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JUTE RESEARCH AND DEVELOPMENT

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INDIA

Technical report: First mission report\*

Prepared for the Government of India  
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## INTRODUCTION

My first visit to IJIRA, from 27 November to 23 December 1988, proved to be interesting and successful, in that it was possible to assess the situation and make detailed recommendations for the programme of work to be carried out in 1989. The need of a textile chemist at the present stage of jute development was very obvious. The IJIRA staff have very limited experience in this area and it was interesting that the mill that has made real progress (Champdany) has a dyer with the necessary experience of cotton finishing.

## SUMMARY OF FINDINGS AND RECOMMENDATIONS

1. The first priority was to make decisions on the equipment purchases outstanding. The Sterolyser bleaching machine (88/3) was rejected as unproven and unlikely to satisfy the defined requirements. The other quotations were for well tested equipment but at prices outside the budget. However, it was agreed that a laboratory Sterolyser unit should be purchased and a detailed schedule of experiments to be carried out also agreed. The correct approach to commercial scale bleaching of jute fabric has still to be established. At this stage the jig will be satisfactory.

The choice of package dyeing machine (88/4) was made on technical grounds (my letter of 30.11.88 to Mr. Ramachandran), although it later appeared that the Dalai machine would also be the cheapest. The choice of jig dyeing machine was approved.

2. Visits were made to four jute mills where there is interest in the development of new products - Anglo India, Birla, New Central and Champdany. In each case their dyeing and finishing problems were discussed and it was possible to assess the degree of commitment to the development of new products.

Close contact with the Birla mill was maintained in order to agree a layout of the UNDP package dyeing and auxiliary equipment to be installed in a new dyehouse there.

At the Anglo India mill the finishing of mixture and blend fabrics was discussed and it was clear that the installation of a stenter might be necessary.

At the New Central mill the extension of warp dyeing on the sizing machine to include azoic colours was discussed. Recommendations were later made for the dyeing of one specific colour as a trial.

The Champdany mill already produces interesting, new fabrics for end-uses outside the traditional areas. A twill fabric containing small amounts of coloured, waste polypropylene, with the jute woollenised and dyed at the fabric stage, could be used for low cost overcoats. A lighter weight reppe fabric, with cotton warp and jute/viscose blend weft, and almost a silk-like appearance and handle, was most attractive (but needed singeing).

I recommended (i) the use of sodium borohydride to improve the light fastness of bleached jute; (ii) the purchase of singeing, padding and stentering machines and (iii) the use of pigments for high light fastness, keeping down the cost by application to the face side only of wall-covering fabrics.

3. Experiments were initiated to improve the wet strength of jute bleached by the IJIRA method that gives good light fastness, at the expense of wet strength. Recent work in Manchester showed that chemical cross-linking under the right conditions did increase wet strength, but the method used would be expensive to implement. The new experiments, using a cheaper reagent (formaldehyde) before, rather than after, bleaching show sufficient promise to justify further work.

4. For decorative end-uses of jute attention has to be paid to light fastness, handle and fibre shedding. More attention is required to the latter problems. I have suggested trials on a compressive shrinkage machine to increase the extensibility in the warp direction and therefore the handle and drape. More basic, however, is the importance of drying on a stenter rather than on cylinders.

The following advantages are to be expected:

- i) uniform width
- ii) better appearance, straighter weft yarns
- iii) improved handle and drape as a result of warp relaxation (overfeed)
- iv) removal of loose fibre by high velocity air jets
- v) balanced extensibility due to crimp interchange (no bagging problem for soft luggage)

5. The recommended programme of work for 1989 is summarised below:

- i) Assess the pad-cold-batch method for hypochlorite bleaching, aiming at the containment of free chlorine within the batch.
- ii) Try using the cold pad-batch approach for peroxide and chlorite bleaching.
- iii) Test the laboratory sterolyser unit, in the manner already agreed.
- iv) Arrange trials of singeing, stentering with overfeed, compressive shrinkage and application of elastomers. Changes in handle, drape and fibre shedding to be assessed.
- v) Complete wet cross-linking trials with formaldehyde to find optimum conditions and compare the results with those obtained by melamine formaldehyde treatment.
- vi) Carry out the azoic warp dyeing at New Central.
- vii) Apply selected sulphur dyes to hessian and measure light fastness.
- viii) Screen print (blank screen) pigment colours on hessian and measure light fastness. Blues and greens at pale and medium depths to be included.

6. I spent one weekend privately at BJRI in Dhaka, where I stressed the importance of marketing. They have obviously impressed the new Minister for Jute and have several innovations that can be exploited.

A substantial length of high light fastness jute is being test-marketed in the USA (possibly for over-printing).

Blankets of jute-acrylic blend yarns have been produced.  
I have one for assessment.

A jute-cotton twill fabric, with a cotton face, has proved  
to show good light stability.

A jute cutting/coir blend fabric coated with bitumen has been  
produced for lining water channels.

7. A second visit to IJIRA in about one year's time is tentatively agreed.