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JUTE RESEARCH AND DEVELOPMENT

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INDIA

Technical report: Final mission of the Chief Technical Adviser*

Prepared for the Government of India
by the United Nations Industrial Development Organization
acting as executing agency for the United Nations Development Programme

Based on the work of R.R. Atkinson
Chief Technical Adviser

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Vienna

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This report covers the last mission of the CTA from 24 April to 23 May 1992 and gives a status report of the remaining action points in the Project.

INSTRUMENTATION

The workshop set up to produce the IJIRA autoleveller and grist monitor has made 84 instruments but in the last six months none have been completed. Orders are being received from the mills and a backlog of orders has built up. Four out of nine of the assembly staff have resigned. Most of those who are left are installing/servicing autolevellers in the mills.

This is a unsatisfactory state of affairs. Two courses of action are open:-

- (1) In-house manufacture. This would require a staff of 10-11 to manufacture, install and service IJIRA developed instruments (autolevellers initially but other sorts of instruments could be made later). By selling the instruments with a modest profit, the unit could be self-supporting. If such a unit were to be formed it should be set up away from IJIRA with a person in-charge dedicated solely to the manufacture.
- (2) Hand the manufacturing aspect over to an electronic assembly company. This was tried before but was not a success. However new contacts have been made with the

Electronic Research and Development Corporation so some progress may be made there.

The choice of route depends on the confidence that IJIRA has in its ability to operate "IJIRA Instruments Ltd." This is really a new commercial approach for IJIRA but one which in a re-organised institute, might be possible. A decision is needed soon because:-

- (a) the instruments are successful
- (b) the mills are anxious to purchase
- (c) IJIRA has made a processing improvement and is duty-bound to assist the mills in this area,

The writer would advise the second route (external manufacturing) since this would be simpler. The first route ("IJIRA Instruments Ltd.") would be prestigious for IJIRA, but, realistically, is a doubtful proposition (although the writer would be delighted to be proved wrong).

KINNISON ENZYME PLANT

The site was visited on 30 April with Dr. Sinha. As has been reported by Dr. Wood, during his visit on 3 January the autoclave exploded and the door and other items were damaged. IJIRA have had an independent engineer's report on the damage and also had an estimate of the cost of repairs, \$2500. It was disappointing to learn that the repair has not been carried

out yet and a request was made for immediate authority through M.O.D. to put the matter in hand. There will be endless arguments with Murhopye Ltd, the supplier, about who should pay but if IJIRA waits until these are resolved the plant will be idle for months to come. The priority must be to get the plant operational then argue about payment.

A matter of further concern is that the supplier has still to repair two of the koji room controls, a laboratory instrument and a few other items. IJIRA has requested that these points be attended to but without result. This supplier is unreliable and should not be considered for any further UNDP work. Since the repairs and strengthening of the autoclave will take 1 month there is no possibility of the plant being operational before the end of the project.

Cost of enzyme manufacture

It is planned to sell the enzyme at a price which will cover the cost of manufacture, administration, depreciation etc. The developers of the plant (Central Food Technology Research Institute, Mysore) have given a theoretical costing but this can only serve as a guide and it is strongly recommended that when the plant has started, a costing based upon the actual conditions be made. There is doubt in the writer's mind about the commercial viability of the unit if the enzyme is sold at its present level of Rs.15/kg.

Insurance

The autoclave explosion fortunately caused no injuries but it could easily have led to a fatality. Once the repair and strengthening is finished the danger of a repeat accident will, one hopes, be over. Nevertheless, it is strongly recommended that insurance be taken out on the autoclave to cover IJIRA against any damage to life or property as a result of another mishap. At least this way the autoclave would get an annual examination by the insurance company's engineer.

Ultrafiltration plant

As recommended by the Expert (Report DP/IND/SER.A 7/2/92) an ultrafiltration plant costing \$40000 has been requisitioned. Purchase of this equipment was deliberately delayed by the CTA until the availability of funds towards the end of the project became clear. Its purchase was requested by IJIRA some 18 months ago but the CTA emphasised the importance of getting the plant operational first, then adding a refinement to it if funds permitted.

The plant is commissioned and would be functioning today if it had not been for the unfortunate accident and, since funds are available, the ultra filtration plant was requisitioned.

JUTE REINFORCED PLASTICS

This activity has reached the stage of commercial exploitation. In the jute industry one mill has installed a machine for making 8x4 sheets and another two are making plans to install similar plant. Outside the industry, seven entrepreneurs have expressed interest and are actively planning to manufacture JRP.

The work has now identified lower cost alternatives to fabrics. These are felt/jute stick/jute whole plant. Since market acceptance will only come if lower costs can be achieved, such developments point the way ahead. A further cost reducer is a chemically-modified resin available locally and it is likely to have a place in JRP for indoor (or short term outdoor) use as it is biodegradable while phenolic resins will hold their place for outdoor (or wet) uses.

BIRLA JUTE (blending)

It has been proved that intersecting gills do not give a more even blend with jute and other fibres. So in this sense it has been a negative result but it has shown that this machine is an effective high-output machine for good quality jute. So much so, that as a result of this UNDP Project input, the management have purchased four machines. The company would not have thought of purchasing this machine for trials and in this respect the UNDP input has been most useful.

BIRLA JUTE (dyeing)

While the colouration side of the plant gives (with few exceptions) good colour with all classes of dye, the drying side is very expensive to run. The savings made are thus nullified and in fact the mill costings show that hank-dyeing and then chamber-drying is about Rs.1000/ton cheaper than package dyeing. Clearly IJIRA must work on this aspect.

While the management was pleased that they had been selected as a pilot plant site, they did feel that communications between the mill and IJIRA could have been better. The writer must agree.

INDIA JUTE -(yarn dyeing)

This plant was commissioned on 12th April but there is a serious defect on the drying side of the machine; the upper cheeses on the carrier are dry while the lower cheeses are still damp. This differential drying is totally unacceptable and the manufacturers, Longclose, have been asked for their solution to this problem. PAC has been requested to withhold some payment (if they can) until the answer is found.

Drying (if it can be called that) takes about 3 hours and is costing Rs.4000/- per ton; this is of the same order as the pressure machine at Birla.

ANGLO INDIA (fabric dyeing)

This mill was the site for an automatic jigger. The mill is under lock-out and because of labour unrest it cannot be moved. However, it is likely that the mill will be bought by another company and in that case the jigger can be removed and re-located in New Central Jute Mills. The GOI is aware of the situation.

MAINTENANCE MANUAL

A useful compendium of machine data and recommended cleaning, maintenance and repair has been written. Many of the machines in the mills are old, and over the years non-standard parts have been fitted. This manual will prove to be of great value to the mills.

PRODUCTIVITY IMPROVEMENT

Under this heading, the Inter-Firm Comparison (Weaving) is yet to be completed. The chief reason for slippage is said to be the delay in preparing a suitable room to house 2 P.C's and the appropriate staff. This, in the writer's view is not acceptable since the computers could have been used in the

general office of the project for a few months at least while this room was being prepared. The necessary infrastructure for data collection could have been finalised but this has not been done yet. The programmer resigned in February and then the executive responsibility for this activity was transferred from Mechanical Processing to a newly-created MIS section.

In view of all this, it is most unlikely that any output may be expected before September.

BUDGETS

According to the latest print-out (30/3/92) the outstanding balances are :

Personnel	:	\$ 55,90
Training	:	38,390
Equipment	:	170,573
Contracts	:	18,721
Misc	:	268

\$ 283,112

Against these must be placed estimates of expenditure from 0/3/92 to 30/6/92

Personnel

11-01	\$ 25000	
11-14	17000	\$ 32000

Training

NPD's Study Tour		14000
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Equipment

Enzyme Plant still to pay	31859	
" " repairs	2500	
" " Ultrafilter	40000	
Video equipment	4000	
Dye plant spares	5126	83485

Contracts

-

Misc

1000

\$ 130485

Note:

Part of the surplus is due to changes in the exchange rate. For example, the enzyme plant cost Rs.33,86,117, and at the start of the Project this was equivalent to \$202761 and it has actually cost only \$171454, due to changes from Rs.17.6/\$ to Rs.28.8/\$.

PERSONNEL

It is regretted that once more a comment must be placed on record about the project staff who are on fixed contracts with IJIRA. With the end of the project only weeks away they become more and more anxious about their future and, it must be said, less motivated in their work. Already, more than 10% of them have resigned. It is essential that a decision is reached about this matter as soon as possible.

Utilisation of uncommitted funds

The surplus at 30 June will be about \$ 130,000, and because of this the opportunity has been taken to purchase spares for the laboratory instruments at IJIRA. This will amount to approximately \$ 40,000.

One scientist Dr. B C Mitra joined IJIRA to work on JRP after the Harwell Fellowships have been organised and it is now the intention to arrange a 6 month Fellowship on the use of jute felt/stick/whole plant in composites. The location which is suggested is the Bio Composite Centre, University of Wales, Bangor, UK where work on a variety of plant materials for composites is going on. If the Centre is prepared to accept Dr.Mitra, the Fellowship could start probably some time in Aug/Sep. The cost will be around \$ 30,000 - 40,000. This Fellowship will provide ground work for the UNDP Sectoral Project where work on composites using non-woven jute is planned for Wisconsin University.

Budget Line 31-99 must be augmented by \$ 40,000 to cover this Fellowship - this can be transferred from 49-99 (Equipment).

Additionally, a purchase of text books may now be made which will strengthen IJIRA's technical library and a sum of about \$ 20,000 should be allowed for.

These changes can be accommodated by moving \$ 20,000 from the Equipment line (49-99) to the Training line (39-99).

Annexure I

Expenditure to the end of the Project

Buline 19-99	Personnel	2-week contract for CTA	\$ 3000
29-99	Contracts		-
39-99	Fellowship	6 months	30000
49-99	Equipment		
	Enzyme plant	32290	
	Autoclave repair	2500	
	Ultrafiltration plant	40000	
	Longclose spares	5000	
	Mettler spares	40000	
	Freeze dryer spares	5000	
	Other lab. spares	40000	
	Technical library	20000	148000
59-99	Miscellaneous	-	
Total			\$ 181000

Annexure II

Justification for Fellowship

A 6-month Fellowship was agreed at the Terminal Review meeting in the subject of Jute Reinforced Plastics. It will, if possible, be executed at

The BioComposite Centre
University of Wales
Bangor
North Wales

The justification for it follows.

Work in the latter parts of the Project shows that, although technically acceptable, JRP based on jute fabric is expensive and cheaper alternative methods of reinforcement, namely felts, macerated whole plant or fibre need to be examined. The Fellowship will address this problem at the BioComposite Centre where work on all sorts of plant material for resin reinforcement is going on.

This Fellowship will form a linkage between the present Project and the forthcoming sectoral programme of which JRP is a segment.

Annexure III

The following two pages give a summary of the action taken and the progress which has been made since the Tripartite Review meeting of November of last year.

WORK PLAN 20/10/91

STATUS 15/5/92

Item	Complete by	
Enzyme plant:		
Commissioned	1 December	Commissioned 31 December; malfunction in January stopped trials, incomplete
Expert's visit	7 January	Complete
Staff trained and first trials completed	30 January	Staff recruited, partially trained
Sales to mills operational	30 March	Not started
Dyeing and finishing:		
India Jute Package dyer commissioned	30 January	Commissioned 28 January
Trials/experiments completed	30 April	Revised date 30 June
Jigger out of Anglo India	15 December	Still at Mill due to industrial action
Alternative mill selected	15 November	Completed
Padding Mangle and dryer commissioned	29 February	Completed
Trials and experiments complete	30 April	Revised date 30 May
JRP:		
Tea box trials complete	30 January	Awaiting Tainting report from Tata Tea
Expert's visit	29 February	Completed
Lower cost forms of jute for composites	30 May	Identified
Final conclusions(technical/economic)	15 June	On target

Industrial engineering:

Publish spinning maintenance manual	30 January	Delayed, now expected 30 June
Publish weaving maintenance manual	30 May	Delayed, no date for publication
Commission computers for IFC (Weaving)	30 November	Delayed :
De-bug software	30 December	Delayed : Responsibility transferred to
Collect mill data and issue first IFC	29 February	Delayed : IJIRA; completion date 30 September 1992
Seminar on IFC for weaving	30 May	Delayed :

Geo jute:

Publish full report on field trials	29 February	Delayed
Make video of field trials	30 May	Delayed, awaiting camera, possible completion by 30 June

General public relations for IJIRA:

Circulate to Members easily-read report on the Project	30 April	Delayed, now 30 June
Hold seminar to publicise new facilities and future plans for activities started in the Project	30 May	Delayed, now 30 June