Environmental Compliance in Textile Industry

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Globally, textile industry has been under increasing pressure to meet stringent social and environmental norms in international market. There has been rising awareness of global environmental and social problems, mainly accelerated by rising consumer pressure. Large international buyers have stipulated their own codes of corporate ethics and noncompliant suppliers are therefore being forced to reconsider these standards in their own operations.

This concept of so-called 'Corporate code of conduct' has become increasingly important. Therefore, we can understand how success of textile industry becomes connected to the increasingly important business concept of the 'Triple bottom line' in which business performance is measured not only in terms of profitability but also in terms of the environmental and social performance of the company.

Textile, with its unfathomable processes for reaching to its end product, has been one of the major contributors to this cause. The high visibility of environmental issues drives customers, investors and employees to pressure companies to go well beyond regulatory and legal compliance.

Table 1: Types of pollution occurred in textile unit

Type	Emission	Effects	Example
Air	Carbon dioxide	Greenhouse gases	Burning wood
Air	Toxic gases	poisoning of species	Burning rubber
Air	Smoke	Visibility loss	Tenter exhaust
Water	Heat	Fish stress	Power station effluent
Water	Color	Potability concerns	Dye house effluent
Water	Toxic Liquid	Poisoning aqueous species	Chemical plant effluent
Land	Salt	Plant growth stunted	Ice salt
Land	Toxic solids	Food chain poisoning	Agricultural chemical discharge
Land	Microbiological hazards	Disease or death	Manure discharge
Noise	Moderate HF & LF	physiological nuisances	Rock music
Noise	Loud HF	Deafness	Spinning frame
Noise	Loud LF	Building damages	Weaving shed
Visual	View obstruction	Aesthetic loss	Hoardings
Visual	Discarded garbage	Landfill overload	Textile waste
Visual	Smog	Limited visibility	Coal fires

Environmental and human safety barriers

Increased awareness of the need to protect the environment (air, water, soil, human life, animal and plant life, natural resources and ecosystems) is bringing changes to all areas of human activity. There are basically three issues under this concern:

- Environmental damage
- Consumer safety
- Worker safety

Environmental impact

The environmental impact is associated with the various textile manufacturing stages starting from cotton growing to finishing.

Whenever the disposal of waste occurs so as to impair or reduce the quantity and quality of environmental services pollution exist. Broadly environmental pollution can be classified in to four types: Air, Water, Noise and Land. Since there is such magnitude of pollution related with the manufacturing of textiles it has become a pre requisite to decide certain norms for textile industry.

The chemical contamination of growing cotton up to the weaving of textiles can be a health risk for farm and mill workers and consumers and for the environment as well. Hazards for the consumers are the allergies that may be triggered by textiles and the carcinogenic substances used in the processing of textiles. Workers are also affected during the growing of cotton and processing of textiles.

Spinning mill

Spinning can be broadly divided into three sections i.e. preparatory, spinning & post-spinning. Auto winder, ring doubler used in post spinning processes need not be taken into account for categorizing the mill from the view point of air pollution there is no liberation of fly, short fibers, etc and do not pollute air.

Draw frame, comber, and rotor spinning machine also do not cause any kind of pollution and hence the type of machinery used in this also need not be considered for the purpose of categorization. Air pollution is more in blow room and card. Air pollution takes in fly frame and ring frame departments also but to lesser extent.

Spinning mills use humidification system to control fly liberation and to provide congenial atmosphere to the work force. Hence, the type of machinery and level of modernization in spinning section, and the installation of humidification system automatic waste evacuation system in the mills are the factors to be considered for categorization of mills from the view point of air pollution.

Table 2: Guidelines for evaluation of the machinery and control system by SITRA

Machinery / system	**Scores**
Blow room	
With rotary air filter	20
With cellar and chimney	0
Card	
Enclosed and provided with suction points	25
Not enclosed, but provided with suction points	15
Not enclosed, and not provided with suction points	0
Fly frame	
Provide with OHTC	5
Not provide with OHTC	0

Ring frame	
Provide with OHTC*	10
Not provide with OHTC*	0
Humidification system	
Provided in preparatory and spinning	20
Provided only in spinning	10
Not provided	0
Automatic waste evacuation system	
Provided in blow room card and comber	20
*OHTC- over head traveler cleaner	

Table 3: Depending on scoring system mill can be evaluated as follow	
No. of scores	**Category of mill**
60 and below	A (Higher potential to pollute)
61 to 80	B (Medium potential to pollute)
81 and higher	C (Very little potential to pollute)

Weaving

Traditional or Modern weaving loom sheds have been notoriously known to produce such high levels viz 110 - 125 db which are harmful for the hearing of the workers.

Wet processing

The textile wet processing (dyeing and finishing) industry has traditionally generated large volumes of waste and been a large consumer of energy. As it may take 150 litres of water to produce, dye and finish one kilogram of finished textile, the industry has a high demand for water and serious effluent management issues to address.

Textile finishing also requires the input of a wide range of chemicals which, if not contained in the final product, becomes waste treatment & disposal problem. A large proportion of the environmental issues affecting the industry are related to the use and discharge of water. Washings from dyeing and rinsing operations may produce hot, alkaline, highly saline, odorous and highly colored effluent.

Other environmental issues requiring consideration are energy, chemical usage, storm water, solid wastes, and emissions to atmosphere, contaminated land, noise, hazardous materials, groundwater and other environmental issues particular to the location of a facility.

At the same time, more than 8,000 chemicals have been identified by the German textile industry to be in regular use for production and processing of textiles. Of these nearly 200 are hazardous, though some cannot be tested at all or the tests are too expensive.

While the impact of these chemicals has not been sufficiently investigated, the textile industry in developed countries, starting with Germany, has voluntarily started advocating ecolabels on textile products to enable consumers to buy ‘clean’ products.

An important aspect of some eco-labeling programmes is the ‘life cycle’ or ‘cradle to grave’ approach, which implies the consideration of the total environmental impact which a product generates from the stages of extraction of raw materials, to production, processing and packaging, through use to disposal. A number of schemes have been proposed in different countries for the textile sector, all of which are private and voluntary.

Ecolabels were considered in this sector to control the environmental damage from the growing of cotton to the finishing stages of textiles. The increase in demand, particularly in the developed countries, for natural fibres and consequent pressure on cotton producing countries to increase exports has resulted in a sense of urgency among developed countries to impose quality criteria through eco-labelling on their imports.

Prevention Methods and Proposals

In order to make significant changes in the wastes generated by textile and apparel manufacturing facilities, several preventative measures must be taken. To begin with, companies should begin to set improved regulations for the raw goods used in manufacturing. Reusable containers should be required, and the use of harmful substances should be limited.

Individuals should be employed by company and industry executives to research and develop new ways of producing goods using less harmful chemicals or wholly alternative treatments altogether. Simple improvements can be made by ensuring optimal settings of equipment and the optimal environment for the facility.

Additionally, organizations should take every step possible to reduce input amount by recycling as much as possible and by continually updating equipment. In order to achieve a new level of environmental responsibility, better training programs for employees must be established. The government needs to become more involved in assisting individual facilities and in the regulations set forth for the industry. Organizations should be encouraged to create ‘eco’ friendly goods.

Green Product Design

Green product design, also known as design for environment, design for eco-efficiency or sustainable product design, involves proactively addressing environmental considerations in the earliest stages of the product development process in order to minimize negative environmental impacts throughout the product's life cycle.

Green product design can encompass material selection, resource use, production requirements and planning for the final disposition (recycling, reuse, or disposal) of a product. It is not a stand-alone methodology but one that must be integrated with a company's existing product design so that environmental parameters can be balanced with traditional product attributes such as quality, cost, and functionality.

Green products can be made with fewer materials and can be designed to be more easily upgraded, disassembled, recycled, and reused than their conventional counterparts. Implementing green product design can provide numerous benefits to a company.

Fig.1: Framework for assessing industrial process

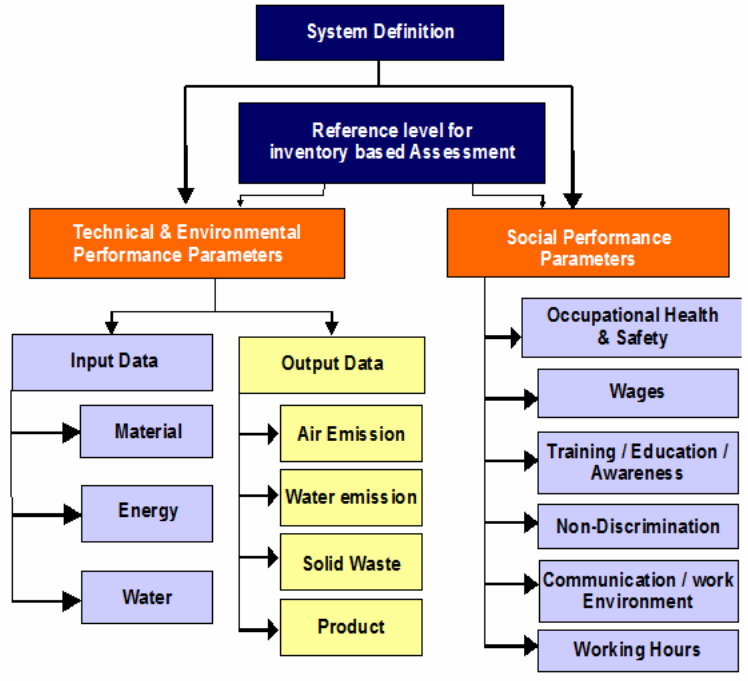
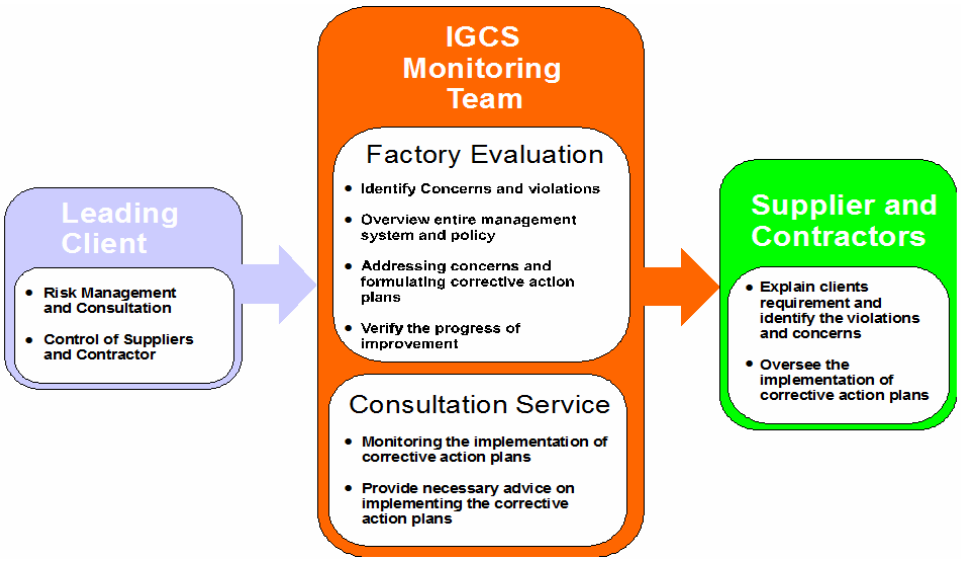


Fig.2. Auditing chart



Supplier Environmental Management

Many companies are beginning to 'green' their supply chain by working on environmental initiatives with their suppliers. Examples of supplier environmental management (SEM) include screening suppliers for environmental performance, setting purchasing standards to bar the purchase of products containing old growth wood or toxic substances like mercury, working collaboratively with suppliers on green design initiatives, and providing training and information to build suppliers' environmental management capacity.

Many companies that have undertaken SEM programs have found that working with suppliers on environmental issues not only generates significant environmental benefits, but also offers opportunities for cost containment and strategic and competitive advantage.

Among leading companies, SEM is gaining attention for a number of reasons. A growing number of companies realize that to achieve their environmental goals and satisfy stakeholders expectations, they need to look beyond their own facilities and involve their suppliers in environmental initiatives.

Leading companies also understand that customers and other stakeholders do not always differentiate between a company and its suppliers, and may hold companies accountable for suppliers' environmental and labor practices. In addition, many companies are working to streamline their supply base and develop more cooperative, long-term relationships with key suppliers, a practice that has fostered greater opportunities to work together on environmental issues.

Eco-labeling

Eco-labeling gives credibility to claims that products are better for the environment, cheaper to maintain, and cleaner to recycle than otherwise similar products or services. Firms that are willing to change manufacturing processes, use recycled content, or otherwise transform a product can benefit from this marketing scheme. Environmental standards allow for an assessment of a product's impact on such factors as air pollution, wildlife habitat, energy, natural resources, ozone depletion and global warming, and toxic contamination. A company can apply an eco-label to inform consumers that its product or service meets specific environmental standards. Ecolabels are primarily a method to provide information to the consumer of the environmental characteristics of the product. This in turn, it is hoped, will raise ther level of consumer's environmental consciousness and help them make a choice for an environmentally better product. An increased demand for environmentally labelled products will stimulate producers and manufacturers to provide more products with the label. This is therefore seen as a market driven tool to stimulate a large scale improvement in the environmental performance of products.

Environmental audit

It is a periodic, systematic and objective evaluation of a corporation's success in meeting enviro-objectives, requirements, standards and criteria. Usually, the audits measure the degree that a corporation operating entities conform to these criteria. Frequently, audit programs focus on the effectiveness of existing ‘management systems’ and the assurance of continued compliance with enviro-goals and objectives.

Audit criteria

These include:

- Applicable regulatory and permit requirements.
- Accepted good enviro-technology and management practices.
- Corporate sponsored environmental policies and compliance programs.

In summary environmental measures the enviro-performance of an operating facility.

Facility may include:

- Raw materials, chemicals, auxiliaries, in-product and finished products storage, transportation and handling facilities.
- Manufacturing and processing plants/mills.
- Waste treatment, disposal and recycle equipment.

Enviro-technology and business advantages of environmental audit

- Identifies problems and corrects deficiencies.
- Reduces pollution control boards (PSB) enforcements, actions, fines and lawsuits.
- Establishes performance baselines.
- Priorities and plans for future enviro-investment.
- Increase employee awareness of enviro-issues and responsibilities.
- Facilitates communication of enviro-management strategies, technological options and techniques.
- Creates good company image in society.

Typical operational actions

- To identify source of air pollution, water pollution and solid waste generates from mills and quantify/analyze effluents and social waste generated at various stages of processing and operation.
- To compile/circulate criteria and identifying specific hazardous wastes and toxic/TLV limit of raw materials, chemical and products.
- To analyze fuels used and survey ambient air quality, particularly for listed pollutants.
- To analyze ground water and soil samples.
- To review on site emergency plans.
- To ensure that statutory as well as company internal pollutants limits are well documented. And at specified periodicity, the actual data are obtained, compared with the limits and circulated to those conserved.

Plan strategies to be in place

- Maintaining an accurate source-emission data.
- Continuously identify solutions to reduce or eliminate pollutant discharges.
- Ensuring preventive maintenance programs are followed and insist on continuous housekeeping.
- All concerned to aware all the time of regulatory stipulations and amendments as and when required.
- Attending routinely to prevent pollution and control equipment.
- Continuously monitoring pollutants/waste discharges.

Effect of the environmental measures on the market:

As compared to developed countries, developing countries are more vulnerable to the adverse effects of environmental measures on market access and competitiveness. Various reasons have been identified.

Lack of infrastructural and monitoring facilities, limited technology choices, inadequate access to (and relatively more expensive) environmentally friendly raw materials and information are one set of reasons identified.

Secondly, small and medium enterprises (SMEs) face more formidable compliance costs and there is an increasing emergence of environmental standards of export interest to them. Thirdly, developing country enterprises lack the skill and technology required for exploiting the positive trading opportunities generated by environmental measures.

Fourthly, developing country exports are more vulnerable to market access barriers on account of their scale and sartorial composition. A connected problem is the diseconomies of scale on account of small domestic markets. Finally, while developed markets are more amenable to harmonization efforts, developing countries have widely differing environmental standards in accordance with their national priorities, rendering harmonization both difficult and inadvisable as compared to mutual recognition and equivalence.

Environmental Requirements and India's Exports

Environmental requirements cover a broad spectrum and include charges and taxes for environmental purposes, requirements relating to products including standards and technical regulations, and eco-labelling, packaging and recycling requirements for achieving environmental objectives. Such requirements have significant effects on market access of developing countries like India into markets that prescribe them.

These effects could be positive or negative. Positive effects, or opportunities, are not always easy to exploit and require expertise, technology and resources that may not always be available. Negative effects relate to expenditure incurred to adapt to new standards, etc. to acquire necessary technology and expertise, to non-availability of materials for meeting requirements (like packaging requirements) and the administrative apparatus required in exporting countries. Studies have identified many environmental requirements that need to be addressed for increasing India's export performance.

- Regulations on dyestuffs affect textile. For example, 20 azodyes are banned. Also the ban applied only to those textiles etc., which touch the skin. Since then, Germany has amended its standards five times, removing some of the azodyes from the banned category. However, the Indian law applies to all textiles and all azodyes even now.
- Presence of formaldehyde, glyoxal and PCP residues in cotton T-shirts led to denial of market access to exporters. According to some exporters, the reason for the ban is that some western companies have developed alternatives like Busan-30, which are 30 times costlier than PCP or equivalent chemicals or they had got patents on the new chemicals and had to create markets for them.
- The effect is more significant on SMEs, as cost of compliance could be prohibitive. SMEs found it prohibitive to shift from PCP to Busan-30, latter costing seven times the former. They also found it unviable to install effluent treatment plants in the tanneries sector and the Government had to come in to help.

Suggestions for Indian market

Clearly, environmental factors play an important role in India's effort to achieve rapid and sustained export growth. The way forward could be identification of sector specific examples of environmental requirements impacting export performance.

- Environmental requirements need to be addressed with a sense of urgency by the Indian Government and industry.
- Better policy choices.
- Increased awareness on the part of the business community and bilateral and multilateral initiatives.
- Generating new trading opportunities, either through niche markets for environmentally friendly products or through competitive advantage arising out of factor endowments.

If these issues are not addressed properly it may affect exports adversely. But by taking in to account different parameters it can create on overall a win-win situation.

Conclusion

The role of textile business is changing. It is no longer just about providing jobs, creating profits and paying taxes. The customers and co-workers expect more. They expect the industry to take an active role in influencing both social and environmental issues. It is good for business because the customers will feel reassured that they are doing business with a company, those shares their views and values. And it is good for business because it can also support cost efficiency. Using resources and raw material efficiently, saving energy, improving working conditions at our suppliers and through that getting more motivated people, will have a positive effect on costs and therefore support fundamental business objectives. Being successful with social & environmental work is not an easy thing. It takes a dedicated organisation. It takes clear goals, strategies, time plans and responsibilities. And above all, it takes a vision, business idea & values that clearly justify actions.

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