

# **OPERATIONAL GUIDELINES OF CENTRAL SECTOR SCHEME OF SCIENCE AND TECHNOLOGY OF THE COIR BOARD - XI PLAN**

\*\*\*\*\*

## **Introduction**

The Research and Development activities of the Board are carried out through the twin research institutes; the Central Coir Research Institute (CCRI), Kalavoor and Central Institute of Coir Technology (CICT), Bangalore. The Central Coir Research Institute, Alleppey was established in 1959 and the Central Institute of Coir Technology, Bangalore in 1980. Whereas CCRI, Kalavoor concentrates on research concerning both the white and brown fibre sectors, CICT, Bangalore confines to the brown fibre sector. Identification of new user areas for utilization of coir and coir waste (coir pith), modernization of production infrastructure for elimination of drudgery in manual operation thereby attaining higher productivity and improvement in quality are integral parts of the research efforts. Research investigations in Central Coir Research Institute have led to development of several new technologies for the coir industry and it has been awarded the prestigious National Research and Development Corporation (NRDC) Technology Awards thrice for innovations in 1999, 2002 and 2004. The recent achievements of the Board include development of a versatile loom, named as "Anupam", for manufacturing various coir products with ease and higher productivity and development of a technology for pollution free retting and a mobile fibre extraction machine (SWARNA) which can be transported easily from one place to another according to availability of husk.

2. Extension of the fruit of the research at the laboratory level for application at the field level and extension of testing and service facility are two main areas of activity under the head. Collaborative research with research organizations, institutes, universities having proven records on varied applications of coir, development of new products, new machinery, product diversification, development of environment friendly technologies, technology transfer, incubation, testing and service facilities are the areas which are given priority consideration.

3. The Plan programmes under the Science and Technology Scheme in Coir Industry have been undertaken through the following Plan Sub-heads:

- Modernisation of extraction and processing of coir fibre
- Development of Coir machinery
- Product Development and Diversification
- Testing and Service Facilities

Having reviewed the need for continuance of the above sub-heads, the sub-heads have been recast, without changing the scope of the Scheme, for implementation during 11<sup>th</sup> Plan period as detailed below:-

- Modernisation of Production Processes
- Development of machinery and equipments
- Product Development and Diversification
- Development of Environment friendly technologies
- Technology transfer, Incubation, Testing and Service Facilities

#### **4. Action Plan under different Programme Heads**

##### **a) Modernisation of Production Processes**

###### **Objectives**

- Modernisation of extraction process of coir fibre leading to enhancement of productivity, upgradation of quality and elimination of drudgery.
- Development of appropriate technologies for improving the productivity and quality in spinning.
- Development of innovative technologies in weaving of coir products by improvisation of the production processes and equipments.
- Development of modern technologies for finishing operations of coir products
- Modernisation of the production and extraction process through application of bio-technology
- Development of technologies for wet processing of coir using natural dyes.

Most of the technologies used in the coir industry is of medium level. Consequently, the amount of drudgery is more and the working atmosphere is not congenial enough for retention of a dedicated work force. The productivity and the quality of the products are not up to the mark either. Continued research activities will result increasing the acceptance of the coir products both by internal and external markets. To achieve these objectives, the following programmes would be undertaken during the XI Plan:-

- Production of coirret and pithplus: Quality improvement of coir fibre by bio-technological intervention.
- Extraction of Lignosulphonates and characterization for end uses.
- Enhancement of longevity of coir by chemical/enzymatic method.
- Coir Pith Organic Manure Production.
- Production of Biogas from Coir Pith
- Enzymatic softening and brightening of brown coir fibres
- To create infrastructure and to undertake Civil Construction and repair works/renovation in respect of above activities through CPWD, as per the provisions contained in GFR126

**b) Development of Machinery and Equipments**

**Objectives**

- Elimination of drudgery in operations
- Improvement in productivity and quality
- Bringing about cost effectiveness

The programme aims at development of machinery for spinning coir yarn, extraction of fibre, weaving coir products etc. Most of the existing machinery are obsolete with low productivity and involves drudgery in operation. Low productivity, low technology application, reluctance to accept rapid mechanization, economic disability to modernize the sector etc. are some of the limitations for growth observed in the coir industry. Modernization essentially involves mechanization and application of modern processes, which necessitates developing appropriate machinery for processing of coir fibre into yarn and products with enhanced productivity. It is proposed to achieve these objectives through the following programmes:

- Design and fabrication of a spinning machine with better quality and better output.
- Development of mobile defibering machine
- Use of wind energy for running the spinning ratts and Anupam Loom
- Development of a chopper-cum-grinder for pulverization of tender coconut husk for effective utilization for various end uses.
- Indigenization of stitched Erosion Control Blanket Machine.
- Development of Wrapping Machine.
- Indigenization of drainage pipe filter making machine.
- Development of an indigenous needled felt machine.
- To create infrastructure and to undertake Civil Construction and repair works/renovation in respect of above activities through CPWD, as per the provisions contained in GFR126

**c) Product Development and Diversification**

**Objectives**

- To develop innovative products out of coir fibre alone and or by blending with other natural fibres.
- To develop new areas of application for coir products like coir geo-textiles
- To develop new technologies for utilization of coir pith
- To develop technology for use of coir in the automobile industry for seat cushions and upholstery
- To develop innovative designs suitable for mats, matting and carpets
- To evolve standards for coir geo-textiles for inclusion in the manuals of PWD etc.
- To establish Design Clinics in the major coir clusters.

Future of coir industry depends on product development and diversification, especially into non-traditional areas. Development of substitutes for wood, synthetic products, geo-synthetics, combination products through blending with other natural fibres etc. would open up new vistas for the coir industry. Development of new application areas and new products are of vital importance for the full utilization of the potential of the industry. It is proposed to achieve the listed objectives through the following programmes:-

- Development of blended coir yarn and blended coir products.
- Development of Kaleens by softening of coir fibre.
- Development of coir nettings and other products for vanilla cultivation.
- Development of rubberized coir mattresses covers with modified PVC sheet
- Development of coated coir fibre for fire retardancy, water-oil repellency and longevity.
- Establishment of a Pilot Plant for extraction of Natural Dyes.
- Finalisation of specifications for coir geo-textiles/coir pith.
- Finalisation of specifications for coir polymer composite boards.
- Production of coir needled felt for experiments and for the industry on service charge basis.
- Development of coir polymer composite board for specific end use for kitchen, drawing room and bathroom etc.
- Development of high tech coir fibres by nanotechnology.
- Geo drainage filters for areas lying below sea level.
- Paper for coir bit fibres.
- Binderless Coir polymer Composite Boards.
- To create infrastructure and to undertake Civil Construction and repair works/renovation in respect of above activities through CPWD, as per the provisions contained in GFR126

**d) Development of Environment Friendly Technologies**

**Objectives**

- To develop appropriate technologies in the abatement of pollution in the production processes.
- To develop a cost effective eco-friendly effluent treatment technology for treating the effluents arising out of wet processing in coir industry.
- To develop technology for disposal of sludge in the ETPs.
- To develop new products like wood substitutes out of coir alone or by blending with other natural fibres.
- To standardise the coir composite products for different applications.
- To undertake studies in estimation of carbon trade by using coir products like composites, geo-textiles etc.

The world is becoming more and more environment conscious and the need for protection of water, air and other natural resources for the posterity is being realized widely. Even though coir and its products are nature friendly in the sense that it is hundred percent degradable, research efforts have to be carried out to minimize the environmental hazards caused by retting and wet processing. The objectives are proposed to be achieved by the following programmes:

- Setting up of an Eco Lab to analyse the effluents of bleaching/dyeing, effluents of retting etc. and to develop appropriate techniques to combat the pollution.
- Adoption of Ecomark for coir products/coir composite products.
- Development of corrugated roofing sheets from coir non-woven felt/woven mat in association with IPIRTI.
- Inclusion of coir villages in the itinerary of domestic and foreign tourists.
- Strengthening of the CICT as a Centre of Excellence and development of environment friendly coir based/composite products and machinery.
- Exploration of the possibilities of varied applications of coir geo-textiles, coir composite boards, coir pith, organic compounds extracted from coir etc. in association with various R & D Institutes, Universities etc.
- Exploration of the possibilities of Carbon Trade by using eco-friendly coir/pith/composite products as wood-substitutes in the back-ground of Kyoto Protocol.
- To create infrastructure and to undertake Civil Construction and repair works/renovation in respect of above activities through CPWD, as per the provisions contained in GFR126”

**e) Technology Transfer, Incubation, Testing and Service Facilities**

**Objectives**

- To transfer the technologies developed by the research institutes to the trade against specific requests and under agreement of technology transfer by realising appropriate fees.
- To establish technology incubation centers in one or many places for training the entrepreneurs in the new technologies developed and transferred.
- To create a tool room for maintenance of and repair of the looms and equipments established in different coir production centers.
- To establish a laboratory for testing of coir composite materials and to extend service facilities to the trade.
- To demonstrate the user friendly technologies developed by CCRI/CICT in the major coir yarn production centers for the benefit of the workers/entrepreneurs.
- To extend technical assistance for interventions in clusters identified by the Board in different coir producing States.

- To undertake testing of coir and coir products, dyed samples, coir pith etc. at the laboratories of CCRI, CICT and Regional Officers and issue test certificates.
- To extend service facilities to the trade in dyeing of coir yarn/fibre at the dye house established at the CCRI.

The result of the research activities need to be disseminated to the industry and trade and diversified uses of coir and coir products have to be popularized through demonstration in the field for increasing the demand of coir. There is also a need of services like testing and certification facilities required by the industry. It is proposed to achieve the objectives through the programmes detailed below:

- Digitalisation of National Coir Information Centre and the information centre at the CICT to create and operate a digital library capable of providing digital information from text, images, electronics media etc.
- Procurement of NABL accreditation to the physical and pith testing laboratory of CICT.
- Transfer of Technology developed by Coir Board to the industry and extension service.
- Establishment of Technology Incubation Centers.
- Establishment of tool rooms in different localities
- Establishment of laboratories for testing of coir composite materials, geotextiles and coir pith.
- To create infrastructure and to undertake Civil Construction and repair works/renovation in respect of above activities through CPWD, as per the provisions contained in GFR126”
- To extend the facilities available in the Institute to the trade on realization of service charges in the areas listed below:
  1. Bleaching, dyeing and drying of coir yarn/fibre and shade matching by extending the facilities available in the modern dye house of CCRI.
  2. Testing of coir and coir products
  3. Testing of NPK content of composted coir pith, lignin content, salinity and electrical conductivity and phytosanitary tests.
  4. Evaluation of dye-stuffs suitable for coir.
  5. Evolving novel designs and sale of copies of design cards using CAD system.
  6. Evolving standard specifications for different coir products.
  7. Upgradation of quality of coir products through field extension programmes and
  8. Improvement of the skills of artisans.

- Field demonstration of PITHPLUS in composting of coir pith for elimination of coir pith hillocks in the fibre extraction centers in all coir producing States.
- Field demonstration of COIRRET in retting of husks and converting mechanically extracted fibre into the quality of retted fibre.
- Field demonstration of Coir Bhoovastra in soil bio-engineering applications in collaboration with various institutions.
- Technical guidance in setting up coir based industrial units.
- Extension of facilities for conversion of coir fibre into coir needled felt.
- Organization of Seminars/Workshops for popularization of various technologies and products developed by Coir Board.
- Providing certification facility under ASTM/Australian Quarantine and Inspection Services etc.
- Technology transfer for setting up Effluent Treatment Plants and Pollution abatement.

### **Phasing of Expenditure under different Programme Heads**

Year	2007-08 (RE)	2008-09	2009-10	2010-11	2011-12	Total
Sub-head						
Modernization of Production Processes	1.50	1.50	2.00	2.00	2.00	9.00
Development of machinery and equipments	1.00	1.00	2.00	2.00	2.00	8.00
Product Development and Diversification	1.50	1.50	1.75	2.00	2.00	8.75
Development of Environment friendly technologies	1.50	1.50	2.00	2.50	2.50	10.00
Technology transfer, Incubation, Testing and Service Facilities	1.50	1.50	1.25	1.50	1.50	7.25
<b>Total</b>	<b>7.00</b>	<b>7.00</b>	<b>9.00</b>	<b>10.00</b>	<b>10.00</b>	<b>43.00</b>

The funds will be released to the Research Institutes through the Coir Board on quarterly basis on certification of utilization of funds released earlier. The funds will be utilized by the Research Institutes for R & D activities and creation of infrastructure & civil construction/repairs etc. relating to R&D activities only as specified in the Action Plan under different Programme Heads of the Scheme.

### **Development “outcomes” and “outputs” of the Scheme / Project**

The Scheme being a Research & Development Activity, the outcome of the Scheme may not be measured in financial terms but the expected outcomes of the Scheme would be as under:-

- Continued implementation of the Scheme will result in development of new technologies for reducing drudgery and improving the quality and productivity of the coir products. Continued research activities will result in increasing the acceptance of the coir products both by internal and external markets.
- The development of more sophisticated machinery with the features of automation will result in enhanced productivity and income. Elimination of physical strain and better incomes would attract younger generation to engage themselves into coir activities. Improvement in the existing equipments and technology would result in the enhancement of the appeal of the product.
- Diversified use of coir would increase the utilization of coconut husk for fibre extraction in all coir producing States providing employment to rural youths which would prevent migration from rural areas to urban areas. The use of coir products for environment friendly activities will result in environment protection. Development of new products and identification of new areas for application of coir will result in the generation of more national income from a waste material i.e. coconut husk.
- Development of a nature friendly technology will enhance the acceptability of the product before the discerning customers both in the domestic and external market who are concerned about the environment. Development of environment friendly technologies will improve the working and living conditions of the workers. The marketability of coir products against synthetic floor coverings can be increased by development of products with more aesthetic appeal.
- Proper incubation/extension of the results of the research efforts to the field level would generate enthusiasm among entrepreneurs on the new processes and prompt them to adopt the technologies. The industry will be equipped with all infrastructure and technological development to face any threat or competition. The testing requirements of customers of various coir products can be met efficiently by establishing sufficiently equipped laboratories.

\*\*\*\*\*



