the body, according to workers this

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accident occurs because of long working hours and night shift workers take a nap and accident occurs.

Compensation after Accident: I found in powerloom industry of Bhiwandi in case accident occurs owners with the help of the senior power loom workers send to hospitals here generally owners prefer to hospitalized affected worker in the private hospital to avoid further compensation with the help of fellow workers they try to solve the matter they try to convince and give him (affected worker) some amount and send him to his native place. Sometime it depends on the nature of the accident if the accident is minor worker is taken to hospital and pay hospital charges and some amount to affected worker and after that nobody entertain him, his rest treatment he takes his own. Here one thing is very clear in case any accident occurs owner avoid to go to police station or any government office.

Loan: Power loom workers take loan for festivals, marriage ceremony, construction of house, sickness, ritual purpose from the money lender with interest. Here I found tendency of workers that they must take loan and celebrate festivals. As mentioned in the chapter II it can be observed that 92% power loom workers take loan from money lender, friends, owners, and relatives where as 15% power loom workers don't take loan on interest, while collecting data I found some information that one south Indian group called Anna gives loan on interest in the Bhiwandi's slum area where majority power loom workers stay.
Addiction: I found Due to long working hours, night shift and nature of work workers succumb to rampant addiction of Tobacco, Gutka and liquor (Deshi wine or Hathbhatti which is made my local people of the village).

No strong union: I found there is no strong union for powerloom workers to get or raise voice against the exploitation of the workers. According to Unionist workers don't take membership of their union and come to them after anything occurs wrong. According to study I found majority of workers don't know about the unions which are working for them some workers know about it but they don't have trust on the union leaders according to their past experience which is explained in the chapter IV.

Fear about communal riot: Bhiwandi city has got historical background of riot in the last 173 years Hindu –Muslim riots are occurring in the city. The main causes of riots are religious, and defame of statue of God and goddesses and great leaders of India and their processions. Due to migration, there is always fear insecurity in the minds of the workers and some senior workers saw the consequences of the riot. I found whenever riots outbursts in the any region of the state or country workers started going back to their places because they don't feel secured here.

Money order: I found 90% workers send money to their family through money order for the family support like education of the child/children, medical purpose, and construction of

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house, agricultural propose or repayment of the loan which is taken for agricultural purpose, marriage ceremony or any religious/ritual purpose cause.

Passive opinion about education: Whenever workers were asked about the education of their child/children I found either they do not know about the importance of education or said no use of education.

Marketing: -According to study I found

1)90% of the entrepreneurs are engaged to catering the product in local market of traders.

2) No verification in product mix. Particularly product innovation/diversification is absent.

3) Catering mostly to cost base market. No brand identity or organized marketing strategy exists in the Bhiwandi powerloom industry.

4) Most of the powerloom units are involved to give their product to local market and doing job work only so they do not have any knowledge about market. Let go attitude of owners: -According to study I found majority owners are not conscious about the welfare of the workers according to X owner workers are luckier they work for 12 hours and get salary and sleep well but we work here for 24 hours under various tensions. I found at many places electric cable/wire is uncovered but owners are least bother about it. In many workplaces there is no first aid box in case any injury or accident takes place while working according to workers owners says nothing happen.

High handedness of owners: According to interview with the workers I found there is highhandedness in the powerloom industry in case any mistakes from the workers they are immediately removed from the job, and in many powerloom shed owners don't speak with workers they are treated like a slave.

Workers are used at the time election as voters by local politician: I found At the time of election of Loksabha, Vidhansabha, Municipal corporation workers are forced to tell to give vote to the particular party by the house owners and he takes money from the particular candidates and decide rate of the particular area basically slum area or village area of the Bhiwandi where majority of powerloom workers stay at that time workers are given voter vise money, wine and food.

Grievances of local workers: I found there is anger among the local workers about the migrants' workers According them they protest with the present working condition and wage structure which is paid to the workers by employer, but migrant are happy with the present salary and working condition, whenever local workers protest or shout against employer migrants don't support them because of it production doesn't stop or affect. On the contrary employer remove the workers from work those who shout or protest against them.

Technology used: I found a majority of the powerlooms in Bhiwandi produce grey materials which are used as shirting and dress material. Cloth produced in Bhiwandi is mainly consumed by Indian market as it is not up to the mark in the international market. One reason for that is the second-hand technology. Most of the power looms in Bhiwandi are obsolete and old, as manufacturers over here prefer low-priced second-hand power looms over new looms. Excluding some big players most of the units run in Bhiwandi are small units and

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could not afford to purchase or import high-priced machinery. Government Schemes but lack of knowledge and awareness: Although there are many government schemes for the powerloom workers but due to lack of knowledge and awareness workers can't take advantage of the scheme when I visited SASMIRA office of the Bhiwandi Mr.Sainy project officer told they try to propagate or create awareness among the workers about the schemes but they get very poor response for it they wait or when any accident take place and after completing formality they visit to that place and call fellow workers to get victim's compensation and publicly announce the compensation amount. But I found there is no awareness about the Insurance Scheme among the workers; Insurance schemes for the powerloom workers and powerloom industry by the government of India are mentioned below.

1) Group Insurance Scheme for Powerloom Workers (Janashri Bima Yojana)
2) 2) Welfare of Powerloom Workers through Group Insurance Scheme
3) 3) Work shed-Cum-Housing Scheme for Powerloom Workers:
4) 4) Mahatma Gandhi Bunkar Bima Yojana.

History of Bhiwandi

Bhiwandi is known as the Manchester of India` because it has the largest number of powerlooms in the country, in addition to being one of the major textile industries of India. Bhiwandi city, the headquarters of the Taluka of Bhiwandi, comes under the administration of the Bhiwandi-Nijampur Municipal Corporation. Bhiwandi city is part of Thane district.

Bhiwandi is considered a part of the Greater Mumbai metropolitan agglomeration, along with Navi Mumbai and the cities of Kalyan, Thane, Ulhasnagar, Dombivli, Mira-Bhayandar, Karjat and the Vasai-Virar region. The city, known for its textile industry, has the largest number of powerlooms in the country and is sometimes dubbed as 'The Manchester of India'. A major portion of the population is employed by the powerloom sector. The Mumbai-Agra highway (NH-3), passing through Bhiwandi ensures the smooth connectivity of the city with Mumbai, Thane, Nashik and the rest of India (Wikipedia).

Demographics: As of 2008 India census, Bhiwandi has an estimated population of 804,703. Males constitute 61% of the population and females 39%. Bhiwandi has an average literacy rate of 66%, higher than the national average of 59.5%; with male literacy at 72% and female literacy at 56%. Population under six years of age is 14%. [1]

History: The name Bimbapuri came into existence because of King Bimb (TDG - 1982).Bhiwandi, or the erstwhile Bimbapuri[2], is a heritage city that has been prominent for several thousand years. The name Bhiwandi is considered to be a corrupt form of Bimbapuri. In the regime of King Shilahar, Bhiwandi city was known as Sonale and in the same period,

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the Muslim population called it Bhimadi. A thousand years ago this city was known as south Konkan. In Mahabharata, this city was known as Aparant or Shorpark orSopara. The ancient city was famous for its harbor that connected Borghat and Naneghat (Patil-2002).

In the early Twentieth century, Bhimadi was a small town, inhabited by Maharashtrian and Konkani Muslims. The main occupations of the people at that time were agriculture, fishing and handlooms. With the advent of electricity, the handlooms began to be quickly replaced by power looms. In the 1930s, it became a hub of the textile industry Bhiwandi had a port on the Kamwadi river during the 16th century in an area known as Bunder Mohalla, which was used for trading of woods & spices. This harbor was well known for the export of salt, teakwood, cotton and grains. Businessmen & merchants travelled frequently to this area. In this period, a merchant was referred to as a 'Saudagar', and now the area is called Saudagar Mohalla. The outstanding features of this city are found in the Kanheri caves.

The labourers who work for the shipping building lived in areas that are today referred as Sutar wada & Hamal Wada. In 750BC, the Egyptian traveler Ptolemy visited seven places of Thane District; and in his travelogue he mentioned his stay at Bhiwandi as one of these places. In 1 542, the Portuguese requested the Nijam of Ahamadnagar not to allow oceanic thieves on the sea way of Kalyan and Bhiwandi In the regime of king Shilahar, Bhiwandi city was famous for the business of diamonds, pearls, silk, perfumes and carved goods. Businessmen would stay in an area named Wani Ali (this reference is also found on a rock inscription in Lonad village of Bhiwandi). According to the explanation of 'Tariq-E-Nava-Id' (an Urdu book), Bhiwandi city was a way or harbor for a pilgrimage to Haj for Muslims in the Konkan region and the hilly regions. Baba Makhadum Ali Farukh Mahimi, after whom the famour Mahim Darga is established, pilgrimaged to the Haj through Bhiwandi. In the 1341 Tribal king Jasaba alias Papera won the Bhiwandi from the king of Jawahar (Taluka of Thane district). According to contemporary corresponding of the Portuguese, it appears that they were afraid of the local tribals (Kolis). In 1616, Badshah Shahjahan won the Bhiwandi local tribals (Kolis) and then attacked the Adilshaahi of Vijapur. In 1657, Chatrapati Shivaji Maharaj fought with the British on the soil of Bhiwandi and in 1659; he constructed twenty fighter ships at Bhiwandi harbor to fight the British. Zenda Naka in Bhiwandi is the spot where Shivaji hoisted his saffron flag. In 1670, he built an army of 500 young soldiers in Bhiwandi and attacked the Mahuli fort of Shahpur. His subsequent victory in Shahpur meant that he had established his rule over the Konkan region (History of Maratha- 216). In 1682, Ranmastakhan attacked and looted Bhiwandi, but Raje Sambhaji (son of Shivaji) defeated him. In 1690, the Portuguese established their rule over Bhiwandi. In 1720, Ran Chandra Mahadev (brother-in-law of I-Bajirao Peshawa) attacked Bhiwandi and established his rule on the city. In 1760, due to the weakness of the Peshavas, the tribal king attacked Bhiwandi and succeeded in establishing his rule. .Considering the importance of Bhiwandi harbor in 1817, the Britisher too attacked Bhiwandi in order to capture it; evidences of this battle are found near Brahman Ali post office (Tomb of Arab soldier).In 1836, the British divided the local tribals and established their Waterloo Battalion.

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There was military camp of the British Army in the Lap Ali area of Bhiwandi. The person navigating the ship lived in what is today called as Tandel Mohalla. In the Moghul period, Bhiwandi city was known as 'Islamabad'. They built a mosque called the Islamabad Masjid and the Eidgah situated at Eidgah road.

In the 1850-1857 (period of East India company), there was a situation of anarchy in North India. The Navab of Avadh existed only for the name's sake, whereas power and control was concentrated in the hands of the hands of British East India Company. There was no emancipator for subjects. Thieves and robbers had run amok. In such a helpless situation, people left their villages for survival elsewhere. Among those who left, a majority of them were weavers. The revolt of 1857 was largely responsible for this situation to arise. Hordes of weavers from Ajamgad, Banaras, East Uttar Pradesh, and South Bihar started their journey to find livelihoods in other areas (Patil-1990). Compared to the north, the south was politically and socially peaceful at the time. Large numbers of these weavers came to Bhiwandi through the Agra Road. While still on the way, some of these weavers settled at spots like Maheshwar (southern part of Indore) Dhule, Jalgaon, Malegaon, and Yeola, however the majority of them settled at Bhiwandi. Since Bhiwandi was close to Mumbai, the textile industry was started in Mumbai. In 1853, the railway routes were extended to reach up to Thane and then on 2nd June 1854 to reach Kalyan. The first textile mill was started in Mumbai in 1854 and by 1860; six to eleven mills were started. 1860 to 1865 was a period of the American Civil War. America blocked the way of the Eastern harbours. The result was that Manchester was in short supply of cotton. Consequently, the demand for Indian cotton increased. In these years, the Mumbai textile industry flourished, which has had an impact on the contemporary handloom in Bhiwandi. In 1927, Philanthropist Dadasaheb Dandekar started an electricity generation company at the local level. Later, he signed an agreement with the Tata to merge his company with the Amalgamated Electric Supply Company. Following this agreement, three phase electric supply was started in Bhiwandi, which instantly gave rise to the number of jobs available in Bhiwandi. Additionally, the electricity charges too were affordable at the time. (Patwardhan-2000).

'Sona Becho Loha Kharido' : Haji Abdul Samad Hajjilal Mohammad Momin (Samad Seth), was the founder of the powerloom at Bangalpura part of Bhiwandi in 1935. For the development of weavers, he formed the first handloom cooperative society in Maharashtra in 1927. Till his death, he remained the chairman of that society. The building of the society still exists on the Parnaka of Bhiwandi for the unity of Hindus and Muslims. Compared to hand loom, the power loom gave much higher production. Samad Seth advised the people of Bhiwandi 'Sona Becho Aur Loha kharido' (sell gold and buy iron). Due to the availability of cheap labour from North India, the development of textile mills and textile market in Mumbai, the, the starting of trams on electricity in 1928 (Ghanvatkar) the construction of Kalyan Railway Station, and the Mumbai Agra highway; Bhiwandi was more developed and rapidly growing in the textile sector as compared to Malegaon and Surat. The sizing mill was started in 1950.

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Geography: Bhiwandi is located in the Konkan coastal lowlands. There are many hills surrounding Bhiwandi, which add to its scenic beauty. The average elevation is 24 mts. The Varhal Devi Lake is the largest lake in Bhiwandi. Thane district is located in the western state of Maharashtra (TDG-1982), India, and located 50 km to the north-east of Mumbai and 15 km to the north-east of Thane city. The exact location of Bhiwandi is 19.293831° N 73.065839° E.

Climate: Bhiwandi has a hot tropical climate with moderate temperature throughout the year. In the summer season, the temperature rises above 100 F and is characterized by high humidity due to the proximity to the sea. The winter is roughly from October to April.
Attraction: Bhiwandi is strategically located 25 miles away from Mumbai, the financial capital of India. It has got a rich cultural, historical and mythological in heritage. The ample availability of low cost lands in the city which is very near to a metropolitan city like Mumbai leads to the planning and development of many water parks, theme parks and re-creational centers in Bhiwandi. The growth of these recreational spots in the recent times, combined with the development of basic infrastructure in the area has given a major boost to Bhiwandi Tourism. A good network of wide roads, transport facilities, easy access to modern ways of communication, good hideouts, high level of local hospitality, and the adoption of new international tourism norms are making Bhiwandi an ideal weekend destination for the people of Mumbai for weekends. In fact, it is places like Bhiwandi that have propelled the basic concept of weekend vacations in Mumbai.

Bhiwandi People and Culture

The migration of large numbers of people from all corners of India into Mumbai every day , has had a huge impact on the people and culture of Bhiwandi. Since people of different religious groups, castes, and languages have found shelter in Bhiwandi, the city has become a symbol of a typical diversified culture (WIKP).
Followers of two major religions can be found in Bhiwandi; Hinduism and Islam. Though large majority of the population is Hindus, the Muslims to form a significant proportion of the population compared to other parts of Maharashtra. As stated above, the city was governed by Muslim rulers in ancient times, Muslims settled in their petty coastal principalities here.Today Bhiwandi is regarded as ‘Mecca of Konkani Muslims. Earlier it is supposed that the initial name of Bhiwandi city was Nijampur. This was formed by Konkani Muslims and Maharashtrian non-Muslims. Kuwari, Faqih, Bubere, Moallim are some of the royal and original names of Muslims from the city.

Communication: Bhiwandi has well developed communication networks. There are six post offices and one telephone exchange equipped with all the latest frame of facilities like STD, ISD, FAX and Internet and all major cellular networks have a presence in Bhiwandi. There are a large number of private courier agencies that facilitate communication and deliveries to

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and from remote areas with special facilities to Mau, Balia, Bhagalpur, and Vijayawada, parts of UP, Bihar, Andhra Pradesh, and Tamilnadu.

Power and water supply: Power supply to the Bhiwandi powerloom industry comes from MSEB main station and is distributed through 23 electrical sub stations. The distribution is made by Torrent Power Company. Bhiwandi has been facing problem of power shortage and power-cuts, even though the number of hours of a power-cut have gone down from 8-9 hours per day to 3-4 hours per day. Power consumption in Bhiwandi circle is around 2400million units and more than 50% of this is consumed by the region. Although regular supply of electricity is the lifeline of this industry, it is facing hard times as there is a load shedding of 3-4 hours and that to every day. This is costing severe losses to the economy of the city, amounting approximately to Rs. 10 crores. Water supply is sufficient from Pise Weir, Atkhipili of Kanwadi River.

Economy of Bhiwandi: The economy of Bhiwandi is mostly dependent on the power loom industry. The decline of Mumbai's textile mills spurred the growth of the power loom sector in the region. In order to meet the demand for grey fabric, power loom centers sprang up in various parts of the State. Textile and migrant workers came in droves to find work at these centers. Bhiwandi became the largest power loom centre in the country. The State government estimates that over 40 lakh people are dependent directly or indirectly on the looms of Bhiwandi. The city is the ‘mother go down’ for several industries and the nodal up-country booking and transit point for several goods transporters; owing to the control benefits that can be availed.

Additionally, the biggest pharmaceutical companies also have their godowns in Bhiwandi. This industry too, is affected by insufficient power supply. Workers are victims of this power shortage as it affects their already low salaries. Cheaper products are flooding the market and the industry is losing out to them due to the above-mentioned factors. Manufacturing costs of the Bhiwandi powerloom sector are higher compared to the low-cost manufacturing countries. Industry leaders of this region were desperately seeking help from the government to revive the sector and the recent budget has brought a ray of hope to this rambling industry. Finance minister of India, P. Chidambaram has included Bhiwandi in one of the six mega clusters that need to be developed. Bhiwandi will be developed as a powerloom mega cluster and Rs. 70 crores have been approved for infrastructure development and improvements in production. Although the Bhiwandi powerloom sector is happy with this announcement and takes this as a positive development for the industry’s growth, it also seeks facilities such as easy-to-procure loans and uninterrupted power supply at affordable costs, so that they can expand from grey cloth production to other activities in downstream chain (MTCO-2010).

Transport

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Intra-City Transport: The main mode of transport within Bhiwandi is the auto-rickshaw. Rickshaws, as they are called, are omnipresent in this city and can be seen everywhere. They run on various arterial routes that wind their way through Bhiwandi. The rickshaws here do not use the meter system, like Thane and Mumbai, but basically operate on a stop-to-stop system. Pre-defined stops have been determined on every arterial route and the minimum fare between two stops is Rs 5. If a person wants to take a rickshaw to address lying on routes other than the predefined routes then the fares are determined by the driver but are open for bargaining.

There is currently no intra-city bus system running within the city, but the Bhiwandi-Nijampur Municipal Corporation is planning to start one. There are bus services provided by the Thane Municipal Transport (TMT) from Thane station to Narpoli and BEST from Mulund to Narpoli. KDMT also run buses on regular interval.

Inter-City Transport

Road: Bhiwandi is well connected with the rest of the country mainly because of the Mumbai-Agra Highway (National Highway-3), which passes through it. The highway is one the most important in the country and as a result there is a heavy flow of traffic through Bhiwandi, consisting of passenger cars as well as the 18-wheel giant tractor trailers. Two flyovers have been constructed on this highway to ease the traffic congestion. For diverting the traffic that does not have to make a stop in Bhiwandi, an alternate subsidiary road, commonly and appropriately called the Bhiwandi-bypass was built. This 4-lane, well-maintained subsidiary road, breaks off from the main highway in Thane, and meets the highway again, 6 km to the north of Bhiwandi, near Shangri-la resort.

The Maharashtra State Transport Corporation (MSRTC) runs bus services to various cities within the state as well as the neighboring states. The Bhiwandi ST (State Transport) Depot is located on the Mumbai-Agra Highway. Buses run every half hour to nearby depots like Mumbai-Central, Thane, Kalyan, Vasai, Wada and Borivali. The Thane Municipal Transport operates bus services from Bhiwandi to Thane, and the Kalyan-Dombivli Municipal Transport operates bus services from Bhiwandi to Kalyan, every 20 minutes. Auto-rickshaws too, run from Bhiwandi to Thane and Kalyan. Jeeps ply from Bhiwandi to the nearby town of Padgha. There is also a private car service that runs between Bhiwandi and Mumbai. It basically caters to the need of businessmen who visit the textile market located in the Kalbadevi area of Mumbai. A minimum of 40 cars make a round trip of Mumbai every day, carrying 10 passengers on every trip.

Railway:

Though the city is well connected by road, the railway services are not as good. The Bhiwandi Road Station (code BIRD) lies on the Vasai-Diwa corridor, between the western line and central line. An EMU service runs from Diwa to Vasai. However there is no direct connection between Bhiwandi and other important centers such as Chatrapati Shivaji Terminus (CST), Dadar, and Thane etc. Commuters have to travel to either Diwa or Vasai to

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get railway connections to Mumbai. This is an inconvenience especially during peak rush hours. Several long distance trains make a stop in Bhiwandi. Recently, computerized reservation service was installed at Bhiwandi station. Prior to this, people had to go to Kalyan to buy tickets. There is a necessity for a suburban rail line for Bhiwandi. The Metro Rail Corporation plans to connect the Thane-Kalyan line through Bhiwandi.

Air

The nearest airports from Bhiwandi are the Mumbai domestic and international airports located at a distance of around 40 kms. A new international airport is currently under construction in Navi Mumbai at Panvel.

Riots and Bhiwandi:

Hindu-Muslim riots have been occurring in Bhiwandi for the past 173 years. The main causes of riots are religious; such as defamation of religious icons of f gods and goddesses, great leaders of India and their processions. The first riot occurred in Bhiwandi in 1837. Hindus had organized a procession of the Hindu god and goddess Vitthal-Rukhamai, and Muslims too had organized the Muharram procession (Tabut) at the same time. Both processions were going on in the city and after some time when they came in front of each other, a riot started. According to some sources, many Hindus were killed and after this incidence, many people left Bhiwandi (Chitale-1951). The second riot occurred in Bhiwandi on 7th May 1970 for the occasion of a procession on Shiv janyanti (birth anniversary of Chatrapati Shivaji Maharaj). A riot started at the old fish market, which soon spread all over the state of Maharashtra. In response, several major cities like Kalyan, Thane, Jalgaon, Dhule, Malegaon etc. were closed. Many innocent people were killed and property worth crores of rupees was shattered. Many powerloom workers too were killed and their bodies were not identified, in this riot also many Hindus were killed (Patil).

The thirds riot occurred in Bhiwandi on 17th May 1984 on the issue of putting the green flag on the tree according to Ghanwatker. It was a historic riot where many Muslims and Hindus were killed. Heaps of bodies lying in the public hospitals could not be identified, there was bloodshed everywhere. The central feature of this riot was that many slum dwellers, essentially migrant workers were killed in the city riot. These were the powerloom workers who were settled in Bhiwandi only to eke out a living (Khopade-1984).

What is a loom?

A loom is a device used to weave cloth. The basic purpose of any loom is to hold the warp threads under tension to facilitate the interweaving of the weft threads. The precise shape of the loom and its mechanics may vary, but the basic function is the same (Collier, 1970). Weaving is a process of formation of fabric with interlacement of two or more sets of yarns using a stable machine called loom. A loom is a device used to weave cloth. The basic purpose of any loom is to hold the warp threads under tension to facilitate the interweaving of

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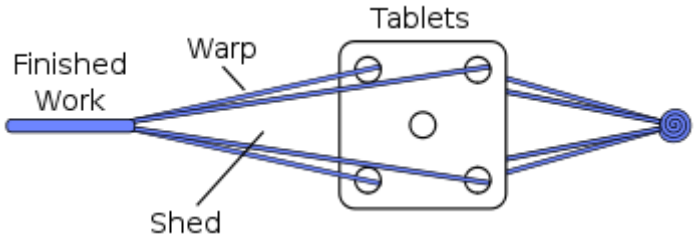
the weft threads. The precise shape of the loom and its mechanics may vary, but the basic function is the same.

Weaving

Weaving is done by intersecting the longitudinal threads, the warp, i.e. "that which is thrown across", with the crosswise threads, the weft, i.e. "that which is woven".

Warp weaving

In weaving, the warp is the set of lengthwise yarns through which the weft is woven. Each individual warp thread in a fabric is called a warp end. Warp means "that which is thrown across" (Old English*wearp*, from weorpan, to throw, cf. German*werfen*, Dutch*werpen*).When weaving on a loom, the warp yarns are placed in tension before weaving begins. Warp is spunfibre. The spin of the fibre can be in either an "s" twist or a "z" twist. These twist directions make yarn that is similar to hands; each the reverse of the other. Initially the fibre would have been wool or flax (which is known as linen when spun). These fibers provided a strong enough thread to be held under tension as the warp. With the spinning technology during the Industrial Revolution, it became possible to make cotton yarn of sufficient strength to be used as the warp. Later, artificial or man-made fibers such as nylon or rayon were employed. The weft is the yarn that is woven back and forth through the warp to make cloth (Wikip)



Weft weaving

In weaving, weft or woof is the yarn which is drawn through the warp yarns to create a fabric. In North America, it is sometimes referred to as the "fill" or the "filling yarn". The weft is a thread or yarn of spun fiber. The original fibre was wool, flax or cotton. Nowadays, many synthetic fibers are used in weaving. Because the weft does not have to be stretched in the way that the warp is, it can generally be less strong. The weft is threaded through the warp using a shuttle. Hand looms were the original weaver's tool, with the shuttle being threaded through alternately raised warps by hand. Inventions during the 18th century spurred the Industrial Revolution, and the hand loom became the more robust spinning frame with the flying shuttle speeding up production of cloth, and then the water frame using water power to automate the weaving process. The power loom followed in the 19th century, when steam power was harnessed. In modern usage, *weft* is a hairdressing term for temporary hair extensions which are glued into a person's hair.[

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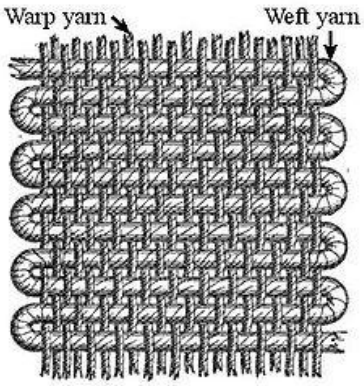

Yarn

Yarn is a long continuous length of interlocked fibres, suitable for use in the production of textiles, sewing, crocheting, knitting, weaving, embroidery and rope making. Thread is a type of yarn intended for sewing by hand or machine. Modern manufactured sewing threads may be finished with wax or other lubricants to withstand the stresses involved in sewing. Embroideryis yarns specifically designed for hand or machine embroidery.

Spun yarn is made by twisting or otherwise bonding staplefibers together to make a cohesive thread.[2] Twisting fibers into yarn in the process called spinning can be dated back to the Upper Paleolithic[3], and yarn spinning was one of the very first processes to be industrialized. Spun yarns may contain a single type of fiber, or be a blend of various types. Combining synthetic fibers (which can have high strength, luster, and fire retardant qualities) with natural fibers (which have good water absorbency and skin comforting qualities) is very common. The most widely used blends are cotton-polyester and wool-acrylic fiber blends. Blends of different natural fibers are common too, especially with more expensive fibers such as angora and cashmere.) Yarns are made up of a number of plies, each ply being a single spun yarn. These single plies of yarn are twisted together (plied) in the opposite direction to make a thicker yarn. Depending on the direction of this final twist, the yarn will be known as *s-twist* or *z-twist*. For a single ply, the direction of the final twist is the same as its original twist.

Filament yarn consists of filament fibers (very long continuous fibers) either twisted together or only grouped together. Thicker monofilaments are typically used for industrial

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purposes rather than fabric production or decoration. Silk is a natural filament, and synthetic filament yarns are used to produce silk-like effects. Texturized yarns are made by a process of air texturizing (sometimes referred to as taslanizing), which combines multiple filament yarns into a yarn with some of the characteristics of spun yarns. Yarn quantities are usually measured by weight in ounces or grams. In the United States, Canada and Europe, balls of yarn for handcrafts are sold by weight. Common sizes include 25g, 50g, and 100g skeins. Some companies also primarily measure in ounces with common sizes being three-ounce, four-ounce, six-ounce, and eight-ounce skeins. These measurements are taken at a standard temperature and humidity, because yarn can absorb moisture from the air. The actual length of the yarn contained in a ball or skein can vary due to the inherent heaviness of the fiber and the thickness of the strand; for instance, a 50 g skein of lace weight mohair may contain several hundred meters, while a 50 g skein of bulky wool may contain only 60 meters.

There are several thicknesses of yarn, also referred to as weight. This is not to be confused with the measurement of weight listed above. The Craft Yarn Council of America is making an effort to promote a standardized industry system for measuring this, numbering the weights from 1 (finest) to 6 (heaviest).[4] Some of the names for the various weights of yarn from finest to thickest are called lace, fingering, sock, sport, double-knit (DK), worsted, aran, bulky, and super-bulky. This naming convention is more descriptive than precise; fiber artists disagree about where on the continuum each lies, and the precise relationships between the sizes. A more precise measurement of yarn weight, often used by weavers, is wraps per inch (wpi). The yarn is wrapped snugly around a ruler and the number of wraps that fit in an inch is counted. Labels on yarn for handcrafts often include information on gauge, known in the UK as tension, which is a measurement of how many stitches and rows are produced per inch or per centimeter on a specified size of knitting needle or crochet hook. The proposed standardization uses a four-by-four inch/ten-by-ten centimeter knitted or crocheted square, with the resultant number of stitches across and rows high made by the suggested tools on the label to determine the gauge. In Europe textile engineers often use the unit Tex, which is the weight in grams of a kilometer of yarn, or decitex, which is a finer measurement corresponding to the weight in grams of 10 kilometers of yarn. Many other units have been used over time by different industries.

Electrically conducting yarn:

An electrically conducting yarnis yarn that conducts electricity. Conducting yarns are used to manufacture carpets and other items that dissipate static electricity[1] such as work clothes in highly flammable environments, e.g., in the petro chemistry industry. There are several methods known to manufacture electrically conductive textiles. The simplest way is to incorporate metal wires or wire meshes into fabrics. Another approach is to use metalized yarns. In staple yarns, it is possible to spin short strands of regular yarns with metal yarn. Yarn may be made of a central metal strand with regular yarn woven around it An altogether different approach involves yarns based on conductive polymers, such as polyaniline.

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The principles of weaving

The major components of the loom are the warp beam, heddles, harnesses, shuttle, reed and take-up roll. In the loom, yarn processing includes shedding, picking, battening and taking-up operations.

Shedding: Shedding is the raising of the warp yarns to form a shed through which the filling yarn, carried by the shuttle, can be inserted. The shed is the vertical space between the raised and upraised warp yarns. On the modern loom, simple and intricate shedding operations are performed automatically by the heddle or heald frame, also known as a harness. This is a rectangular frame to which a series of wires, called heddles or healds, are attached. The yarns are passed through the eye holes of the heddles, which hang vertically from the harnesses. The weave pattern determines which harness controls which warp yarns, and the number of harnesses used depends on the complexity of the weave. Two common methods of controlling the heddles are dobbies and a Jacquard Head.

Picking

As the harnesses raise the heddles or heads, which raise the warp yarns, the shed is created. The filling yarn in inserted through the shed by a small carrier device called a shuttle. The shuttle is normally pointed at each end to allow passage through the shed. In a traditional shuttle loom, the filling yarn is wound onto a quill, which in turn is mounted in the shuttle. The filling yarn emerges through a hole in the shuttle as it moves across the loom. A single crossing of the shuttle from one side of the loom to the other is known as a pick. As the shuttle moves back and forth across the shed, it weaves an edge, or selvage, on each side of the fabric to prevent the fabric from raveling.

Battening

As the shuttle moves across the loom laying down the fill yarn, it also passes through openings in another frame called a reed (which resembles a comb). With each picking operation, the reed presses or battens each filling yarn against the portion of the fabric that has already been formed. The point where the fabric is formed is called the fell. Conventional shuttle looms can operate at speeds of about 150 to 160 picks per minute. With each weaving operation, the newly constructed fabric must be wound on a cloth beam. This process is called taking up. At the same time, the warp yarns must be let off or released from the warp beams. In order to become fully automatic, a loom needs a filling stop motion which will break the loom, if the weft thread breaks. An automatic loom requires 0.125 hp to 0.5 hp to operate.

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A Northrop loom manufactured by Draper Corporation in the textile museum, Lowell, Massachusetts

For all this to happen, the yarn has to be prepared. The weft or filling must be wound tightly on the correct size pins, quills or bobbins. Weaving happens at great speed so the yarn must be at the correct tension when it leaves the shuttle. The warp passes through the heddles which stretch it at each pick, and through the reeds which are abrasive. The warp is thus sized, that is coated with a mixture that can include china clay and flour, to give it extra strength and to act as a lubricant. It is dressed or wetted while passing through the loom. The warp, hundreds of ends of yarn rolled in parallel, comes on a wooden beam. Before weaving can commence each end must be passed through the heddles and reeds: a process known as looming.

Chronology of the Invention of Power Loom: Rev. Edmund Cartwright's invention of the power loom, and his modifications to the loom he patented in 1785 was described in his own words. It was to be forty years before his ideas were modified into a reliable automatic loom. Cartwright was not the first man to design an automatic loom, this had been done in 1678 by M. de Gennes in Paris, and again by Vaucanson in 1745, but these never developed and were forgotten.

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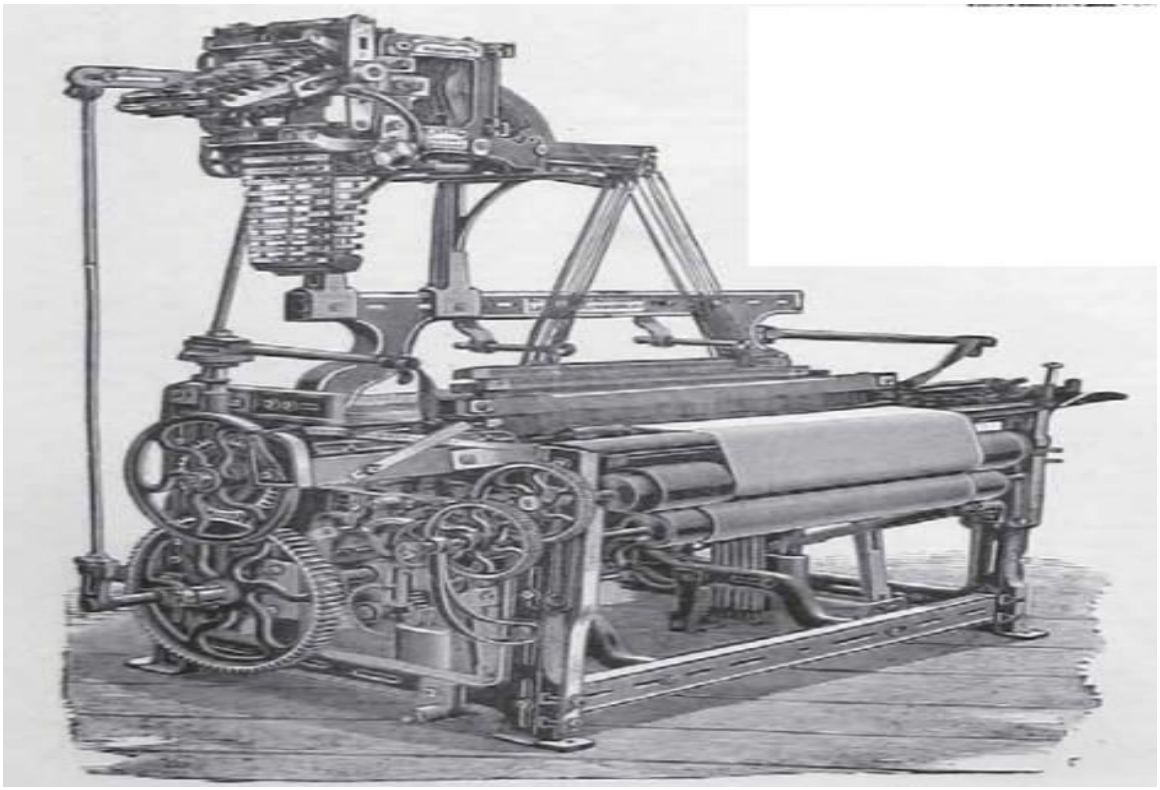

A loom from the 1890s with a dobby head. Illustration from the Textile Mercury

Those designs preceded John Kay's invention of the flying shuttle and they passed the shuttle through the shed using levers. Cartwright's interest in looms was aroused by conversations in Matlock Bath on how to use the surplus yarn that was being spun on the new water frames (Miller & Wild 2007). His first design, for a vertical loom, was made before he had observed a weaver at work. His second design adopted the handloom frame, and added mechanisms to solve known problems- instead of the warp beam he used a bobbin frame, his loom automatically *sized* or *dressed* the warp. There was no take-up reel, the cloth was delivered into a box. The *slay* or *lathe* was oscillated on primitive swords driven by a rocking rail beneath. There were shedding tappets, and cams to drive the picking. The loom only had one shaft, and the movements would have been irregular and harsh. There was a stop-motion incorporated effected by a swivel plate in the shuttle, which on dropping would engage on a hook in the shed. It was not a commercially successful machine. His ideas were licensed first by Grimshaw of Manchester who built a small steam powered weaving factory in Manchester in 1790; the looms had to be stopped to dress the warp. The factory burnt down before anything could be learnt. A series of inventors incrementally improved all aspects of the three principal processes and the ancillary processes.

- ✓ Grimshaw 1790 Manchester- dressing the warp
- ✓ Austin 1789, 1790 -dressing the warp, 200 looms produced for Monteith of Pollockshaws 1800
- ✓ Thomas Johnson, 1803, Bradbury- dressing frame
- ✓ Factory for 200 Steam Looms on Manchester 1806

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- ✓ Two factories at Stockport 1809. One at Westhoughton, Lancashire 1809
- ✓ William Radcliffe of Stockport 1802- improved take up mechanism
- ✓ John Todd of Burnley 1803- a heald roller and new shedding arrangements, the healds was corded to treadles actuated by cams on the second shaft.
- ✓ William Horrocks of Stockport 1803- The frame was still wooden but the lathe was pendant from the frame and operated by cams on the first shaft, the shedding was operated by cams on the second shaft, and the take up motion was copied from Radcliffe
- ✓ Peter Marsland 1806- improvements to the lathe motion to counteract poor picking
- ✓ William Cotton 1810- improvements to the letting off motion
- ✓ William Horrocks 1813 -Horrocks Loom Modifications to the lathe motion- improving on Marsland
- ✓ Peter Ewart 1813 -a use of pneumatics
- ✓ Joseph and Peter Taylor 1815 -double beat foot lathe for heavy cloths
- ✓ Paul Moody 1815- produces the first power loom in North America. Exporting a UK loom would have been illegal
- ✓ John Capron and Sons 1820- installed the first power looms for woolens in North America at Uxbridge, Massachusetts
- ✓ William Horrocks 1821 -a system to wet the warp and weft during use, improving the effectiveness of the sizing
- ✓ Richard Roberts 1830, Roberts Loom, These improvements were a geared take up wheel and tappets to operate multiple heddles [5]
- ✓ Stanford, Pritchard and Wilkinson- patented a method to stop on the break of weft or warp. It was not used
- ✓ William Dickinson of Blackburn Loom the modern over pick loom

There now appear a series of useful improvements that are contained in patents for useless devices

- ✓ Hornby, Kenworthy and Bullough of Blackburn 1834- the vibrating or fly reed
- ✓ John Ramsden and Richard Holt of Todmorden 1834- a new automatic weft stopping motion
- ✓ James Bullough of Blackburn 1835- improved automatic weft stopping motion and taking up and letting off arrangements
- ✓ Andrew Parkinson 1836- improved stretcher (temple).
- ✓ William Kenworthy and James Bullough 1841- trough and roller temple (became the standard), A simple stop-motion.

At this point the loom has become fully automatic. The Cartwright loom weaver could work one loom at 120-130 picks per minute- with a Kenworthy and Bullough's Lancashire Loom, a weaver can run up to six looms working at 220-260 picks per minute- thus giving 12 times more through put. The power loom is now referred to as 'a perfect machine', it produced

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textile of a better quality than the hand weaver for less cost; an economic success. Other improvements were:

- ✓ James Bullough 1842 - the loose reed, which doubled the operating speed
- ✓ John Sellers 1845 - Burnley Brake, a loom brake
- ✓ Blackburn 1852- Dickinson Loom Modern over pick- or side pick using the cone and bowl that substituted the lever picks. Invented in Dickinson's mill.

Power loom: A power loom is a machine or device for weaving thread or yarn into textile with the help of electricity. Looms can range from very small hand-held frames to large free-standing handloom to huge to automatic mechanical devices. Loom itself derives from Middle English Lome, in turn from Old English geloma (ge-was an old English Prefix), meaning 'an implement or tool of any kind.' The earliest attestation of loom with its specific meaning quoted by the Oxford English Dictionary is from the Nottingham Records of 1404, but hand-woven cloth existed much earlier, perhaps as far back as 8000 BC.

Power loom Shed: The power loom was designed in 1784 by Edmund Cartwright and first build in 1785 and set up a factory in Don Caster, England to manufacture cloth. A prolific inventor, Edmund Cartwright also invented a wool combing machine in 1789. Originally Power looms were with shuttle, and they were very slow. Cartwright's powerloom needed to be improved upon and several inventors did just that. It was improved upon by William Horrocks. By 1850; Cartwright's designed looms were in full effect in England, with over 250,000 machines in use. It was one of the key inventions of the Industrial Revolution though it did not achieve its full potential for another 25 years after its invention. It was initially limited by its reliance on water power, which required workshops equipped with power looms to be located near a source of running water. By the start of the 19th century, however, the advanced steam engines of James Watt and others enabled the use of power looms anywhere that steam power could be installed. Cartwright himself profited greatly from this,

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selling hundreds of his looms to Manchester firms. The power loom allowed large amounts of cloth to be made in a shorter time than a human could do it. Workers Repair powerloom Machine: Originally power looms were shuttle operated but in the early part of the 20th century, the faster and more efficient shuttles loom came in to use. Today, advances in technology have produced a variety of loom designed to maximize production for specific types of material. The most common of these are air-jet looms and water-jet looms. Computer-driven looms are now also available to individual home (non-factory) weavers. Industrial looms can weave at speeds of six rows per second and faster. After the flying shuttle the power loom was a common product in most factorieWorking on a Power loom

Power looms in America: The first American Power loom was constructed in 1813 by a group of Boston merchants headed by Francis Cabot Lowell. The city of Lowell and other early industrial American cities grew supporting nearby Francis Cabot Lowell's designed Power loom, an amended version of the British, Edmund Cartwright. The Power loom allowed the wholesale manufacture of cloth from ginned cotton, itself a recent innovation of Eli Whitney's. According to the Lowell National Historical Park Handbook, for the first two centuries of American history, the weaving of cloth was a cottage industry, even after the introduction of power spinning frames in 1790. Yarn produced machines in water-powered factories was still put out for weaving on handlooms in homes. All clothes were woven in basically the same way, although weavers followed patterns to produce cloths with intricate weaves. Because the operations of loom focus on such a small working area, its movement must be exact. And weaving, as opposed to spinning requires a cycle of sequential steps and involves reciprocal movement as well as Circular. In a powerloom, movements coordinated by the human hand and eye have to be replicated through the precise interaction of levers, cams, gears, and springs. For these reasons, weaving was the last step in textile production to be mechanized. Successful power looms were in operation in England by the early 1800s, but those made in America were inadequate. Francis Cabot Lowell realized that for the United States to develop a practical power loom, it would have to borrow British technology. While visiting an English textile mill, he memorized the working of their power looms. Upon his return, he recruited a master mechanic, Paul Moody to help him recreate and develop what he had seen. They succeeded in adapting the British design, and the machine shop established at the Waltham mill by Lowell and Moody continued to make improvement in the loom. With the introduction of a dependable power loom, weaving could keep up with spinning, and American textile industry was underway.

Decline and reinvention:

Originally, power looms used a shuttle to throw the weft across, but in 1927 the faster and more efficient shuttleless loom came into use. Sulzer Brothers, a Swiss company had the exclusive rights to manufacture shuttleless looms in 1942, and licensed the American production to Warner & Swasey. Draper licensed the slower rapier loom. Today, advances in technology have produced a variety of looms designed to maximize production for specific

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types of material. The most common of these are Sulzer shuttleless weaving machines, rapier looms, air-jet looms and water-jet looms.

Looms and the Manchester context

The development of the power loom in and around Manchester was not a coincidence. Manchester has been a centre for Fustians by 1620 and acted as a hub for other Lancashire towns, so developing a communication network with them. It was an established point of export using the meandering River Mersey, and by 1800 it had a thriving canal network, with links to the Ashton Canal, Rochdale Canal the Peak Forest Canal and Manchester Bolton & Bury Canal. The fustian trade gave the towns a skilled workforce that was used to the complicated Dutch looms, and were perhaps accustomed to industrial discipline. While Manchester became a spinning town, the towns around were weaving towns producing cloth by the *putting out* system (Smelser 2006). The business was dominated by a few families who had the capital needed for the investment in new mills, and buy hundreds of looms. The mills were built along the new canals so immediately had access to their markets. Spinning developed first, and until 1830 the handloom was still more important economically than the power loom when the roles reversed. Due to the economic growth of Manchester, a new industry of precision machine tool engineering was born and here were the skills needed to build the precision mechanisms of a loom (Wip.)

Types of looms

There are many types of looms which are explained below:

Warp-weighted

The earliest looms were probably vertical Warp-weighted looms, with the warp threads suspended from a branch or piece of wood and weighted or attached to the ground the weft threads would be pushed into place by hand or a stick that would eventually become the shuttle. At first, it was necessary to raise and lower every warp thread one at a time, which was a time consuming and laborious process. Basic techniques, such as insertion of a rod, were developed to produce a shed, the space between warp threads (perhaps every other thread would be alternatively raised and lowered), so that the weft thread or shuttle could pass through the entire warp at once.

Ground looms

On a horizontal Ground loom, the warp would be strung between two rows of pegs. The weaver would have to lean over in order to work, so pit looms were developed, with the warp strung over a pit, so the weaver could sit with his or her legs underneath and would then be on level with the loom.

Frame loom

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Frame looms followed basically the principles of Ground looms. The loom constructed out of sticks and boards attached at right angles (producing a box -like shape), meant that it was portable and could even be held in the weaver's lap. Frame looms are still in use today, usually as a portable, less expensive and compact alternative to a table or floor loom.

Back strap loom

Back straps loom with a shed-rod

Back strap loom, as the name implies, are tied around the weaver's waist on one end and around a stationary object such as a tree, post or door on the other. Tension can be adjusted simply by leaning. Back strap looms are portable, since they can simply be rolled up and carried. A simple loom has its roots in ancient civilizations; comprising two sticks or bars between which the warps are stretched. One bar is attached to a fixed object and the other to the weaver usually by means of a strap around the back. On traditional looms, the two main sheds are operated by means of a shed roll over which one set of warps pass, and continuous string heddles which encase each of the warps in the other set. The weaver leans back and uses her body weight to tension the loom. In order to open the shed controlled by the string heddles, the weaver relaxes tension on the warps and raises the heddles. The other shed is usually opened by simply drawing the shed roll toward the weaver. Both simple and complex textiles can be woven on this loom. Width is limited to how far the weaver can reach from side to side to pass the shuttle.

Warp faced textiles, often decorated with intricate pick-up patterns woven in complementary and supplementary warp techniques are woven by indigenous peoples today around the world. They produce such things as belts, ponchos bags, hatbands and carrying cloths. Supplementary weft patterning and brocading is practiced in many regions. Balanced weaves, too are possible on the back strap loom. Today, commercially produced back strap loom kits often include a rigid heddle.

Handloom

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Hand loom at Hjerl Hede, Denmark, showing grayish warp threads (back) and cloth woven with red filling yarn (front)

The earliest loomswere wooden vertical-shaft looms, with the heddles fixed in place in the shaft. The warp threads pass alternately through a heddle and through a space between the heddles (the shed), so that raising the shaft raises half the threads (those passing through the heddles), and lowering the shaft lowers the same threads—the threads passing through the spaces between the heddles remain in place (Mohanty- 2006).

Four harness table looms

The yarn passes through the heddles in each shaft of this four-shaft table loom. Hand weavers today tend to use with at least four shafts or harness. Each shaft contains a set of heddles through yarn can be threaded (and attached, through a variety of mechanisms, to the front and back beams of the loom) and by raising the harnesses in different combinations, a variety of patterns can be achieved. Looms with two such shafts are used for weaving tabby or even weave fabrics. Multishaft looms with eight, twelve, sixteen or more shafts are available.

Foot-treadle floor loom

The shafts on a floor loom are controlled by a series of peddles called treadles. This is an important development, since it keeps the weaver’s hand free to manipulate the shuttle and it is easy to raise and lower warp threads in selected combinations. As the fabric is woven it is rolled around the cloth beam, as unwoven warp or yarn is unrolled from the warp beam, so the length of weaving is not limited by the size of the loom. A table loom is similar, but as the name suggests it is smaller and equipped with hand levers rather than treadles, since it is made to sit on a stand or on top of a table. A computer assisted loom has no actual treadles as the computer program dictates which harness or shafts is lifted either by manual peddle or air cylinders, hydraulic cylinders or electric solenoids A loom that can only lift the shafts is called a raising shed loom or jack loom. A loom that can sink and lift the shaft at the same time is either a counterbalance (CB) loom countermarch loom (CM), these looms are called a sinking shed loom. Most CB looms are a four harness; a CM loom can use many harnesses up to about thirty two harnesses.

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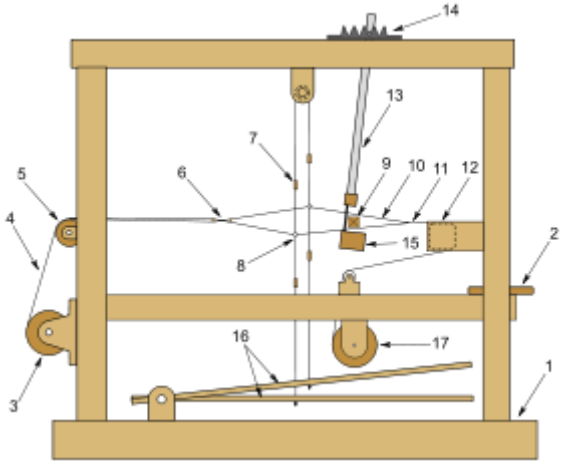
Elements of a foot-treadle floor loom



- ✓ Wood frame
- ✓ Seat for weaver
- ✓ Warp beam- let off
- ✓ Warp threads
- ✓ Back beam or platen
- ✓ Rods – used to make a shed
- ✓ Heddle frame - heald frame - harness
- ✓ Heddle- heald - the eye
- ✓ Shuttle with weft yarn
- ✓ Shed
- ✓ Completed fabric
- ✓ Breast beam
- ✓ Batten with reed comb
- ✓ Batten adjustment
- ✓ Lathe
- ✓ Treadles

Rigid heddle looms

Rigid heddle looms cross multiple types of looms, including frame loom and blackstrap looms. In Rigid heddle looms there is a typically a single shaft, with the heddles fixed in place in the shaft. The warp threads pass alternatively through a heddle and through a space between the heddles, so that raising the shaft will raise half the threads (those passing through the heddles) and lowering the shaft will lower the same threads- the thread passing through the spaces between the heddles remain in place.

Haute lisse and basse lisse looms: Looms used for weaving traditional tapestry are classified as haute lisse looms where the weft is suspended vertically between two rolls, the basses lisse looms, where the weft extends horizontally between the rolls.

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The Jacquard loom: The Jacquard loom was the first machine to use punch cards to control the pattern being woven. It is a form of dobby loom where individual harnesses can be raised and lowered independently. Invented just after 1800, at first it was human powered. Later it was motorized, and current versions replace the punch cards with electronic computer control.

Knitting Looms

Recently popularized in crafting circles by the knifty knitter system, Knitting Looms are a descendant of the frame loom. Grooved pegs are spaced along a central frame. These pegs are wrapped with yarn in various ways, and then the knitter uses an angled hook to pull the wrapped yarn over the top of the peg, resulting in a fabric with stitches similar to a needle knitted item. The Fundamental parts of power looms are the warp beam, a cylinder on which the warp threads are wound, heddles (rods or cords) each with an eye through which is drawn a warp thread, the harness, a rectangular frame set with series of heddles operated to form a shed between the warp threads for the insertion of weft threads, the reed, a comb like frame that pushes the filling yarn firmly against the finished after each pick or row, breast beam, over which the cloth is wound creating a tension with the warp beam, the cloth beam on which the cloth is rolled as it is constructed.

Modern looms are of two types, those with a shuttle (the part that carries the weft through the shed) and shuttle less looms. The dummy Shuttle, the most widely used, contains no weft but moves through the shed depositing a trail of yarn. A second type, the newest of loom, makes use of jet or air or water to force the weft through the shed. A third kind, called the rapier type and widely used in carpet weaving, uses steel rod to move the weft into the shed.

Social and economic implications

The power loom reduced demand for skilled hand weavers, initially causing reduced wages and unemployment. Protests followed its introduction. For example, in 1816 two thousand rioting Colton weavers tried to destroy power loom mills and stoned the workers. In the longer term, by making cloth more affordable the power loom increased demand and stimulated exports, causing a growth in industrial employment, albeit low-paid. The power loom also opened up opportunities for women mill workers. A darker side of the power loom's impact was the growth of employment of children in power loom mills.

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Chapter – II
Power loom Sector of India

The decentralized power loom sector came into existence, mainly with the conversion of handloom into power driven looms and the mill sector losing the ground. The power loom sector is the second largest employer after agriculture. There are about 19 lakh power looms in the country which employs about 48 lakh peoples. Today the decentralized sector is facing numerous problems like obsolete technology, no implementation of business ethics, traditional methods of marketing, lack of trained human resource, high cost of production with low quality etc. But the performance of the industry within the last few years has proven that the industry is standing against the age of globalization. The industry has been transforming itself into a modern industry.

The power loom industry in divided into two parts one is Mill Sector and other is decentralized sector. The latter occupies the major share in the power loom industry. The emergence of power loom sector in India is characterized by the conversion of Handloom industry into power loom industry. Many handloom weaving clusters concentrated geographically at various places, gradually switched over to power driven looms for achieving higher productivity and earning better livelihoods. Handloom weavers in various clusters like Bhiwandi, Malegaon, and Surat etc. started the installation of power looms. With the closure of textile mills in 1970s and after serious labour turbulence and strike in 1980-1981, in Mumbai, the organized mill sector started losing ground and the power loom sector came into existence.

ROLE OF POWERLOOM SECTOR

The power loom sector plays a vital role in meeting the clothing needs of the country. Production of cloth as well as generation of employment has been rapidly increasing in the power loom sector. There were over 19 lakh power looms in the country as on 31st March 2006 distributed over approximately 4.30 lakh units. This is about 47% of the total power looms in the world. The power loom sector contributes about 95% of the total cloth production of the country, and provides employment to about 48 lakh persons.

Productivity

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The production rates of the various types of looms are presented for comparison in the following table.

Production Rate of Various Types of Looms

Loom Type	Available width in cm	Speed in rpm	Weft insertion Rate(picks per minute)
Projectile			
Sulzer Ruti			
P7100	190-540	320	1100-1200
P7200	190-540	430	1500
STB Russia	180-330	300	750
Rigid Rapier			
SACM	150	550	1100
Dornier	150-400	460	1000
GUNNE	230	330	1200
Flexible Rapier			
Somet	165-410	550	1300
Vamatex	160-380	510	1300
Sulzer Ruti	110-280	325	1200
Nuovo Pignone	220-420	440	1000
Water Jet			
Metor SPA	230	1000	1600
Nisson	150-210	1000	2000
Tsudakoma	150-210	1000	2000
Air Jet			
Sulzer Ruti	up to 300	750	1600
Picanol Omni	190-380	800	1800
Picanol Delta	190	1100	2000
Toyoda	150-330	850	2000
Tsudakoma	150-340	1000	2200
Lakshmi Ruti	190	500	1200
Dornier	430	600	2520
Linear Multiphase			
Elitex	About 190	1100-1600	2000-3000
Drum type			

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Multiphase			
Sulzer M8300	190	3230	6088(Plain)
	170	2430	4118(Twill)

(Source: - O/o the Textile Commissioner, Govt. of India)

GROWTH OF POWER LOOMS

The decentralized powerloom sector plays a fundamental role in meeting the clothing needs of the country. Production of cloth as well as employment generation has been rapidly increasing in the powerloom sector. During 1998-99, the production of cloth, in the decentralized powerloom sector was 20,690 million sq. Mtrs. and the employment generation was 3.99 million. During the year 1999-2000 (up to September '99), the production of cloth and employment generated was 11,225.93 million sq. Mtrs. and 4.05 million respectively. The powerloom industry produces a wide variety of cloth; both grey as well as processed, with intricate designs. The contribution of the powerloom sector to the total cloth production of the country is to the extent of 57% excluding the cloth produced by non-Small Scale Industries (SSI) weaving and hosiery/knitting units. Powerloom fabric also contributes significantly to the export earnings of the country. In order to encourage new and incremental powerloom exports, the Government has earmarked specific export quota of fabric and made-ups to quota countries covered by the Multi-Fibre Arrangement (MFA) for powerloom manufacturers since the year 1992. Starting with 3%, it increased to 5% in the year 1993 and to 10% from 1998 to 1999. This has been enhanced to 15% under the Quota Policy and has become operative from 2000 (Ministry of Textile).

In the process of the growth of the textile industry, power looms were the last to come up on a fairly large scale. The handloom sector is as old as the civilization itself. Even though there are official records indicating the inception of the mills, there are no authentic records indicating the birth of powerloom sector in India. According to the Powerloom Inquiry Committee (PIC), 1960 the introduction of the power loom in the decentralized sector dates back to 1904. The earliest powerloom installation was at Ichalkaranji; now in Maharashtra state (then one of the Princely states).

The World War I brought prosperity to the decentralized sector as it started attracting many to the powerlooms. In the early thirties several entrepreneurs purchased looms discarded by the mills in Bombay and Ahmadabad and converted them into powerlooms. - Since powerlooms reduced the strain of operations, were relatively less expensive, provided higher efficiency and productivity they become popular. In addition, the margins of profit were much higher. This was the main reason for the affluent shifting from handloom weaves to powerloom. Around the same time, the mill sector also strengthened itself and secured a prominent place in the country as a clothier of the population (PPII-1984). During World War II, the mill sector reached its peak of prosperity. Defence demand for cloth made it necessary to ration cloth for the civilian population. As a consequence, intensive working of the

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machinery resulted in heavy wear and tear of the looms. These looms were to do be replaced in order to meet the requirement of the post-war markets. Though not quite efficient in the mill sector, the looms had adequate life for being used as powerlooms. This helped the sector to grow extensively. The post-war industrial disharmony which resulted in strikes and lockouts did not affect the powerlooms. At some center mill worker encouraged to own their looms. This happened particularly at places close to the prominent mill centers. The expansion of electricity services in the country also helped the powerloom sector to strengthen its roots during the period. The post-independence period with government supporting 'conversion plan'—conversion of handloom to powerloom also helped. One does not know whether consistent with the yarn available for weaving a saturation point has been reached in the development of powerlooms. There is reason to believe that this may be far off it the growth of unlicensed looms reoffered to earlier is an indication.

The growth of this sector of the industry has been so sporadic and haphazard that statistically occurs at figures are extremely difficult to collect. Various alternatives were used by entrepreneurs to expand their operations. This included establishment of unlicensed looms, using the same license for expanding capacity, shifting of the loom from one place to another, taking looms to nearly rural centers to avoid the rigor of inspection and so on. All this was possible because there is inadequate inspectorate to check the growth of unlicensed looms. Besides, uncertain government policies have resulted in ambiguities, which served to facilitate business expansion plans of shrewd entrepreneurs. The textile strike in Bombay composite sector in 1982-83, followed by the closure of mills on large scale in the city, and the fallout of this phenomenon in Ahmadabad may have helped the power loom sector in western India to grow the extent that it has (PPII-1984). What has certainly happened is that the sector has helped itself to cashing on the benefits of the prevailing market conditions.

Growth of unauthorized powerlooms: Several factors have been responsible for the haphazard growth of unauthorized powerlooms in several large centers. Though no authentic estimates exist about its numbers, it is always said that the total number of unauthorized looms are just as many as authorized looms, if not more. This is perhaps one of the most crucial factors creating difficulties for this industry today.

The first attempt to regularize powerloom was made in 1955, and then again in 1966 when large number of unauthorized looms were given licenses (Texmark). However, its growth had never been checked and the unauthorized loom still continue to exist in large numbers. The Ashok Mehta committee (1964) estimated 60,000 operating powerlooms. Later, the estimates committee (1977-78) brought the unauthorized power looms figure to 60,000 against 2.11 lakhs authorized powerlooms and 40,000 non-cotton looms against 1.36 lakhs authorized looms. The committee reports, 'It seems that an impression has gone round that once powerlooms are set up Government will ultimately regularize them.' Further, the committee felt, 'that it is not so much lacunae in the law but laxity in the enforcement that is responsible for the growth of unauthorized powerlooms. 'The comments made by various committees set up by the government itself are self-explanatory. No further justifications

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seem necessary to substantiate the reasons for the unchecked growth of unauthorized powerlooms in the country (RPPII-1984).

Powerloom centers and their characteristics: In order to get understand the growth of this sector in the country, one can identify major powerloom centers and study the characteristics of each.

Belgaum (Karnataka): Once a flourishing handloom centre for shares, in more recent years, it has been languishing, mainly due to the change of styles. Some owners converted their looms into powerlooms twenty years ago. It was reported to be suffering because of progress made by Ichalkaranji which is not far away from Belgaum.

Bhiwandi (Maharashtra): Owing to its proximity to the metro city of Mumbai, this center enjoys some advantages. Firstly, it has a large market to tap. Additionally, it also benefits from some industrial facilities and perhaps regularity in financial assistance. The Powerloom enquiry committee reported that almost eighty percent of the powerloom in Bhiwandi were working for master weavers. The owners of the looms are concerned only with the production, while the master weavers are responsible for the marketing and finance.

Burhanpur (Madhya Pradesh): In Madhya Pradesh, the powerlooms exist in two or three important clusters that produce only cotton cloth. There were about 10,000 powerlooms in this state prior to independence. The number increased to 16000 by 1983. The most important powerloom cluster in this state is at Burhanpur, which is also an important handloom center. The powerloom industry in this center started in 1932 when electric power was made available to the town. At present there are 12000 powerlooms operating in this center. Originally, the entire weaving population of the town was working on handloom, but in the process of development of powerloom sector some handloom owners become powerloom owners, even today the powerlooms and handlooms are located side-by-side and intermingled.

Kolkata (West Bengal) The growth of this center goes back to the partition era, when weavers migrated from east Bengal set up their powerloom plants in the vicinity of the Kolkata city. The intention was to take advantage of yarn supply and processing facilities available in the Kolkata mills and the city market. Today, Kolkata is the main powerloom center in West Bengal and the surrounding states. However, in terms of size, it is not comparable to the other prominent centers in India. It has around 10000 authorized powerlooms and an indeterminate number of unauthorized ones. The prominence of handloom sector catering to the bulk of the clothing needs of the region confined to saris and dhotis, together with restriction on powerlooms over the use of color yarn has kept the size and growth of the powerlooms sector frozen over the last few years. The powerloom center too has been dominated by small powerlooms working only on cotton. The ownership ranges from 4 to 40 powerlooms. The master weaver system is reported to be absent.

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Doddabalapur (Karnataka): This small township near Bengaluru is full of powerlooms working on silk yarn. It has a long history almost since the days it was patronized by upper classes in the old Mysore state. Due to its specialization in weaving silks, it is used to seasonal, fluctuating markets. With new marketing practices however, the flow of orders seems to be more even. The main difficulty experienced by workers is still the uncertain duration of work. With no protection against this contingency, the one complaint voiced with some force was that there must be continuity of work. The other issue was that of low wages and the third was the margins covered by the employer due to large machines. The size of units generally ranges from one to ten looms. Workers have started unionizing recently, and according to them the backlog of complaints will take long for being wiped out.

Faridabad (Haryana): This center has similar and different characteristics to that of Bhiwandi. Bhiwandi is a purely textile center whereas Faridabad has a substantial complex of a range of industries. It is at the heart of industrial expansion of Delhi Metropolitan in the south. Because of its location in the rural hinterland some industrial establishments located at the centre are moving to rural areas in order to avail themselves of concessions given by the state government for establishing rural industrial units.

Ichalkaranji (Maharashtra):- This town has a historical association with the powerloom sector in the sense that the establishment of powerlooms was encouraged in this erstwhile princely state prior to World War I. After withering the storm affecting the sector in the inter war years, there was a brisk switch over from the handloom into powerloom since independence at this centre. Ichalkaranji is now also a centre for small industries. Some powerloom activities work on a cooperative basis. . There are also cooperative spinning mills in the neighborhood. All these account for the relative prosperity of the powerlooms in the Ichalkaranji.

Madurai (Tamil Nadu):- This is one of the major centers in the South where both the handloom and powerlooms prosper along with composite mills. The major attraction for this sector in Madurai is the existence of cotton spinning mills at that centre. Yarn from this centre as well as other spinning mills in the southernmost state move north and has ready market in the powerloom sector. Other centers of repute in the state of Tamilnadu are Virudhnagar, Rajapalayam, Salem, Komarpalayam and Coimbatore. All these centers manufacture both cotton and art silk fabrics. They have a fairly large market outside the state which encourages handlooms; particularly so, due to suitable policies designed to develop small scale production not only in textile but in other industries as well.

Malegaon (Maharashtra): Likeall centers elsewhere, Malegaon also had a local community of weavers that start ding with handloom and their own special brand of fabrics, and have now partially moved on to powerlooms. The centre had a number of difficulties intermittently

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but continues to enjoy the status as the chief powerloom centre in the northern and eastern parts of Maharashtra.

Meerut (Uttar Pradesh): This centre has a sizable powerloom sector, while its growth has been similar to those of other centers in North India **Mahalingpur (Karnataka):-** This was at one time a small centre of handloom industries. Powerlooms made their appearance around 1965. Labour is mostly local. This centre specializes in handloom production of fast color sarees. This centre too, had a gradual conversion of handloom capacity into powerlooms. **Panipat (Haryana)** Panipat acquired importance after partition, when many artisans working on handlooms migrated from Multan (Pakistan) and other equally reputed centers in the neighboring areas. These places were known for the manufacture of coarse sheets (popularly known as 'Khes') originally started by master weavers and their family members. The ownership changed hands in due course. Now the industry is managed, controlled and run by a combination of business communities and master weavers. Most of the master weavers work on a salary or piece-work basis on behalf of merchants. Such a practice is not unknown in other centers of the powerloom sector.

Surat (Gujarat): - The state as whole was traditionally the second- most important state in the country for powerlooms. It is now third, the second being Tamilnadu, which now stands next to Maharashtra. While this is the position, Surat perhaps has the largest concentration of powerlooms in India. Specialized in weaving pure silk, the weaver of Surat took to powerloom weaving of art silk yarn just before World War II. Since then, this sector has expanded. Today the authorized powerlooms in Surat is in the neighborhood of one lakh. More than 90% of these are art silk looms. Man-made fiber is rapidly replacing silk. All ownership types co-existed in this city. Apart from the authorized powerlooms, the number of unauthorized powerlooms is increasing at very fast rate. On an average, about hundred weavers make their way to Surat with families daily, creating a variety of environmental and other problems. (Shivram Committee report-1974)

GROWTH OF THE POWERLOOM SECTOR since1991 to2010)

The government of India conducted a census of powerlooms with the help of the National Council of Applied Research (NCAER). The estimated numbers of power looms in the decentralized sector in the country at various stages of production are as follows:

(As on 31st December2010)

Year	No. of Powerlooms	Year	No. of Powerlooms
1991	11,34,966	2001	16,52,841
1992	12,00,111	2002	16,92,737
1993	12,39,268	2003	18,36.856
1994	13,14,003	2004	19,02,953
1995	13,65,284	2005	19,43,892
1996	14,11,903	2006	19,90,308
1997	15,23,336	2007	21,06,370

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1998	15,95,344	2008	22,05,352
1999	16,19,689	2009	22,46,474
2000	16,39,981	2010	22,61,416

** Source: State Govts. & UTs and office of Textile commissioner of Mumbai*

The fast growth of the decentralized powerloom sector has been due to certain specific benefits of the industry itself, viz, low overheads, low requirement of working capital requirement vis-à-vis the composite mills. Traditionally, the mills and the powerloom sector have been viewed as antithetical to each other. In fact, over the past two decades, while there has been a steady fall in the production by the mill sector, there has been a rapid proliferation in the number of units in the powerloom sector during the same period resulting in an increase in its production.

PRESENT POLICIES RELATING TO INSTALLATION OF POWERLOOMS

The present policy relating to the installation of powerlooms has been simplified. In terms of Textiles (Development & Regulation) Order, 1993, on installing the powerloom in the SSI sector, every person should submit an Information Memorandum in the prescribed form to an officer notified by the state government within whose territory the powerloom has been installed, with a copy to the Textile Commissioner, Mumbai. The Information Memorandum (IM) is to be filed to the authority concerned, as the case may be, along with the prescribed fee of Rs. 1000/- irrespective of the number of powerlooms proposed to be installed in the unit. Every person on installing any powerloom in the non-SSI sector (other than units requiring Industrial Licences) should file an IM to the textile commissioner (Mumbai) within 30 days of the installation for obtaining an acknowledgement. License is required in the case of non-SSI units, only when the location of the unit falls within 25 kms from the periphery of the standard urban area limits of a city, having a population of more than 10 lakhs, as per 1991 census. However, if the location is within an industrial area/ estate set up by the government prior to 24th July, 1991, licence will not be required.

ALL INDIA POWERLOOM BOARD

The All-India Powerloom Board (AIPB) was first constituted as an Advisory Body in November, 1981. This Board was reconstituted on 28/10/98 for tenure of two years. It has representatives of the central and state governments and federation/association of powerloom industry as its members. The first meeting of this re-constituted AIPB was held on 8/1/99 at Mumbai, the second at New Delhi on 21/7/99, and the third meeting of AIPB was held on 07/01/2000 at New Delhi.

MODERNISATION & STRENGTHENING OF EXISTING Powerloom Service Centers (PSCs)

The powerlooms in the PSCs are old and outdated and cannot run for long hours continuously. The looms and equipment in the PSCs do not match up to the and the modern

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machinery existing in the industry. In such circumstances, it becomes difficult to attract people from that area for training. Powerlooms are mostly installed in the house itself. Being a traditional occupation, every child since birth is acquainted with the operation of the looms. The weavers attending trainings, require training on the latest looms and equipment, not on the existing machinery available with the PSCs. In many cases, the training ends up being highly theoretical as the PSC is not able to give practical orientation and training due to lack of modern machinery.

Taking into consideration these ground realities, the expectations of the powerloom industry and the need for a thrust on technological up gradation in the industry, the modernization and strengthening Programme of the Powerloom Service Centers was taken up. The Government of India approved the modernization and up gradation proposal for 21 PSCs (7 under TXC and 14 under TRAs) during the 9th Five Year Plan period at an estimated cost of Rs.16.09 crores. During the year 1998-99, the Ministry of Textiles released Rs. 10 lakhs to ATIRA, Rs. 11.30 lakhs to SASMIRA and Rs. 16 lakhs to SITRA for meeting the non-recurring expenditure of their PSC under this Programme.

The Powerloom industry

"*The history of cotton and of textiles is not only the history of growth of modern industry in India, but in a sense, it might be considered the history of India*"

- Jawaharlal Nehru

The decentralized power loom sector is the lifeline of Indian Textile Industry. India manufactures 5% of its cloth through organized sector, 20% through the handloom sector, 15% through the knitting sector and 60% is produced through the decentralized power loom sector. The latter is therefore, the lifeline of the Indian textile industry. India has approximately 29.42 lakhs of powerlooms weaving almost 19000 million meters of fabric, and provides employment to more than 7 million workers. The industry now produces a wide range of fabrics ranging from grey, printed, dyed, cotton and various mix of cotton, synthetic, and other fibers. The country exports Rs. 44,000 million worth of goods to countries like USA, France, Germany, Bangladesh, Hong Kong, Italy etc. Although the growth of power loom industry was slow initially; it started to pick up pace.

The numbers of shuttle less looms have augmented to almost 50,000, of which, about 35,000 looms operate in the decentralized sector. Most of the power loom units are concentrated in semi urban or rural areas. The state of Maharashtra has the highest number of powerlooms amounting to approximately 10 lakh powerlooms, followed by Tamilnadu with 5 lakh units, and then by Gujarat with 4 to 4.5 lakhs power looms.

The Textile industry is the largest industry of modern India. It has a significant presence in the economy as well as in the international textile economy. Its contribution to the Indian economy is manifested in terms of its contribution to the industrial production, employment generation and foreign exchange earnings. It contributes 20 percent to the overall industrial production, 9 percent to excise collections, nearly 20 percent to the country's total export earnings and 4 percent to the Gross Domestic Product. It provides

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employment to 18 percent of the workforce (Datt, and Sundaram, Indian Economy p 658). In human history, the past and the present can never ignore the importance of textile in a civilization decisively affecting its destinies, effectively changing its social scenario. Textiles have 20% weightage in India's Index of Industrial Production. According to estimates, it is the second largest employment provider for India after agriculture. The industry registered a total cloth production of 36200 million sq. Mtrs.

Importance of the Indian Power loom Industry to the world economy

Indian textile industry occupies an important position in world textile economy. It contributes about 12% to the world production of textile fibres and yarn including jute. It is the largest jute producer in the world and the second largest producer of silk (after China), third largest producer of cotton and cellulose fibre and the fifth largest producer of synthetic fibres/ yarns. It contributes 20% to the world spindalge and it has the second highest spindalge in the world after China. India's rapidly growing population is the major driving force for development of domestic textile industry. Theoretically, every member of the 1 billion Indian populations is a potential consumer, depending on his/her purchasing power. The challenge lies in providing affordable products at competitive rates. The industry structure is complex. Segments of this industry span the organized and unorganized sector while weavers; artisans and farmers form the base of this industry. The industry itself is interwoven with various fibre categories like cotton, jute, wool, silk, man-made fibre and lastly, blended varieties of the same. Cotton farming, weaving and the garment sector are highly decentralized.

In the organized sector, cotton/man-made fibre textile mill industry provides direct employment to about 1 million people while nearly 5 million more are employed indirectly in units producing accessories, spares, ancillaries and chemicals. But the employment generation capacity of the organized mills sector is fast declining; since out of the total 1788 mills (1510 spinning mills and 278 composite mills), 284 cotton/man-made fibre mills (184 spinning and 100 composite) were reported to be closed. Possible reasons for this sickness are: competition from power looms in the decentralized sector (power looms enjoy greater cost effectiveness), low productivity due to lack of modernization, stagnation in demand and inability of some units to expand in the export market, increase in the cost of inputs, difficulties in getting timely and adequate working capital and so on. As of February 1999, a total of 399 units were registered with the BIFR. While the organized mill sector is fighting for its survival, the unorganized power loom sector appears to have flourished and emerged as a major source of employment. It provided employment to 3.9 million people in 1998, compared to 3 million in 1992. Total cloth production by this sector also has gone up significantly, from 22978 million sq.mts in 1991-92 to 27420 million sq. mts. in 1997-98. . The powerloom industry produces grey as well as processed cloths. Nearly 55% of total cloth production excluding the cloth produced by non-SSI weaving and hosiery/ knitting units is contributed by this sector. In order to encourage new and incremental power loom exports,

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the government has earmarked specific export quota of fabric and made-ups to quota countries covered by Multi-Fibre Arrangement (MFA) since 1992.

History of the Indian Textile Industry

India has been well known for its textile goods since ancient times. The traditional textile industry of India was virtually decayed during the colonial regime. However, the modern textile industry took birth in India in the early nineteenth century when the first textile mill in the country was established at Fort Gloster near Calcutta in 1818. The cotton textile industry, however, made its real beginning in Bombay in 1850s. The first cotton textile mill of Bombay was established in 1854 by a Parsi cotton merchant then engaged in overseas and internal trade. Indeed, the vast majority of the early mills were the handwork of Parsi merchants engaged in yarn and cloth trade at home and in the Chinese and African markets. The first cotton mill in Ahmadabad, which was eventually to emerge as a rival centre to Bombay, was established in 1861. The spread of the textile industry to Ahmedabad was largely due to the Gujarati trading class.

The cotton textile industry made rapid progress in the second half of the nineteenth century and by the end of the century there were 178 cotton textile mills; but during the year 1900 the cotton textile industry was in bad state due to the great famine. A number of mills of Bombay and Ahmadabad were to be closed down for long periods.

The two world wars and the 'Swadeshi' movement provided great stimulus to the Indian cotton textile industry. However, in the period 1922-1937, the industry was in doldrums and a number of the Bombay mills changed hands. The WWII however, during which time, textile imports from Japan completely stopped, brought about an unprecedented growth of this industry. The number of mills increased from 178 with 4.05 lakh looms in 1901 to 249 mills with 13.35 lakh looms in 1921 and further to 396 mills with over 20 lakh looms in 1941. By 1945, there were 417 mills employing 5.10 lakh workers.

The cotton textile industry is described as a Swadeshi industry because it was developed with indigenous entrepreneurship and capital, and in the pre-independence era the Swadeshi movement stimulated demand for Indian textile in the country. The partition of the country at the time of independence affected the cotton textile industry too. The Indian union got 409 out of the 423 textiles mills of the undivided India. 14 mills and 22 per cent of the land under cotton cultivation went to Pakistan. Some mills were closed down for some time. For a number of years since independence, Indian mills had to import cotton from Pakistan and other countries. After independence, the cotton textile industry made rapid strides under the Plans. Between 1951 and 1982 the total number of spindles doubled from 11 million to 22 million. It increased further to well over 26 million by 1989-90. With the growing awareness in the industry of its strengths and weaknesses and the need for exploiting the opportunities and averting threats, the government has initiated many policy measures as follows (Singh, Indian Economy Today, year? p248).

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- ✓ The Technology Up Gradation Fund Scheme (TUFS) was launched in April 1999 to provide easy access to capital for technological up gradation by various segments of the industry.
- ✓ 2. The Technology Mission on Cotton (TMC) was launched in February 2000 to address issues relating to the core fibre of cotton like low productivity, contamination, obsolete ginning and pressing factories, lack of storage facilities and marketing infrastructure.
- ✓ 3. A New Long-Term Textiles and Garments Export Entitlement (Quota) Policy 2000-2004 was announced for a period of five years with effect from 1.1.2000 to 31.12.2004 covering the remaining period of the quota regime.

SWOT ANALYSIS OF INDIAN TEXTILE INDUSTRY

The Indian textile industry has several strengths and weaknesses.
Strengths:
♦ Abundant raw material availability: Allowing the industry to control cost and reduce overall lead-times across the value chain
♦ Low-cost skilled labor: Low-cost skilled labor providing a distinct competitive advantage for the industry
♦ Presence across the value-chain: Presence across the value-chain providing a competitive advantage when compared to countries like Bangladesh and Sri Lanka that have developed primarily as garmenters

♦ Reduced Lead-times: Manufacturing capacity present across the entire product range, enabling textile companies and garmenters do source their material locally and reduce lead-time
♦ Super Market: Ability to satisfy customer requirements across multiple product grades-small and large lot sizes specialized process treatments etc.
♦ Growing domestic market: Growing Domestic market which could allow manufacturers to mitigate risks while allowing them to build competitiveness
Weaknesses:
♦ Fragmented industry: leading to lower ability to expand and emerge as world-class players
♦ Effect of historical government policies: Historical regulations, though relaxed, continue to be an impediment to global competitiveness
♦Lower Productivity and Cost Competitiveness: Labor force in India has much lower productivity as compared to competing countries like China, Sri Lanka etc. The Indian industry lacks adequate economies of scale and is therefore unable to compete with these countries. Costs like indirect takes, electric power and interest rates are relatively higher
♦ Technological Obsolescence: a large portion of the processing capacity is obsolete. While

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state of the art integrated textile mills exist, majority of the capacity lies currently with the powerloom sector. This has also resulted in low value addition in the industry.
Also, the Indian textile industry has several Opportunities and Threats.

Opportunities

♦ Post 2005 challenges: During the year 2005 is a huge opportunity that needs to be capitalized

♦ Research and Development and Product Development: Indian companies need to increase their focus on product development in areas such as newer, specialized fabrics and treatment, smart fabrics etc. It needs faster turnaround time for design samples. It needs also to invest in design centers and sampling labs. There needs to be increased use of CAD to develop designing capability in the organization for developing greater options. Finally, there is a need to invest in trend forecasting to enable growth of the industry in India.

Threats:

♦ Competition in domestic market: Competition is not likely to remain just in the exports space, the industry is likely to face competition from cheaper imports as well. This is likely to affect the domestic industry and may lead to increased consolidation.

♦ Ecological and social awareness: The Indian industry needs to prepare for the fall out of such issues by improving its working practices. Development in the form of increased consumer consciousness on issues such as usage of child labor unhealthy working conditions etc.

♦ Regional alliances: Regional trade blocs play a significant role in the global garment industry with countries enjoying concessional tariffs by virtue of being members of such blocs/ alliances. Indian industry would need to be prepared to face the fall out of the post 2005 scenarios in the form of continued barriers for imports.

Structure of Textile Industry

The Indian Textile industry is a highly fragmented sector. It is fully vertically integrated across the whole value chain and interconnected with various operations. It comprises small-scale, medium-scale, large-scale, non-integrated, spinning, weaving, finishing, and apparel-making firms and enterprises. This is in the unorganized sector and includes handlooms, powerloom, hosiery, knitting, readymade garments, Khadi, carpet and handicrafts manufacturing units. The organized mill sector comprises of spinning mills and composite mills where spinning, weaving, and processing activities are done. The fiber and yarn Sector of the textile industry includes textile fibers, natural fibers such as cotton, jute, silk and wool; synthetic (man-made) fibers such as Polyester, Viscose, Nylon, Acrylic and Polypropylene. The man-made textile sector includes fiber and filament yarn manufacturing units of cellulosic and non-cellulosic origin. The cellulosic fiber/ yarn Industry is controlled

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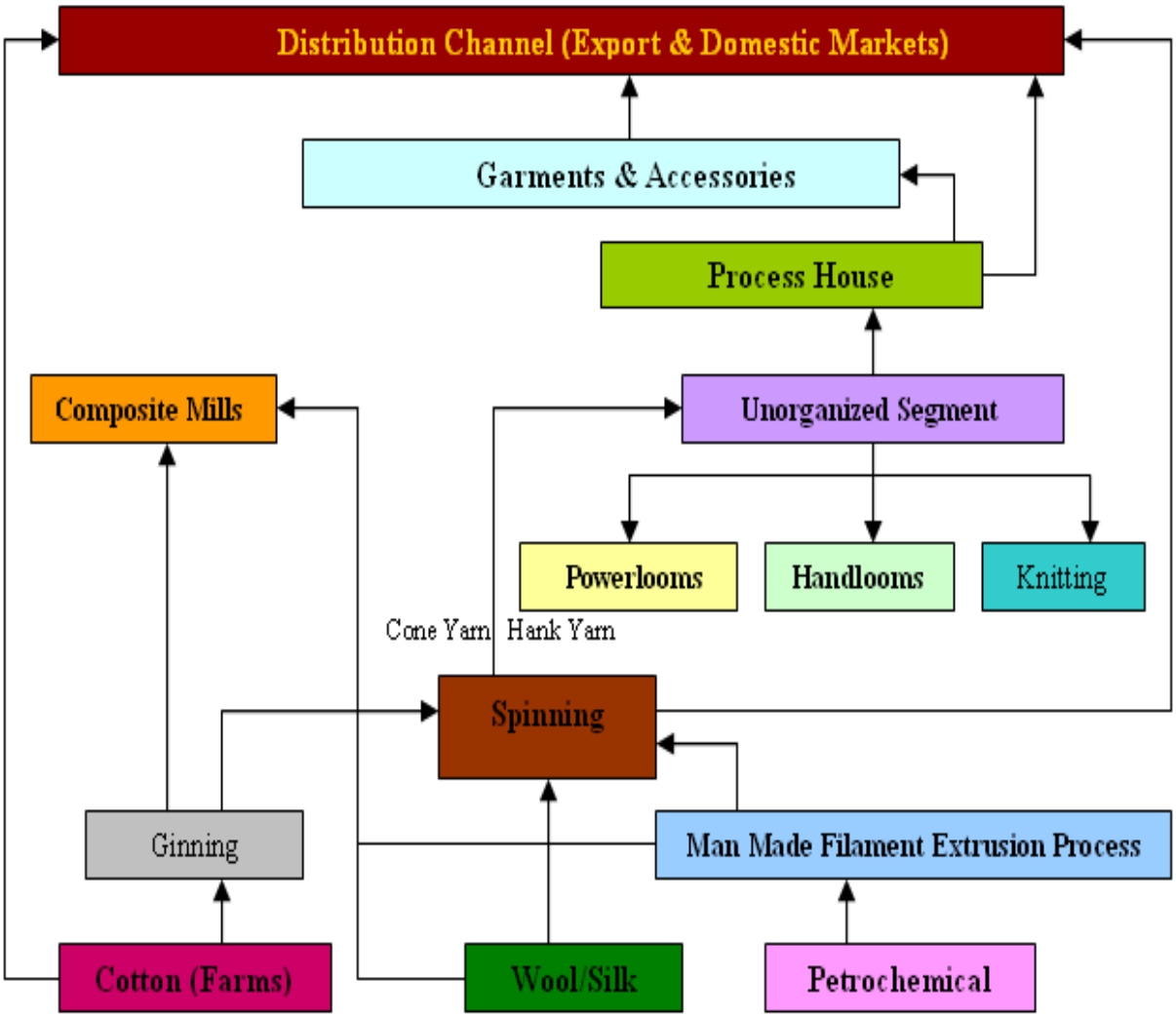
by the Ministry of Textiles, and the non-cellulosic Industry is controlled by the Ministry of Chemicals and Fertilizers. India is the largest producer of jute, the 2nd largest producer of silk, the 3rd largest producer of cotton and cellulosic fiber/ yarn and 5th largest producer of synthetic fibers/ yarn.



India exported Textiles & Clothing items

During 2009-10 (April- December) India exported Textiles & Clothing items worth US$ 15.91 billion as against US$ 15.59 billion in the corresponding period of financial year 2008-09.The share of textile exports in total exports has increased from 10.78 per cent (April-December 2008) to 12.04 per cent (April- December 2009) .

Cotton is one of the principal crops of the country and is the major raw material for the domestic textile industry. It provides sustenance to millions of farmers as also the workers involved in the cotton industry; right from processing to trading of cotton. The Indian textile industry consumes a diverse range of fibers and yarn, but is predominantly cotton based.

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The ratio of the use of cotton to manmade fibres and filament yarns by the domestic industry is about 56:46. The Indian textile industry has an overwhelming presence in the economic life of the country. Apart from providing one of the basic necessities of life, the textile industry also plays a pivotal role through its contribution to industrial output, employment generation and the export earnings of the country. It contributes about 14% to the industrial production, 4% to the GDP and 14.42% to the country's export earnings. The textile sector is the second largest provider of employment after agriculture. Hence, growth and all-around development of cotton and cotton industry has a vital bearing on the overall development of the Indian economy.

Export of cotton Textile to the different countries

(Value in Million Rs.)

Country	May-2009	APR -2009 May-2009	May-2010	APR - 2010 May – 2010
AFGHANISTAN TIS	85.49	241.47	2.35	112.56
ALGERIA	86.69	97.93	143.2	274.43
ANGOLA	78.18	408.56	317.25	648.28
ARGENTINA	167.52	241.85	332.31	841.06
AUSTRALIA	863.51	1491.54	1107.12	2273.5
AUSTRIA	94.92	157.4	30.64	349.26
BAHARAIN IS	38.54	69.52	215.5	703.76
BANGLADESH PR	7110.32	15990.08	25418.62	46074.07
BELGIUM	1488.02	2751.04	2011.26	4063.17
BENIN	85.04	461.04	375.01	1021.03
BRAZIL	1016.33	2018.77	7192.01	16034.4
BULGARIA	101.52	185.1	167.56	221.75
CAMBODIA	66.35	261.26	189.87	318.29
CAMEROON	20.12	157.51	14.85	196.93
CANADA	900.2	2123.67	1236.29	2646.42
CHILE	113.87	188.58	367.38	625.23
TAIWAN	427.9	657.43	912.56	2159.36
CHINA P RP	4193.05	8081.67	6961.27	16991.11
COLOMBIA	1001.16	1794.66	4209.04	7548.96
CONGO P REP	652.42	1049.46	219.29	425.04
COSTA RICA	3.4	3.4	9.8	38.22
CROATIA	214.36	424.5	228.44	713.2
CYPRUS	55.94	77.69	23.4	36.3
CZECH	410.38	896.7	281.23	912.78

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REPUBLIC				
Country	May-2009	APR -2009 May-2009	May-2010	APR - 2010 May – 2010
DENMARK	342.98	616.15	657.19	1237.4
DJIBOUTI	58.13	110.83	16.16	141.18
DOMINIC REP	29.13	61.73	644.82	1223.31
ECUADOR	64.57	99.88	27.76	154.19
EGYPT A RP	3073.42	5351.54	5540.68	11379.68
EL SALVADOR	19.57	100.38	109.64	143.02
ERITREA	11.35	14.1	7.33	12.1
FINLAND	89.59	355.03	270.06	441.82
FIJI IS	1.55	32.2	14.44	57.91
FRANCE	1490.49	3199.11	1915.83	4169.67
GABON	117.88	294.72	36.15	36.15
GAMBIA	717.31	1532.23	408.09	1104.24
GERMANY	3510.81	7418.28	7346.92	13112.13
GHANA	628.81	1238.43	94.08	246.01
GREECE	344.83	720.41	612.28	1074.22
GUATEMALA	326.93	749.33	1307.13	2454.78
GUINEA	860.37	958.3	53.63	178.42
GUYANA	0.07	0.07	13.94	18.04
HONDURAS	50.62	50.62	278.04	425.02
HONG KONG	1266.38	2407.3	3293.27	5792.99
HUNGARY	0.5	27.04	6.2	27.8
INDONESIA	456.92	697.31	562.35	1494.63
IRAN	635.19	1272.29	929.54	2147.97
IRELAND	81.44	185.91	120.75	287.97
ISRAEL	876.81	1254.47	1016.08	2349.74
ITALY	4615.15	8457.98	6367.15	507.17
COTE D'IVOIRE	673.18	1224.37	193.79	507.17
JAPAN	1576.3	3007.67	1872.3	3789.24
JORDAN	9.14	12.78	17.12	40.86
KAZAKHSTAN	15.53	19.49	0.67	43.33
KENYA	332.75	569.83	379.24	880.12
KOREA DP RP	11.55	42.81	60.79	156.53
KYRGHYZSTAN	3.12	6.17	10.19	13.43
KOREA RP	6003.15	11967.87	12942.79	26179.6
KUWAIT	137.66	207.58	99.57	147.33
LATVIA	46.04	69.65	10.1	194.14

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LEBANON	220.74	329.06	263.42	449.44
LESOTHO	35.74	229.87	207.01	418.28
LIBYA	4.06	51.36	0.08	7.15
LITHUANIA	116.36	258.07	205.33	244.54
Country	May-2009	APR -2009 May-2009	May-2010	APR - 2010 May – 2010
MADAGASCAR	97.39	194.38	109.25	449.29
MALAWI	5.76	94.23	0.03	0.04
MALASIYA	547.27	1201.41	1239.71	2375.59
MALDIVES	19.49	31.5	21.55	35.94
MALI	296.91	296.91	122.69	123
MAURITANIA	373.13	812.71	435.58	803.88
MAURITIUS	570.47	1231.72	1091.25	2033.27
MYANMAR	205.9	258.62	344.24	516.36
MEXICO	243.8	516.32	486.17	687.39
MOROCCO	386.73	966.36	1415.52	2066.14
MOZAMBIQUE	399.75	1103.4	764.54	1441.38
NEPAL	1167.16	2158.95	880.85	1782.76
NRTHERLANDTIL	2.45	11.15	3.76	31.4
NEW CALEDONIA	1.02	1.02	0.31	0.8
NEW ZEALAND	20.21	140.44	140.88	224.31
NIGER	184.6	351.3	198.38	361.03
NIGERIA	219.64	491.85	799.87	1359.53
NORWAY	227.32	517.62	349.12	586.19
OMAN	53.24	77.85	103.59	191.03
PAKISTAN IR	333.39	717.85	808.89	2766.9
PANAMA REPUBLC	104.38	104.38	1.88	61.75
PAPU N GNA	11.49	11.55	32.49	46.04
PARAGUAY	4.01	4.6	34.54	34.54
PERU	921.94	2050.71	3383.02	7829.53
PHILIPPINS	574.13	1151.64	823.98	2082.51
POLAND	975.19	1847.88	1615.13	3673.42
PORTUGAL	1917.15	3265.32	4979.85	9492
QATAR	53.25	85.14	36.9	118.07
REUNION	3.79	14.72	27.95	68.56
ROMANIA	68.79	230.42	75.23	289.28
RUSSIA	1351.38	2979.51	2121.29	4384.34
SAUDI ARAB	874.59	1865.97	1013.41	1928.43

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SENEGAL	2076.9	47.73	34.34	34.34
SEYCHELLES	11.78	12.38	16.6	17.19
SLOVAK REP	0.77	0.77	10.73	10.96
SINGAPORE	193.38	839.81	259.59	698.84
SLOVENIA	136.55	216.4	177.6	522.01
SOMALIA	29.02	29.02	1.46	1.46
SOUTH AFRICA	912.68	1578.92	677.34	1713.04
SPAIN	1270.65	2508.93	1826.7	4129.04
Country	May-2009	APR -2009 May-2009	May-2010	APR - 2010 May – 2010
SRI LANKA DSR	6662.27	12355.2	7165.42	13598.71
SUDAN	610.17	1260.95	1179.545	1911.41
SURINAME	4.03	4.14	4.55	4.55
SWEDEN	541.12	975.72	741.24	1492.3
SWITZERLAND	235.01	538.14	338.9	615.47
SYRIA	141.3	378.43	7.11	615.47
TANZARIA REP	47.33	159.6	181.15	442.27
THAILAND	575.06	931	836.5	2055.12
TOGO	766.85	1997.79	518.61	1110.69
TRINIDAD	0.03	24.74	11.88	15.46
TUNISIA	271.91	752.18	635.59	1020.68
TURKEY	2828.67	5235.55	4957.78	11728.03
UGANDA	82.5	93.99	7.65	13.46
U ARAB EMTS	2745.85	5045.98	3457.22	7193.88
U K	2391.57	4580.66	3603.35	7487.2
UKRAIN	35.65	38.12	118.82	227.99
U S A	18039.48	36914.06	34602.77	65732.76
URUGUAY	69.57	99.54	72.01	331.96
UZBEKISTAN	1.61	1.61	0.18	0.18
VENEZUELA	340.22	490.09	335.23	905.18
VIATNAM S REP	528.4	918.08	2210.84	3590.43
YEMEN REPBC	290.14	462.34	318.64	555.46
ZAMBIA	3.56	17.4	0.31	9.26
ZIMBABWE	0.27	0.27	1.76	17.52

SOURCE: - DGCIS & S

Indian Cotton Varieties

India produces large number of cotton varieties and hybrids. India is the only country that grows all four species of cultivated cotton, namely, Gossypium arboretum, herbaceum (Asian cotton), G.barbadense (Egyptian cotton) and G.hirsutum (American Upland cotton).

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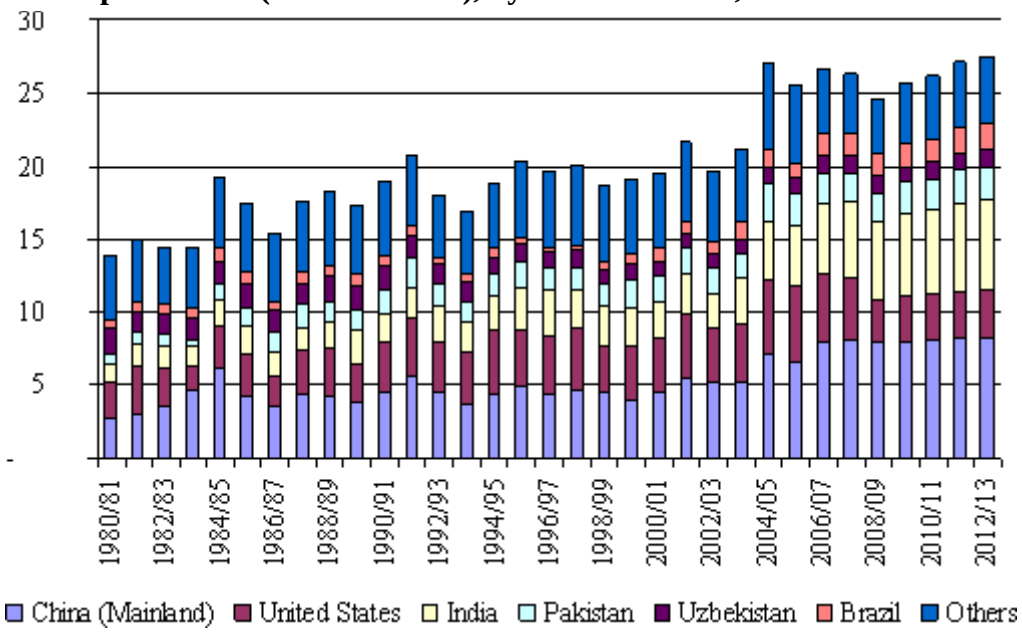
Gossypium hirsutum represents 90% of the hybrid cotton production in India and all the current Bt cotton hybrids are G.hirsutum. Though the number of varieties in cultivation exceeds seventy-five, 98% of the production is contributed by about 25 varieties only.

Cotton production and productivity

Cotton is produced in India in three zones viz., Northern zone comprising the states of Punjab, Haryana and Rajasthan, Central zone comprising the states of Maharashtra, Madhya Pradesh and Gujarat and the southern zone comprising the states of Andhra Pradesh, Karnataka and Tamil Nadu. Besides these nine states, cotton cultivation has gained momentum in the eastern state of Orissa. During cotton season 2008-09, the country once again harvested higher cotton production for the fifth consecutive year at 4.93 million metric tons (equivalent to 29.0 million bales of 170 kgs each).

World cotton production (million tonnes), by main countries, 1980/81 - 2012/13



Source: UNCTAD secretariat, based on International Cotton Advisory Committee (ICAC) statistics

A declining trend of cotton's share in textile fibres since the 1970s compare to the chemical textiles (branched off oil) was stated- in 1960 the part of cotton was of 68.3% against 21.8% for chemical textiles and at the opposite the percentages were respectively of 39.7% and 57.7% in 2002. Cotton remains nevertheless by far the most important natural fiber of the 20th century. In the development context, cotton is crucial for income and employment provided in its production and processing. Much of the growth of cotton production since the end of WWII was due to improved yield (output per hectare more than quadrupled between 1945/46 and 2006/07, from 0.2 tons per hectare (t/ha) to 0.8 tons per hectare, according to the International Cotton Advisory Committee - ICAC), rather than to expanded area (cultivated land increased by only 35% over the 1945/46-2006/07 period,

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expanding from 22.3 million hectares to 34.8 million). The development of the cultivated area mainly occurred at the end of the 1940s and remained relatively unchanged since then.

In 2007, cotton was grown in 90 countries. In 2006/07, the four main producing countries China, India, the USA and Pakistan accounted for approximately three quarters of world output. If we added Uzbekistan and Brazil, six countries would account for 83% of world cotton production. This concentration in cotton production, which appears to have been increasing for several years, has to be put into perspective by considering the impact of domestic policy reforms in the largest cotton producing countries, as well as climatic and sanitary contingencies. For example, global output increased by 30% between the seasons 1983/84 and 1984/85, rising to 19.2 million tones up from 14.5 million tones. Most of the growth came from China, where increases in production (Chinese production edged upward from 4.6 million in 1983/84 to 6.3 million in the 1984/85 season) were prompted by incentive measures taken by the Government.

In order to stimulate the growth of production, the Government used price incentives (price adjustment increased from 15% to 50% according to the main commodities) and above-quota premiums in cotton procurement (in China farmers were assigned quotas for delivering cotton at administered prices). Additional policy measures were taken to stimulate cotton production in the 1993/4 season, including loans at preferential rates and advance payments to cotton producers before planting. The combined effect of these policy reforms was remarkable. Cotton production increased by 3.7 million tons in the 1992/93 season to 4.34 million tonnes in 1993/94 (a 16.1% increase). The increase in production remained around the trend in the 1995/96 season, as the Government announced that it would increase cotton procurement price by 25%.

Cotton consumption in the world

Since the beginning of the 1940s, world cotton consumption has increased at an average annual growth rate of about 2% (roughly the same as production). Growth in the demand for cotton was comparatively higher in the 1950s and 1980s, with an average growth rate of 4,6% a year during the 1950s and 3% in the 1980s. Developing countries have absorbed much of global cotton output since the end of WWII. Their share in global consumption has become even more significant since the beginning of 2000s. Developing countries accounted for approximately 78% of global cotton consumption between 1981and 1999; since 2000 their ratio has been above 80%; according to projections based on ICAC figures, in 2010 they would absorb almost 94% of global cotton output.

Cotton consumption has shifted to developing countries mainly as a reflection of rising wage levels in developed countries. In the textile sector, labour accounts for about 1/6 of production costs. This means that raising labour costs eroded the competitive edge of developed countries, and contributed to the shifting of cotton processing to low-cost economies (most notably Asia and the Maghreb, but also Africa). Following specialization, certain countries were able to forge new patterns of comparative advantages out of competitive differences in quality. These countries built on the competitiveness and dynamism of the textile sector, which became the foundation stone of their development.

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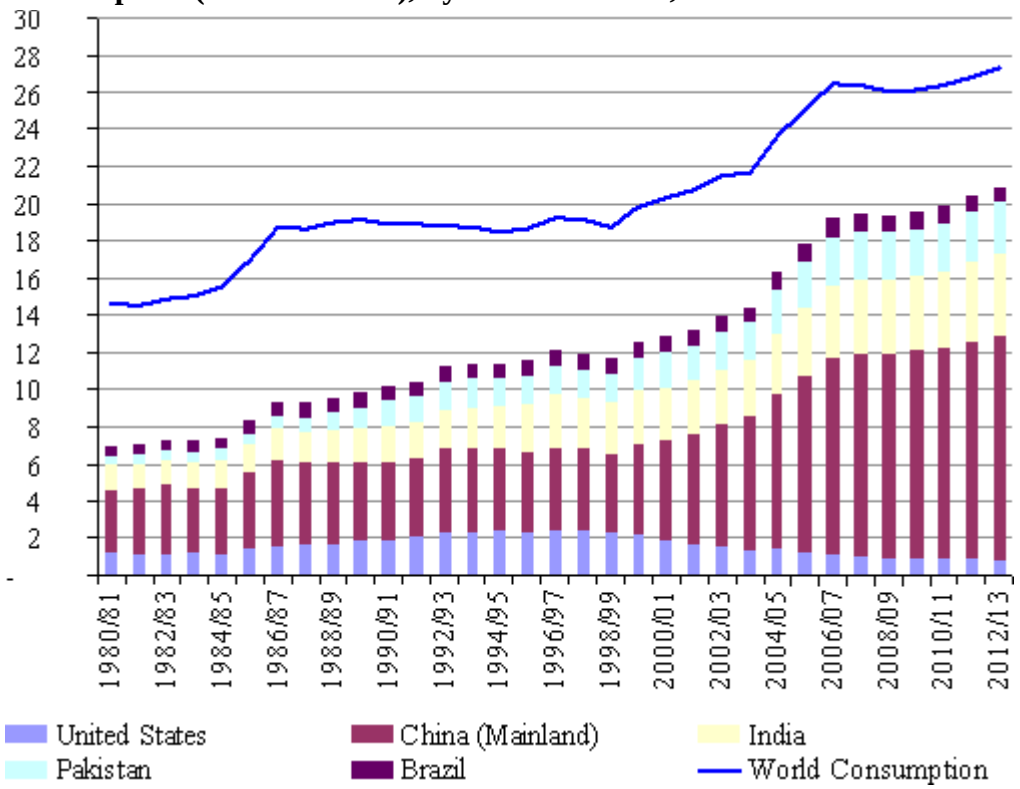
Other exogenous factors (such as the development of new technologies and improved infrastructures) favored delocalization of production by multinational companies based in developed countries.

The main cotton producing economies also account for a large part of consumption. According to ICAC data, China, the United States, India, and Pakistan as a whole have accounted for approximately more than 55% of global cotton consumption over the period 1980 to 2008. Their overall consumption has risen considerably in volume (see figure below). For example, consumption multiplied by 3 in China and by more than 3 in India. Pakistan has had the largest increase in volume (which multiplied by 6 between 1980 and 2008) in order to respond to export-driven demand for textiles.

Cotton consumption (million tonnes), by main countries, 1980/81-2012/13



Source: UNCTAD secretariat, based on International Cotton Advisory Committee (ICAC) statistics

International trade in cotton

Despite increasing local processing (especially in developing countries), cotton is still the main traded agricultural raw materials with more than 30% of cotton production (approximately 6.3 million tonnes of fibre) traded per annum since the beginning of the 1980s.

Exporting	**Exports**	**Trading partner** *(% of exports)*

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country	**(value in '000 US$)**	**Developing countries**	**Countries in transition**	**Developed countries**
USA	3'719'793	92.5		7.5
		Developing countries: - 79% of US exports are sent to Asia (inc. China (43%), Turkey (16%), Indonesia (9%), Thailand (6%), Pakistan (5%)) and, - 12% to Mexico.		
West Africa	994'048	84.9	0.1	14.1
		Developing countries: - 80% of West African exports are sent to Asia (inc. China (36%), Indonesia (21%), Thailand (10%) and, - 18% are traded in Africa (16% in the West African region and 12% to Morocco).		
Uzbekistan	867'692	59.8	17	23.1
		Developing countries: Uzbek cotton sold to developing countries is mainly traded with Asia (99.5%) and to China (52%) and Bangladesh (35%) in the lead. Countries in transition: The main trading partner within the area is the Russian Federation (89%). Developed economies : The main destination of Uzbek exports is the EU (99%)		
Australia	705'720	87.1	0.2	12.7
		Developing countries: The main trading partner of Australia in regard to its cotton is Asia (which accounts for 99.7% of Australian exports to developing countries). Within the region, the main sources of imports are: Indonesia (33%), China (26%) and Thailand (16%) in the lead.		
Egypt	298'690	65.5		34.5
		Unlike other cotton producing / exporting countries, Egyptian exports are well distributed among country groups (developing / developed). This fact may mainly be explained by the specificity of Egyptian cotton fibers. In regard to developing countries: 98% of Egyptian cotton fibers are exported to Asia (mainly to India (34%), Pakistan (18%), China and Turkey (9% each) and Thailand (7%) in the lead. In regard to exports to developed countries, the European Union is the main market for		

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		Egyptian cotton and accounts for 56% of Egyptian exports to developed countries.

Source: UNCTAD statistical data

With 3.7 billion dollars and almost 3 million tons of cotton exported over the 2002-2006 period (around 40% of world exports over the period), the United States is by large the dominant exporter with regard to cotton fibre.

In terms of direction of trade flows, 73% of US cotton exports went to the developing countries in Asia in the 2002-2006 periods, the remaining went to mainly to Mexico (11%).

The United States is indeed the single largest exporter of raw cotton to Mexico, which has relied heavily on US imports to supply its export assembly plants, known as Maquiladoras. Up to 1992 these transactions were only recorded by the Central Bank of Mexico. Starting 1992, they have been incorporated into official international trade statistics, which explains the (apparent) sharp rise in Mexico's imports from the USA since then.

Cultivation of cotton in the world

Cotton is primarily grown in dry tropical and subtropical climates at temperatures between 11°C and 25°C. It is a warm climate crop threatened by heat or freezing temperatures (below 5°C or above 25°C), although its resistance varies from species to species. Excessive exposure to dryness or moisture at certain stages of the plant development (lasting 5 to 7 months) may be detrimental to cotton quality and yields, and might also kill the plant. The seeds should be planted in well-prepared moist soil with high nutrient supplying capacity. Indeed, the cotton plant is particularly weak and its moisture and nutrient uptake is remarkable. Cotton production tends to exhaust the soil, which may require some soil management practices typically by means of physical adjustments, fertilization, and crop rotation (notably with a culture of leguminous plant and one of cereal). Moreover, the root system of the cotton plant is particularly developed and penetrates downward deeply (its depth can sometimes double the height of the surface stem). Accordingly, cotton should be planted in rich seedbeds that are muddy or argillaceous-sandy, where the taproot would grow downward deeply and develop under favorable conditions. Seedling emergence can occur between one week and a month after planting. During this phase (germination, emergence and seedling growth), the plant needs warm temperature and much moisture (7,000 to 9,000 m3 by hectare), which can be supplied by nature or by means of irrigation. Cotton leaves are about 12-15 cm in length and width. They develop along the main stem in a spiral arrangement. Each new leaf commonly develops 5 to 8 cm above the preceding leaf.

Flowering generally starts one and a half month to two months after the crop is planted. Blooming will continue regularly for several weeks, even months, as long as growing conditions are suitable. After flowering, the inner part of the bloom gradually develops into a fruit (called ‘cottonbowl’). Cotton bolls keep growing until full size (approximately 2 to 3 cm width). It will take about two months between the blooming of the flower and the first opening of the bolls. Cotton bolls burst open upon maturity, revealing soft

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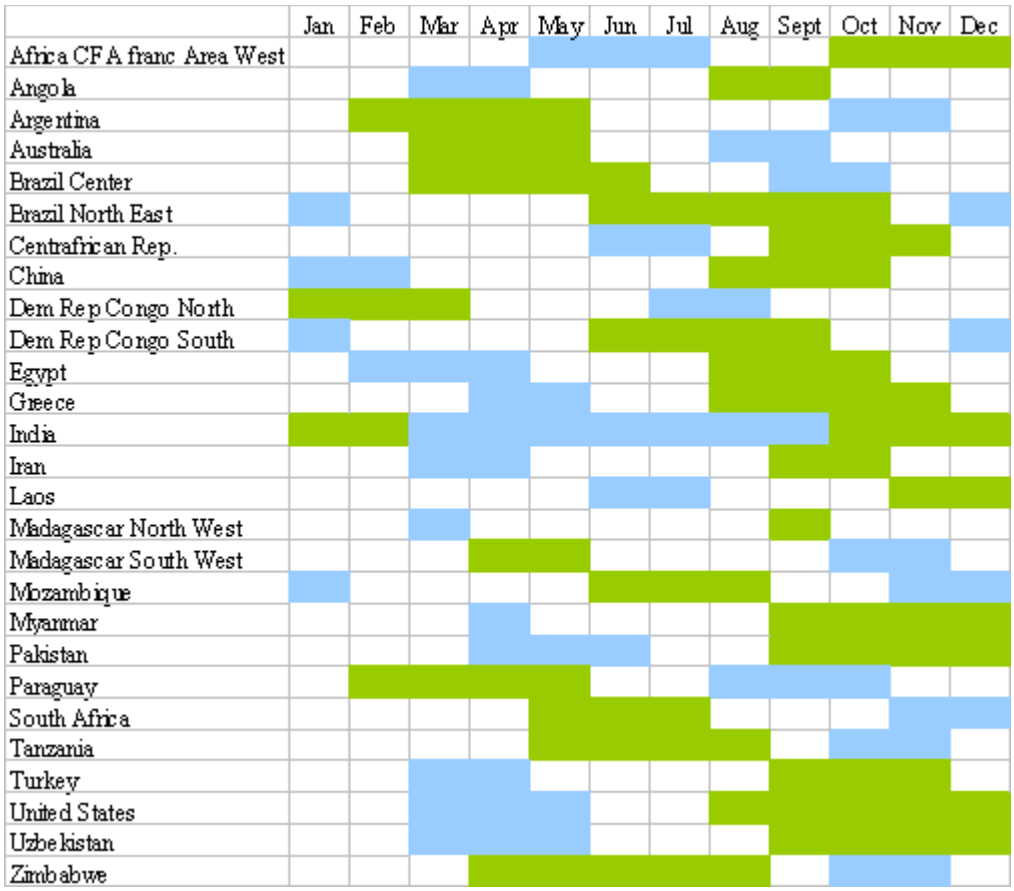
masses of fibers. Cotton harvesting is then possible (the relevant timeframe is detailed in the table below, to which the reader is referred). The cotton is picked either manually or mechanically. Manual picking is a highly labor intensive and time-consuming task, and it may be rather expensive. However, it generally produces quality lint with limited amount of trash, since cotton bolls are picked by hand as they burst open upon maturity. Cotton is harvested mechanically by *cotton pickers* (the most commonly used) or *cotton strippers*, which remove all the cotton bolls. Cotton strippers are generally used after application of a defoliant. Mechanical harvesting is faster than the manual picking of cotton. However, unwanted leaves and twins may be collected with the cotton. Cotton picked by a stripper might thus need additional cleaning (sorting of the trash) in order to obtain quality lint. Once the cotton is picked (either mechanically or manually) it is transported to a cotton gin, where the cotton fibres (lint) are separated from the cottonseeds. The cotton lint is then compacted in bales and stored.

Especially in the United States, cotton is increasingly grown as 'irrigated' cotton. Although irrigated cotton farming tends to be more expensive than 'dry land' cotton (which relies on rainfall), it generally produces higher quality lint with greater uniformity and yield potential. Moreover, the maturation period tends to be shorter than for dry land cotton.

Planting and harvesting times for cotton, by producing country

The cotton season conventionally starts on the 1st of August each year.



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Planting period

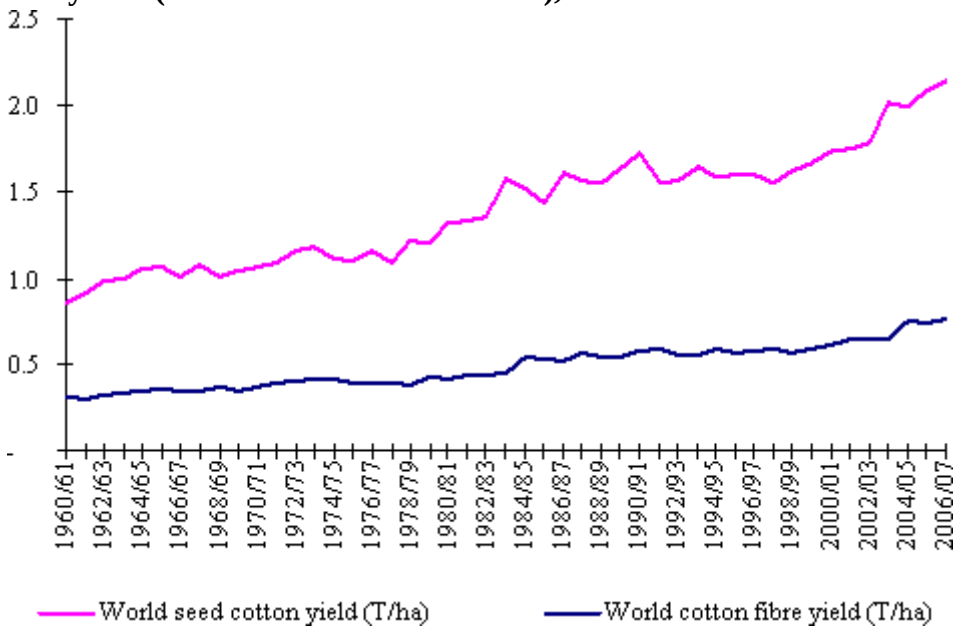
Harvest time

Source: UNCTAD secretariat, based on Geocoton and ICAC information

For further information, please refer to:

- Cotton with Special Reference to Africa (A. N. Prentice): chapter 10 - the physical environment: climate and soil, 1972.

World cotton yields (seed cotton and cotton fibre), 1990/91 to 2006/07



Source: UNCTAD secretariat (Data: Food and Agriculture Organization (FAO) for seed cotton; the International Cotton Advisory Committee (ICAC) for cotton fibre)

If the world annual yield production of seed cotton has increased in a constant manner since the early 1960s (with an annual average around 2.2%), yields in seed cotton rose from 0.86t/ha in 1960/61 to 2.14t/ha in 2006/07.

While during the 1960-1980, yields in developed countries were on average more than twice and a half those of developing countries, since the beginning of the 1980s the gap has increasingly narrowed, up to a ratio of 1:4 in 2005. Much of the rise in developing countries' share can be attributed to improved yields in China, mainly as a result of investment in research and innovation. Cotton fibre yields have also followed the same path than seed cotton yields. Over 1960/61-2006/07 period, fibre output per hectare (world average) grew from 0.3 tons to 0.8 tons. A world average around 0.86 tons is forecast for 2012/13 by ICAC. Two large increases in the world yield have been recorded in 1980s (+2.5% per annum) and 2000s (by how much?) (According to the ICAC, annual growth rate may reach +3% over the 2000s).

The five largest producers in the period 1990-2006 were, by order of importance, China, the United States, India, Pakistan and the Commonwealth of Independent States (Uzbekistan in particular since 1992). Since the beginning of the 2000s, China recorded higher yields per

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hectare compared to the other countries with an average of 3.5 tons per hectare for seed cotton (almost 2.5 times the American yield over the period) and 1.1 tons per hectare for cotton fiber.

Cotton yields, China

Between 1990 and 2007 seed cotton and cotton fibres yields have been multiplied by 1.7 respectively reaching record crops for both seed cotton (4.21 tons per hectare) and cotton fibres (1.3 tons per hectare). ICAC predicted yields to follow this upward trend and finally reach 1.36 tons per hectare in 2012/13.

	1990-2000	**2000-2007**	**2007**
Seed cotton yields (t/ha)	2.61	3.95	4.21
Cotton fibre yields (t/ha)	0.84	1.28	1.29
Ginning output (%)	32%	32%	31%

Source: UNCTAD secretariat (Data: ICAC (fibre yields) and FAO (seed yields))

Cotton yields, Uzbekistan

The former Soviet Union was able to produce higher cotton yields per hectare than the other major cotton producing countries before 1991. Since the collapse of the Soviet state and over the 1992-2007 period, productivity has been flattening. The average annual output of the cottonseed yield of Uzbekistan (the main producing country of this geographical area) over the period 1992-2007 was approximately 2.35 tons per hectare and of 0.76 tons per hectare for cotton fibre. ICAC's projections until the end of the decade plan a relative stability of yields for the crop years to come.

	1990-2000	**2000-2007**	**2007**
Seed cotton yield (t/ha)	2.41	2.61	2.28
Cotton fibre yield (t/ha)	0.79	0.85	0.82
Ginning output (%)	33%	33%	36%

Source: UNCTAD secretariat (Data: ICAC (fibre yields) and FAO (seed yields)

Cotton yields, India

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Indian cottonseed yields have dramatically increased since 2002/03, the average yield from 2003/04 to 2006/07 jumped by more than 50% compared to its level over the previous period (1990/91-2002/03). Indian ginning output is particularly high compared to other major producing countries (see table below).

	1990-2000	**2000-2007**	**2007**
Seed cotton yield (t/ha)	0.71	0.99	1.02
Cotton fibre yield (t/ha)	0.30	0.43	0.52
Ginning output (%)	42%	44%	51%

Source: UNCTAD secretariat (Data: ICAC (fibre yields) and FAO (seed yields))

Cotton yields, United States

In regards to the United States, second world producing country with 11.1 million tons of cottonseed since the beginning of the 2000s, the productivity rate is far above world average yields (+16% above the world yield since the beginning of the decade). Despite this pretty high level, American yields remain far below the ones recorded by China (-14%) or Uzbekistan (-32%) for instance.

	1990-2000	**2000-2007**	**2007**
Seed cotton yield (t/ha)	1.88	2.50	2.83
Fibre yield (t/ha)	0.72	0.93	0.91
Ginning output (%)	39%	37%	32%

Source: UNCTAD secretariat (Data: ICAC (fibre yields) and FAO (seed yields))

Cotton yields, Pakistan

In regard to Pakistan, the world's fourth producing country, with an average output of 6 million tonnes of cottonseed grown (since 2000), yields are very similar to the world average.

	1990-2000	**2000-2007**	**2007**
Seed cotton yield (t/ha)	1.73	2.22	1.99
- World	1.61	1.93	1.73
Cotton fibre yield (t/ha)	0.57	0.73	0.67
- World	0.57	0.69	0.62
Ginning output (%)	33%	33%	34%

Source: UNCTAD secretariat (Data: ICAC (fibre yields) and FAO (seed yields))

World cotton chain

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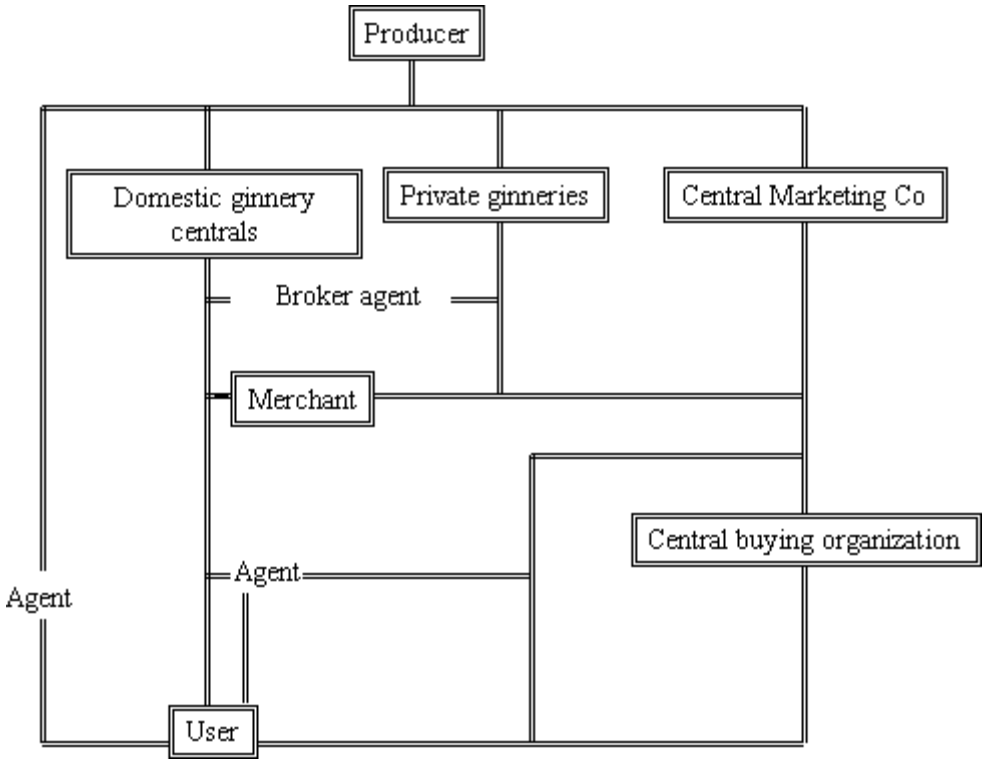

Source: Training Manual on Cotton Trading Operations (UNCTAD/WTO International Trade Centre)

Full-scale vertical integration, from growing cotton to the marketing of end-use products, is unusual in the developed countries' cotton sectors. One notable exception regarding the United States (US) cotton industry is the Plains Cotton Cooperative Association (PCCA). This cooperative accounts for about 15% of US production. In addition to growing, ginning, warehousing cotton and producing cottonseed oil, PCCA owns a number of textile mills for the manufacture of end-use products. By contrast, although to varying extents, liberalized cotton sectors in developing countries still exhibit a relatively high degree of vertical integration. As in the case of some Francophone West African countries, foreign companies have acquired equity interests in the former parastatals, as they seek to secure consistent and timely supplies of cotton.

The cotton sectors of developed and developing countries differ in various respects, including: the size of cotton farms; the level of mechanization (in harvesting, processing, and grading systems -visual and instrumental) and the uses of harvested cotton.

Production and marketing of cotton in China

China has been producing cotton for 2000 years. The major cotton producing areas are the Yellow and Yangtze River Valleys, accounting for more than three fourths of China's cotton output. Traditionally, the most commonly cultivated species of cotton was Gossypium hirsutum. New cotton varieties were introduced from the United States in the 1950s and 1960s. The most important cultivars now include Delta pine, Stoneville and Coker.

China's cotton sector became fully centralized in 1953, after the introduction of the first Five-Year Plan. The procurement and marketing of cotton was monopolized by the

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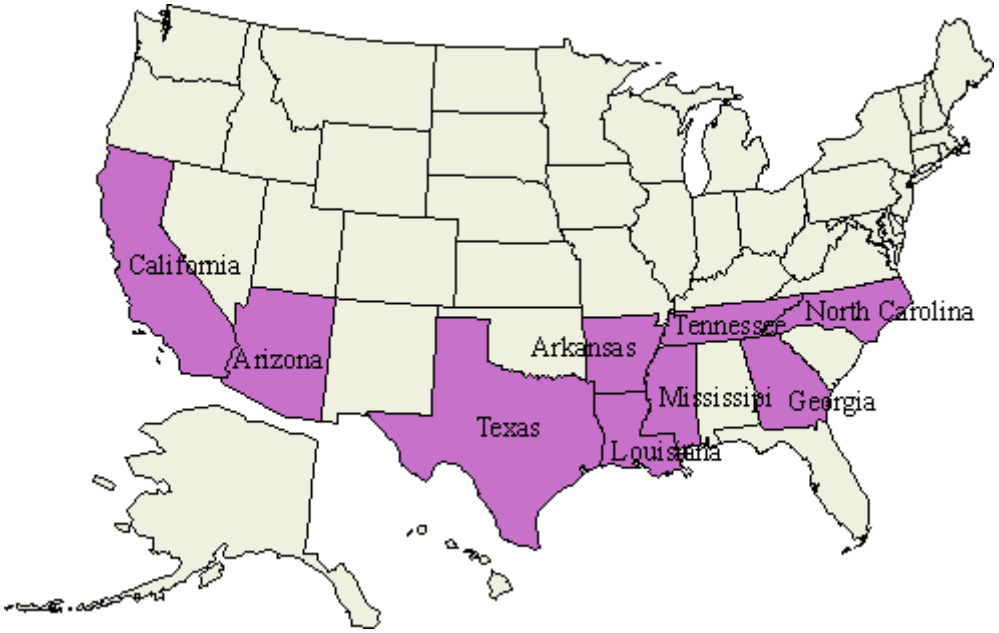
government procurement agency, the Supply and Marketing Cooperatives (SMC) system. Farmers were assigned compulsory quotas for delivering cotton to the local branches of the SMC at administered low prices. SMC controlled the whole marketing process, from purchasing through processing to marketing. State intervention distorted domestic supply and demand, and also affected movements in world cotton prices. Since the 1980s, China has made changes to its cotton policy toward an increased market orientation. A major institutional change occurred in 1978 when land use rights were contracted to individual farmers under the 'Household Responsibility System' (HRS). In 1985 a 'contracted purchasing' scheme replaced the united procurement system. Another step toward market-oriented system was eventually established in the early 2000s. For instance, under the new system, domestic textile firms granted from authorization delivered by provincial authorities were allowed to purchase cotton directly from growers, the growers association, or the local branches of the SMC.

The US cotton industry

The cotton industry has generated considerable revenue in the United States (by value, cotton ranks fifth among agricultural commodities). The United States is the second-largest producer of cotton, supplying approximately 20% of world output. The United States remains by far the largest exporter of cotton in the world, accounting for about one fourth of the world exports.

Main cotton producing States in the United States



Source: UNCTAD secretariat

The main cotton producing states include Texas, Mississippi, and California. In the period 1965 to 2003 they accounted for a combined 60% of the US production. Cotton acreage began shifting to Western States in the 1960s and 1970s, but has started shifting back

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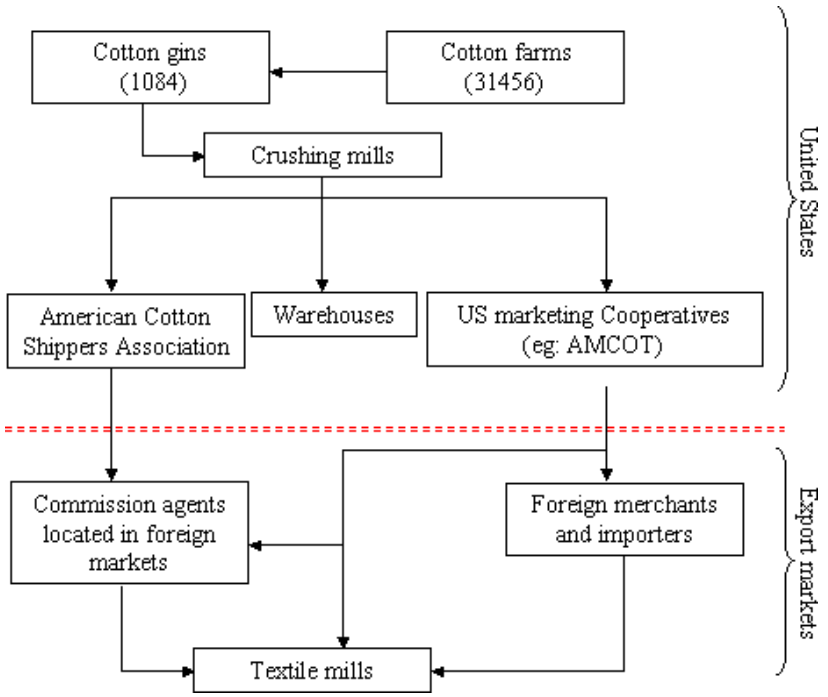
to traditional cotton-growing regions since the 1980s. Texas still remains the largest single cotton-producing state (above one fourth of domestic output since the mid-1960s), despite the fact that its share has been declining. Most of the cotton grown in the United States is of two varieties, upland cotton (*Gossypium hirsutum*) and extra-long staple (ELS) cotton (Gossypium barbadense), which is also referred to as American Pima cotton.

US cotton chain



Source: UNCTAD secretariat

Cotton farming has consolidated into larger farms since the WWII. Over the last fifty years, the number of cotton farms dropped by 98% (down to 31,500 in 2000 from 2 millions in the 1930s), whereas cotton acreage has declined by 25%. Therefore, the average farm size has increased. Cotton farms are primarily owned by individuals and families (according to US figures - Industry Trade Summary- 80% of farms are individual or family-owned) and are dedicated to cotton monoculture. Cotton gins are located in close proximity to cotton farms. As for cotton farms, ginning capacity has consolidated into larger gins, especially in the 1980s and 1990s. In 1999 there were less than half the numbers of active gins in the 1980. Cotton gins are predominantly owned by farmers either individually or through cooperatives.

The cotton is harvested using mechanical pickers or strippers. After harvesting, cotton is either ginned immediately or stored in field modules. The ginned cotton fibre is then compacted into bales. Samples are taken from each bale and classed for quality by means of High-Volume Instrument (HVI). Concerning domestic marketing, farmers can either store the classified bales in government-approved warehouses, or sell them immediately. When cotton

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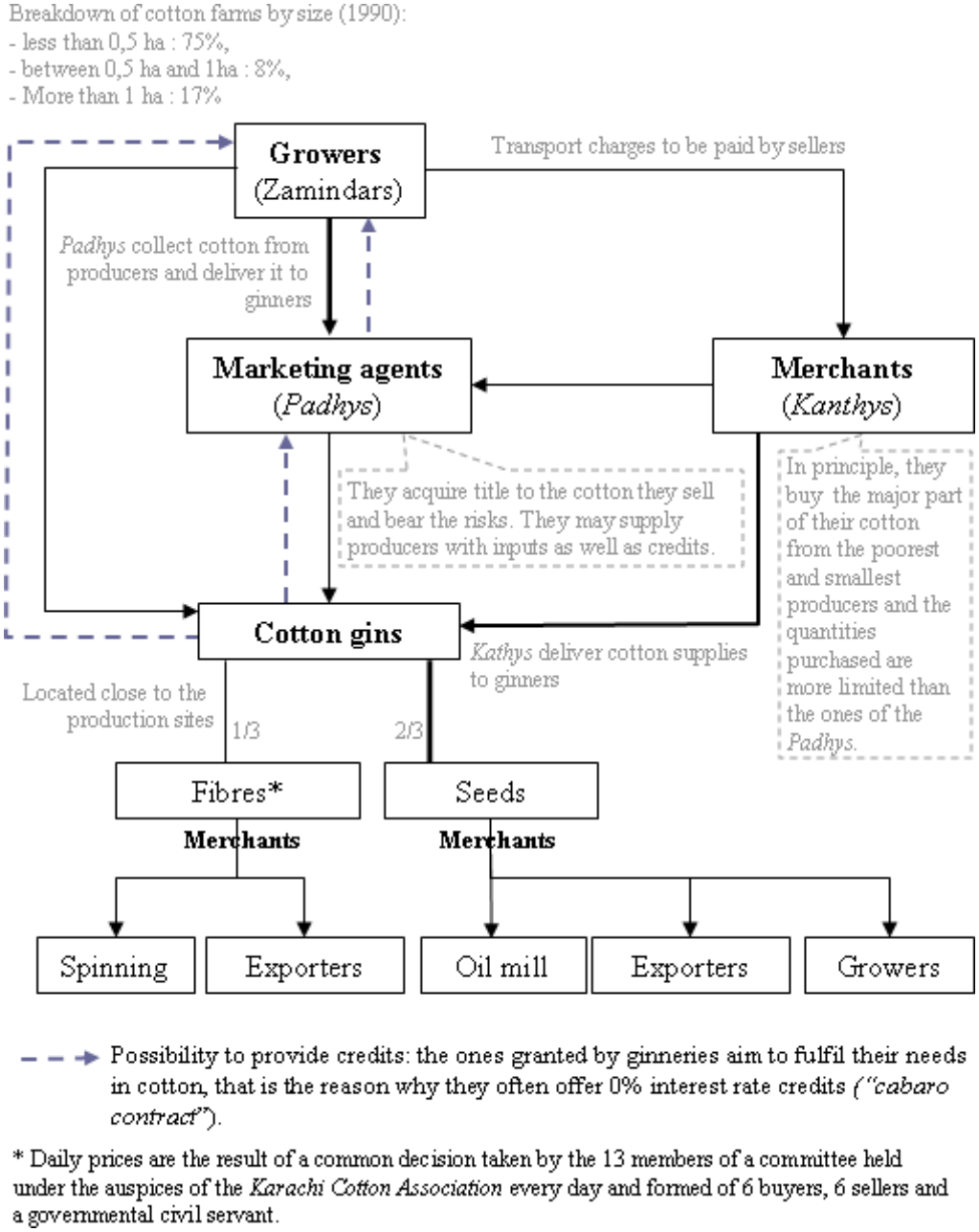
bales go into storage, farmers can borrow money against them (using the cotton as collateral), and sell the bales at a later stage. Ownership is retained by farmers through storage until final sale. On the other hand, farmers can sell the classified bales immediately to textile mills (which does not occur frequently) or independent merchants (brokers and intermediate processors of textile products).

Cotton chain in Pakistan

According to *UK Trade & Investment* cotton and cotton by-products account for more than one third of total exports from Pakistan.

Cotton marketing structures in Pakistan



Source: Comparing the Seed cotton and Wheat Marketing Chains in Sindh (H. R. Lohano, L. E. D. Smith, M. Stockbridge) - The Pakistan Development Review (spring 1998)

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Exports of Indian cotton during 2006-09

As a part of measures to boost cotton trade, the Government of India had liberalized raw cotton exports since July 2001, dispensing with the system of allocation of cotton export quota in favour of different agencies and traders. Exports of cotton from the country are under Open General Licence (OGL) since July 2001. During the year 2008-09, the cotton exports from the country reached at US$ 850 million including 35 lakh bales.

The details of exports of cotton during last three years and projection of 2009-10, are given below:

Year	**Qty. (in lakh bales of 170 kgs each)**	**Value (in US$ million)**
2006-07	58.00	1170
2007-08	88.50	1850
2008-09	35.00	850
2009-10 (Estimated)	55.00	NA

Quantity figures as per Cotton Advisory Board (CAB)
Value figures as per DGCIS Kolkata
(Source: Annual Report 2009-10, Ministry of Textiles)

Man-Made Staple Fiber and Filament Yarn

The production of man-made staple fibre industry is expected to increase by 19% during 2009-10. The production of all the manmade staple fibres except polypropylene staple fibre is expected to record a positive growth in 2009-10 as compared to previous year. Viscose, Polyester and Acrylic staple fibre are expected to increase by 29%, 16%, 20% respectively while Polypropylene staple fibre is expected to decrease by about 6% in 2009-10. The total production of man-made filament yarn is expected to increase by 7% during 2009-10. The production of viscose, nylon and polyester filament yarn are expected to increase by 1%, 6% and 8% respectively. The installed capacity and details of production of man-made staple fiber and filament yarn are given below:

Type	No.of Units	Installed Capacity (TPA)as on 30.12.2009 (P)	Production (Mn. Kg.)			
			2007-08	2008-09 (P)	2009-10 (Apr-Dec) (P)	2009-10 (P)
STAPLE FIBRE						

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Viscose	6	418.68	279.90	232.75	220.86	301.00
Polyester	15	1182.73	879.61	750.11	653.54	870.54
Acrylic	8	153.00	81.23	79.51	72.08	95.22
Polypropylene	3	8.70	3.43	3.43	2.37	3.24
Total	32	1763.11	1244.17	1065.80	948.85	1270.00
FILAMENT YARN						
Viscose	7	80.10	51.07	42.42	32.02	42.86
Nylon#	11	32.00	27.62	28.07	22.40	29.66
Polyester##	43	2013.49	1420.14	1332.09	1081.48	1436.46
Polypropylene#	13	17.63	10.51	15.08	11.34	14.87
Total	74	2143.22	1509.34	1417.66	1147.24	1523.85

P-Provisional

#=The exclusive capacity of N.F.Y. and P.P.F.Y.

= The Capacity under Broad Banding Scheme has been indicated against P.F.Y.

Source: Annual Report 2009-10, Ministry of Textiles

METHOD OF PRODUCTIONIN THE POWERLOOMS UNIT

A powerloom housed inside a small shed with a low ceiling, minimal light, congestion and poor ventilation. There are many looms (minimum 20 maximum 60) set up in such sheds, and the workers' pay a heavy price in terms of health. Outside the powerloom, a big gutter, filth and pigs are running around. The Powerlooms unit is where the production happens, powerloom workers, Mehta, bigari, kandifiller, Mukadam, and warper work in this unit.

A majority of the powerlooms in Bhiwandi produce grey materials (Frontline- 2008) which are used as shirting and dress material. The cloth produced in Bhiwandi is mainly consumed by Indian market as it is not up to the high standards required for the international market. One of the reasons for that is the second-hand technology. Most of the power looms in Bhiwandi are obsolete and old, as manufacturers prefer low-priced second-hand power looms over new looms. Excluding some big players, most of the units run in Bhiwandi are small units and cannot afford to purchase or import high-priced machinery.

PROCESS OF PRODUCTION

Weaving is a textile production method which involves interlacing a set of longer threads called warp with a set of crossing threads called weft. This is done on a frame or a machine known as a loom. There are a number of types of looms, although some weaving is still done by hand. However, a vast majority of weaving activities are undertaken through mechanized knitting and crocheting. The latter involves interlacing loops of yarn, which are formed either on the knitting needle or on a crochet hook, together in a line. The two processes are different, in that, knitting has several active loops at one time, on the knitting

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needle waiting to interlock with another loop, while crocheting never has more than one active loop on the needle. Braiding and plaiting involves twisting threads together in to the cloth. Knotting involves tying threads together and is used in making macramé. Lace is made by interlocking threads together independently, using a backing and any of the methods described above, to create a fine fabric with open holes in the work, lace can be made by either hand or machine.

The plain fabric is used as a raw material in manufacturing printed bed sheets, Sarees, dress materials, furnishings, shirting's, suiting's etc. The finished powerloom cloth can be supplied either bleached or unbleached and in a wide range of colors and shades. For colored cloth, the yarn is bleached and dyed before weaving. There is a high demand for cotton cloth throughout the country. The demand for cotton fabric is on an increase for its use as bed sheets, Sarees, dhotis, towels, kerchiefs, dress materials, furnishings, napkins etc. The cloth from powerlooms is cheaper in price, has a good quality finishing and a uniform appearance when compared to the cloth from handlooms.

The principles of weaving

The major components of the loom are the warp beam, heddles, harnesses, shuttle, reed and take-up roll. In the loom, yarn processing includes shedding, picking, battening and taking-up operations (Explained in the earlier topic i.e. what is loom?)

Bhiwandi Powerloom Product Profile

Description	EPI	PPI	Warp	Weft	Grey width	Finish width
Shirting	80	76-80	80D Roto	80DTex	37.5"	36
Shirting	84	68-72	45PV/PC	45PV/PC	37.5"	36
Shirting plain &Dobby	96-102	76-80	2/80PC	2/80PCor 40PC	37.5"	36
Suiting	84-120	60-60	150DTex	20-30 PV	58-62	54-60
Saree	72	60-68	60sC	40-60C	47	44
Saree	70	66-68	60sPC	60sPC	47	44
Dress Materials	120	60-64	75Dbright	30PV	47	44
Bosky saree	68-72	64-68	80D(250TPM)	80D	47	44

Source: - Office of Textile Commissioner Mumbai.

Scale of Production

The scale of production with master weavers is the core issue around which profits revolve. Though these are the general production conditions in the industry, many crises show up time to time with varied causes. In spite of the costs of power being lower now, erratic power supply has led to production losses. Apart from this, there is a slump in the demand for the product in the market, and hence a lengthening of the slack season. Some of the reasons for the slump in the market are steep and fluctuating yarn prices, competition in the market from other powerloom centres in Malegaon and Ichalkaranji and shift in the consumer demand for cotton. The job workers working under the master weavers are paid Rs 1.20 per meter for polyester cloth of which 60 paisa is paid to workers and they incur another

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30 paisa on power, maintenance, rent for looms, transport charges etc; the remaining 30 paisa is earmarked as income. The payments fixed per meter cloth do not undergo change for a considerable span of time (Krushi 2008).

These are not adjusted for rising cost of inputs (yarn and credit) and transport costs. In addition to the above, the master weavers, especially the bigger ones, do not pass on the part of the incremental profit margins from stable and sustained increase in the price of cloth that they negotiate with the traders. The job workers have no option but to take whatever is offered as they depend on the master weavers for inputs (yarn and credit) and do not negotiate directly with markets.

The powerlooms in Bhiwandi work in two shifts, each shift being 12 hours. One worker is employed in a shift for four to eight looms in the case of polyester and four looms in the case of cotton. Each polyester loom produces 30 metres and therefore six looms in a shift produce 180 metres. At the rate of 60 paisa per meter, a worker on polyester loom earns Rs. 108 in a shift. In the case of cotton cloth, the price paid is higher at 90 paisa but the per loom production is comparatively less at around 20 to 25 metres of cloth, which would fetch a daily wage of Rs. 75-93. Workers generally work exceeding their capacity. For example, they work on eight looms in the case of polyester cloth to produce more and get a higher wage of Rs. 144 per day. As working on eight looms is too stressful for the workers, generally workers below 50 years and in a good physical condition are the only ones who can withstand such painstaking work. Moreover, workers can work at high capacity for 10 years after which they are burnt out and remain prone to occupational hazards which result in tuberculosis, asthma, etc. The pressure to work on more looms and on an increased turnover is high on the workers as the piece rate is low and they need to earn at least Rs. 150 per day to meet minimum needs of the family.

Besides, work availability is reduced by 30% between July and December every year during what is termed as the ‘off season’. Wage agreements have been taking place once in two years but have been seldom implemented. The rate per meter and hence wage is determined according to the number of picks and reeds per inch of cloth which signify the quality of the cloth. In 2000, the wage provided was 12 paisa for 54 picks which amounts to Rs. 0.65 per meter and in 2007 June again, there was a wage agreement for Rs.13.50 paisa after a 15-day old strike by the trade unions. The present wage given is even less than the wage agreement signed in 2000 for Rs. 0.65 per meter. The workers’ stagnant wages coupled with rise in the prices of food and non-food items they consume further deteriorates their living conditions (EPW-2009).

Workers aged above 50 and also those suffering from physical ailments cannot compete for work and they lose out and end up in a vicious cycle of ill health, indebtedness, and/or starvation. Therefore, the system revolves around the logic of increasing production in the hope of fetching enough for all, starting from the master weaver to the worker. The government intervention subsequent to periodic crises has to some extent led to the growth of the industry but distribution of incomes has not been changed much. Besides, the oligopolic nature of the market at all phases fixes the price from the top and is passed on downward

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from agent/trader to master weaver to job worker and to the hired worker. As a result, the whole production process in Bhiwandi leaves hired workers vulnerable in terms of employment, and social security thus resulting in the aged and diseased being subjected to starvation.

Profile of power loom Owners of Bhiwandi

After witnessing the expansion of the frontiers of Mumbai because of the growth of industries and employment opportunities, one important area not very far from the financial capital, is seem to be emerging as new economy rules for the unemployed people. These places are Bhiwandi one, slightly distant suburbs of Mumbai. From the perspective of economy, it is increasingly continuing to generate employment and housing facilities, which the capital of state falling short of. Their major source of income and employment is the vast number of power looms. Bhiwandi is less known place, primarily because of its semi-rural features, and because it has not been greatly encroached upon by the nearby flourishing cities like Kalyan. It is a Muslim dominated area. On the other hand, it attempts to understand the problems of power loom owners who are running the power looms against all odds. This is to understand their problems, their views on government's co-operation, and their background.

Family Background:

Majority of owners are between 30 to 65age group. They are emigrants from the States like Uttar Pradesh, Andhra Pradesh, Rajasthan, and Gujarat. They are Hindu, Muslim, Gujarathi and Sindhi. As they have come from different provinces they communicate in different languages like Hindi, Marathi, Gujarathi, Kacchi, Bihari, and Sindhi. They are in this business from around 5 years to 50 years. Before they start their own power loom, many of them were power loom workers, for some of them this business has come from their forefathers.

Business Background:

For few owners this business came hereditarily but emigrants have chosen this business because government used to give them quota of yarn but that is up to 1979 and few on the basis of their knowledge of cloth industry. (Virendra Sing)

Types of Looms they have:

- ✓ English
- ✓ Japanese
- ✓ Soldier and
- ✓ Half Japan
- ✓ Rotiz

Unionism and owners:

The owners trust the institution of Union and the Leaders. They are considered as the bridge between the workers and the owners. They share good relation with them. They help them to settle the issue and the matter of the factory. Few owners mention that their relations with workers are very professional and few showed their reluctance about workers by saying that

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'workers are workers and no one can change them'. So, their opinions regarding workers were mixed one. But they do know the importance of the good workers.

Electricity: What makes life difficult for power looms owner is the system by which they are billed for power. For long time Bhiwandi's loom owners have been known for their ability to steal electricity. The Maharashtra State Electricity Board (MSEB), to bring discipline, decided to charge them a fixed monthly rate. "Whether the looms are running or not we are billed for them, " explains Rushi Fakih of the Bhiwandi power loom owners' Association, pointing out that even empty sheds are accruing huge debts. "Many of us run our units only to minimize losses."

Electricity is the major issue of concern for all the owners because of the load shading in these areas, they waste their precious hours of production and it affects their trading a lot. So even after less hours of work they are bound to pay the workers who have reported on work without much of the production. So the basic problem is load shading. Many of the owners propose the privatization of electricity. One more technical difficulty that they all face is that if at all transformer burnt, they have to pay 30 to 50 thousand to Maharashtra State Electricity Board (M.S.E.B.) and it takes 15 days to repair it and they have to pay workers their salary. It consumes time, money and energy and that is the major issue of concern to all the power loom owners. They need electricity for 15 to 18 hours a day but because of load shading they get the electricity only for 10 to 12 hours only, which reduces their production. Above all government has increased the rate per unit. Earlier it was Rs. 1. 40 paisa per unit and now it is Rs. 3.40 paisa per unit. So that over burdens them in sense of economy.

"Powerloom owners need bank loans and electricity at subsided rates for improvement of the sector," said Zahid Mukhtar, who owns 144 powerloom units in Bhiwandi. "As per my knowledge the scheme has all the facilities, we needed for a long time but it depends on implementation," he pointed out.

"I don't know anything about the scheme. But if anything, good is happening for the city, we are happy with it," said 65-year-old Azimullah, a native of Allahabad who has been a powerloom worker in Bhiwandi for 35 years. "We need electricity for more hours every day, first," said Mohammed Ibrahim Makhadum (35), another power loom worker and a native of Jaunpur in Uttar Pradesh who earns a monthly salary of Rs 5,000. "If this load-shedding continues for nine to 10 hours every day, we lose out on precious hours of work and money as well."

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Rajesh Mengharajani, owner of 35 powerlooms in Bhiwandi, says, "It is difficult to survive here. Making investments in machines here is a complete failure. We cannot think of expanding our business, even if we want to. All our money is going towards expenses for diesel."

Taxes: Power loom owners have to pay income tax, sales tax, land taxes and toll. So most of their income they have to expend in paying taxes and government is not providing them subsidies. These are their grievances against government.

Working Hours: According to Shafiq Bhai workers work for eight hours to twelve hours and they go to house and sleep but we work for minimum 15 hours under pressure. There is no holiday for owner as such. Moreover, they have to stretch themselves in unavoidable circumstances. Market Related Problems: To sell their final product Power loom owners have to pay 1% to 2% commission to the agents. At the same time give charges which are ½ to 1 % and transportation charges as well. The biggest threat is that agent could cheat them.
Products: They generally produce fabrics like polyester, cotton, polyester-viscous and Swiss cotton, Doriya, Buta design, Handkerchief, Malmal cotton, which are sent for manufacture of suiting and shirting in Mumbai, Ahmadabad, Surat, and Delhi.

Opinion on octroi: - They propose to cancel the octroi because they are already paying government VAT (Value Added Tax), Sales tax, and Toll tax and land tax. They have to pay octroi on their goods as well so they all are opposing octroi and appealing the same to government.

Raw Material Related Problems: It is observed that many yarn manufacturers give their yarn to owners and pay labor charges only for making cloths. But Yarn manufacturers do not give credit to power loom owners and they charge 1 % interest for a month. Synthetic threads owner have to depend upon the yarn manufacturers of Surat and Vapi. Cotton thread owners have to depend upon the yarn manufacturers of Chennai, Coimbatore, and some places in South

Local Problem: They do not have much local problem as threat or extortion only at the time of the community festival local people and political leaders demand more contribution from them.

Akhter Ansari, Praween Jain, Ganesh Agarwal, Babu Lal Jain, Anil Kumar and many other power loom owners accept the fact that since they do not get even break-even prices of the cloths and are unable to pay better salaries to workers. But they also add that one of the root causes behind the fate of workers at powerlooms is the violence raised by MNS workers which forced North Indian workers to return home. They are facing two kinds of trouble: less income and lack of workers. In this scenario the once thriving powerloom industry has

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reached its nadir and powerlooms are closing down day by day. Industry leaders of the region have been shouting for help from the government to revive the sector .

Organization or Association: Opinions of owners differ on this issue. Few believe in organization or owners association and they are actively involved in it. But some mentioned that these associations or organizations are of no use to them and they even do not have the membership of it.

Government Policy: There is no co-operation from government. Earlier they used to give quota but now they give no facility. They demand subsidies and for that they met Chief Minister as well, but they got only assurance. They also propose that the license that they need to run the power loom should be given within 15 days. They expect co-operation from government in these matters.
Causes of Contract System: To run power loom, they need workers and for that they have to take up contract system. They sometimes give their looms on contract basis; Causes of contract system are given below:
No Child: There are more than 3% owners given their powerlooms on contract basis because they are not having child to take care of their business according to them it is a hectic business person should always be involved in the business and due to age and sickness, they could not give much time to the business that is why they preferred to give their business on contract basis.

Barren land: According to Shanu Ansari this business is profit making he had five Guntha (33ft x 33ft = 1 Guntha) lands he constructed there shed and purchased 10 powerloom and started business and given on the contract basis every year he gets good amount from the contractor, he made agreement with contractor for eleven months. There are more than 10% owners given their land or shed on contract basis.

To avoid headache: According to Mansurali this business is definitely profit making but always we have to involve in the business some time electrical problem occurs they we have to visit to MSEB office, some time for license purpose we have to visit to government office, to sale the product we have to request to concern agent and to get money from him again we have to request them to avoid all this headache I preferred to give my business on contract basis now he get good money from the contractor only after every eleven months he has to renew his contract. There are more than 15% owners given their business on contract basis because of avoiding headache.

Two businesses: According Ibrahim Khan powerloom industry is their traditional business since his grandfather but he is having his own garage and power loom business, power loom business is time consuming he is not having much time to take care of his traditional business and children also taking education brothers are having their own businesses Then preferred

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the way of contract system now every year he gets good money from the contractor. According to observation and interviews taken by owners in Bhiwandi there are more than 30% owners who gave their business on contract basis because of dwell business.

Investment: According to Ismail Shaikh (power owner owners), he invested money in the power loom industry because it is good business for money making, he is himself government servant and he is not having time to run the business he invested money in the power loom industry only because of contract system. According to him there are many parties from Mumbai they have invested their money because of contract system.

Rivalry in the Business: There is rivalry in business. The main problem is market rates. Few owners sell their product with low rates to roll their business and to get immediate money. One of the biggest things is that they steal electricity and somehow manage to sale it at low rate. So we find fluctuating market rates and threat among the factory owners and so there is rivalry in this business.

Relation with Political Leaders: In Bhiwandi nearby all political parties are working like Congress, Shiv Sena,Bhartiy Janata Party, Republican party of India, Bahujan Samaj Party, Janata Dal, Samajwadi party, Communist party, Maharashtra Nav Nirman Sena etc. Power loom owners have good relations with all local political leaders. Few said they do not have any relation with political leaders.

My Observation while conducting interview: Whenever I was collecting data, I found owners heisted to give information, and they were little bit afraid, after collecting data I used to go to labor office of the Bhiwandi, what happened in the powerloom unit before hours, labor inspector narrated me means owners used to tell them I was asking above mentioned information, according to this it is cleared that there is good relation between government officers and owners.

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Chapter-III:
Conclusion

Bhiwandi is progressing, though in slow motion, despite all the constraints. This is the largest power sector in the world and it must be modernised through the introduction of new ideas. The mindset of the power loom weavers is to be improved for their own benefits. Let them realise that profitability increases with more technical know-how, diversification, and innovative ideas. Profits cannot be made by avoiding the truth. Newer generations, with greater acceptance power, are to be involved. The TRAs and the service centres are to be revamped for the true sense of service. Weaver training centres are to be started on a large scale, which will improve the skills of the weavers. There are lots of opportunities to improve this largest power loom sector with support from MoT, Service Centres, TRAs, etc

- ✓ Bhiwandi Powerloom sector is filled with more than 90% older plain looms and contributing to 55% of the grey cloth production by the micro enterprises. They are not able to go for fresh investment on capital goods and advanced technology due to their financial soundness and most of them do not want to opt for loan as they need to pay installments irrespective of their returns.
- ✓ Most of the entrepreneurs to the extent of 65%, have invested their own funds without being dependent on loans. Banks contribution is to the tune of only 10% for the modern units. Hence, banks should also be flexible in extending its loans to MSMEs with some flexible norms. MSMEs biggest problem of that they are not good at book keeping and banking relations. Hence, they are not able to meet the requirement of bank norms in submitting 3 years profit and other requirements. Only 11% of the respondents have availed the benefits of TUFS out of 150 members.
- ✓ Many unit owners don't know about various government policies, schemes of subsidies, seed capital formation etc. and policies regarding development of textile industry. It was observed that efforts are not being made by unit owners for obtaining such information. From the point of view of unit owners, it is very difficult and time-consuming procedure of obtaining subsidy for technology up gradation, due this reason also there is no any response from the unit owners.
- ✓ Because of low rate of investments in micro enterprises (upto Rs. 25 lakh) majority of the textile product are in low cost, low value-added segment, which will never generate enough economic surplus for continuous investment in technology, practices and research.
- ✓ Because of using low cost and inferior quality of machinery and equipment in production process, the productivity is less, which is resulted in high cost of production and less profit margins

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- ✓ About 72% of the local entrepnuers purchase raw materials from the local traders and 57.33% of their products sell to the local traders. Due to cut throat competition, raw material deficit, marketing problems unit owners are not getting the right margins.
- ✓ In the entire supply chain, marketing plays a significant role and the same is under the control of local trader and have monopoly in price fixing. There is no 41-scope found that there is no any collective efforts by unit owners for controlling the malpractices such as hoarding of yarn by some trader. Because of hoarding yarn there is no any control over the price of yarn and therefore unit owners are always facing the problem of price fluctuation.
- ✓ Majority of unit owners have no direct contact with their end users to know their needs, like and dislikes. They do not have any knowledge about the needs, like and dislikes of the consumers. Establishing Marketing information to these micro entrepreneurs and linking them with markets by some agency would improve their reach in markets.
- ✓ About 78% of the entrepreneurs expressed that the availability of skilled labour is one of the major concern of the industry. As per the data, 83% of the respondents confirmed that there is a decrease of labour during the last 5 years.
- ✓ Skill Development Programme of weaving, designing, loom mechanism etc to the workers at BTRA with the support of Government Funding and linking them to industry. This would enhance the skills and also earnings to the workers as well as quality production and output to the entrepreneurs.
- ✓ Establishing National Powerloom Development Corporation who takes care of yarn supply to the decentralized Powerloom industry on the similar lines of National Handloom Development Corporation, (NHDC) supplies raw materials like yarn, Dyes & Chemicals
- ✓ In order to remain competitive, the global market and to withstand increasing competition in domestic market it is necessary to ensure the large investment in modernization and expansion. This will be possible only if the Technology up gradation fund scheme (TUFS) is properly utilized.
- ✓ Maharashtra State Govt is also providing a specifiable package of additional 10% subsidy to SC/ST and Minorities over and above TUFS is an encouraging MSMEs in Powerloom sector.

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