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07170



United Nations Industrial Development Organization

Distr.  
LIMITED

ID/WG.233/15  
12 October 1976

ORIGINAL: ENGLISH

Meeting of Selected Heads of  
Research Institutes

Vienna, Austria, 18 - 22 October 1976

NOTE ON THE FEDERAL INSTITUTE OF INDUSTRIAL  
RESEARCH, OSHODI <sup>1/</sup>

by

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<sup>1/</sup> The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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## INTRODUCTION

The Federal Institute of Industrial Research (FIIR), Oshodi, was established in 1955 following a recommendation by the World Bank Mission which visited Nigeria in 1954. Its primary objective was to conduct research on local raw materials in order to determine their suitability for industrial use. The functions of the Institute were then stated as follows:-

- (a) "to carry out basic research into raw materials available in Nigeria for use in industry, and the processes which can be used most effectively to convert them;
- (b) to carry out pilot-scale trials of processes found in the laboratory to be technically feasible;
- (c) to calculate, by means of larger scale tests or otherwise, the probable viability of such processes if established on a commercial scale."

Its scope of activities has now been expanded to include technical assistance to industries and the Governments of the Federation.

### I GOVERNING COUNCIL

The Institute is an arm of the Federal Ministry of Industries and has a Governing Council which acts as an advisory body to the Ministry on the research programmes of the Institute. As of now, the Industrial Research Council of Nigeria is the Governing Council of FIIR.

### II CURRENT ACTIVITIES

The operational activities of the Institute can be categorised as follows:-

- (1) **Basic or Applied Research involving**
  - (a) the characterisation of local raw materials for use in manufacturing industries e.g. timber for pulp, cereals for malt and clays for ceramics;
  - (b) the development of indigenous technology e.g. mechanisation of gari production, design and fabrication of a distilling apparatus for native gin and improvement of infant formula Soy-ogi or akamu;
  - (c) operations research into the management systems of Nigerian industries e.g. inventory stock control, production scheduling, quality control and engineering design and maintenance.
- (2) **Technical services for which nominal charges are made involving:-**
  - (a) laboratory testing and analyses of product samples for government agencies, private industries and individuals;
  - (b) feasibility studies of industrial project based on the use of local raw materials;
  - (c) trouble shooting services in production engineering, instrument repair and calibration and cost accounting processing for small scale industries;
  - (d) industrial, technical and scientific information dissemination through direct inquiries or by technical publications.
- (3) **Demonstration of research results involving:-**

- (a) semi-commercial production of new products e.g. gari, soy-ogi, vinegar, and nico-cream;
- (b) participating in trade and industrial exhibitions.

### III ORGANISATION

FIIR is divided into six operating and one administrative divisions:-

Food Science and Technology: Nutrition, Biochemistry, Processing.

Materials Science: Textile and Fibre Technology, Ceramics and Physical Chemistry, Organic Chemicals and Products.

Applied Biology: Microbiology, Fermentation, Toxicology, Distillation, Microbial Culture Bank.

Engineering: Design, Fabrication, Control, Maintenance, Electric, Instruments.

Industrial Analysis: Economics, Statistics, Operational Research, Marketing, Documentation.

Analytical Services: Product testing, Quality Control, analytical methods.

### IV IMPORTANT ACHIEVEMENTS

The most spectacular achievements of the Institute are in the field of food technology. Its mechanised production of gari and the manufacture of soy-ogi (protein-rich food made from maize and soya beans) have won international recognition. A distillation apparatus which was designed and developed for the distillation of palm-wine into alcoholic beverages is now in great demand in Nigeria and of considerable interest to people in a number of West African countries. Other major achievements include the following:-

production of coir fibre as upholstery filling;

refining of kaolin and its use in ceramic wares;  
pulping of Gmelina Arborea for Nigeria's pulp  
and paper industry;  
development of cosmetic cream from local vegetable  
oils;  
modification of cassava starch for textile industry;  
production of composite bread from cassava, soya  
and wheat flour.

In addition, the Institute has the following publications:-

Research Reports - 48 titles  
Technical Memo - 28 titles  
Articles in journals: 50 (approx.)  
Papers delivered at conferences and  
meetings: 75 (approx.)  
Miscellaneous reports 16  
Technical Information Bulletin for industry:  
11 quarterly issues published to date.

#### V PLANS FOR THE FUTURE

Apart from continuing with basic research and consultancy services, the Institute hopes to demonstrate the practicability of some of its research results by setting up demonstration factories during the Third National Development plan. The factories which will be set up by the Research Products Development Company will use predominantly Nigerian raw materials, and thus will further illustrate the fact that research is not all paper work; that research and production are not antithetical.

During the same period, it is proposed to establish field stations in a number of state capitals outside Lagos in order to reach wider sections of the population, and be able to communicate more effectively to them the research



findings of the Institute. Already, Kano field station has been established, arrangements are on to open other stations in the main geographical zones of the country. Furthermore, using the field stations as a base, it will be possible to make the Institute's consultancy services available to a larger clientele and in this way, come nearer to fulfilling this very important aspect of the Institute's assignment.

In pursuance of the Federal Government policy of accelerating the transfer of technology through the development of local capabilities in the manufacture of processing machinery, the Institute proposes to upgrade its engineering division into an engineering design and fabrication centre.

#### VI STAFF

The staff of the Institute is drawn from a wide spectrum of disciplines - chemists, physicists, biologists, nutritionists, technologists, engineers, economists, sociologists and librarians. There are a total of 42 professionals, 18 technicians and 106 junior officers. Supporting the professionals and technicians are four senior administrative and 60 miscellaneous junior staff.

The Institute's key staff currently are:-

- Dr. I. A. Akinrele - Director of Research
- Dr. G. O. Chigbo - Deputy Director of Research
- Dr. O. A. Koleoso - Assistant Director of Research
- Mr. O. O. Onyekwere - Principal Research Officer  
(Food Sc. & Tech. Div.)
- Dr. A. B. Oniwinde - Acting Principal Research  
Officer (Appl. Biol. Div.)
- Mr. L. L. Akerele - Principal Research Officer  
(Material Sciences Div.)
- Mr. O. Olunloyo - Principal Research Officer  
(Industrial Analysis Div.)
- Dr. E. Ofulue - Acting Principal Research  
Officer (Analytical  
Services Division).

## VII FINANCE

With the exception of a very small sum obtained from nominal fees charged for testing and research services, all FIIR's income is derived from the Federal Ministry of Industries budget. Operating costs (actual and estimated) over the last three years are:-

	<u>ACTUAL</u> 1974/75 N	<u>ACTUAL</u> 1975/76 N	<u>ESTIMATE</u> 1976/77 N
Personal Emoluments	364,323	912,810	959,010
Other Charges	127,047	229,000	288,300
Special Expenditure	25,937	77,000	60,000
Capital Expenditure	84,791	850,000	500,000
Total Expenditure	<u>602,098</u> *****	<u>2,069,310</u> *****	<u>1,807,310</u> *****

Capital costs are budgeted on a four year programme which is reviewed annually. In the current four year period, this sum allocated is N1.32 million mainly for the building programme. In the 1970-74 period, N580,000 was provided. Of the Capital budget, about N100,000 is allocated annually for equipment which includes all laboratory and pilot plant equipment, workshop machines, standby generator etc. It is for this reason that outside aid is sought for equipment.

## VIII LINKAGE AND COOPERATION ACTIVITIES

The Institute has over the years engaged in cooperative programmes with other research and technical institutions, both at the local and foreign levels. Some of the prominent linkage projects are mentioned below:-

### (A) Tropical Products Institute, London

The British Government through Tropical Products Institute provided assistance to FIIR by donating

a complete set of laboratory equipment for pulp and paper testing. Thereafter, the equipment was used in carrying out a collaborative study of the pulping characteristics of Nigerian hardwood timbers. The results of these studies which spanned a period of nearly ten years have now provided the raw material base for the three pulp and paper mills being set up in the country.

Similarly, a flour and bakery test laboratory was established in the Institute to support a UNDP assisted programme of wheat growing trials. Through this facility, the TPI was able to transfer composite flour technology to FIIR utilising local wheat flour extenders from cassava, millet, sorghum and soya beans. FIIR has now started a programme of technology workshops aimed at transferring the newly acquired and more appropriate technology to local industry.

(B) Denver Research Institute, Denver, Colorado

Denver Research Institute has proposed and established an international network programme involving six industrial research Institutes of which FIIR is one. The purpose was to conduct a collaborative study of the application of bio-conversion technology to agro-industrial wastes in the respective countries. There was initial enthusiasm amongst participants but this has since thinned down due to the fact that supportive funding could not be obtained to cover the cost of the comprehensive network activities.

(C) David Livingstone Institute, University of Strathclyde, Glasgow

FIIR developed proposals for a collaborative study with the David Livingstone Institute to

evaluate the wide range of technology alternatives in use in Nigeria for the extraction of oil from local oilseeds. The oilseeds of commerce in Nigeria consist of cotton-seed, groundnut (peanut), soya beans, palm nut, palm kernel, coconut, cocoa, beniseed (sesame) and the lesser known ones such as sheanut, conophor, melon and rubber seed. The project was supported by the Ford Foundation who were to fund the costs of a participating Research Fellow from Strathclyde. Unfortunately, this project could not take off due to administrative bottlenecks which upset the time availability of required staff.

(D) Local Collaboration for the Development of the Village Still

The most practical experience the Institute has had in the development and transfer of appropriate technology is one involved in the development of an indigenous technology for distilling spirits. The project started with seeking out the practitioners of the art, who paradoxically had been driven to the backwoods because of the legislation against their unwholesome product. The opportunity to come into the open provided the fillip to confide in us and to expose their methodology to us. Whereupon, basic biochemical and engineering studies were carried out to design and fabricate a new still suitable for their use in the backwoods, but still guaranteeing the potability of their final product. The developments of this still and the accompanying technology have generated considerable interest both in Nigeria and other neighbouring countries and as a result, it was possible for a local engineering firm to take on the licence to produce and market the still on a commercial basis.

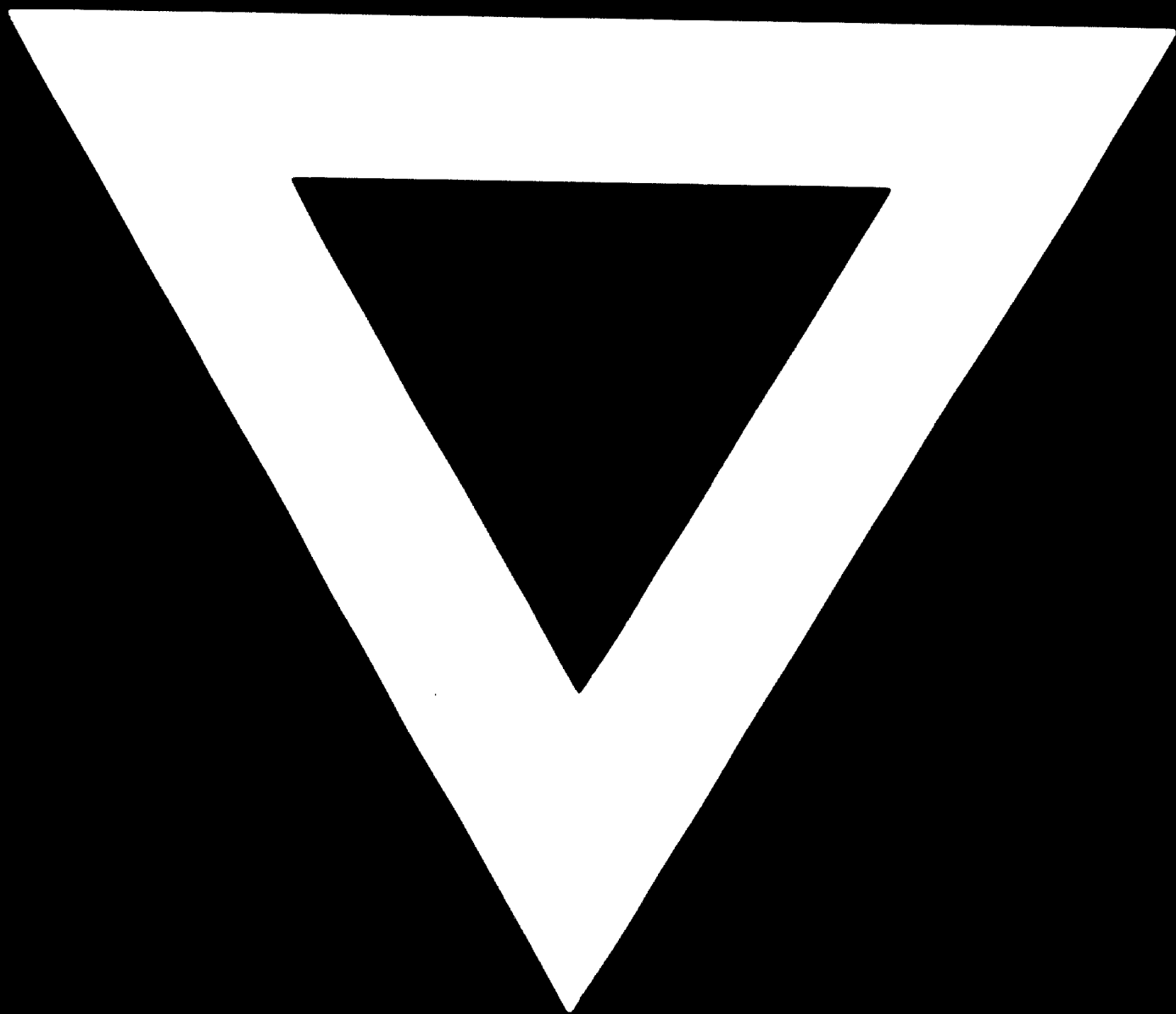
## IX INDUSTRIALISATION OF FIIR RESEARCH RESULTS

Our emphasis in the chain of activities associated with the transfer of technology is the industrialisation of our research results. It is in this sector that our performance has been weakest. The reasons are typical of many developing countries. There is an over reliance on the transfer of technology by direct investment. There is the lack of credibility for the local research institutions and their incapacity to supply the supporting technical services required by entrepreneurs. There is the national infra-structural constraint in engineering design and fabrication of production equipment and machinery. All these are formidable problems the development and transfer of technology.

However, FIIR has initiated a programme of demonstration factories that will utilise the results of research primarily to convince indigenous entrepreneurs of their commercial viability. This started with a revolving fund scheme which enabled us to mobilise our pilot plant equipment for semi-commercial production of research products. In this way, sufficient material is made available to enable product evaluation (i.e. customer acceptability, nutritional value of a food, market surveys etc.) to be carried out. More recently, the concept of establishing a Research Products Development Company has been accepted. The company will operate mainly as an Investment holding organisation to sponsor the commercialisation of industrial research results. One of the strategies to be adopted in developing new technologies generated would be by means of joint ventures with established and reputable manufacturing organisations so that the benefit of their commercial experience could be blended into the technological operations. Already, one multi-national company has become interested in the exploitation of local research result under the proposed scheme.



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