WORKING AND MANAGEMENT OF MANUFACTURING SECTOR- A CASESTUDY IN ALLEPPEY CO-OPERATIVE SPINNINGMILL,KAYAMKULAM

PROJECT

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Certificate

This is to certify that the project entitled **"Working and Management of Manufacturing sector :A Case Study In Alleppy Co-operative Mill Ltd**. **Kayamkulam** "is an authentic record of work carried out by, **Abi T Ajayan, Daniel Mathew, Izahak Johnson, Sreelekshmi.S, Tibin Jijo** in the Department of Economics, Mar Ivanios College of Arts and Science ,Mavelikara in partial fulfillment of the requirements of BA Degree (CBCSS) in Economics.

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DECLARATION

We hereby declare that ,this dissertation entitled **"Working and Management of Manufacturing Sector : ACase Study In Alleppy Co -operative Mill Ltd.Kayamkulam**"under the guidance of **Prof. AswathyP** is a genuine record of research work carried out by us in the Department of Economics, and no part of it has been previously used for the award of any degree in any University.

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CHAPTER 1

INTRODUCTION

"The textile industry was the automobile industry of the middle ages "

This is one of the famous words of an American historian author Barbara W. Tuchman.The textile industry is primarily concerned with the design, production and distribution of yarn, cloth and clothing. The raw material may be natural, or synthetic using products of the chemical industry.

1.1 INDIAN TEXTILE INDUSTRY

India's textiles sector is one of the oldest industries in the Indian economy, dating back to several centuries .The industry is extremely varied, with hand-spun and hand-woven textiles sectors at one end of the spectrum, while the capital-intensive sophisticated mills sector on the other end. The decentralised power looms/ hosiery and knitting sector forms the largest component in the textiles sector. The close linkage of textiles industry to agriculture (for raw materials such as cotton) and the ancient culture and traditions of the country in terms of textiles makes it unique in comparison to other industries in the country. India's textiles industry has a capacity to produce wide variety of products suitable for different market segments, both within India and across the world.

The textile industry in India constitute of distinct section representing broadly 3 levels of technology and organization via mill, power room and handloom. The first attempt to establish a cotton textile in India was made since 18L8, under. It was Mr.Dorer, a business man with greatest enterprise vision and foresight. Who happens to be the first Indian textile industries to establish a mill in Bombay name son Bombay Spinning Mill in the year 1854? The period from 1854 was really a good period for the pioneering enterprise in the field of textile it gives employment to vast number of people get raised and opportunity for a riches and are varied life get opened. Ahmadabad is called the machetes of India.

First spinningmill was established Mumbai in the year 1854. The period of 1856-1860 was nice period as for as textile industries were concerned. But during 1990‟s the textile industries saw their through due to famine. Mills in Bombay produced yarn. A number of mills in Bombay and Ahmadabad to close drown for long periods. At present textile industry in India comprise of 698 mills and out of which 409 are spinning mills and 289 as composite mills. Quite a large number of spinning mills 190 are located in Tamilnadu. While the appreciate number of composite mills 168 are located in state of Gujarat and Maharashtra.

Our countries average output is about 2700kg of cotton per sectors. India's total export in the world trade is only 0.6% with us and 45billion and this is expected to raise 1% le, us 80 billion over the next 5years. The world trade in textile and clothing around us 250 billion of which one country's share is 3.3% about us 12 billion, India's cotton textile industry occupied a unique position it accountants for about 7% of the gross domestic product, 20% of the export earnings. It contributes over Rs.5/- billion in terms of excise duty to the exchequers

Around 50 million people earn their livelihood through its cultivation or trade and processing. A considerable it's in directed employment. At the time of independence the textile industry, the largest organized industry in the country, comprised an estimated 2.5 million handloom eaves and 356 mills, with an installed capacity of about 10.3 lakhs workers. After that, the increased in fabrics production is mainly because of the availability of major raw-materials, such as cotton and man-made fiber however the chare of cotton gradually declined from percent in the fifties to 69 percent in 1997.

INDIAN TEXTILE INDUSTRY CONSTITUTE OF THE FOLLOWING SEGMENTS

1) Readymade segment

2) Cotton textile including handloom

3) Man made textiles

4) Silk textiles

5) Woolen textiles

6) Handicraft, coir and jute

STRENGTH OF INDIANTEXTILE INDUSTRY

1. India has rich resources and raw materials of the textile industry. It is one of the largest producers of cotton in the world and is also rich resources of fiber like polyester, silk, viscose etc.

2. India is rich in highly trained man power. The country huge advantage due to lower wage rates because of low labour rates the manufacturing cost of textile automatically come down to very responsible rate.

3. India is highly competitive in spinning section has presence in almost in all process of the value chain.

Textile Industry in Kerala

As in the country as a whole, in Kerala too it was the cotton mill industry , which pioneered the industrialized of the state today it is one among the most important medium and large scale industries in the state . A large number of people get direct employment in the mills number of people get direct employment in the mills and on even large number get undirected unemployment .Textile mill of Kerala now operate in a hazardous situation most of privately owned mill are closed down resulting in large-scale unemployment. Some of the mills were taken over by the textile corporation of Kerala Government and National Textile Corporation. There taken over mill made huge losses within about thirty different cotton mills. The workers complained that for a long period, then have been no revision in this wage structures. The workers themselves acknowledged the fact that then in no possibility of establishing new textile mills.

Importance of Textile Industry in India

Like the other developing countries, the Textile industry in India also occupies an important place in the economy as shown below:

Key Indicators

- Accounts for 17% of total Exports
- Is the largest employment provider after Agriculture (82 million people direct/indirect)
- Market size of the Textile industry (exports & domestic) is US$ 52 billion, at present
- Expected to reach US$ 110 billion by 2012

Covers the Entire value chain

- RAW MATERIAL: Cotton Production estimated at 4.32 million Tons
- SPINNING: 37.5 million spindles
- WEAVING: 1.93 Million looms (excluding hand looms)
- APPAREL: Current level of exports - US$ 10 billion

1.2 IMPORTANCE AND RELEVANCE OF THE STUDY

Even though cotton mill industry offers valuable contribution to the economy, now it is not a booming industry in Kerala. Rather it passes through a critical phase and even faces existence problems. Several mills face the challenge of shutting down and some units have already become sick units. Both the managerial problems and labour unrest make it a vulnerable industry. Since many of these industries run with limited technologies and semi skilled labour force, scope for advancement and diversification are limited. As it supports the livelihood of a large number of people, the improvement in this sector not only enhances the contribution to GDP but directly instil welfare to the lives of those masses.

For that it is essential to generate reliable baseline data regarding the fundamental problems facing these industries. Then only it would be possible to frame apt policies for

resolving it in respective industries. Most of the research studies in this area either focus on handloom sector or concentrate on managerial aspects. Another school of studies thrust on the co-operative sector. Limited studies are available on cotton mills and labour problems and deficiencies of welfare measures in public sector units. Hence the present study tries to address this research gap makes an empirical study in this direction.

1.3 OBJECTIVES

- To evaluate the competencies of textile goods produced in the spinning mill Kayamkulam.
- Evaluate various spinning machines and their capability of production.
- To study the impact of COVID 19 pandemic in textile industries as a whole or in particular.

1.4 LIMITATIONS OF THE STUDY

- Very difficult to accure data
- The study is limited due to the COVID Pandemic

1.5 METHODOLOGY AND DATA SOURCE

- The study is both analytical and empirical. It made use of secondary data.
- Secondary data was collected from various government reports, and net sources.

1.6 SCHEME OF THE STUDY

- The study has been divided into the following four chapters.
- The first chapter serves as introduction.
- The second chapter deals the literature Review

- The third chapter contains the history of textile industry
- The fourth chapter analysis the textile industry and spinning mills based on the availability of secondary data.
- The fifth chapter consist the summary and conclusion.

CHAPTER 2

REVIEW OF LITERATURE

Textiles and clothing industries are important in economic and social terms, in the short-run by providing incomes, jobs, especially for women, and foreign currency receipts and in the long-run by providing countries the opportunity for sustained economic development in those countries with appropriate policies and institutions to enhance the dynamic effects of textiles and clothing.

S.V. Chorghade (1976) in his research work studied the "Powerloom Industry In M aharashtra". Maharashtra state has a lion's share in the growth and development of the Powerloom industry. He attempted to undertake a detailed study of structure and problems of Powerloom industry in Maharashtra. The components of textile industry are the Mill sector, Decentralised Powerloom Sector and Handloom sector. In which the decentralised Powerloom sector is the dominant. For the study, he covered five important clusters of Maharashtra i.e. 1) Bhiwandi 2) Malegaon 3)Bombay 4) Ichalkaranji and 5) Nagpur. About 80 percent powerlooms are concentrated in Bomaby(Mumbai) and Pune Divisions in which Bhiwandi, Malegaon, Ichalkaranji and Bom bay (Mumbai) are most important powerloom centres.

P.R. OJha in 1978 studied the dividend distribution of 51 cotton textiles companies. He analysed the dividend distribution of the companies on the basis of size, region, ownership group, management pattern and age of the companies. Textile units located in Ahmedabad region earned the highest profits while those located in north region earned the lowest, the Bombay (Mumbai) region and south region earned the medium profits. Companies managed by the government controllers showed the poorest profitability.

R. R, Ansari (1984) in his research work explained the marketing problems of Powerloom industry in Malegaon City of Nashik District. He has very specifically indicated the marketing problems faced by the Powerloom industry. The marketing of the product is of vital importance for survival and growth of any enterprise. Clothing is basic and elem entary desire of the human being. The need is fulfilled by the handloom weavers, Powerloom weavers and textile mills. The Powerloom industry is the dominant in the

production of cloth. So the marketing problems relating to the Powerloom industry is discussed in the study.

Onikar Goswami (1985) has made an analysis of demand and supply in the cotton textile industry. According to him, only the Powerloom sector and the pure spinning units seem to be doing well. Sixty five to seventy percent of composite mills and the entire handloom sector are sick.54 From an analysis of the demand aspects in the textile industry Goswami reached the following conclusions;

1) There has been an overall stagnancy in the per capita dem and for textiles.

2) There has been a remarkable switch from cotton to non-cottons and blended fabrics.

3) The elasticity of demand for synthetic and blended cloth have been greater than those of cotton.

B.M. Dolle (1992) in his research work revealed the socio - economic problems of powerloom industry in Malegaon. He studied the powerloom industry of Malegaon for the period of 1935 to 1985. The main conclusions of the study are; the powerloom industry in Malegaon has seen many ups and downs in its development and it is one of the im portant industries of Maharashtra. The powerloom industry in Malegaon h as glorious past and bright future. There aremany socio economic problems in the powerloom industry of Malegaon like scarcity of the finance, marketing problems, labour problems etc D. C. Mathur in his book "Personnel Problems and Labour Welfare : A study of cotton textile industry (1993)" had explained about personnel managem ent in the cotton textile industry. He explained that for the economic results the management of personnel is very important. In managing personnel the role of welfare activities can not be emphasised. Personnel management and labour welfare are important for smooth running of industrial concern.

Y. N. Rao in his book "Financing of Cotton Textile Industry in India (1994)" had studied all the aspects related to the financial position of the India textile industry. He concluded that review should be done on the control of the centralised sector of the textile industry. The excise duty should be fixed on the fabrics for the progress of the decentralised sector of the textile industry. He has clearly mentioned that the government should reduce

taxes & duties on the textile industry. He stated that, the crucial problem faced by the textile industry is modernisation of the industry. The government should frame the policy of the incentives for the investm ent in the textile industry. He mentioned that textile industry in future is required to look for new sources of short and long term finance. Iranna T.Hatti (1996) in his research work has explained the economic problems and prospects of cotton powerloom industry in Bomaby (Mumbai) - Karnataka region. He emphasised on the importance of decentralised powerloom.Textile Committee, Mumbai conducted a study on various aspects of the powerloom sector of textile industry in M aharashtra in 1996.

The study throws light on the pattern of yarn consum ption in the powerloom sector of the decentralised sector of the textile industry in Maharashtra. It contains basic information about the structure and consum ption pattern of yarn in the important clusters in M aharashtra. Unorganised powerloom industry, m ainly situated in the state of Maharashtra. Most of the powerlooms are concentrated in Bhiwandi, Ichalkaranji, Malegaon and Sholapur. In Bhiwandi, Ichalkaranji and Malegaon, mostly used type of looms are Plain looms while in Sholapur Jacquard looms are used.

CHAPTER 3

TEXTILES INDUSTRY IN INDIA AN OVERVIEW

In India cotton textiles industries which are over a quarter century old. They play an important role in the economy producing nearly 50000million meters of cloth and earning huge foreign exchange by export. unfortunately the industry faces a very high

competition with their profit margin pricing of finishing product is depends on availability rate of cotton, supply and demand export obligation, Govt. registration, extent modernization and obviously the management ability and so on. The cotton textile industry is the largest industry in the organized structure of manufacturing.

Market Size

India's textiles industry contributed 7 percentage to the industry output (by value) in 2018-19. The Indian textiles and apparel industry contributed 2 percentage o the GDP, 12 percentage to export earnings and held 5 of percentage the global trade in textiles and apparel in 2018-19.Textiles industry has around 4.5core employed workers including 35.22lakh handloom workers across the country. Cotton production is expected to reach 36 million sales in FY21(fiscal year).The domestic textiles and apparel market stood at an estimated US dollar 100 billion in FY19.The production of raw cotton in India is estimated to have reached 35.4 million bales in FY20. During FY19, production of fibre in India stood at 1.44 million tones (MT) and reached 1.60 MT in FY20 (till January 2020), while that for yarn, the production stood at 4,762 million kilograms during same period.

Investment

The textiles sector has witnessed a spurt in investment during the last five years.
The industry (including dyed and printed) attracted Foreign Direct Investment (FDI) worth US dollar 3.46 billion from April 2000 to September 2020.

Government Initiatives

Indian government has come up with several export promotion policies for the textiles sector. It has also allowed 100% FDI in the sector under the automatic route.
Initiatives taken by Government of India are:

- Defence Research and Development Organisation (DRDO) is helping the Indian textile industry to produce yarns and eliminate dependence on import of Chinese and other foreign clothing for military uniforms.

- In October 2020, the Cabinet Committee on Economic Affairs chaired by Mr. Narendra Modi approved mandatory packaging of 100% food grains and 20% sugar in jute bags. Under the Jute Packaging Materials (Compulsory Use in Packing Commodities) Act, 1987, the government is required to consider and provide for the compulsory use of jute packaging materials for supply.
- Government launched production linked incentive scheme to provide incentives for manufacture and export of specific textile products made of man-made fibre.
- On September 2, 2020, the Union Cabinet approved signing an MOU between textile committee, India and M/s Nissenken Quality Evaluation Centre, Japan, for improving quality and testing Indian textiles and clothing for the Japanese market. This India-Japan pact on cooperation in textiles will facilitate Indian exporters to meet the requirements of Japanese importers as per the latter's technical regulations.
- Under Union Budget 2020-21, a National Technical Textiles Mission is proposed for a period from 2020-21 to 2023-24 at an estimated outlay of Rs. 1,480 crore (US$ 211.76 million).
- In 2020, New Textiles Policy 2020 is expected to be released by the Ministry of Textiles.
- The Directorate General of Foreign Trade (DGFT) has revised rates for incentives under the Merchandise Exports from India Scheme (MEIS) for two subsectors of Textiles Industry - readymade garments and made-ups - from 2% to 4%.
- The Government of India has taken several measures including Amended Technology Up-gradation Fund Scheme (A-TUFS), estimated to create employment for 35 lakh people and enable investment worth Rs. 95,000 crore (US$ 14.17 billion) by 2022.
- Integrated Wool Development Programme (IWDP) was approved by Government of India to provide support to the wool sector, starting from wool rearer to end consumer, with an aim to enhance quality and increase production during 2017-18 and 2019-20.

Achievements

Following are the achievements of the Government in the past four years:

- I-ATUFS, a web-based claims monitoring, and tracking mechanism was launched on April 21, 2016. 381 new block level clusters were sanctioned.
- Under the Scheme for Integrated Textile Parks (SITP), 59 textile parks were sanctioned, out of which, 22 have been completed.
- Employment increased to 45 million in FY19 from 8.03 in FY15.
- Exports of readymade garments (of all textiles) was worth US$ 1.04 billion as of November 2020.

Emerging trends in World Trade

With the removal of the Quota system, in the year 2005, the textile and clothing industry is undergoing structural changes worldwide with production lines further shifting distinctly towards low cost producing countries with flexible production systems, to match the growing retail power.

Perceived as a "third migration" this shift is seen more towards Asia- away from Europe, US and a large number of small suppliers who were "Quota rich" prior to 2005 and whose rising cost structures are increasingly precluding them from being able to compete.

A noteworthy feature of these emerging trends in international trade is that the developed countries even though exiting from direct manufacturing, continue to dominate it by controlling the retail end of the supply chain.

The cost and price structure globally is being characterized by higher potential for profit from innovation, marketing, and retailing rather than production, assembly, finishing and packaging. Multiple store retailers are already selling 70% of the clothing in Western Europe and 85% in the US.

The developing countries on the other hand, are becoming manufacturing hubs for textile products, and are increasingly getting themselves integrated with the global market place

and offering capabilities not only in production capacities, but also in product development and efficient Supply Chain management.

Application of Technology

In this emerging scenario, wide spread application of technology is required not only to upgrade the quality of products, determine consumer choices, but also to overcome locational disadvantages and reduce overhead costs on unsold inventories.

The developed countries are already focusing on niche products like protective clothing, clothing for medical use by developing competitiveness in novel "nanotechnology" coatings, greater adoption of Product Life-cycle Management (PLM) Systems, in order to deliver new "fast fashion" paradigms, while at the same time remaining steadfastly committed to lower production costs.

The textile industry in the developed countries is also restructuring itself in a manner so as to take advantage of product innovation. Some of the products, now being developed are jackets that cool the wearers down, warm them up, and send out soothing vibrations, textiles with healing and caring properties and protection from harmful radiation. Intelligent Textiles, Smart Clothing are receiving unprecedented attention and are in the realm of possibilities.

Immense opportunities are also being seen in the entire gamut of Technical Textiles given the range and diversity of row material, processes, products and applications that they encompass. "Technical textiles" have been breaking new ground due to their cost effectiveness, durability, versatility, user friendliness, eco-properties. In fact, it is estimated that around 40% of all textiles made in Germany are now covered under the field of "Technical Textiles".

While the developed countries are seeking to upgrade their presence in the textiles and clothing sector by moving in to the field of technical textiles, the developing countries are equally concerned about the need to adapt themselves to the changing requirements of the

consumers and move up the value added supply chain by adopting innovative technologies and redefining the product mix.

Indian Textile Industry: Changing Profile

The Indian textile industry has embarked on an ambitious programme of modernization and technological upgradation in recent years to transform the textile sector from a state of low technology level to a producer of high technology products. Technological upgradation in India has resulted in: -

- A shift from commodity based trading to high value added fashion garments.
- Vertical integration and horizontal consolidation of production process leading to lowering of manufacturing costs.
- Improved productivity gains
- Efficient supply chain management
- Development of Economies of scale.

COTTON TEXTILE INDUSTRY IN KERALA

The textile industry in Kerala is the oldest and occupies a key position on the state economy development. The Malabar spinning and wearing company at Ponnanikkara in Calicut started in 1884. The second important textile exit setup in the state was quit on spinning mills. However some of the mills became silk units and were taken by national textile corporation.

The national textile corporation was incorporated in April 1986, with the main objective of ensuring continued employment to the result of closure and also for managing the over by the GOW. The Kerala state textile corporation was incorporated in 1972 with the objective or promoting textile industry and assisting mills. In Kerala there are 31 established textile and out of that in mills are owned by central and state Government, and business are private owned mills, out of that 7 mills are situated in Thrissur District. These mills are follows.

- Rajagopal Textile Ltd.
- Vanya Textile Ltd (lock out)
- Sitaram Textile Ltd (Govt. undertaking)
- Kerala Lakshmi Textile Ltd. (Central Govt. undertaking)
- Co-operate spinning mill Ltd. (Co-operation)
- Alagappa Textile Ltd (Central Govt. undertaking)

Throughout Kerala have a number of cotton textile mills. The raw materials, cotton is not widely cultivated here. It is obtained from other states or imported from outside India. The climate conditions of Kerala frequently change .So suitable arrangements are made in factories to mint the desires atmosphere conditions for the production of Jayns. A huge number of people get direct employment. More than 2000 workers are working in the different cotton textile mills in Kerala.

Textile industries in Kerala also suffer from many problems. As stated before high power cost. High raw materials cost, low technology etc. all applicable to textile mills in Kerala. Another major problem is in the form of modernization it is may be viewed from two aspect.

1. Insufficiency of fund for modernization

2. Modernization may involve installation of modern mechines

Machines which may bring a reduction in employment opportunities last. But not the least. The labour problems makes in Kerala then least proffered place for any industry.

SPINNING MILL UNDER THE TEXFED

.•Malappuram Co-operative Spinning Mill Ltd

- Malabar Co-operative textile, Kuttippuram
- Priyadharshini Co-operative Spinning mill, Kottayam
- Mala Co-operative Spinning Mill, Thrissur

- Cannanor Co-operative Spinning Mill, Kannur
- Thrissur Co-operative Spinning Mill, Thrissur
- Quilion Co-operative Spinning Mill, Kollam
- Alleppy Co-operative Spinning Mill, Kayamkulam.

CHAPTER 4

ANALYSIS OF WORKING AND MANAGEMENT OF ALLEPPEY CO-OPERATIVE SPINNING MILL, KAYAMKULAM

The Alleppey Co-operative Spinning Mills Limited was registered on 21 Jul 1981 to set up a Spinning Mills in Alleppey District with an ultimate capacity of 25000 Spindles and functioning under Department of Industries, Government of Kerala.

The Mill has commenced commercial production during October 1999 with 6048 Spindles which was increased by another 6048 Spindles on 15 Dec 2011.

Also a Hank Yarn Project was implemented in the Mills to make available the Hank Yarn to the Hand loom Weavers at reasonable price.

The Alleppey Co-operative Spinning Mills producing both Carded and Combed Yarn from 40s to 100s Count in Cone, Hank and Doubled form.

During 2015 the mill is identified for rehabilitation , modernization and expansion project by the assistance of National Co-operative Development Corporation and Govt. of Kerala.

Total cost of project was 33.9426 crores and during Feb 2020, the project was completed and the spindle capacity is increased to 25,200 by installling state of the art technology machines. Now the mill is able to produce best quality yarn in combed and carded, single and doubled form.

In order study the working and management various secondary data used.

PRODUCTION PROCESS OF YARN

Raw Material

Polyester and cotton is the main raw material required for the production of the yarn.

Mixing

Mixing is the first stage of production process. Standardization is the main aim of mixing. It is the process of mixing polyester and cotton in the standard proportion.

Blow Room

Blow machine clean the cotton generally 5 to 7%

Carding

The lab from the blow room is spread to the feed roller of the carding machine. In this stage the material are opened. The materials are passed the right point of the flat as result of the long fiber is made and this taken in a cylinder by the action machine.

Drawing

It is the process of converting thin silver into thinner silver after making some twister process.

Simplex

The main activity undergone here is reducing the weight by using raving machine.

Spinning

It is the main process in the production of yarn. It is the process of drawing out and twisting fibers to join them correctly.

Winding In the winding process to 50-60 yarn spindles is transferred to 1.5kg.

Packing 40 cones are packed in each bag. It is done only in first shift.

Yarn Production Kerala

Yarn Production Kerala data was reported at 20.219 kgmn in 2017. This records a decrease from the previous number of 24.650 kg mn for 2016. Yarn Production data is updated yearly, averaging 26.585 kgmn from Mar 1999 to 2017, with 19 observations. The data reached an all-time high of 33.687 kgmn in 2001 and a record low of 20.219 kg mn in

2017. Yarn Production Kerala data remains active status in CEIC and is reported by Office of the Textile Commissioner.

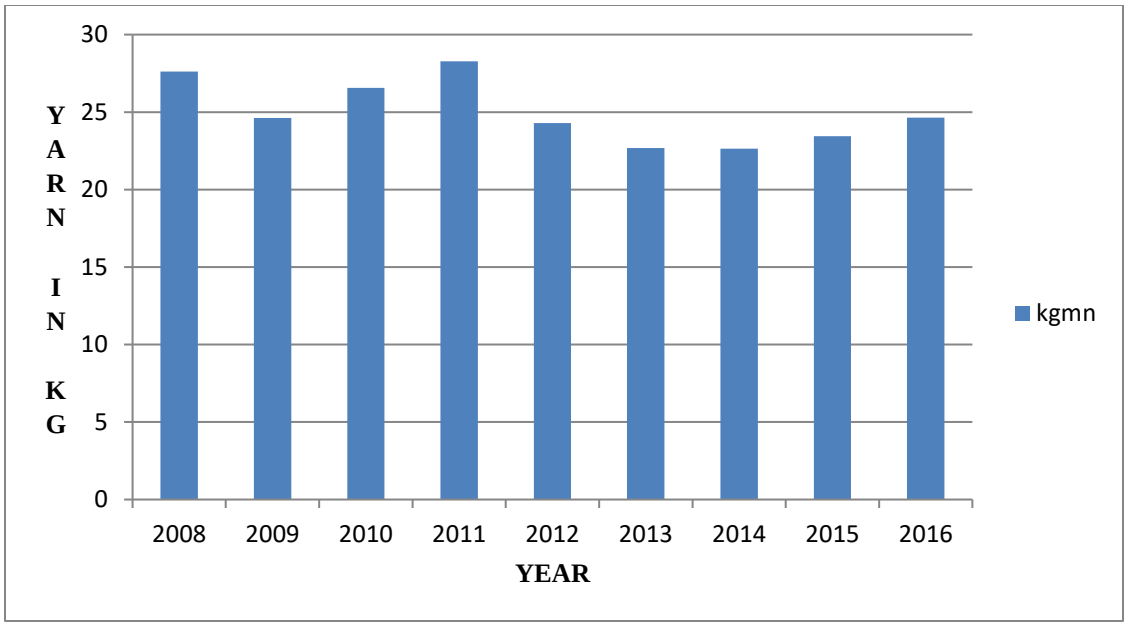
Table 4.1

Yarn Production: Kerala from 2008 to 2016

Year	Yarn (kg)
2008	27.621
2009	24.612
2010	26.568
2011	28.277
2012	24.289
2013	22.674
2014	22.630
2015	23.439
2016	24.650

Figure 4.1

Yarn Production: Kerala from 2008 to 2016



Textile Yarns

A textile yarn is a continuous strand of staple or filament fibers arranged in a form suitable for weaving, knitting, or other form of fabric assembly. Also, a yarn is a textile product of substantial length and relatively small cross-section consisting of fibers with twist and/or filaments without twist. The yarn can be twisted with one or more yarns to create added value or aesthetics. Traditionally, yarns have been constructed of fibers of finite length called staple fibers.

Filament yarns tend to be smoother, more lustrous, more uniform, harsher, and less absorbent. Spun yarns have a hairy surface, are more uneven in appearance, have lower luster, are softer, and more absorbent. Spun yarn is the yarn of choice in many woven and knitted fabric products. The short fibers can be natural fibers such as cotton where the fiber grows in short lengths. But they can also be synthetic fibers such as polyester that are manufactured in a continuous length and then cut into shorter staple lengths

Ring Spun Yarns

The processing of a cotton ring spun yarn must go through a carding machine. If it is desired, the fiber may also be combed which would be in addition to the carding. A carded cotton ring spun yarn begins with a bale lay-down. There are multiple bales in the lay-downs. A lay-down is a grouping of bales of fiber based on fiber properties to meet the specifications of a particular yarn. Each lay-down feeds into a series of opening and cleaning equipment.

Bales are then placed in an individual lay-down according to fiber strength, fiber length, fiber micronaire (thickness of the cotton fiber), and color. Cotton from different growth regions may be in different laydowns or in the same lay-down. A lay-down of cotton fibers would be in a separate area from a lay-down of another fiber type such as polyester. Small tufts of fibers are plucked from the bales by a top-feeder which automatically moves up and down the lay-down. The bales are normally computer selected so that lay-downs are controlled according to important properties of the fibers assuring consistency from lay-down to lay-down. The fiber tufts are then processed through various types of opening and cleaning machinery in order to open or separate the fibers which also aids in cleaning or removal of trash particles mixed in with the fiber. The trash is composed of cotton plant materials such as leaf trash and seed hull fragments.

Carded Ring Spun Yarn

The carding machine has a chute feed which delivers a thick mat or blanket of fibers to rotating wire-covered cylinders that separate individual fibers to create total fiber opening. Most small particles of trash that are left in the fibers and neps (small entanglements of fibers) will get removed at carding. The card wires will form a thin layer of fibers which looks like a spider web. The action of the carding surfaces helps to align the fibers. The card web gets condensed at the front or delivery end of the carding machine to form what is called a sliver. The strand of sliver will be placed into a large cylindrical can and transported to the next process .It must be remembered that all fibers are carded whether cotton or cotton blends, including fibers that go into combed yarns.

Carded sliver is then transported to the drawing process where multiple cans of sliver are placed behind the drawing machine. The multiple ends of sliver are fed simultaneously through a set of progressively faster rotating rollers which aids in better fiber alignment and improved blending . A 100% cotton blend would have all slivers of cotton. If desired, slivers of different fiber type can be blended at drawing to produce a fiber blend referred to as a draw blend. if three cotton slivers were blended with three polyester slivers, the result would be a 50/50 cotton/polyester blend in the delivered sliver. Draw blends are used when shade variation in dyeing will not be as critical and also when forming a fiber blend for heather yarns. Sliver blending is more productive than fiber blending.

Combed ring spun yarns

When processing combed ring spun yarns, some additional processes must be included. After card slivers go through one drawing step, lap winders wind multiple ends of sliver in a parallel arrangement onto a spool or package called a comber lap. Laps are in turn placed onto the combing machines. Combing is a value added process and will make various improvements to the sliver quality. It removes short fibers, neps, and any remaining small trash particles while parallelizing the fibers. Thus the resulting yarn will contain longer fibers, fewer neps, and be cleaner. Improved fiber alignment will lead to more uniform yarns. Combed fibers are mainly used in ring 10 spun yarns. Combing allows the spinning of finer counts of yarn that cannot be spun with just carded fiber.

Table 4.2

Carded and Combed Ring Spun Yarn Comparison

	Carded	**Combed**
Staple length	Shorter	Longer
Evenness	Less even	Even
Neps	More	Less
Traps	More	Less
Fiber orientation	Less	More
Strength	Lower	Finer
Range of count	Coarser	Smoother
Yarn surface	Hairy	Thinner
Diameter	Thicker	Higher
Luster	Less	More
Processing costs	less	More

Data source:secondary data

Spinning

Spinning in textiles, process of drawing out fibres from a mass and twisting them together to form a continuous thread or yarn. In man-made fibre production the name is applied to the extrusion of a solution to form a fibre, a process similar to the method by which silkworms and similar insect larvae produce filament to make their cocoons from a viscous fluid that they secrete.

Spinning calculations

The production is usually calculated in the units of weight/time or length/time i.e oz/hr, lb/shift, yd/hr, Hk/day etc. The most commonly used unit of time for production calculation is hour.

Count

Count is the measure of fineness or coarseness of yarn.

Systems of Count Measurement

There are two systems for the measurement of count.

1) Direct System
2) Indirect System

Direct System It is used for the measurement of weight per unit length of yarn. When count increases, fineness decreases. (count↑ fineness↓) Commonly used units in this system of measurement are:

1) Tex (1 Tex = 1g/ 1000m)
2) Grex (1 Grex = 1g/ 10,000m)
3) Denier (1 Denier = 1g/ 9000m)

Indirect System used for the measurement of length per unit weight of yarn. When count increases, fineness increases. (count↑ fineness↑) Commonly used subsystems of indiret system are:

1) English System (1 Ne = 1 Hank/ lb)
2) Metric System (1 Nm = 1 Km/ kg)

For cotton yarn, length of 1 Hank = 840 yards

Table 4.3

Basic conversions

Length	Weight	Time
1 in = 2.54 cm	1 lb = 7000 g	1 min = 60 se
1 yd = 36 in	1 lb = 16 oz	1 hr = 60 min
1 m = 1.0936 yd	1 oz = 437.5 gr	1 shift = 8 hr
1 Hk = 840 yd	1 kg = 2.2046 lb	1 day = 24 hr
1 Hk = 7 leas	1 bag = 100 lb	1 day = 3 shifts

Data source : Secondary data .

Table 4.4

Count Conversion Table

	Ne	**Nm**	**Tex**	**Grex**	**Denier**
Ne =	1 x Ne	0.5905 x Nm	590.5 /Tex	5905 /Grex	5315 /Den
Nm =	1.693xNe	1 x Nm	1000 /Tex	10,000/Grex	9000 /Den
Tex =	590.5 /Ne	1000 /Nm	1 x Tex	0.1 x Grex	0.111 x Den
Grex =	5905 /Ne	10,000 /Nm	10 x Tex	1 x Grex	1.111 x Den
Denier =	5315 /Ne	9000 /Nm	9 x Tex	0.9 x Grex	1 x Den

Data source : Secondary data.

tex – linear mass density of fibre'

grex – numerical system for measuring the size if fibre'

denier – a unit of measure for the linear mass density of fibre'

tpi - twist per inch'

tm - twist multiplier'

Production calculations

Production

The output of a m/c per unit time is called its production. The production is usually calculated in the units of weight/time or length/time e g, oz/hr, lb/shift, yd/hr, H k/day. The most commonly used unit of time for production calculation is hour. So if the unit is not mentioned, it is understood to be a production/hr.

Efficiency

It is the ability of a material to perform its task. In other words, it is the ratio of the output of a m/c to the input of that m/c.

Mathematically,

Efficiency = output /input

Its value ranges from 0→1. it has no units.

Efficiency Percentage

It is the percentage performance of a m/c.

Mathematically,

Efficiency = output / input 100

Its value ranges from 0→100. If the efficiency of a m/c is 0.8, its percentage efficiency 80. The word ‘percent’ means ‘per 100’ which suggests that the efficiency is 80 / 100

Cleaning Efficiency (%)

It is the ratio of the trash extracted to the total trash content in a material. For any m/c,

mathematically,

Cleaning eff. = trash in fed material - trash in del. Material/ trash in fed material

Beating action

The regular hard hits or strikes made by a rotating beater through a material (for its opening or cleaning) are known as beating action.

Beats per inch

The no. of beats made by a beater per inch of a material surface is known as beating action.

Mathematically,

Beats/inch = beater rpm x no. of arms / π x feed roller dia" x feed roller rpm

Twists per inch

Twist insertion & draft in a sliver gives roving and further twisting and drafting of roving gives yarn. So the no. of twists in one inch of yarn (or roving) is known as TPI (twists per inch).

Mathematically,

TPI = spindle speed (rpm) /Front roller delivery (in/min) Also, TPI √count TPI = TM x √count

Hank

The word ‘Hank’ is used in two ways. Literally, it is a unit of length,

1 Hank = 840 yard but practically, we take it as a unit of English count,

1 Hank = 840 yd/lb

2 Hank = 1680 yd/lb

Roller Speeds

In spinning calculations, we deal in two kinds of roller speeds, surface speed and rotating speed (rpm). So when the speed of a roller is mentioned without any units, this means that it is the rpm of the roller, e-g;

speed = 20 means

speed = 20 rpm

Spinning Technologies

Whether making carded ring spun yarn or combed ring spun yarn, the next step will be the production of roving. Roving is a strand of fibers lightly twisted together with a thickness similar to a pencil or pen. Drawn slivers are fed into the machine and bobbins of roving are delivered. Roving is the product that is fed into the ring spinning machine that follows the roving process.The rotation of the flyer and bobbin inserts a low level of twist into the roving, just enough to hold the roving together.

Ring spinning

In ring spinning, roving is fed through a series of rotating rollers which draft or reduce the roving thickness into the final yarn thickness which equates to the yarn count or yarn number . By adjusting the differential speed of the drafting rollers to reduce the linear mass, a range of yarn counts can be produced from the same roving.

The reduced mass of fibers is passed through a traveler which rotates around a stationary ring device. At the same time the bobbin of wound yarn is also rotating. The rotation of traveler and bobbin allows the necessary yarn twist to be inserted.

The rotational direction of the ring bobbin can be clockwise or counterclockwise to produce Z and S twist yarns. The twist will migrate from the traveler up to the nip of the front roller.

Since the spinning bobbin rotational speed is constant, the front drafting roller is slowed down to allow more twist insertion and speeded up to allow less twist insertion. Finer yarns require 13 more twist and therefore the production is lower while coarser yarns require less twist which promotes a higher productivity. That is why finer yarns tend to cost more compared to coarser yarns.

Table 4.5

Ring spinning production formula

Twist / Inch (TPI)	Spindle speed / FRS FRS – front roller surface speed in inches/mi
Spindle speed	m/min x TPI x 39.37
Hank delivered	spindle speed / (tpi x 62.89)
Ring Traveller speed in m/sec	(spindle speed x ring dia in mm x 3.14) / (60 x 1000)

Data source:secondary data

Table 4.6

Machine Data

Number of spindles – max. – min. – per section	 1824 288 48
Spindle gauge	70 mm
Ring diameter	36, 38, 40, 42, (45 mm up to 1 632 spindles)
Tube length	180 – 230 mm (up to 1 632 spindles) 180 – 210 mm (up to 1 824 spindles)
Machine width – over centre of spindle – doffer retracted – doffer extended	 660 mm 1 062 mm 1 380 mm

Data source:secondary data

Open end spun yarn

Open end spun yarn is produced with fewer processes and more automation compared to ring spinning. Therefore it is less labor intensive. The productivity is generally 8-10 times higher compared to ring spinning. Because no roving is necessary for open end spinning, typically single-processed or double-processed drawing sliver is fed into the machine. No separate winding operation is needed in open end spinning since the yarn packages are formed on the machine as the yarn is delivered from the rotor. Also, open end spun yarns offer better evenness and less skew than ring spun and air jet yarns.

The fibers are mostly parallel in the open end yarn core but are more randomly arranged on the yarn surface. There is also the presence of wrapper fibers which tend to be perpendicular to the yarn axis. The wrapper fibers are like a belt around the waist of the yarn. These wrapper fibers are very unique to open end yarn and make it easy to identify microscopically.

Wrapper fibers do not contribute to the yarn strength; therefore, the yarn is generally 15 to 20 per cent weaker than ring spun yarn. The wrapper fibers 16 also create a harsher hand than found in ring spun yarn. However, open end spun yarns are more uniform and exhibit less torque than ring spun.

The rate of feeding the sliver into the open end rotor controls the yarn count or size of the yarn produced. Thus different counts of yarn can be produced from the same size sliver by adjusting the speed of the feed roll. The combing roll has a wire covered surface to aid in separating the fibers from the sliver and introducing them to a tapered channel for transport to the rotor.

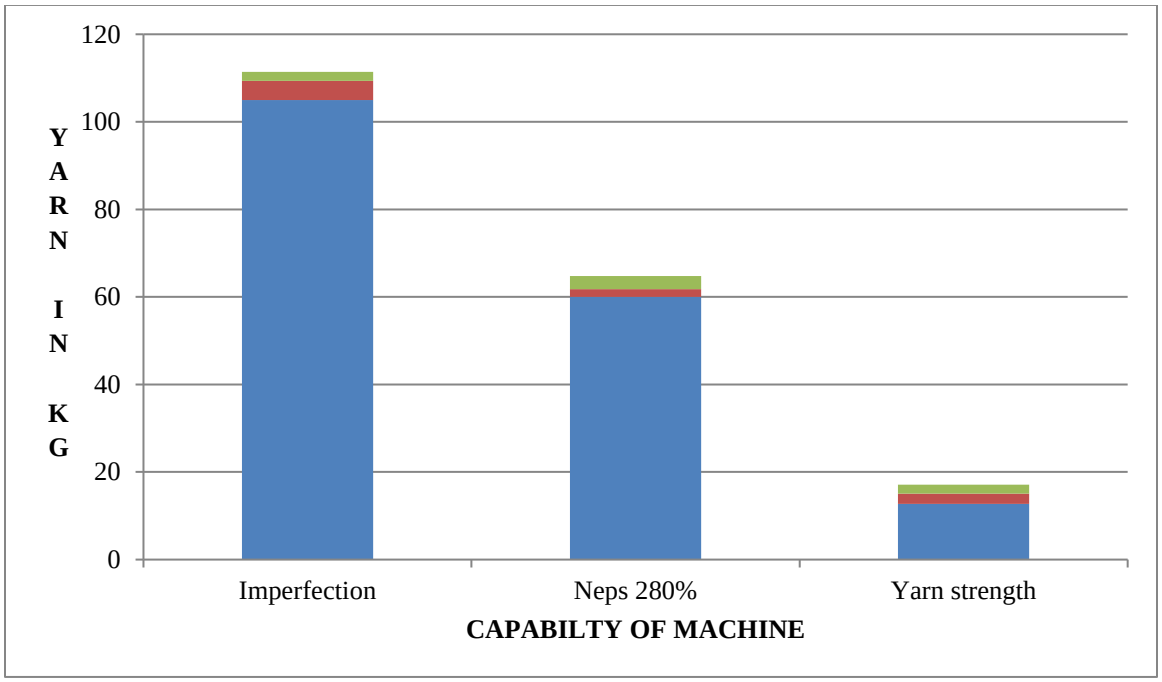
The rotation of the rotor stays constant while a delivery roller controls the rate of yarn delivery from the rotor. A slower delivery allows the rotor to turn more times which puts more twist in the yarn. A higher delivery speed would do the opposite. As in ring spinning, finer yarns need more twist and coarser yarns need less twist. After the yarn is formed, it travels through the navel which is located in the center of the rotor. The navel

can be easily changed to produce a more or less hairy yarn which affects the hand of the yarn and resulting fabric.

Navels can have high frictional surfaces or be smoother to enable the processing of different yarn characteristics. The rotors in open end spinning turn in a clockwise direction only and thus only Z twist can be inserted.

Figure 4.2

High Yarn strength, lower IPI and Neps



Data source:Secondary source

Ipi - imperfection index'

Neps - A nep can be defined as a small knot (or cluster) of entangled fibres consisting either entirely of fibres.'

Table 4.7

Machine data

Design	Double sided semi automatic rotor spinning machine with independent driven machine sides and with two separate package transport belt
Gauge	230 mm
Number of spinning units	20 per section; maximum 600 spinning units (30 sections)
Can diameter	Up to 400mm in two rows under the machine up to 500 mm (20") in three rows
Can height	915 mm (36"), 1 070 mm (42") and 1 200 mm (48")
Package size	Cylindrical package up to 320 mm or 4.5 kg Conical package 1°51 up to 320 mm or 4.2 kg
Waxing device	Online application of wax to the produced yarn, with individual drive on each spinning position
Piecing	AMI spin or AMI spi -Pro with front yarn entry and loop compensation
Yarn quality monitoring	yarn clearer Q 10 for monitoring yarn as well as piecing quality yarn clearer Q 20AF with optical foreign fiber detection
Rotor speed	With frequency converter 25 000 – 120 000 rpm
Delivery speed	Up to 200 m/min with full machine length (cyl. packages, up to 36° winding angle). Max. 180 m/min for conical packages

Data source:Secondary source

Air Jet Yarn

There are two types of air jet spinning technologies. These are MJS (Murata Jet Spinning) and MVS (Murata Vortex Spinning).

Conventional Air Jet Spinning (MJS)

Conventional air jet spinning is referred to as the MJS (Murata Jet Spinning) system since Murata, a Japanese company, is the only supplier of the technology .Air jet spinning also does not use the roving process and does not need a separate winding operation. The productivity is 20 to 22 times higher than ring spinning and approximately twice that of open end spinning.

Air jet spinning has automation similar to open end spinning. Conventional air jet spinning is restricted to the use of 100% manmade fibers and blends of cotton and manmade fibers. Yarns containing 100% cotton are too weak for normal end uses. Air jet yarns have a parallel core of fibers which are held together by a narrow band or ribbon of fibers that are spirally wrapped around the yarn surface.

The tightness of the wrapping of the ribbon fibers is controlled by an air nozzle. Tighter wrapping leads to stronger but stiffer yarn. These yarns have a reputation of producing less pilling in fabrics.

Vortex Spun Yarns (MVS)

The newest method of air jet spinning is known as vortex spinning or MVS. A vortex of highly rotating air flow is created by multiple air nozzles to form a yarn that has similar properties as ring spun yarn. This system of spinning is capable of producing 100% cotton yarns and cotton /synthetic blends compared to MJS. MVS imparts better fiber orientation thereby allowing 100% cotton to be used.

The fibers flow into the vortex area and flare out prior to moving through a narrow channel. The flared fibers form the outer spiral wrap of fibers that get twisted around the yarn core fibers, creating a ring-like hairiness. Any short fibers in the fiber mix will be vacuumed away and end up as spinning waste. The waste will be recycled into another form of yarn.

Table 4.8

Machine data

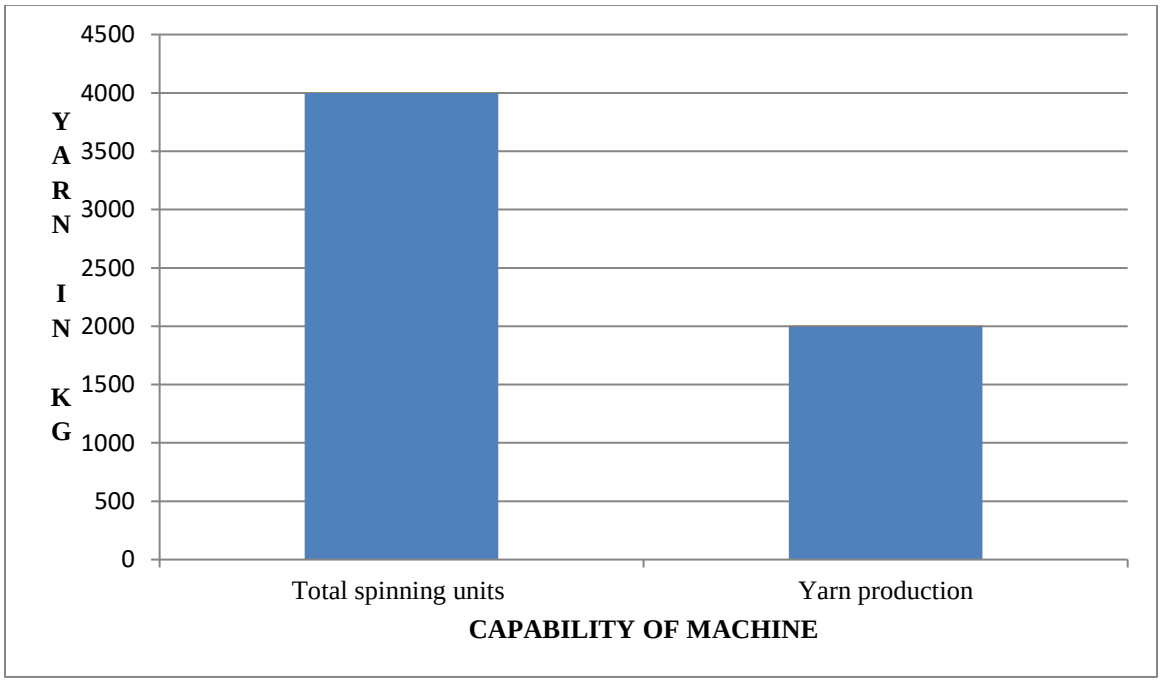
Total draft	mechanical 43 – 317 technological 170 – 220
Total yarn count	8.5 – 37 tex /Ne 16 – 70/Nm 27 – 116
Maximum delivery speed	500 m/min
Spin nozzle housing	spin nozzle housing for Z or S twist
Spin tip	0.9/1.0/1.2 mm ceramic spin tip for different yarn counts
Package format	cylindrical or conical 4°20*
Package dimension	cylindrical packages up to 300 mm in diameter and 4.5 kg conical packages 4°20* with up to 240 mm diameter
Tube loader capacity	max. 412 tubes (206 for each side)
Waxing device*	big wax blocks with 160 g, individually driven
Machine design	double-sided machine with sectional construction
Spinning unit gauge	260 mm

Data source:Secondary source

Figure 4.3

Production

High productivity in combination with other cost-saving concepts provides the lowest yarn manufacturing costs and highest margins for applications. With the same available floor space, as in the example of below figure, output of the machine is up to 108 percentage higher and production margins up to 128 percentage higher compared to other air-jet spinning machines.



Data source:Secondary source

Table 4.9

Comparison of Properties of Different Spinning Systems

Ring spun	Open end	MJS	MVS
Advantages 1. Strongest yarn 2. Finest yarn 3. Softest yarn 4. S and Z twist	**Advantages** 1. More even 2. High strength uniformity 3. Higher production rate 4. Fewer processes 5. Lower costs 6. Fewer imperfections	**Advantages** 1. Very high productivity 2. Fewer processes 3. Good evenness 4. Less pilling 5. Fewer imperfections 6. S and Z twist	**Advantages** 1. More ring-like 2. Lower hairiness 3. Dyes darker 4. Good hand 5. Highest productivity
Disadvantages 5. Lowest productivity 6. Most uneven 7. Most expensive 8. More hairy generally 9. More torqu	**Disadvantages** 7. Harsher hand 8. Not as strong 9. Limited count range 10. More abrasive 11. Z twist only	**Disadvantages** 6. Weaker yarn 7. Limited count range 8. Harsher and stiffer hand	**Disadvantages** 6. Lower elongation 7. More torque 8. More waste in spinning 9. Z twist only 10. Limited count range

Data source:Secondary source

Impact of COVID 19 on textile industry

Textile sector is highly unorganized sector. The government has initiated special measures to help ameliorate the conditions in textile sector due to COVID pandemic and to boost production, marketing and job opportunities in the sector.

The government has conducted a study viz. 'Impact of Covid-19 pandemic on Indian silk industry' to ascertain the crisis caused to the sector. The industry has faced various problems of production, cocoon and raw silk prices, transportation problem, non-availability of skilled workers, sale of raw silk and silk products, working capital and cash flow , reduced export/import orders, besides restrictions.

The last three month orders and supply as given below shows declining trend in jute production during the peak Covid-19 period which is substantially improving now.

Table 4.10

Increase in the production

Month	**Order**	**Supply by Mills**
June 2020	2.75 bales	1.78 bales
July 2020	3.59 bales	2.48 bales
August 20020	3.52 bales	2.32 bales

Data source:Secondary source

Government has conducted a Symposium with textile Export Promotion Councils and other industry stakeholders for finalizing a list of potential export products against which exports of textile and apparel can be enhanced. The list of potential export products were shared with the Indian Mission abroad for identification of potential buyers in the respective countries.

In order to make the textile sector competitive by rebating all taxes/levies in international market, the Government has decided to continue the RoSCTL (Rebate of State and Central Taxes and Levies) scheme until such time the RoSCTL scheme is merged with Remission of Duties and Taxes on Exported Products (RoDTEP) scheme. For this purpose, the Government has approved adhoc allocation of funds of Rs. 7398 crore for FY 2020-21 for issuance of duty credit scrips under RoSCTL scheme. Further, in order to boost exports in MMF sector, Government has removed anti-dumping duty on PTA (Purified Terephtallic Acid), a key raw material for the manufacture of MMF fibre and yarn. To mitigate the effect of the COVID-19 pandemic on trade, this Ministry has taken up the various trade facilitation related issues raised by the industry stakeholders from time to time with the concerned Ministries for early redressal.

A special measure to alleviate the difficulties of beneficiaries under Amended Technology Upgradation Funds (ATUFS) was initiated in the Ministry of Textiles during the COVID pandemic. Under this measure, an option has been extended to the applicants, where the physical examination of the machineries by Joint Inspection Team (JIT) has been completed, to avail their subsidies released on submission of Bank Guarantee. The advance release of subsidy against bank guarantee is met from the regular budget allocation under ATUFS.

The Government of India has also announced a special economic package viz**.** Aatma Nirbhar Bharat Abhiyaan for boosting economy of the country and making India self-reliant. Relief and credit support measures have been announced for various sectors. The weavers & artisans can avail benefits of these relief and credit support measures to revive their businesses which have suffered due to lock down necessitated by Covid-19 pandemic.

Apart from the above special economic package, the Ministry of Textiles has taken following initiatives for the benefits of handloom weavers and artisans across the country: -

i. To support the handloom and handicraft sectors and to enable wider market for handloom weavers/artisans/producers, steps have been taken to on-board weavers/artisans on Government e-Market place (GeM) to enable them to sell their products directly to various Government Departments and organizations.

ii. To promote e-marketing of handloom products, a policy frame work was designed and under which any willing e-commerce platform with good track record can participate in online marketing of handloom products. Accordingly, 23 e-commerce entities have been engaged for on-line marketing of handloom products.

iii. A social media campaign #Vocal4handmade was launched on the 6th National Handloom Day by the Government, in partnership with all stakeholders, to promote the handloom legacy of India and to ensure people's support for the weaving community. It has been reported that the social media campaign has resulted in renewed interest of the Indian public in handlooms and several e-commerce players have reported increase in sale of Indian handloom products.

iv. The Ministry of Textiles has requested the Chief Ministers of all States and UTs to instruct their State Handloom Corporations/Co-operatives/Agencies to make purchases of the finished inventory available with the handloom weavers/artisans so as to put some ready cash in the hands of the weavers to enable them meet their household needs.

v. In the face of the unprecedented Covid-19 pandemic, it is not feasible to hold conventional marketing events such as exhibitions, melas, etc. To deal with this crisis, the Government endeavors to provide online marketing opportunities to our weavers and handloom producers.

vi. Taking a step towards realizing "Aatma Nirbhar Bharat", the vision of our Hon'ble Prime Minister, Handloom Export Promotion Council has endeavored to virtually

connect the Handloom Weavers and exportersfrom different corners of the country with the International Market.

With more than 200 participants from different regions of the country showcasing their products with unique designs and skills, THE INDIAN TEXTILE SOURCING FAIR was organized on 7, 10 and 11th August 2020. The show has attracted considerable attention of the International Buyers.

vi. Design Resource Centres are being set up in Weavers Service Centres (WSCs) through NIFT with the objective to build and create design-oriented excellence in the Handloom Sector and to facilitate weavers, exporters, manufacturers and designers for creating new designs.

vii. Apart from the above initiatives, Ministry of Textiles is implementing various schemes through the Offices of Development Commissioner (Handlooms) for overall development of handlooms and welfare of handloom weavers across the country. The Scheme details are as under: -

- National Handloom Development Programme (NHDP)
- Comprehensive Handloom Cluster Development Scheme (CHCDS)
- Handloom Weavers' Comprehensive Welfare Scheme (HWCWS)
- Yarn Supply Scheme (YSS)

Under the above schemes, financial assistance is provided for raw materials, purchase of looms and accessories, design innovation, product diversification infrastructure development, skill upgradation, lighting units, marketing of handloom products and loan at concessional rates.

CHAPTER 5

SUMMARY AND CONCLUSION

This chapter presents the summary and conclusion regarding the study we have conducted on the "Working And Management Of Manufacturing Sector: A Case Study In Alleppy Co-operative Mill Ltd. kayamkulam". In order to study the working and the management of spinning mill various secondary data is used.

The first chapter was an introduction to the study of Cotton Textile Industry in India. Review of Literature is dealt in the second chapter. The third chapter dealt with Textile Industry In India An Overview.The fourth chapter dealt with An Analysis of Working and Management of Spinning mill:A case study of Alleppy co-operative mill Ltd.kayamkulam.

The study shows that the mill is able to produce the best quality carded and combed yarn from 40s to100s count in cone, Hank, and doubled form.The processing cost carded is less than the combed yarn. The production of Yarn in Kerala from 2008-2016shows that year 2011 having high production of yarn.

Various technologies were used in a spinning mill to enhance production and to produce good quality yarns.Studies shows that conventional air jet spinning and vortex spun yarn has high productivity than Ring spun.Covid-19also affect the working and management of spinning mill and has faced various problem of production, lack of availability of raw materials, transportation, non availability of skilled labour, reduced export order etc.The supply of yarn production shows a declining trend during the peak of covid -19which is substantially improving now

Policy Suggestions

1)It is suggested to provide more incentives to the workers due to the covidpandemic

2) Reduction of transportation cost to increase production

3) Estimate the volume of goods to be handled in future

4) Reusable technologies to support standard business process

5)It is suggested to maintaining profitability and growth by developing and introducing new product

6)The company should use non-renewable energy resources like solar panel which reduces the electricity charges, which is one of the main charges which is incurred in production

7)It is suggested to give technical guidance and advice

8) Electricity should be supplied at concessional rates to the powerloom sector.

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