

**PROJECT TITLE:**

**A Value Chain for Cotton Fibre , Seed and Stalks: An innovation for Higher Economic Returns to Farmers and Allied Stake Holders**

**PROJECT DETAILS:**

Date of Start : 15<sup>th</sup> December 2007

Likely date of Completion : 30<sup>th</sup> June 2012

**1. Name of the Component of the National Agricultural Innovation Project (NAIP):**

Research on production to consumption system (PCS) (Component2) of NAIP  
<http://www.naip.icar.org.in/>

**2. Consortium Leader and Consortium Partner**

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**3. Name and designation of the Consortium Principal Investigator:**

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#### 5. Objectives of the project.

- To grow established cotton genotypes in the adopted villages with integrated production technology practices.
- To reduce the level of contaminants in cotton by adopting appropriate on-farm and off-farm management practices and to label cotton bales with fibre attributes after appropriate ginning.
- To prepare yarn, fabrics and garments in the modern mill & marketing and to manufacture eco-friendly textiles in handloom sector by employing CIRCOT technology for bio-scouring and natural dyes.
- To ensure additional income to farmers and alternate raw material to industry by establishing cotton stalks supply scheme to board industries /briquetting
- To demonstrate innovative scientific processing of cotton seed for oil extraction and value addition to its by-products.

**6. Duration of the project** : 4 ½ years

#### 7. Operational area of the Project:

From cultivation, appropriate picking, ginning, yarn making, eco-friendly processing and dyeing ,garment making and marketing. Apart from this, Scientific processing of cotton seeds for efficient removal of linters and extraction of oil using enzymes pretreated kernels and cotton stalks as raw materials to board industries.

## 8. Main innovations in the project:

- Cotton cultivation with best management practices
- Adoption of on-farm and off-farm management practices for contamination free cotton
- Tagging of individual Bales with fibre attributes
- Bio-scouring of yarns and fabrics
- Removal of linters from enzyme pretreated seeds
- Enzymes pretreatment for kernels to realize enhanced oil recovery
- Enrichment of cottonseed hulls with proteins using microbial consortium for enhanced digestibility.
- Biological pretreatment of cotton stalk for seeding oyster mushrooms
- Establishment of cotton stalk supply chain to board industry
- Gossypol free protein from cottonseed kernel/cotton seed meal cake.

## 9. Expected Outputs:

### *Cotton Production*

- Good Quality seed cotton

- ❖ Ensuring certified seeds for sowing with integration of Best Crop Management practices are expected to result in at least 15% more yield with expected quality attributes. Farmers can get additional income to their produce and about 5%-10% premium for the quality.

### • Post Harvest Management

– Reduced level of contaminants in cotton

- ❖ The adoption of recommended on-farm and off-farm management practices will result in low levels of contaminants and trash (from present 4%-5% trash level to around 1%-2%).

– Better quality yarn

- ❖ Ensuring quality attributes to individual bales, spinning mills can adopt blending practices with desired end product quality and hence lot of time will be saved. This will result in yarn with expected quality.

### • Bio-scouring

– Eco-friendly pre-processing

- ❖ Ensuring bio-scouring in place of conventional chemical method will result in energy efficient pre-processing in Handloom sector. Pollution load will be minimal. It is energy efficient process. Low levels of pollutants in the effluent.

*Natural Dyes :*

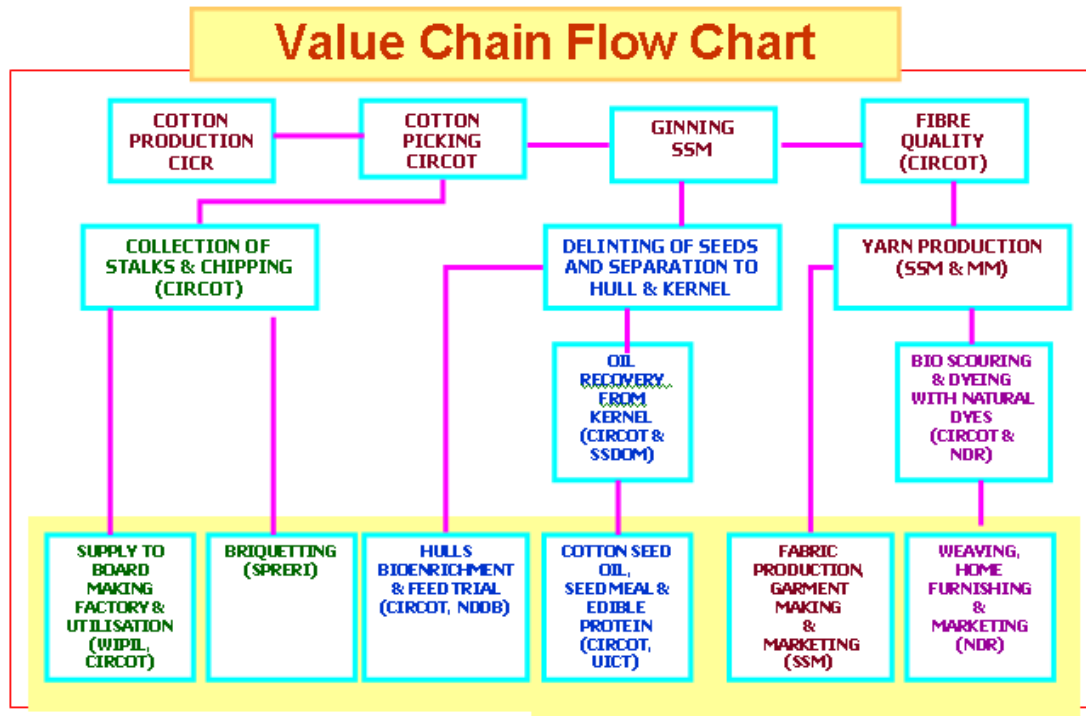
Bio-scoured yarn will be dyed with natural dyes, woven into fabric at Handloom sector and converted into suitable garments and marketed.

- Additional income to farmers
  - ❖ Farmers can get an additional income of Rs.500/-per tonne of stalks. Cleaning, chipping and transportation to board industry within a distance of 50 km can fetch the farmer Rs. 2000/- per tonne of chipped stalk.
- Additional raw material for board industry
- Energy efficient process for growing oyster mushroom
  - ❖ The initial pasteurization (80<sup>0</sup>C) of substrates is totally dispensed with due to the adoption of biological treatment at room temperature.

*Seed*

- Enhanced oil recovery
  - ❖ Even with 1% increase in oil recovery, one oil mill crushing cottonseeds at 100 tonnes per day can earn Rs. 9-10 lakhs per month additionally.
- Energy efficient process for mechanical delinting
  - ❖ It is expected to reduce the energy consumption by 20%.
- Bio-enriched cattle feed from hull
  - ❖ Enrichment of cottonseed hull with microbial protein with increased digestibility by solid state fermentation is an eco-friendly and energy efficient technique with no discharge of pollutants
- Edible protein from cottonseed kernel
  - ❖ Gossypol free protein from cottonseed kernels could go in food grade formulations.

## 10. Schematic Representation of the Project



11.

**Partners :** CIRCOT, CICR AND SSM

**Associates :** Mohota Mills Ltd. (MM), Natural Dye Resources (NDR), Sardar Patel Renewable Energy Research Institute (SPRERI), SSD Oil Mills Co. Ltd. (SSDOM), Western India Plywood Industries Ltd. (WIPIL), National Dairy Development Board (NDDB), University Institute of Chemical Technology (UICET)

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