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JUTE RESEARCH AND DEVELOPMENT

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INDIA

Technical report: Sixth mission report*

Prepared for the Government of India
by the United Nations Industrial Development Organization,
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* This document has not been edited.

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Upgrading jute by micro-biological methods

Preparations for the implementation of this activity are well advanced. UNDP/UNIDO have prepared the mechanism for the local acquisition of the pilot plant and the orders are being placed now, for delivery in 4-6 months.

The site at Kinnison Jute Mills will be ready in advance of the delivery of the machinery but some alterations to the buildings have been suggested.

The visit of the Expert, Dr B Wood, proved most fruitful. His knowledge and experience fitted exactly into the requirements of the project and his contributions have been greatly appreciated by the project staff. His next visit should be made in September 1990 by which time the pilot plant will have been functioning for a few weeks.

Dr Sinha, a Fellow who has been in America for 6 months, is due back at IJIRA in mid-December, will be able to give the Head of the Division welcome assistance during the installation of the pilot plant at Kinnison. The relevance to jute processing of his studies during his Fellowship is not entirely clear and the selection of the site seems to have been made on the grounds of academic excellence rather on practical utility as far as softening of low-grade jute is concerned.

CHEMICAL SOFTENING OF JUTE

The first stage of this output has been completed successfully. It has been demonstrated in two mills, Reliance and JK, that the use of an appropriate mixture of urea, soda ash and Acinol offers a method of upgrading low quality jute. In extensive tests it has been shown that it is possible to reduce the batch cost by incorporating more low-grade fibre i.e. cheaper fibre, which, after treatment, yields yarn of satisfactory quality. Additionally, a small increase in machine output seems to have been achieved but this would require much longer trial periods to establish more clearly.

The next phase is to extend the use of these chemicals to 15-20 mills. A Technical Report has been written but it was recommended that a more-easily read edited version be prepared for the industry, showing clearly the savings which can be made by using these methods. After issuing a practical manual for chemical softening, visits must be made to encourage mills to adopt the method and to offer guidance during each mill's trials.

This output has progressed well and its full industrial impact should be seen during the next 6-12 months

PRODUCT DESIGN AND DEVELOPMENT

(1) 50 kg grain bags

800,000 bags of a new construction are on an 18-month trial with the Food Corporation of India. No adverse reports on their performance have been received so far. These bags weigh only 650g and if they are successful they could add 75000 tons a year to the home market for jute bags.

(2) Geo-jute

The trials with bitumenised twill fabrics with the Calcutta port authorities continue and encouraging reports are being received on their performance. A geo-textiles conference was attended at Bangalore at which a presentation on jute as a geo-textile material was presented. The visit by the Expert, Mr J Thomson is expected in early January 1990.

(3) Blends

The intersecting gill-box has been installed at the mill of Birla Jute and Industries Ltd. So far it has only been run on 100% jute slivers and some difficulty with excessive waste of good long fibre has been encountered. This problem has been taken up with the makers.

A Project Profile for blended jute yarns for the handloom industry has been published which provides a useful introduction to any mill contemplating entering the jute blend market.

NEW/HIGH VALUE PRODUCTS

BLEACHING AND DYEING

(1) Blended yarn

The package dyeing plant from Dalal Engineering is almost ready for dispatch and the site at Birla Jute and Industries will be completed by 31 December 1989. Installation and commissioning and preliminary trials will occupy the first 10-12 weeks of 1990, so by April the pilot plant should be ready for daily use.

The intersecting gill-box is running at Birla but so far only 100% jute slivers have been handled but blended yarns will be made shortly, which can then be bleached/dyed in the package plant. Weaving can be carried out at Birla, so there will be an integrated pilot plant capable of handling the planned blends.

(2) Carpet yarns

India Jute Mill has installed 4 van de Velde face-to-face carpet looms and the project package dyer will be used to prepare all-jute and blended jute yarns for carpet weaving. It is understood that another mill is setting up a carpet weaving unit so the knowledge gained at India Jute will be available for this mill also.

Preparations have begun on the site for the plant. The project has selected the Longclose plant as being technically the most suitable and PAC are now engaged on procurement during this financial year.

(3) Fabric dyeing

This section of the project requires careful thought. The present plan is to site a jigger, a padding mangle and a cylinder drier at Anglo-India Jute Mills. Since this decision was reached some two years ago, the mill has been experiencing severe financial problems. The company had three jute mills and a wool-combing operation in the same compound. Two of the jute mills have been sold and during the CTA's visit the wool-combing unit was under lock-out. The supply of steam was to come from the wool-combers but because of the labour trouble there, it was impossible to supply steam and consequently the erection of the jigger was delayed for some weeks. A special arrangement with the labour union was reached to allow a temporary steam line to be laid into the pilot plant area for 14 days so that erection at least could continue.

During the site meeting on 1 December the future supply of steam was discussed. It was agreed that the jute mill (who have stopped raising steam for their own process) will, by prior arrangement, provide steam from their own boilers as and when required. While this gets around the immediate problem, it does not seem a totally desirable solution as far as the project is concerned. Careful forward planning of the various trials and excellent communications will be needed so that the

Anglo-India boilers can be put on in due time.

The alternative is to purchase a small boiler solely to supply steam for the pilot plant. This adds more to the already high costs of this activity. These are discussed in the next paragraphs.

During the mission, quotations were received from PAC for the padding mangle and the can-drier. From 18 enquiries only 2 bids were received, the cheaper of which amounted to some \$ 200,000 against the project's estimate (May 1989) of \$ 75,000. PAC had approached only one Indian firm who did not respond, so the names of four others were telexed to Vienna so that a lower offer might be obtained. At \$ 200,000 the cost to the project is out of all proportion to the peripheral benefit which may be gained from this activity. If a considerably lower price cannot be obtained it is recommended that, if the plant stays at Anglo-India, the mills own squeeze roller and can-drier should be used even though they are very slow, "home-made" machines.

A management decision is required on the above factors. Summarising, these are -

Can we expect this mill to function normally without fear of lock-outs, shortage of working capital or other problem?

Can the work of the project be planned successfully in such a manner to give the mill an advance programme for putting on its boilers?

If the answer to these points is, "no", where should the plant be relocated?

If a mangle and drier cannot be obtained for \$ 75,000, will the mills equipment suffice?

My recommendations are -

Have a frank discussion with the Board of Anglo-India at which the future of the mill may be examined

Provided the future is reasonable, proceed with the procurement of the mangle and drier but only if their combined cost does not exceed \$ 75,000. If the cost is to be much more than this, arrange to use the existing equipment at the mill. If the mill equipment is used then development work can start now but if new machinery is acquired, a further 6 months delay will occur.

If the future does not look safe, move the jigger immediately to another site - BJEL would seem to be a good alternative where a mangle and drier are already in place.

PROCESS CONTROL INSTRUMENTATION

The output from this activity is the setting up of a workshop which can make and service process control instruments for the jute industry. In this respect, the object has been achieved. There now exists a small workshop which is making autolevellers for jute finisher cards. These instruments are useful in reducing the irregularities in jute slivers and, by so doing, improving the quality of yarn.

The Fellowships (2) are complete and steps have been taken by the project staff to locate a suitable Expert. One such Expert suggested by UNIDO, Mr A Campbell of Napier College, Edinburgh, is unacceptable to the project. An alternative, Dr B Smith of N Carolina State University is being sought by the Head of the Physics Division.

There is provision for a study tour in relation to this output but, for personal reasons, the candidate (Dr U Mukhopdhyay) has been unable to take advantage of it. It is hoped that he can make his tour by March 1990. If this cannot be fulfilled, for some reason or another, it is strongly recommended that the tour should be deleted from the project since its execution at this late date would be of no benefit to the project.

INDUSTRIAL ENGINEERING

Following the first visit of the Expert, Mr G Haines, a programme of work has been made for studies and improvements in three mills. This will include standardisation of machine performance and spares, lubrication schedules and making proposals for preventative maintenance schedules.

IJIRA already makes a regular computer-based inter-firm productivity comparison (IFC) but the form in which it is presented to the industry is not ideal so a concise, easily-understood extract is to be prepared for each participating mill. The IFC only covers spinning at the moment and it is now to be extended to cover the remainder of the process.

An experienced jute technologist has been recruited (under the GOI's contribution) as a part-time consultant and a full-time industrial engineer has been taken into the project. These men will hold 2-day induction course for IJIRA and mill staff as a preparation for the practical work in the mills.

A work-plan covering the next three months has been developed and if progress has been satisfactory it is recommended that the Expert should return for his second visit of 4-6 weeks in April 1990. However, if delays occur, the NPD should inform UNDP/UNIDO when he wishes the Expert to return.

To sum up, a start has been made to this activity but to achieve the necessary outputs, the momentum must be maintained. The Head of the Division has a clear programme to follow and we expect that the next 3-4 months will show considerable progress.

TUFTING TECHNOLOGY

12 months ago an additional activity was put into the project, the investigation of the potential for wrap-spun yarns in primary carpet backing cloth. Since then, two wrap-spinners have been installed in jute mills under IJIRA's own research programme. The yarn made on them is to be tufted by another mill using modern projectile looms and the cloth will be sent to Europe for evaluation. Since this was, in essence, the work planned for the project, there is no merit in repeating it and so it is proposed that this activity should be deleted from the project.

The NPD and the Head of Division saw no great benefit to be gained from Fellowships or a study tour; neither was any equipment required.

AUTOMATIC BAG MAKING

During the earlier part of the project the possibility of automating, wholly or partially, the sack-sewing operation was examined. After exploratory visits to European machinery makers there appeared to be little hope of reaching this goal although one manufacturer (Samco Strong) did put a multiple cloth cutter into an Indian mill but withdrew it after severe practical difficulties were encountered. After this there seemed no value in trying to pursue this objective, desirable though it was.

In recent weeks, the Head of Division has had conversations with an Indian company who claim to be able to produce such a system. Vijaya Sewings Private Ltd, 17D Everest, 48C Chowringee Road, Calcutta are makers of equipment for the garment industry and special tools and hydraulic systems. For the sum of about \$47,000 they will design and build an automatic line for hemming and Herakle sewing twill bags and cement bags.

Their claims are attractive but little or nothing is known of their technical or financial background so before any further steps are taken the NPD will investigate their competence. If he is satisfied in this regard I would support a decision to place such an order provided it was framed in such a way that the payments were phased and conditional on IJIRA's approval of the work done during each phase. There is a risk of failure but the chance of reducing the heavy costs of sack-sewing would warrant accepting it.

SITE PREPARATIONS

(1) Project laboratories at IJRA

No real progress has been made in the last six months and the final planning permission still eludes the project. The NPD has made every effort to expedite matters but bureaucratic delays prevent any progress being made. These have been referred to in the CTA's mission reports and in the minutes of the first TPR meeting.

On 29 November 1989 a senior official from the planning authorities visited IJRA and the seriousness of the situation was emphasised to him. Subsequently, the CTA confirmed this by letter to him and requested UNDP Delhi to reinforce the desperate need for action through a formal letter to the planning authorities.

While it is true that so far the work of the project has not been seriously held back by the lack of suitable laboratory accommodation we have now reached the stage where its absence causes serious concern. Unless these laboratories can be completed in 6 months there is no way in which the essential scientific work on bio-softening and applied chemistry can be completed by the end of the project.

Some \$ 250,000-worth of equipment is lying unused because these laboratories are not ready and, moreover, the maker's warranty period has run out on many items so if they do not function correctly we can have no redress from the supplier.

(2) Yarn bleaching and dyeing plant (Birla Jute and Industries)

The site was visited on 28 November. Building is well-advanced and it is estimated that it will be complete. with all services by the end of this year. This should, it is hoped, tie in with the delivery of the machinery.

(3) Yarn bleaching and dyeing plant (India Jute and Industries)

The site is earmarked and preparatory work has been started. Discussions were held with management during the site visit on 5 December. The order for the machinery is being processed now and with a delivery time of 6 months, the building work should be ready in time but the project staff need to watch progress carefully.

(4) Jute reinforced plastic (Birds Jute and Exports Ltd)

The original site being prepared for the cold shuttle press has had to be changed because of the mill's own development plans but a new site only a few metres away is being made ready and the machine should be operational in a few weeks.

(5) Fabric bleaching and dyeing (Anglo-India Jute Mills)

The first machine, the Marubeni jigger, could not be installed because of a lack of a steam line. This problem was overcome

and by 1 December, the machine was seen in place. During the visit, it was arranged that preliminary trials would be conducted while the Marubeni engineer was on site.

The site for the rest of the equipment can be made ready in due time .

(6) Enzyme plant (Kinnison Jute Mills)

Building is proceeding and if the rate of work can be kept up, the site will be ready to receive plant in due time.

As a result of the advice given by the Expert and the CTA during his visit to the mill on 10 November some modifications have been suggested.

FELLOWSHIPS

The status of Fellowships is:

Division	m/m completed or under way	m/m still to complete
App. Chemistry	6	-
Physics	6	-
Biology	6	6*
Mech. Processing	12	24*
Jute/plastics	6	6
Indust. engineering	-	3
Marketing	-	3

*Those to be completed are all arranged. These not marked have still to be settled formally.

SUBCONTRACT

The proposal for the next Harwell contract is still awaited. Dr Bowen, who is preparing it, is currently ill but it will be

submitted as soon as possible. This is also holding up the drafting of the Job Description for the plastics Expert.

EXPERTS

Since the last mission, two Experts have visited the project, Mr G Haines for industrial engineering (11-09) and Dr B Wood for microbiology (11-02). Their visits, though brief, were of great benefit to the project. It is proposed that, subject to IJIRA's progress, Haines will spend 4-6 weeks in Calcutta in March/April 1990 and Wood will attend for 4-6 weeks in September 1990. Their reports are in course of preparation.

Dr Miles (11-11), bleaching and dyeing was unable to come as planned during 1989 but will be available in November 1990 and his contract should be re-scheduled for that time. He has been asked to nominate an alternate for Jan-Feb 1990.

Mr Thomson (11-50), geo-jute, was unable to come when planned but it is hoped that his visit will be made in January 1990. His Job Description and contract are ready.

Dr PK Chatterjee (11-03), chemical softening is expected in mid-December 1989.

Dr Niyogi (11-02), bio-softening, will be at IJIRA in December 1989

The candidate put forward for post 11-04, instrument designer was Mr A Campbell but the project staff did not feel that he have the expertise for which they were looking and Mr B Smith of N Carolina State University has been approached by the Head of Physics with a view to having him visit IJIRA in the first quarter of 1990.

It was agreed at the second TPR meeting that the marketing Expert should be fielded by ITC in about 12 months.

VISITS

During the mission visits were made to the project pilot plant sites at

Birla Jute and Industries

Birds Jute and Export Ltd

Kinnison Jute Mills

Anglo-India Jute Mills

India Jute Mills

and

Jute Technological Research Laboratories