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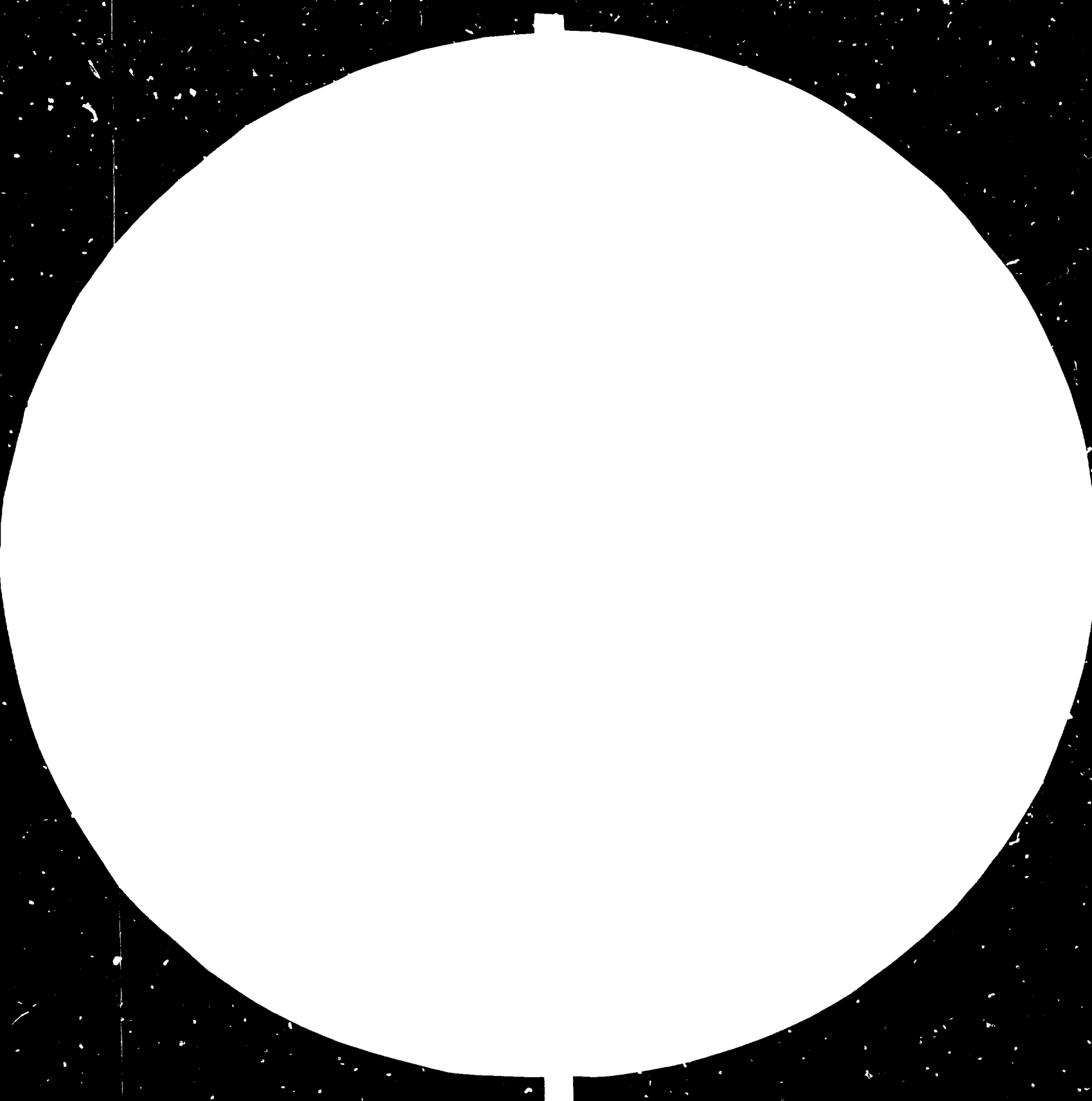
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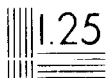
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Sudan.

CELLULOSE CHEMISTRY & TECHNOLOGY RESEARCH UNIT

ST / SUD / S2 / 001

SUDAN

Interim Report .

by

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Vienna

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This report has not been cleared with the United Nations Industrial Development Organisation which does not, therefore, necessarily share the views presented.

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SECRET

The project started in June 1962 for a duration of two years ending May 1964. Since then, the laboratories extension and arrangement have been completed. The equipment procurement, delivery and installation phase has taken a considerable longer time than planned which hindered the start of full research work. Still about 30% of the equipment had not reached the Unit. Local training started and is still going on. Overseas training (Fellowships and study tours) has not been completed because of difficulties encountered in placement of fellows in European and American research institutes. A tripartite review meeting was held at UNN, Naartoun on 5-6 September 1963 and it was agreed to extend the project for one year (June 1964 to May 1965). A new work plan for the extension period will be prepared in June 1964. The project objectives and outputs were reviewed and new specific outputs were added to the original ones aiming at promoting and strengthening the National Industries based on the utilization of indigenous raw materials. It was agreed that a review meeting should take place before the final mission of Mr. Ibrahim in May 1964.

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INTRODUCTION

The Project Document was signed on 20 February 1962 by the representatives of the Government of Sudan, UNIDO and UNRISSTO and went into operation in June 1962 for a duration of two years. Total contribution by UNRISSTO is US \$ 647,000 and that by the Government is Is. 264,400. The UNRISSTO contribution (inputs) covers the expenditure of the international personnel, training of the national personnel, supplies, equipment and miscellaneous while the Government contribution covers the assignment of the national staff and provision of buildings provided with all facilities necessary for laboratories, offices, workshop, etc.

The development objective of the project as outlined in the project document is to strengthen and promote industries based on the utilization of forest and agricultural residues as well as strengthening the indigenous scientific and technological capacity in the area of cellulose chemistry and technology via support for the creation, adaptation or application of technology in the National Development Plan. The main immediate objective of the project is the establishment of Cellulose Chemistry and Technology Research Unit (CTRU) to conduct research work directed towards the application of science and technology for the utilization of indigenous wood and agricultural residues in the field of pulp, paper, paperboard, construction board, animal feed, energy, etc.

The purpose of this mission (30 Aug. - 30 Sept. 62) was to follow-up and review the progress of the project in order to take

corrective actions aiming at reaching the project objectives. For the same purpose, a trigamete review meeting attended by the representatives of the Sudan Government, UNISCTD and UNIDO was held on 5-6 September 1983.

#### RECOMMENDATIONS

1. Delivery of the missing equipment should be urged in order to help conduct full research work. Corrective actions for the equipment not conforming to specifications are to be taken.
2. Technical assistance throughout the life span of the project to help achieve its immediate and development objectives is requested.
3. Proper research work on the utilization of local raw materials for making pulp, paper, paperboard, construction board and animal feed should be intensified. The expert and research team leaders are requested to pay more efforts.
4. Establishment of stronger link between OJTRU and the existing paper and board industries through quality control of raw materials and end products, trouble shooting, training of personnel and development of process and product is strongly recommended.

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MEMORANDUMA- Tripartite Review Meeting

The tripartite review meeting was held at the UN, Manhattan on 5-6 September 1983 and attended by the representatives of the Government, UNICEF and UNIDO. After discussions, the participants arrived at the following recommendations:

1. The execution of the project is in line with the envisaged objectives according to the project document. The preparatory stage has taken a considerable period of time. In the time left until May 1984, the research activities will be intensified.
2. All parties agreed on an extension of the project for one year and that by the end of June 1984, Dr. Gabir and Dr. Ibrahim will work out a work plan covering the extension of the project by one year within the revised budget.
3. It was noticed that the budget did not allocate funds exclusively for workshop tools. As this is necessary for the project, US \$ 5,000 from the uncommitted equipment allotment should be reserved for purchasing these tools.
4. It was found that this project is in the scope of the current macro objective: The rehabilitation of the

current industrial sectors. It was recommended by the meeting that a team including representatives of this project, Ministry of Industry and SIDA - Office, should be established in order to prepare terms of reference for a further study which should be finished by June 1984. The purpose is (a) to analyse the current resources including machinery, the need for development and markets, and (b) to prepare recommendations how to rehabilitate pulp and paper industry (two idle mills and two on-going mills) in order to make full use of local raw materials and of the idle capacity. The representative of the Ministry of Industry, Mr. George, and SIDA promised close co-operation.

5. Mr. Judd (UNIDO) and Mr. Alahmardi (UNTSSTD) stressed the point that the additional financing should be sought under TSDC Programme for helping revitalizing existing paper mills. Although the first efforts have not been too encouraging, "Friends should help friends". If needed, Mr. Alahmardi offered to submit the request to TSDC, New York.

5. All participants were of the opinion that a review meeting should take place before the final mission of Mr. Ibrahim in May 1984.

7. It was agreed to give the Government the flexibility in changing budget lines except for DI 16 and 54 by request from UNISSUD.

For further details, reference is made to the minutes of the meeting prepared by SIDDI - Office, UNDP, Khartoum.

### 3- Inputs / Budget

#### 1. Government Inputs

##### 1.1. Assignment of National Personnel:

According to the revised work plan (1962), 4 research assistants and 3 technicians were to be assigned in addition to the available staff of the JTRU. Actually 4 research assistants were assigned (two in November - December 1962 and two in June 1963). Of the three technicians, two were appointed in 1962 and the third one failed to join the Unit. The assignment of the third technician should be done as soon as possible. The Government promised to assign more research assistants and technicians to meet the needs of the Unit.

##### 1.2. Laboratories and Facilities:

The extension and rearrangement of the laboratories were nearly completed on schedule except for the physical

testing laboratory which has been recently completed due to shortage of materials and scarcity of competent contractors.

The laboratories have been provided with all facilities including water supply, drain, electricity, etc. For improving the water supply, two tanks (one ground and one overhead) and one pump were installed. Two electric lines for 230 V and 380 V were provided. Special arrangements were made to provide the laboratories with butane gas.

However, due to frequent electricity cuts at the area of COMPU causing interruptions to the work in the laboratories, an emergency supply of electricity should be furnished. The Consultant suggested and it was agreed by the tripartite meeting to provide the Unit with an electric generator to ensure continuous running of the equipment. Consequently, the order for a gas-generator will be replaced by an electric generator.

Concerning the Government inputs, a total of about Ls. 200,000 has been spent up to the end of August 1953 for buildings, construction, salaries, etc. According to the project document, about Ls. 64,000 are left.

## 2. UNSSRD Inputs

### 2.1. Assignment of International Staff:

UNIDO assigned two experts to the project, Dr.

Ibrahim as Consultant for 6 months in 4 split missions and Mr. Jayasingam as P/LJ and Paper Expert for 18 months. By the end of September 1983, the Consultant would have completed three missions and the Expert 15.4 months.

### 2.2. Training:

#### 2.2.1. Local Training:

The Consultant and the Expert conducted a theoretical training programme for the research personnel at the Unit. At the time-being, the research personnel are receiving on-job training.

#### 2.2.2. Overseas Training:

Two technicians, Mr. El Taki and Mr. Osman completed their overseas training for two months (Feb. - March 1983) in Egypt. Two research assistants, Mr. El Hilo and Mr. El Assoum completed the first part of their overseas training for two months in Egypt last June 1983. Unfortunately, they could not continue their training in U.S.A. for another three months as it was planned. This is because

of difficulties encountered in placement of the two fellows to the Institute of Paper Chemistry, U.S.A. As a result, the fellows returned home and then resumed their overseas training early September 1963 for four months up to December 1963 at the Empire State Paper Research Institute, New York, U.S.A. The other two fellows, Mr. Lutfi and Mr. Mizzallah have not yet commenced their overseas training.

According to the project budget, a total of US\$ 50 000 was allotted to 20 m/m overseas training for the research personnel. This was distributed as follows:

- 4 m/m for 2 technicians (2 month in Egypt)
- 10 m/m for the first batch of 2 research assistants (2 months in Egypt + 3 months in U S A)
- 6 m/m for the second batch of research assistants (1 month in Egypt + 2 months in U S A).

However, with the extension of the overseas training of the first batch of research assistants to 4 months instead of 3 months in USA, 16 m/m will be consumed. As a result, only 4 m/m are left for the second batch of research assistants with an uncommitted balance of US \$ 10,769 as per the status of allotments for the Project at 31 August 1963. Accordingly, there would be two

alternatives; either to proceed with the fellowships as originally planned i.e. 6 m/m for the second batch of research assistants and in this case the allotment for the fellowship has to be increased by about USD 10,000, or to reduce the fellowship to 4 m/m to cope with the uncommitted balance.

As it is intended to intensify the research work in the time left for the project, especially after completion of the delivery of the equipment and the return of the first batch of research assistants in December 1963, it would be advisable for the second batch of assistants to have one month training in Egypt through November 1963 in the field of construction board and animal feed from agricultural residues and come back to take part in the research activities of the Unit for one year and then they can resume their overseas training in Europe or USA for the second part of their Fellowship.

### 2.2.3. Study Tours:

According to the revised work plan (1952), three study tours for the National Director of COTMU were scheduled for January 1953, August 53, and March 1954. The first study tour took place in March 1953 for one month in China, India, Pakistan and Egypt. The second study tour will be postponed to June 1954 for the same reason mentioned above for the fellowship of the second batch of research assistants.

### 2.3. Supplies and Equipment:

Two vehicles were supplied for the project, one limousine for the use of experts and one pick-up for the transportation of raw materials.

Up to September 1953, almost all the chemicals and glassware as well as about 70% of the equipment were received at site. However, some essential equipment required for full research work were still missing such as the straw cutter and wood chipper for the preparation of raw material for pulping, the laboratory beater and the air compressor for the handsheet press for the evaluation of pulps. Furthermore, some of the equipment received were not conforming to the specifications ordered. A claim was raised to the Purchase Section - UNIDO to take corrective actions.



During his visit to Khartoum early September 1963, Dr. Judd (UNIDO), reviewed and discussed with the Consultant, the Expert and the National Director of the Unit the equipment required in order to take actions for ordering the missing equipment. It is hoped that these equipment will reach the Unit in the coming two months.

As to the budget, the status of allotment for the project at 31 -6- 1963 - UNIDO. shows that the total uncommitted balance is US \$ 212,513 which indicates a total expenditure of 434,467. It is to be noted that according to a Mandatory Project Revision (1963) agreed by UNIDO on 12-5-63 and approved by UNFSSFD on 15-6-63, Budget lines 15 (Project Travel ) and 49 (Equipment) were decreased by about US \$ 43,256 and savings transferred to DL 11-01 to cover Expert's actual costs in 1962 and commitment in 1963 with no increase in total over previous allocation.

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### 3- Outputs

#### 1. Review of Outputs:

The outputs outlined in the Project Document were thoroughly discussed in the emigrante review meeting. The participants agreed to the request of Mr. Alsharidi (UNISERV) that there should be a clear distinction between inputs and outputs of the project, for instance physical completion of research facilities is just an input while the achievement of their operational status is an output. It was also agreed to add the following specific outputs to the original ones:

- Quality control of raw materials and end products for the paper and converting mills.
- Trouble shooting of the existing paper mills
- Continued research work on better utilization of agricultural residues.
- Training courses for mill personnel and students in pulp and paper making.
- Updating annual statistics on the quantities of agricultural residues available in Sudan.

## 2. Current Status of Outputs:

### 2.1. Research Activities:

Because of the protracted phase of the procurement and installation of equipment, proper research work could not be started on schedule. Up till September 1963, about 30% of the equipment has not reached the Unit.

However, with the available research facilities, a good part of the investigations and analysis could be made as for example:

- Morphological and anatomical structure of agricultural residues.
- Chemical analysis of raw materials.
- Pulping and bleaching.
- Mechanical and chemical treatment of agricultural residues for animal feed trials.

So far, the only activity started and is still going on, is the mechanical and chemical treatment of groundnut shells for animal feed trial. Also, chemical analysis of four local raw materials, namely wheat straw, sugar cane bagasse, cotton stalks and sorghum stalks has recently

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been started. A progress report on the findings is expected to be issued early October.

The research work should be more intensified, especially after completion of the equipment and return of the research assistants from their overseas training.

As regards the five research projects previously formulated as a framework for the research activities of OSTRV, it was agreed to give the project "Residues of Agricultural Residues" to the Energy Council of OTR to avoid duplication in research.

#### 2- Technical Assistance:

As it is intended to intensify the research work in the time left for the project up to May 1964 and through the extension period of one year, it has been requested by the Government to extend the technical assistance of UNIDO to the project through the said period. This would help achieve the immediate and development objectives of the project.

Furthermore, a well-experienced technician is needed for one to two months to check and calibrate the equipment supplied to OSTRV and to train the national personnel on operating and maintaining the equipment.

E- Work Plan:

It has been found necessary to revise the project work plan in light of the prevailing conditions and to work out a revised work plan covering the period September 1903 to May 1904. Annex I shows the revised work plan for the said period.



