TEXTILE INDUSTRY:WORK PRACTICES IN ORGANIZED AND DECENTRALIZED SECTOR.

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Abstract

The Terry towel sector is one of the important sectors of the Indian economy both in terms of its spread over the economy and its contribution to the generation of income, employment and foreign exchange earnings. The sector is sub-divided into two parts – organised sector and unorganised sector. These two sectors differ significantly in terms of gross value of output, employment generation and use of latest technologies etc. The textile segment is highly fragmented and many large textile companies are also conglomerates of medium-sized mills. This paper focused on work practices and energy consumption for terry towel in solapur cluster. Solapur is renowned for towels and bed sheets. The products manufactured in Solapur Textile Cluster units has domestic and export market. The products are also exported to various European and Gulf countries. Textile industry is one of the oldest and the most widespread in Solapur. The textile industries in Solapur produce cotton yarn and process yarn for doubling, dyeing, warping, and weaving by power looms. But in a World that is fast losing its traditional boundaries and borders are becoming invisible, there is need to bring about technological improvement and structural changes.

Introduction

About the solapur textile cluster

The products manufactured in Solapur Textile Cluster are cotton terry towels and bed sheets. The towels and bed sheets are renowned in the country and have good market in India. The main raw material for the units is cotton yarn, which is procured from local spinning mills and agents. The cost of energy (electrical and thermal energy) as percentage of manufacturing cost varies between 8 and 10%. Majority of the cluster units are of integrated type, where the raw material yarn is processed in-house to the final product. The energy cost is second to the raw materials cost. Majority of the units in the cluster are dependent on local/ run of the mill technologies of low end and with little investment initiatives and technology up-gradation. The main energy forms used in the cluster units are grid electricity, wood, and small quantity of coal. The electricity is used for power looms, doubling machines, winding machines, hydro extractors, warping machines and lighting. Wood is used as fuel for boilers, thermic fluid heaters, and chul has for hot water generation. The details of annual energy consumption of a typical unit having a production capacity of 1, 20,000 kg of final product of the cluster are furnished in the Table below:

Table 1 Details of annual energy consumption of a typical unit

Sr. No.	Parameter	Unit	Value
1	Electricity consumption	kWh/annum	1,97,784
2	Wood consumption	tonne/annum	144
3	Production	kg/annum	1,20,000

Production process

The main operational process for production of towels and bed sheets in cluster units are:

Doubling

In the Doubling process, thin single yarn is converted to double yarn for strengthening the
yarn by using doubling machine.

Yarn dyeing

Initially, the yarn is soaked in soap water for 24 hours to remove the dirt and other foreignmaterials and after soaking, the yarn is taken for bleaching. Bleaching is carried out bysoaking the yarn in tanks mixed with bleaching agents and after completion of the process;the yarn is washed with normal water.The hang dyeing machine tanks are filled with required quantity of normal water andrequired chemicals and dyeing agents are added. The temperature of the water is raised byoil circulation or direct steam injection. Fire wood is used as fuel. The required colors areadded to the yarn and the dyeing process takes about 90 to 120 minutes per batch. Afterdyeing, the yarn is washed with normal water, and the yarn is taken for soaping for colourfixation in hot water for about 20 minutes in hang dyeing machines. The water is drained tothe waste drainage lines. The wet yarn is taken to hydro extractors for removing the water inthe yarn and taken for drying in the natural sunlight.

Winding

The yarn after drying is taken for winding in which the yarn is wounded to bobbins andcones. The winded yarn is taken for further process.

Warping

In warping, the winded yarn is wound to beams according to designed pattern (customizeddesigns). Then the beams are taken for Weaving.

Weaving

The beams, which are wound with yarn are taken and placed in power looms where thedesigned pattern is already set. In power looms, the yarn is converted to final product (Towelor bed sheets) by weaving. The product obtained from weaving is taken for stitching andpacking.

Work Practices at Decentralized sector.

Energy performance in cluster

Majority of the industries located in solapur are engaged in manufacturing of towels and bedsheets. The main energy sources for Solapur cluster units are electricity and fuels such as Wood & briquettes. The wood and GN husk

briquettes are used as fuel for boilers, thermic fluid heaters and chulhas for hot water generation and electricity is used for operation of prime movers of doubling machine motors, ID & FD fans, pumps, hank dyeing machine drives, power loom drives, winding machine motors, etc. Majority of the units in the Solapur textile cluster are using wood for thermal energy generation due to easy availability and economical point of view. Energy cost is around 8 to 10 percent of manufacturing cost in typical manufacturing unit, out of which the cost of electrical energy works out to 58 percent of the total energy cost and remaining accounts for thermal energy. In a typical textile manufacturing unit annual consumption of electrical energy and wood is1,97,784 kWh and 144 tonnes respectively for average production capacity of 1,20,000 kg of final product.

Specific energy consumption of final product

Specific electrical and thermal energy consumption in textile unit depends upon the final product manufactured in that unit. The electrical and thermal energy consumption of typical textile unit is 1.65 kWh per kg of final product and 1.20 kg of wood per kg of final product respectively (includes all colours dyeing in cold water, medium temperature water and high temperature water)

Description of existing equipment

During energy audit studies in various textile industries in Solapur textile cluster, it was observed that about 1200 power loom in Solapur Textile cluster. All power looms are of shuttle type and are too old. These power looms are used for weaving terry towels and bedsheets. In the present conventional shuttle looms, it is necessary to pass a shuttle weighing around half a kilogram through the warp shed to insert a length of weft yarn which weighs only few grams. The shuttle has to be accelerated rapidly at the starting of picking cycle and also to be decelerated, stopped abruptly at the opposite end. This process creates heavy noise and shock and consumes considerable energy. Beat-up is done by slay motion which again weighs a few hundred kilograms. The wear life of the picker and checking mechanism is also limited due to heavy shock. Due to the above reasons smooth sequence of weaving is disturbed which affects the maximum running speed and hence machine production. In multi Auto loom/Rapier Loom (8 Nos.)5colour weft insertion, Drop box motion is attached which is also further limits the speed of the machine. The small weft package in the shuttle requires frequent replenishments and for each loom stoppage there is a possibility of one defect. The probability of weft way fabric defects are high to the tune of 70% in shuttle looms. Even in automatic shuttle looms there is a chance of transfer failures and weft lashing in defects.

Role in process

The power looms are one of the most important equipment in producing of cotton terry towels and bed sheets. The power looms are used for weaving the dyed yarn to towels and bed sheets.

Baseline for existing equipment

Energy consumption for Power loom would depend on following:

• Load on Power loom
• Operational & maintenance practices

Design and operating parameter

Present conventional loom is operated for 12 hours in a day and average electricity consumption is 34 kWh per day (8.5 kWh per loom for four conventional looms) connected with 1 HP motor. The average production is 48 kg per day per machine. The power loom machines are operated in two shifts in a day.

Barriers for adoption of proposed equipment

The technology and innovations in SMEs are generally different from that of large firms. Technology in the SME sector has an increasingly complex or combinative character, most of the SMEs units in Solapur cluster are labour intensive and utilize local resources. The SME entrepreneurs are generally not willing to invest in state-or-art technology. Major barriers in the up-gradation of technology in the cluster are non-availability of technology; distrust on technology supplier, lack of awareness about energy efficiency among small and medium enterprises, prevents them from adoption of energy efficient technologies.

Technological Barriers

The major technical barriers that prevented the implementation of New Technology are

• Lack of awareness and information about the technology and its benefit
• Absence of local supplier
• Dependence on local equipment suppliers, whom doesn't have technical knowledge about looms and its proper installation

Financial Barrier

Implementation of latest technology requires much more investment per unit. Such investment is not commonly seen in the cluster units for energy efficiency improvement. Further, from the business perspective of SMEs, it is more viable, assured, and convenient to invest on project expansion for improving the production capacity or quality, rather than make piecemeal investment in retrofit and replace options for energy savings. In view of this and given the limited financial strength of the textile mills, it is evident that the owners would not like to take the risk and invest in energy efficiency measures. However, the financial attractiveness of the project activity may motivate the owners to move forward in taking up initiatives in energy conservation and efficiency.

Skilled manpower: The non-availability of skilled manpower having awareness about energy efficiency and related issues in the cluster is one of the major barriers. Lack of skilled manpower for operation and maintenance of the new technology is also one of the major barriers that prevented the implementation.

Other barrier (If any): The instability in for the products in national and international markets was also one of the major barriers for the adaptation of technology.

Factors of low productivity: There are Some important factors which can affect the productivity of textile SMEs :synchronization of management processes, weaving and dyeing, input process quality, HR policies for textile SMEs, process technology, labor behavior, use of scientific tools and techniques and systems deployment.

Work Practices in Organized Sector: Organized sector are more environment friendly. In unorganized sector, consumption of fuel is high in comparison to organized sector. However there may be chances that consumption of fuels for household activities are also recorded against fuel consumed for manufacturing purpose which run from houses, and it is difficult to bifurcate the consumptions for manufacturing activities of the enterprises.

Strength of Organized Terry Towel Sectors: The main and basic strength of organised terry towel sector is Up gradation of technology, due to adaptation of latest and new technology, the organised sector have created the brand name in terry towel at global market. This leads to increase the great responsibility for continuous production of best quality of terry towel. As we know "Great Powers Come with Great Responsibilities"

Another one is the good management activity which tends to provide the continuous labor force, providing the training for producing the good and skill full workers for production of best quality of terry towel. Management activities provide huge contribution in reduction of cost of production, by adopting the Optimum use concept. The optimum use a of man, machine, material and money is help to tremendous increase in the Quality, efficiency and production which directly make reduction in the cost of production. In organized terry towel sector they focus on man and machine allocation on the basis of operative efficiency of man, it will help to increase in production and quality of terry towel, Operative efficiency of person is measured and increase by arranging the training program for workers. The organized terry towel sector are also have main focus on the waste generation, the continuous focusing on work practices at department, to avoid the unnecessary generation of waste in department.

Economic Benefits for Organized Terry Towel Sector

Fuel saving: Fuel saving is possible by the implementation of the latest Technology and upgrading of old technology

Electricity saving: Huge saving in electric consumption per year.

Improvement in product quality: Latest Technology has significant impact in improving the quality of the Terrey Towel.

Increase in production: The Technology upgradetion increased in production is almost 2.5 to 3 times per loom.

Reduction in raw material consumption: Raw material consumption is reduces due to reduction in breakages of the yarn in shuttle
power loom.

Social Benefits

Improvement in working environment: An eliminates in Mechanical shock, Vibration and sound etc., this may less the breakdowns and working environment may improve**.**

Improvement in skill set of workers: The technology selected for the implementation is new and energy efficient. Implemented will create awareness among the workforce about energy saving.

Environmental benefit

Reduction in effluent generation

Reduction in GHG emission such as CO2, NOx, etc:

Conclusion

The rationalization of the fiscal duty structure would strengthen the organized sector particularly the composite sector which has intrinsic strength in terms of economies of scale, higher productivity, superior technology, integrated working, skilled workforce and has the capability to produce the superior quality of terry towels. In the competitive globalized scenario the resurrection of composite sector is of utmost importance if India has to emerge as a major player in the global textile market. Concentrated, coordinated and focused approach for integration and modernization is the need of the hour.

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