

DETAILED PROJECT REPORT
JUTE TECHNOLOGY MISSION (MINI MISSION-IV)

JTM SCHEME NO. 7.1/DDS/2,
PROJECT SERIAL NO. 04

- PROJECT TITLE -
MANUFACTURE OF BRAIDED CLOTH BY APPROPRIATE
DESIGN INCORPORATION IN BRAIDING MACHINES



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PROJECT TITLE - MANUFACTURE OF BRAIDED CLOTH BY APPROPRIATE DESIGN INCORPORATION IN BRAIDING MACHINES

A. Project Background

Jute is a strong, cheap and bio-degradable natural fibre, available in abundance in our country. These properties of jute can open up new avenues for its prospective uses in low capacity flexible packaging areas and also in the field of agro-textiles. For quite some time, considerable volume of successful research work have been done to introduce jute in the various value-added diversified end uses. The proposed Project aims for the development of such a new diversified product with jute for a newer field of application, which is certainly a potential and appropriate one.

In the nurseries, mainly polythene sleeves are presently used for growth of saplings. During transplantation of the grown up plants the polythene sleeves are torn off and thrown away. This practice causes damage to the root network of plants and pollution to the environment. Besides, during growth of plants, these polythene sleeves hinder circulation of air and water, causing high degree of mortality of young plants. All these problems can be avoided, if the sleeves are made of jute.

Circular / tubular structure with jute yarns can be made on the Braiding machine as ready to end uses, directly utilizing jute yarns received from spinning department and without involving any preparatory, weaving, cutting, stitching and so on processes (only a bottom closer system will suffice the end uses for the product). As a result, tubular structure or sleeves made of jute braided cloth are likely to be cheaper than those made from woven fabrics. Additionally, such jute braided tubular cloths are quite capable of being used in the field of packaging and agro-textile application.

IJIRA has recently procured one Braiding machine of 80 spindles along with one winding machine of 4 spindles and installed in its Pilot Plant. However, this machine is mainly made for processing glass and synthetic yarns. Preliminary trials with this Braiding machine indicate that with necessary modifications, the machine can be used to process jute yarns of different counts to manufacture different jute – braided structures.

In another recent exercise, IJIRA initially procured a few small Braiding machines of 8 spindles and then modified them at its workshop to run manually for producing braided products with varieties of jute yarn at the interior rural areas. IJIRA organized several demonstrations cum training programs to the rural Artisans and members of Self Help Group (SHG) with the help of District Rural Development Agency, Dist. Dhubri and one NGO (Vivekananda Society) at Gouripur, Dist. Dhubri, in the state of Assam. Nearly 175 members from 80 SHGs have been trained. These initiatives of IJIRA generated tremendous encouragement among the jute cultivators and SHGs, since there is a reasonable scope to utilize the jute fibres at the rural level for manufacturing diversified jute products and selling them in the local market.

B. Project Objectives and Rationale

Objectives

- (i) To manufacture jute braided cloth on a braiding machine
- (ii) To manufacture jute braided sleeves of different widths and constructions
- (iii) To optimize the structures and dimensions of jute braided cloth according to end use requirements
- (iv) To study the structure – property relationships of jute braided cloth

Rationale

- (i) Main advantage with braided structure is that it can be made utilizing directly jute yarns received from spinning department without involving any intermediate conventional preparatory processes. As such, it is likely to be cheaper than the woven structure. Additionally, such jute braided tubular cloths are quite capable of being used in the field of packaging and agro-textile application.
- (ii) Jute braided sleeves are cheaper, eco-friendly and quite compatible for growth of saplings in the Nurseries, reducing the rate of mortality of young plants, usually found with toxic synthetic sleeves.
- (iii) The strength, elongation and other properties of braided cloth depends mainly on the closeness or openness and nature of interlacement of the component yarns in the cloth. These properties, on the other hand, are the prime factors for consideration before any end use of that cloth.
- (iv) The properties of jute braided cloth depend on the nature of interlacement of the component yarns in the cloth. Knowledge on the relationship between these two variables is essential during any product development exercise with jute braided cloth.

C. Project Components

Sl. No.	Components with detail activities	Outputs
1	Survey work: Literature survey, need assessment of braided product with special emphasis on jute variety	A knowledge base on the past work on Braiding process and product
2	Machinery Development: Necessary modifications of the braiding machine and its winding machine at IJIRA pilot plant for using different jute yarns	A Braiding machine at the disposal for use of jute yarns
3	Product Development: Manufacture of circular braided cloth and sleeves of different widths, constructions and with different counts of jute yarns	Braided product With jute yarns
4	Physical testing of braided cloths	Properties of products
5	Standardisation: Further necessary modifications of the machine and the braided product for optimization of product as per end use requirement	Properly tuned machine and standard product
6	Adoption of cost effective bottom closure mechanism for jute sleeves	Proper jute sleeves
7	Quality assessment of product in collaboration with the nurseries of Agriculture, Horticulture, Forestry and retailers	Properties of products
8	Field Trials: Field trials for performance evaluation of the product	Level of performance of the product
9	Incorporation of necessary modifications in the product based on the results of field trials	Improved product
10	Large scale field trials for performance evaluation of the product	Critical level of performance of the product
11	Knowledge Implementation: Entrepreneurship development, organizing training programmes, especially in the small scale sector and Transfer of technology	Commercialization of product
12	Documentation and dissemination of knowledge	Knowledge bank

D. Summary Cost Tables and Financing Plan

(i) Summary Cost Table by Component

Project Title – Manufacture of Braided Cloth by appropriate design incorporation in Braiding Machines

Sl. No.	Project Component	Total Cost (Rs. In Lakhs)
1	Survey Work	1.00
2	Machinery Development	6.50
3	Product Development	3.50
4	Standardisation	7.50
5	Field Trials	9.75
6	Knowledge Implementation	5.00
7	Contingencies	1.75
	Total	35.00

(ii) Summary Project Cost by Component and Year

Project Title – Manufacture of Braided Cloth by appropriate design incorporation in Braiding Machines

Component	PY 1	PY 2	PY 3	Total Cost (Rs. In Lakhs)
1. Survey Work	7.50	-	-	7.50
2. Machinery Development				
3. Product Development	-	11.00	-	11.00
4. Standardisation	-	-	14.75	14.75
5. Field Trials				
6. Knowledge Implementation				
Sub-Total	7.50	11.00	14.75	33.25
Contingencies	0.50	1.00	0.25	1.75
	Grand Total			35.00

(iii) Detailed Cost Table by Category and Item of Expenditure

Project Title – Manufacture of Braided Cloth by appropriate design incorporation in Braiding Machines

1	2	3	4	5	6
Category of Expenditure	Sub-category of Expenditure	PY 1	PY 2	PY 3	Total Cost (Rs. In Lakhs)
1. Survey Work	Literature survey, need assessment	1.00	-	-	7.50
2. Machinery Development	Modifications of the braiding machine and its winding machine	6.50	-	-	
3. Product Development	Manufacture of circular braided cloth and sleeves	-	3.50	-	11.00
4. Standardisation	Standardisation of machine parameters and Braided product	-	7.50	-	
5. Field Trials	Performance evaluation of the product	-	-	9.75	14.75
6. Knowledge Implementation	Entrepreneurship development, Transfer of technology	-	-	5.00	
Contingencies					1.75
Grand Total					35.00

E. Work Plan and Implementation Schedule

Project Title – Manufacture of Braided Cloth by appropriate design incorporation in Braiding Machines

Work Plan:

PY	Quarter	Main Activities	Responsibility	Output
1	1	Survey work: Literature survey, need assessment of braided product with special emphasis on jute variety	IJIRA Project Team	A knowledge base on the past work on Braiding process and product
	2	Machinery Development: Necessary modifications of the braiding machine and its winding machine at IJIRA pilot plant for using different jute yarns		A Braiding machine at the disposal for use of jute yarns
	3			
	4			
2	1	Product Development: (i) Manufacture of circular braided cloth and sleeves of different widths, constructions and with different counts of jute yarns, (ii) Physical testing of braided cloths		(i) Braided product With jute yarns.
	2			(ii) Properties of products
	3	Standardisation: (i) Further necessary modifications of the machine and the braided product for optimization of product as per end use requirement. (ii) Adoption of cost effective bottom closure mechanism for jute sleeves		(i) Properly tuned machine and standard product
	4	Quality assessment of product in collaboration with the nurseries of Agriculture, Horticulture, Forestry and retailers		(ii) Proper jute sleeves Properties of products
3	1	Field Trials: Field trials for performance evaluation of the product		Level of performance of the product
	2	Incorporation of necessary modifications in the product based on the results of field trials		Improved product
	3	Large scale field trials for performance evaluation of the product		Critical level of performance of the product
	4	Knowledge Implementation: Entrepreneurship development, organizing training programmes, especially in the small scale sector and Transfer of technology		Commercialization of product
		Documentation and dissemination of knowledge		Knowledge bank

Implementation Schedule

PY	Quarter	Component	Activity
1	1	Survey work	Literature survey, need assessment of braided product with special emphasis on jute variety
	2	Machinery Development	Necessary modifications of the braiding machine and its winding machine at IJIRA pilot plant for using different jute yarns
	3		
	4		
2	1	Product Development 1	Manufacture of circular braided cloth and sleeves of different widths, constructions and with different counts of jute yarns
	2		Physical testing of braided cloths
	3	Standardisation:	Further necessary modifications of the machine and the braided product for optimization of Product as per end use requirement. Adoption of cost effective bottom closure mechanism for jute sleeves
	4		Quality assessment of product in collaboration with the nurseries of Agriculture, Horticulture, Forestry and retailers
3	1	Field Trials	Field trials for performance evaluation of the product
	2		Incorporation of necessary modifications in the product based on the results of field trials
	3		Large scale field trials for performance evaluation of the product
	4	Knowledge Implementation	Entrepreneurship development, organizing training programmes, especially in the small scale sector and Transfer of technology. Documentation and dissemination of knowledge

