

Indian Cotton Textile Sector Network Report

Network Overview

Within the initiative

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



Partner
Organizations



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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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Content

Ideal Cotton Textile Network	4
Cotton farming.....	4
Ginning	5
Oil mills.....	5
Spinning	6
Weaving	6
Clothing	7
Composite Mills.....	7
Cotton Textile Network	8

Ideal Cotton Textile Network

Ideally the complete cotton network mainly involves the two major phases the first is the cotton farming and harvesting and the second phase involves the further treatments.

Cotton farming

Cotton growing season of approximately 150 to 180 days is one of the longest of any annually planted crop in the country. Since there is much variation in climate and soil, production practices differ from region to region. Planting begins in the month of March or April in different regions.

Planting is accomplished with 6, 8, 10 or 12-row precision planters that place the seed at a uniform depth and interval. Young cotton seedlings emerge from the soil within a week or two after planting, depending on temperature and moisture conditions. Squares, or flower buds, form a month to six weeks later and creamy to dark yellow blossoms appear in another three weeks. Pollen from the flower's stamen is carried to the stigma, thus pollinating the ovary. Over the next three days, the blossoms gradually turn pink and then dark red before falling off, leaving the tiny fertile ovary attached to the plant. It ripens and enlarges into a pod called a cotton boll. Individual cells on the surface of seeds start to elongate the day the red flower falls off (abscission), reaching a final length of over one inch during the first month after abscission. The fibers thicken for the next month, forming a hollow cotton fiber inside the watery boll. Bolls open 50 to 70 days after bloom, letting air in to dry the white, clean fiber and fluff it for harvest. The proper arrangement should be done for the weed control and insect management. There are variety of pesticides are available in the market for this purpose.

The cotton plant's root system is very efficient at seeking moisture and nutrients from the soil. From an economic standpoint, cotton's water use efficiency allows cotton to generate more revenue per gallon of water than any other major field crop. Most of the Indian cotton acreage is grown only on rain moisture. A trend toward supplemental irrigation to carry a field through drought has increased in acreage and helped stabilize yields. Cotton's peak need for water occurs during August, when it is most vulnerable to water stress. A limited supply of irrigation water is being stretched over many acres via the use of highly efficient irrigation methods such as low energy precision applications, sprinklers, and surge & drip irrigation.

While harvesting is one of the final steps in the production of cotton crops, it is one of the most important. The crop must be harvested before weather can damage or completely ruin its quality and reduce yield. Cotton can either be picked by hand or by machines. Manual picking is slow but

better preserves fiber characteristics of cotton. In India cotton harvesting is mostly done by the hand picking only because of the availability of the large man power.

The waste coming out of cotton farming is cotton stalks and leaves after harvesting. It was found that about 18 Million tones of cotton stalks are available in India. It can be used as the raw material for particle board manufacture. A Cotton plant stalk has the good fiber quality compared to the ply wood. It is branchy, bulky and difficult to transport. If used properly it gives the additional farm income. The rate for the cotton stalks are Rs. 500 per tones for cleaned stalks at farm gate and Rs. 1500 per tones for cleaned chipped cotton stalks. The cotton leaves can used for the bio manure preparation.

Cotton fiber coming out of farm undergoes several processes to reach the stage of final cloth which in turn forms the network. The processes are as mentioned below:

Ginning

Ginning is the method of separating the cotton fibers from the seedpods, and sometimes with the sticky seeds. This is done in the cotton field with the help of machines. Ginning is the process where cotton fiber is separated from the cotton seed. The first step in the ginning process is when the cotton is vacuumed into tubes that carry it to a dryer to reduce moisture and improve the fiber quality. Then it runs through cleaning equipment to remove leaf trash, sticks and other foreign matter. Ginning is accomplished by one of two methods. Cotton varieties with shorter staple or fiber length are ginned with **saw gins**. This process involves the use of circular saws that grip the fibers and pull them through narrow slots. The seeds are too large to pass through these openings, resulting in the fibers being pulled away from the seed. Long fiber cottons must be ginned in a **roller gin** because saw gins can damage their delicate fibers.

Oil mills

After being separated from the lint at the gin, the cotton's seed is transported to a cottonseed crushing mill. There it is cleaned and conveyed to delinting machines which, operating on the same principle as a gin, remove the remaining short fibers which are known as linters. The linters go through additional processing steps before being made into a wide variety of products ranging from mattress stuffing to photographic film and also currency grade paper, cellulose acetate, dissolving grade pulp etc.

After the linters are removed, the seed is put through a machine that employs a series of knives to loosen the hulls from the kernel. The seeds are then passed through shakers and beaters. The separated hulls are marketed for livestock feed or industrial products and the kernels are ready

for the extraction of oil, the seed's most valuable byproduct. Solvent extraction or presses remove the oil. After further processing, the oil is used in cooking or salad oil, shortening and margarine. Limited quantities also go into soaps, pharmaceuticals, cosmetics, textile finishes and other products.

The remaining meat of the kernel is converted into meal, the second most valuable by-product. High in protein, it is used in feed for all classes of livestock and poultry.

Cottonseed meal makes an excellent natural fertilizer for lawns, flower beds and gardens.

Spinning

Spinning is the succeeding step to ginning. This process involves the making of yarn from the cotton fiber to be used for weaving and knitting. The spinning involves the different process such as cleaning, carding, doubling, drafting, yarn making and finally conditioning of yarn. The cotton yarns are made of different thickness in this stage. Largely due to deregulation beginning in the mid-1980s, spinning is the most consolidated and technically efficient sector in India's textile industry.

Weaving

Weaving is the most important process in the making of cotton cloth. In this process, two yarns are placed to make warp and weft of a loom which successively turn them into a cloth. India's weaving and knitting sector remains highly fragmented, small-scale, and labor-intensive.

Fabric finishes and treatments

After weaving the cotton fabric passes through different processing stages till it reaches to the state of final product. The stages are mentioned below, but it is not necessary for the fabric to undergo all the process for e.g. grain bags cloth are used unbleached.

- **Singeing** - This process burns off the fibers sticking in the goods.
- **Desizing** - This process involves removing the size material from warp yarns in woven fabrics.
- **Scouring** - The cleaning part of the fabrics are involved in this process.
- **Bleaching** - The fabrics are bleached here to make it more whiter and lighter.
- **Mercerizing** - In this process, the fabric is immersed in alkali to make it more strong, shining, durable, shrink free and stretch free.
- **Dyeing** - This process involves the changing of the fabric color by the treatment with a dye.

- **Finishing** - In this process, the fabric is treated with some chemicals or other useful agents to make it qualitatively better, for e.g. cotton is made sun protected by treating it with UV protecting agent.

Clothing

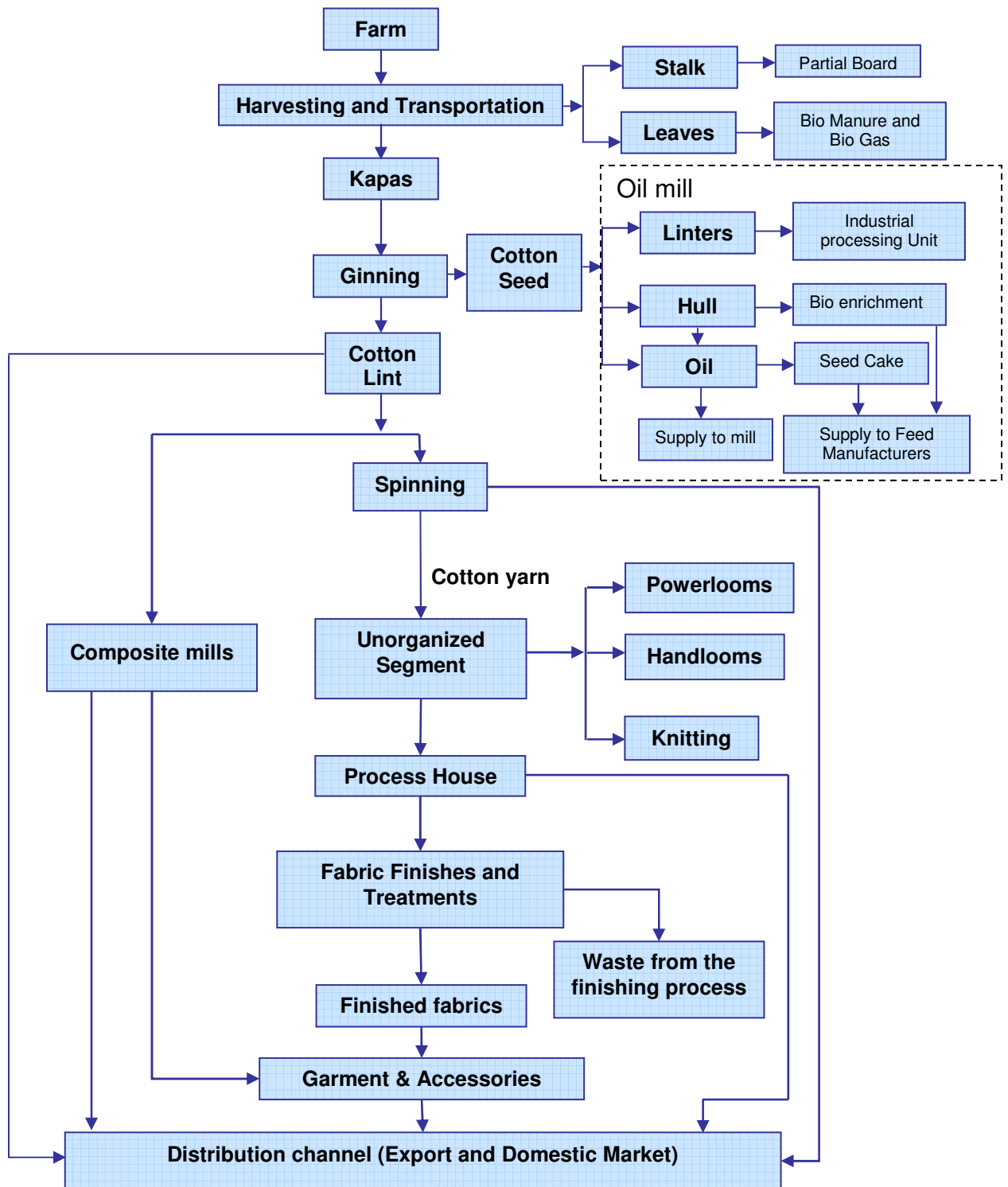
Apparel is produced by about 77,000 small-scale units classified as domestic manufacturers, manufacturer exporters, and fabricators (subcontractors).

Composite Mills

Relatively large-scale mills that integrate spinning, weaving and, sometimes, fabric finishing are common in other major textile-producing countries. In India, however, these types of mills now account for about only 3 percent of output in the textile sector. About 276 composite mills are now operating in India, most owned by the public sector and many deemed financially “sick.”

Thus the cotton textile network revolves round the cotton farm, primary production and ancillary units and secondary processing and ancillary units as mentioned earlier. And if maintained properly with the new upcoming technologies this network can be grown and can be made more sustainable.

Cotton Textile Network



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