



Indian Cotton Textile Sector Network Report (Draft)

Scoping & Sustainability Analysis

Within the initiative

Sustainable Industrial Networks and Its applications on Micro
Regional Environmental Planning (SINET)



**Partner
Organizations**



Scoping & Sustainability analysis of the Cotton Textile Sector Network

The Textile Sector network included in the present study comprises of the following important links:

- Cotton farming and the labour employed therein
- Transportation of cotton from farm to market/industry
- Cotton ginning and spinning mills and the associated human resource
- Cotton seed oil industry
- Textile and dyeing industry

The following sections deal with the sustainability and unsustainability aspects of the cotton textile sector network

Economic Sustainability

- Cotton is one of the major cash crops grown in the country. In terms of global production, India is the third largest producer of cotton behind China and the United States. The total production of cotton in India increased from 2.67Mt (Million Tones) in 2001 – 02 to 4.57 Mt in 2006 – 07.
- Due to increase in the cotton production, the cotton export increased from 0.013 Mt in 2001-02 to 0.94 Mt in 2006 – 07. This in turn contributes towards the economy of the country.
- Organic farming: as organic cotton farming involves less production costs and generates higher incomes, farmers are less prone to become indebted. In addition, there are some indications that the risk of crop failure due to drought or pest damage is lower in organic cotton fields.
- In terms of the cotton output, over the last five decades, there has been an increase from 30 lakh bales (170 KG each) in 1950-51 to 177.90 lakh bales (170 KG each) in 1996-97 (Ministry of Textiles – Annual Report 04-05). The contribution therefore to the spinning mills, estimated at 75 % (Ministry of Textiles – Annual Report 04-05) of the total fibre consumed, is substantial.
- The number of cotton mills is also increasing thereby contributing towards the economy of the local community as well as the country.
- The waste coming out from the farming activities such as cotton stalks after harvesting can be used in board making and provides the opportunity for profit making for the grower on per hectare basis of cotton production.
- Cotton seeds come after the ginning activity which can be sent to the cotton seed oil mill where oil is extracted from the seed which is one of the important byproduct and

the waste from the mill after oil extraction known as seed oil cake can be used as cattle feed.

- Secondary business such as transportation business is one of the growing businesses in this network contributing towards the secondary employment generation and improvement in the economy of the local community.

Economic Unsustainability

- In 1998-99, it was estimated that the area under cotton cultivation in India was 92.87 lakh hectares (Ministry of Textiles – Annual Report 04-05). However, the area under cotton has been decreasing over the last few years and provisionally it is estimated that it is approximately 89.69 lakh hectares in 2004-05 due to some of the environmental as well as the social problems.
- Cotton being a cash crop finds favour with the farmers as it ensures high profits in case of a bumper crop. This prompts many small and medium sized farmers to take up cotton cultivation, irrespective of their monetary status, type of soil in their farms and the irrigation facilities available at their disposal. The prospects of a bumper crop earning them huge profits encourages the farmers to take huge loans from the banks or the private money lenders and engage in cotton cultivation. If things go as planned, the farmer is able to reap a good crop, repay his loans and earn a decent profit. But in most cases this does not happen and the cotton cultivating farmer possibly due to his lack of knowledge or due to lack of sufficient funds for carrying out the essential activities after sowing the cotton seed will result in poor crop yield and inferior quality of cotton which does not fetch him a high price in the market. The farmer is unable to repay his loan and what follows is a vicious cycle of numerous hardships faced by the debt ridden farmer which many times sadly culminates in the farmer committing suicide. Reports suggest that seventy per cent of small farmers have already lost their landholdings as collateral for loans they can never repay.
- The Minimum Support Prices (MSP) is announced by the government and the Cotton Corporation of India Ltd. (CCI) undertook massive MSP operations in all the cotton growing states. Most of the states have the private sector in cotton processing but in Maharashtra cooperative sector is one of the major sectors. In cooperative sector, the cotton is purchased by the federation office from all the cotton growers and later it is sold to the mills. But due to negligence by the federation office, cotton growers sometimes prefer to sell the cotton to the private sector where they can sell it directly to the mill owners and in some cases private mill owners offer better prices than the cotton federation.

Environmental Sustainability

- **Organic farming**

The average cotton yields in organic fields are 4-6% higher in the two years of observation, though this difference is statistically not significant.

Most of the interviewed organic farmers stated that the capacity of their soils to absorb and retain water has increased after conversion to organic management. Farmers reported that they need less rounds of irrigation and that the crops can sustain for longer periods of drought. Thus no external addition of pesticides is required and the yield of crop can be increased using the organic cotton.

- **Cotton seed oil mill**

Cotton seeds are the waste from the ginning operation and goes to the oil mill for taking out oil from the seed. The waste generated from the different operations in the oil mill are used as the raw material for the other processes or the cotton seed oil cake is used as a cattle feed, making this unit a clean unit.

Environmental Unsustainability

- **Cotton Yield**

The yield of cotton can get reduced due to following reasons

- Cotton crop is highly prone to pest and diseases such as Aphids, various types of bollworms, root rot, rust, bacterial blight, etc.
- Yield is proportional to irrigation as cotton is a water intensive crop
- Proper irrigation pattern is required to obtain a high crop yield
- Black cotton soil is the best soil for cotton production
- Proper pest control practice is vital for a good yield

Thus environment is the major factor which governs the cotton yield.

- **Bt Cotton**

Introduction of the transgenic variety of Bt cotton and the effects that have followed is another important aspect which needs careful scrutiny. The promoters of Bt cotton promised lucrative returns to the farmers who would cultivate the Bt cotton crop without giving them full information about the associated side effects that the genetically modified crop would have. Cattle deaths had been reported in areas where cattle grazed in harvested Bt cotton fields, women working in cotton fields have complained of rashes, and there were reports that mango trees did not flower.

There are many reports that cultivation of Bt cotton increased farmers' indebtedness in many regions of India because of high inputs costs, including cost of seeds that were comparatively high. Moreover, there was an abundance of spurious seeds in the market to cash on the craze that BT cotton generated during its initial introduction into the market and most farmers adopted the technology without any preparation for the complex management practices required to cultivate Bt cotton.

It has been claimed by many independent observers who have been studying the issue of Bt cotton and its effect on the farmers that the Bt technology was not need-driven but supply-driven and in many cases the government was also at fault as it promoted the cultivation of Bt cotton in rain fed areas knowing fully well that the crop would fail as the Bt cotton is known to succeed only in irrigated areas.

- **Water Pollution**

Large quantity of water is used at various stages of the cotton textile from Cotton farming to cotton finishing. Water gets polluted due to excess use of pesticides in the cotton farming. During rainy season these excess pesticides gets mixed with the surface water as well as the ground water causing the ill effects on the human health as well as the aquatic life. Large quantity of water is used in the finishing process of the cotton fabric and the waste coming out of these finishing industries pollutes the nearby water bodies.

- **Water management issue**

Water resources need to be protected from unsustainable use and pollution. Approximately 73% of cotton is produced in irrigated fields and only 27% under rain-fed conditions. Most irrigation systems in cotton production rely on the technique of flood irrigation – freshwater is drawn from source and transported to the place of its consumption. Losses of freshwater can occur through evaporation, seepage and poor water management.

Water losses can be drastically cut through good water management practices which are integral to the farming approach taken in the Fairtrade cotton standard including input of organic matter, crop rotation, and appropriate irrigation methods (if needed). In areas of water shortage, appropriate measures should be taken to improve water storage and collection systems.

- **Soil Pollution**

Soil in the cotton growing region and near by region is getting polluted because of the excessive use of the chemical pesticides resulting into the low yield. This can be avoided by using organic compost for growing the cotton.

- **Pollution due to Lint**

The pollution due to lint in the cotton ginning industry is very hazardous to health. Workers exposed to cotton dust laden environment generally become patients of byssinosis. Byssinosis, also called brown lung disease, is a chronic, asthma like narrowing of the airways that result from inhaling particles of cotton, flax, hemp, or jute. In the spinning operation also there is high amount of lint in the air and if worked in this condition unprotected, its dangerous to the health.

- **Air Pollution**

The transportation of the cotton from the farm to market/industry is usually done through the tractor trailer, truck that runs on diesel resulting in air pollution of the local region especially during the post harvest period. Transportation through bullock carts can be an environmental friendly option provided the market and the industry are located at close distances of each other.

Social sustainability

- One of the major sustainable issues with this network is the high employment generation capacity. From cotton farming to finishing, large numbers of workers are required which in turn leads to large scale employment generation.
- Living standards of the local community increases due to high employment generation
- In cooperative sector, the member farmers are given the training on the new emerging technologies in the cotton farming and they are provided with the new quality seeds.
- The mills have developed hospitals at the village level for their workers where the free health check up is done. They have also developed schools and gardens for the local community, which contributes towards the local infrastructure development.

Social Unsustainability

- The labour that is employed in the cotton farms usually comprises of the women folk of the farmer's family as well as the children especially during the sowing and harvest time, besides the male farmers. The women folk are burdened with doing the essential chores of the house as well as working in the fields which has a negative impact on their health. This is many times neglected as the family does not have money to provide for the medicines and the health of the women is neglected which could sometimes be fatal.

- The children drop out of schools as they have to lend a helping hand in their own fields or work as labors in the fields of the rich landlords to partly repay the debts of their fathers. The monetary constraints are another prime reason for the farmer's children dropping out of school. Besides, all the farm labors are also subjected to the harmful effects of pesticides that are sprayed on the cotton crop to protect it against the diseases and pests.
- Forced labor constitutes a violation of a fundamental international human right – freedom of employment – and often connected to caste or tribe, whereby illiterate workers are not aware of their rights.
- The dyeing procedure directly exposes workers to various dyes and chemicals used for bleaching, printing and finishing. Skin diseases, such as allergic contact dermatitis, irritant dermatitis and inflammation of mucous membranes, result from contact with dyes and chemicals, particularly acids, alkalies, oxidizing and reducing agents, detergents and solvents.

Thus, occupational health and safety issues should become a priority within the SMEs as they are the major contributors of cotton yarn to the other dependent industries further down the supply chain, compared to the few large cotton yarn producing industries. The ministry and the cotton industry associations such as Confederation of Indian Textile Industry (CITI) should intervene to ensure the occupational safety of the work force. They should realize that a stronger, healthier work force is the biggest asset of any nation wishing to take rapid strides towards development.

Conclusion

Thus it can be concluded that cotton textile sector has a great potential towards the economical, environmental and social sustainability of the network. Some of the positive aspects of this network can be summarized below:

- One of the major sources of employment generation,
- Increases the living standard of the local community
- Infrastructure development of the local community
- Increase in the production capacity of the cotton yield contributes towards the economy of the local community
- Some of the environmental friendly techniques for the cotton growing need to be developed and its awareness should be increased, which contributes towards the environmental sustainability

- Cotton seed oil can be promoted as it is one of the important byproduct of the cotton network, as it can be used for the bio-diesel production thus in turn limits on the energy dependency
- Some of the secondary business, such as transportation business is emerging from the network contributing towards the economy of local community.

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Asia Pro Eco Programme

Is a five years programme launched by European Union in 2002, The main target is to adopt policies, technologies, and practices that promote cleaner, more resource efficient, sustainable solutions to environmental problems in Asia. The programme provides support through grants to policy reinforcement, operational and practical dialogue, diagnostic studies, technology partnership and demonstration projects, in the field of environment. The programme supports non profit organizations from EU and Asia.

About SINET

The aim of sustainable industrial network and its application on micro regional environmental planning is to interpret and adapt an understanding of the natural system and apply it to the design of the man-made system, in order to achieve a pattern of industrialization that is not only more efficient, but which is intrinsically adjusted to the tolerances and characteristics of the natural system. An industrial system of this type will have built-in insurance against environmental surprises, because their underlying causes will have been eliminated at the design stage. A micro-region is a distinct territorial unit with clearly marked boundaries below the regional level, but above the village level. Micro-regional environmental planning attempts to coordinate the planning activities of the various actors within a limited territorial unit.

The project will look at analyzing and documenting various success and failure stories of industry networks from Sweden/Europe and India/Asia, and to ascertain their impacts on environment and sustainability aspects of the respective micro regions. Emphasis will also be placed on creating awareness on the influence of industry network (key economic activity) on the micro region's environmental and sustainability aspects.



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