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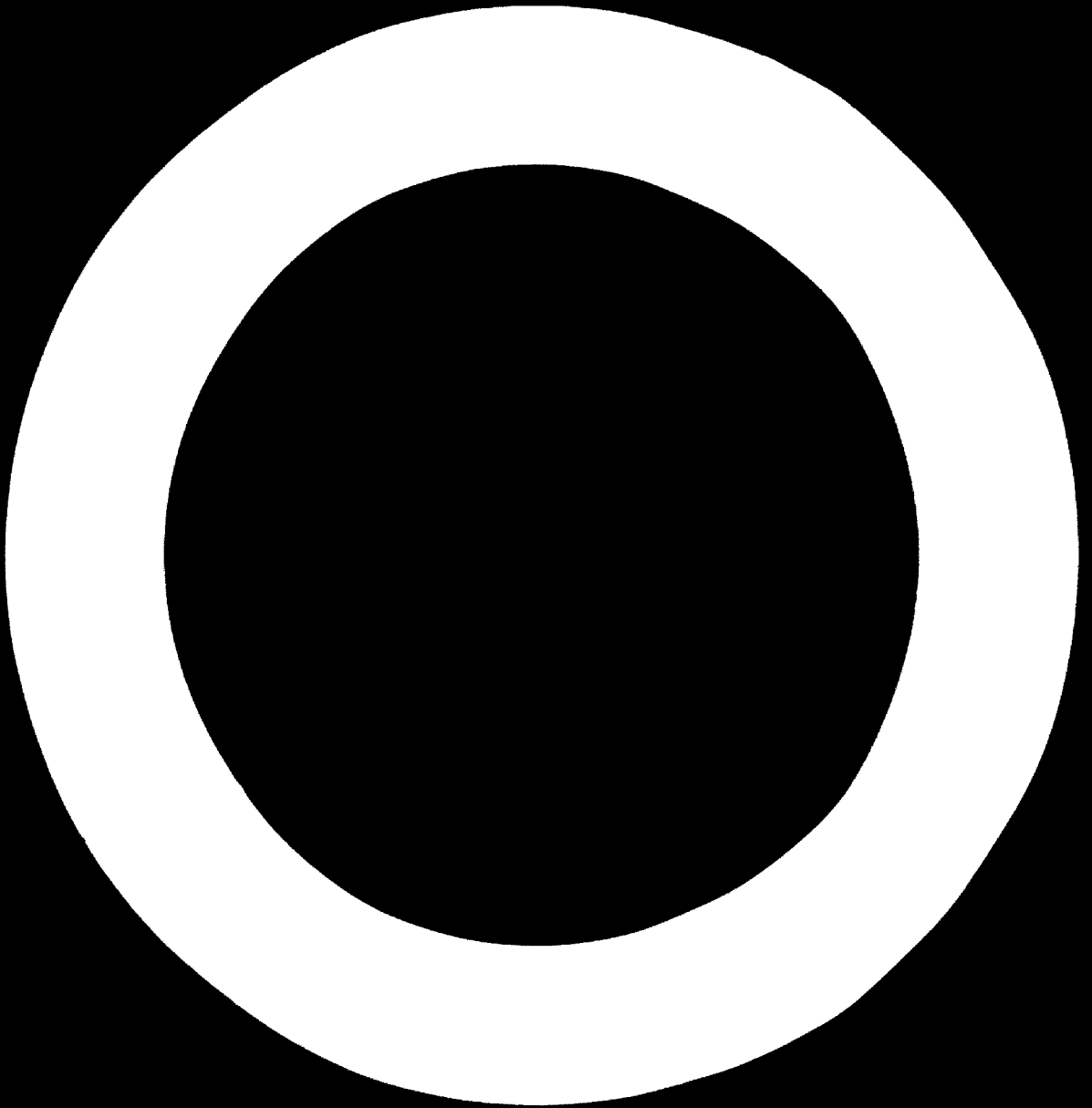
REPORT OF THE ADVISORY MISSION TO THE GAMBIA
ON TECHNIC-ECONOMIC CONDITIONS OF PRODUCING AND PROCESSING ILICHITE

by

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The Industrial Policies and Programming Division

id.73-6939



BACKGROUND

Description of the Project in the PDS of the Mission

Two substantive staff members of UNIDO - experts in production, processing and export marketing of related industrial products - will assist the Government of The Gambia in exploring possibilities of industrial co-operation in processing ilmenitic sands.

The Government of The Gambia plans to initiate negotiations with representatives from the Government of Iceland on the possibilities of supplying ilmenite concentrates to Iceland where the material would be processed. The two UNIDO staff members will act in a technological, advisory capacity, to the Government of The Gambia prior and during the above mentioned negotiations, with a view to ensure the maximum practicable industrial processing of this raw material in The Gambia.

In addition to the Description of the project contained in the Project Data Sheet, on 6 September 1973, Mr. Maneck wrote to Mr. W. Harper, Resident Representative of UNDP, setting out in more detail the tentative objectives of the UNIDO mission, which were:

- (a) to consider the possibilities in The Gambia of the industrial processing of heavy black sands to more sophisticated products including the possibility of further UNIDO technical assistance in this sphere.
- (b) to examine the current situation for undertaking with UN assistance the feasibility study for local industrial processing of Gambian black sand deposits, giving proper consideration to the completion of the geological survey and the identification of the potential market for the ilmenite concentrate.
- (c) to investigate the possibilities of an agreement or an expression of intent without commitment between the Gambian authorities and the potential overseas partner/importer, which would include that the overseas partner would incorporate data on the Gambian ilmenite concentrate in a feasibility study to establish a metallurgical plant and would include that the Gambian authorities receive a copy of this feasibility study.

With the assistance of Mr. W. Harper, UNDP Resident Representative, and Mr. A. Klu, Project Officer, to achieve its objectives, the mission had discussions with the following Gambian Government officials:

Messrs. E.H. Christensen, Secretary General, President's Office
T. Sossah, Deputy Secretary General, President's Office
T. Sowe, Perm. Secr. Ministry of Local Government, Lands and Mines
G.A. Armstrong, Chief Economist, President's Office
A.A. N'Jie, Lands Officer, Lands Office
J. N'Dow, Assistant Secretary, President's Office
J.H.B. Eyo, Deputy Chief Economist, President's Office

Description of Mission

In accordance with its objectives as a first stage, the mission advised the Gambian authorities on the current status of their request for a feasibility study on the processing of heavy black sand into ilmenite concentrate in The Gambia. The Government were advised that UNDP had certain doubts regarding SIS financing for this project. These doubts stemmed from the question of the market for the ilmenite concentrate-products and from the uncertainty regarding the extent of black sand deposits in The Gambia.

With regard to the market for the ilmenite concentrate, the Gambian authorities were advised of the interest of the Icelandic Government in possibly importing and processing Gambian ilmenite concentrate. When aware of this interest, the President's Office cabled the Icelandic Minister of Industries officially inviting an Icelandic mission to visit The Gambia. However, in replying, the Icelandic Minister while reaffirming Iceland's strong interest in this project, indicated that the mission was not possible at that point of time. However, he raised the possibility of a meeting at a senior government level at a convenient venue. It is anticipated that this meeting between Gambian and Icelandic officials probably at a ministerial level, will take place in Europe in the last quarter of this year. Subsequently the Icelandic Minister of Industries set out his views in a letter to the Gambian authorities a copy of which is attached.

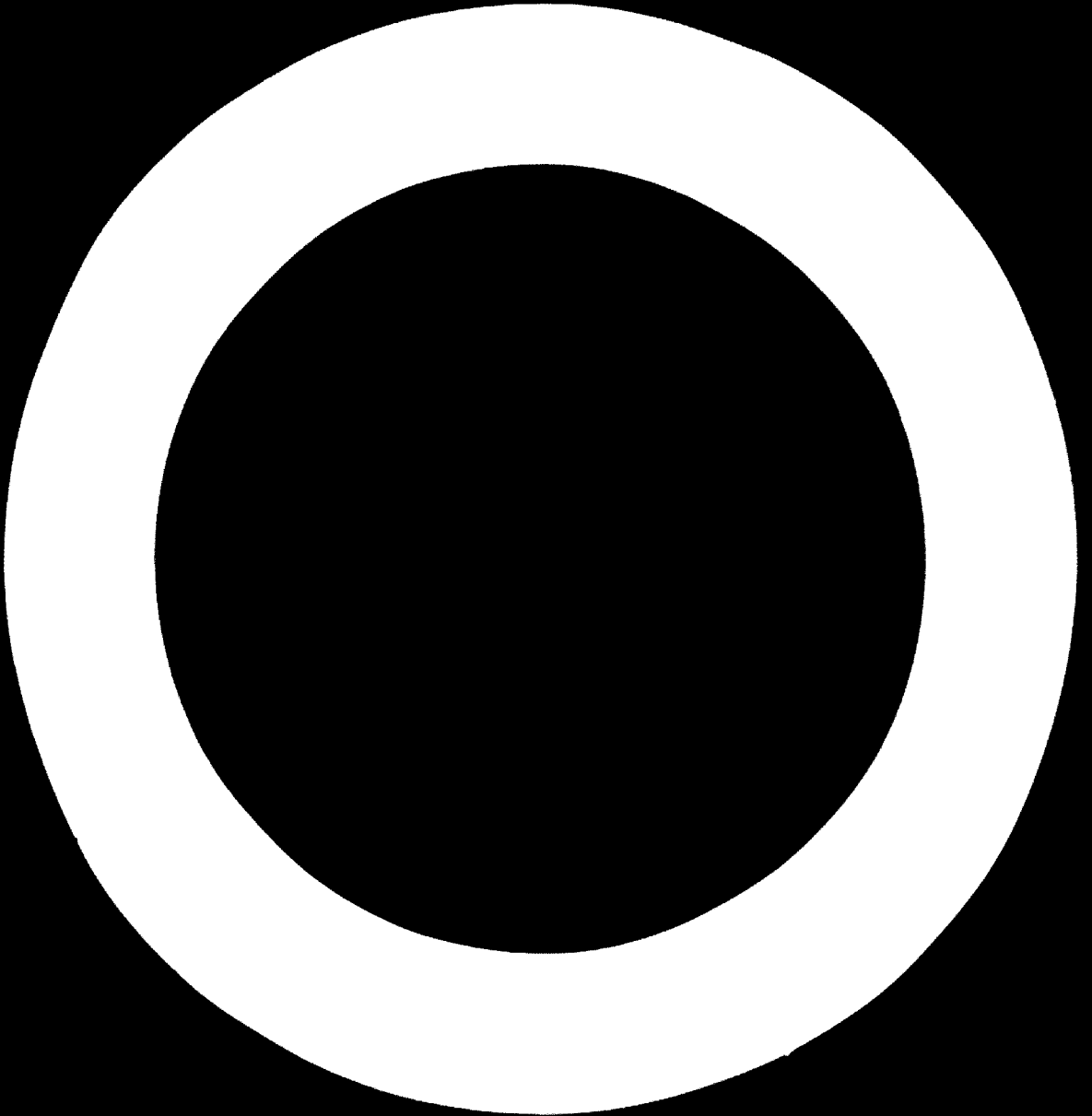
In order to establish a framework for such a meeting, the UNIDO mission prepared and presented an "expression of intent" for the consideration of the Gambian Government. The expression of intent sets out possible guidelines for future co-operation with the Icelandic partner. The Gambian Government indicated that they would study the expression of intent and also expressed the wish that a copy be sent to the Icelandic authorities (copy of expression of intent is attached).

It was agreed with the Gambian Government that both Gambian and Icelandic authorities will study the expression of intent incorporating any changes they feel necessary. The revised versions would then be returned to UNIDO for the preparation of the final version which would be signed by both parties. This document will form the basis for a co-ordinated technical assistance effort on the project from the United Nations.

Having stimulated the **contact** between the two potential partners, UNIDO's role can be seen also in an advisory light in future developments in this project. In fact, the Gambian Government indicated that they would be interested in having UNIDO's substantive advice during the forthcoming negotiations with the Icelandic partner. The mission also stressed the importance of undertaking an investigation into the homogeneity and extent of the ilmenite bearing sands in The Gambia. The Government was made aware of the contradiction between an original assessment of the extent of these sands undertaken by an English company during the 1950's and the findings of the laboratory test which was undertaken recently with UNIDO assistance. The Government fully recognized the necessity of clarifying this aspect as a pre-requisite for the feasibility study of establishing local dressing operations on an industrial scale.

Following discussions with the UNDP Resident Representative and the relevant Government officials, it was agreed that such an additional geological investigation could be undertaken by the Czechoslovakian company, Polytechna which has been investigating kaolin in The Gambia. This company would be returning to The Gambia to undertake an additional study on the quantity and homogeneity of components other than kaolin such as quartz sand, laterite, etc. It was felt that during this study they could also undertake an investigation of the heavy black sands in The Gambia. Therefore, it was agreed that the Government would send a revised project request within the framework of the Country Programme to allow for an additional \$3,300 (to a total of US\$ 15,000 as compared with US\$ 11,700 requested earlier for the additional kaolin study), to enable this additional examination to be carried out.

Bearing in mind that the objectives of the mission were not limited to an investigation of ilmenite, but also included the further processing of other minerals contained in the heavy black sands, the mission also looked into the possibility of the local processing of Zircon concentrate-product of the eventual dressing operations. The mission felt that there was a possibility that zircon concentrate could be processed into fine ground zircon flour; however, this would require an expert study and, towards this end, the mission presented to the Gambian Government, a terms of reference for such a study. A copy of this terms of reference, which are currently being studied by the Gambian Government, is attached.



COPY

IDNA DAFRA DUNEYTI
Ministry for Industry
Arnarhvoli
Reykjavik, Iceland

Government of The Gambia
Banjul
The Gambia
WEST AFRICA

Our Ref. Date
I/223-23 19.09.73.

Iceland/UNIDO Mission to the Gambia

Dear Sirs,

This is to acknowledge and thank you for your cable of Sept. 14 reading as follows:

Etat
Hon Kjartansson
Minister Industries
Reykjavik

Following cabled information and discussions with UNIDO mission comma wish to confirm interest of Gambian Government in receiving Icelandic mission to arrive Gambia approx 20. September (.) Opportunity to establish contact and discuss joint action plan for preparations at senior government level for possible ilmenite cooperation venture

Presof Banjul.

Today we have cabled as follows in reply:

Government of the Gambia
Banjul, Gambia
West-Africa

Re your tel Sept 14
Regret due to unforeseen reasons Icelandic mission to Gambia this week has to be cancelled stop Government very interested take up negotiations at government level at a convenient location in near future Letter follows

Kjartansson
Minister of industry
Reykjavik.

As you are aware we have for some time had under preparation a mission to the Gambia to study with your experts and UNIDO officials the feasibility of establishing cooperation between our countries with regard to electro smelting of ilmenite concentrates. It was foreseen that a chemical engineer and an economist from our side would join the UNIDO mission in the Gambia around Sept. 20.

After receipt of your above cable, however, we have come to realize that the composition of mission envisaged from our side - would not be the most suitable one at this stage. In fact, we fully agree with you that the mission should be on a Senior Government level.

Unfortunately, we have found it impossible to prepare a new mission on such short notice and have, therefore, cabled to you as above.

It is our impression that such high level meeting should be the best first step. Therefore a technical mission to the Gambia seems to have no grounds for the time being.

Accordingly, we should like to make the following proposals:

1. Both Governments agree to arrange a joint meeting of senior government officials as soon as possible.
2. Preferably, the meeting place should be for inst. in Iceland or somewhere in Europe at the choice of the Gambian Government.
3. The aim of the meeting should be to prepare a plan for the further development of the project, i.e. to initiate negotiations for a possible joint venture leading to a letter of intent and discuss the desirability of a joint feasibility study.
4. The meeting should also decide when an Icelandic technical mission to the Gambia and such one from the Gambia to Iceland should take place.

As much as we regret not being able to be represented at the present time in the Gambia, we do hope, however, that you will understand our position and that you will find our proposals above acceptable.

Assuring you of our highest esteem,

Your sincerely,

(signed)

Magnús Kjartansson,
Minister of industry.

(signed)

Arni Snævarr,
Secretary General.

Expression of Intent

(Draft)

It is the intention of the Government of The Gambia and that of the Government of Iceland to establish contact at a high Government level with a view to exploring the possibilities in the field of ilmenite processing, for industrial co-operation which would mutually benefit both countries. The co-operation envisaged would allow both countries to take advantage of exploiting local natural resources. In the case of The Gambia this would involve the mining and dressing of Gambian black sands to produce ilmenite and other mineral concentrates. In the case of Iceland it would enable the further utilization of inexpensive hydro-electric power required for the metallurgical processing of ilmenite concentrate.

Already certain preparatory stages have been carried out in this respect. With UNIDO assistance, a metallurgical investigation has been undertaken of a representative sample of the Gambian heavy black sands in a specialized laboratory. The results of the investigations were encouraging with regard to the yield and composition of ilmenite concentrate and its suitability for further metallurgical processing to titania slag and pig iron. Again with UNIDO assistance, a pre-feasibility study was carried out in Iceland on the establishment of an electro-metallurgical plant for processing imported ilmenite concentrate. The results of this study were also positive. Both the Gambian investigation and the Icelandic study were undertaken on the request of the respective Governments.

As a preliminary indication of the willingness to co-operate the Governments of The Gambia and Iceland exchanged the reports of the two studies. However, it is recognized that a number of other preparatory stages would be necessary before an agreement on co-operation could be arrived at. On the one side, it is necessary to assess the exact extent of the black sand deposits in The Gambia and to elaborate the techno-economic feasibility of establishing an industrial dressing plant for processing the sands into mineral concentrates. On the other side, a full feasibility study needs to be undertaken in Iceland on establishing a metallurgical plant for processing ilmenite concentrate.

Fully aware of the uncertainties inherent in these preparatory stages, at this point in time the Governments of The Gambia and Iceland are prepared to demonstrate with practical measures, their interest in an eventual co-operative venture which would be to the benefit of both countries. Towards this end, the Government of The Gambia is prepared to agree that the Gambian ilmenite concentrate will be one of the varieties taken into account in the Icelandic feasibility study. Also, the Government of Iceland is prepared to agree to provide one copy of the feasibility study to the Gambian authorities. On completion of the feasibility studies in both countries, it will be possible to examine a further linking of the preparatory work being undertaken in these countries.

This represents one form of initial co-operation which would involve no commitment from either partner. However, a number of important aspects relating to such a co-operation would need to be discussed between the Governments of The Gambia and Iceland. With this in mind, it is the intention of the two Governments to enter into an exchange of correspondence aiming at convening a meeting, in the near future, of senior Government officials, preferably at ministerial level, at a mutually convenient venue, possibly Vienna. The meeting would be directed towards agreeing in principle on establishing a programme of co-operation in processing ilmenite concentrate and examining the various means by which such co-operation could be achieved.

.....
(signature)

Date:

.....
(signature)

Date:

Terms of Reference of a UNIDO Expert Study on
possibilities of local processing of Zircon Concentrates
eventually produced in The Gambia into more advanced
industrial products

(on UNIDO Consultancy Funds)

As a result of laboratory metallurgical investigations of a representative heavy beach sand sample from The Gambia, carried out with UNIDO technical assistance, it was clarified that one of the commercial products of dressing the sands would be a zircon concentrate, with a 64.5% zirconic content, 0.26% titanium-oxide content and 0.14% iron oxide content.

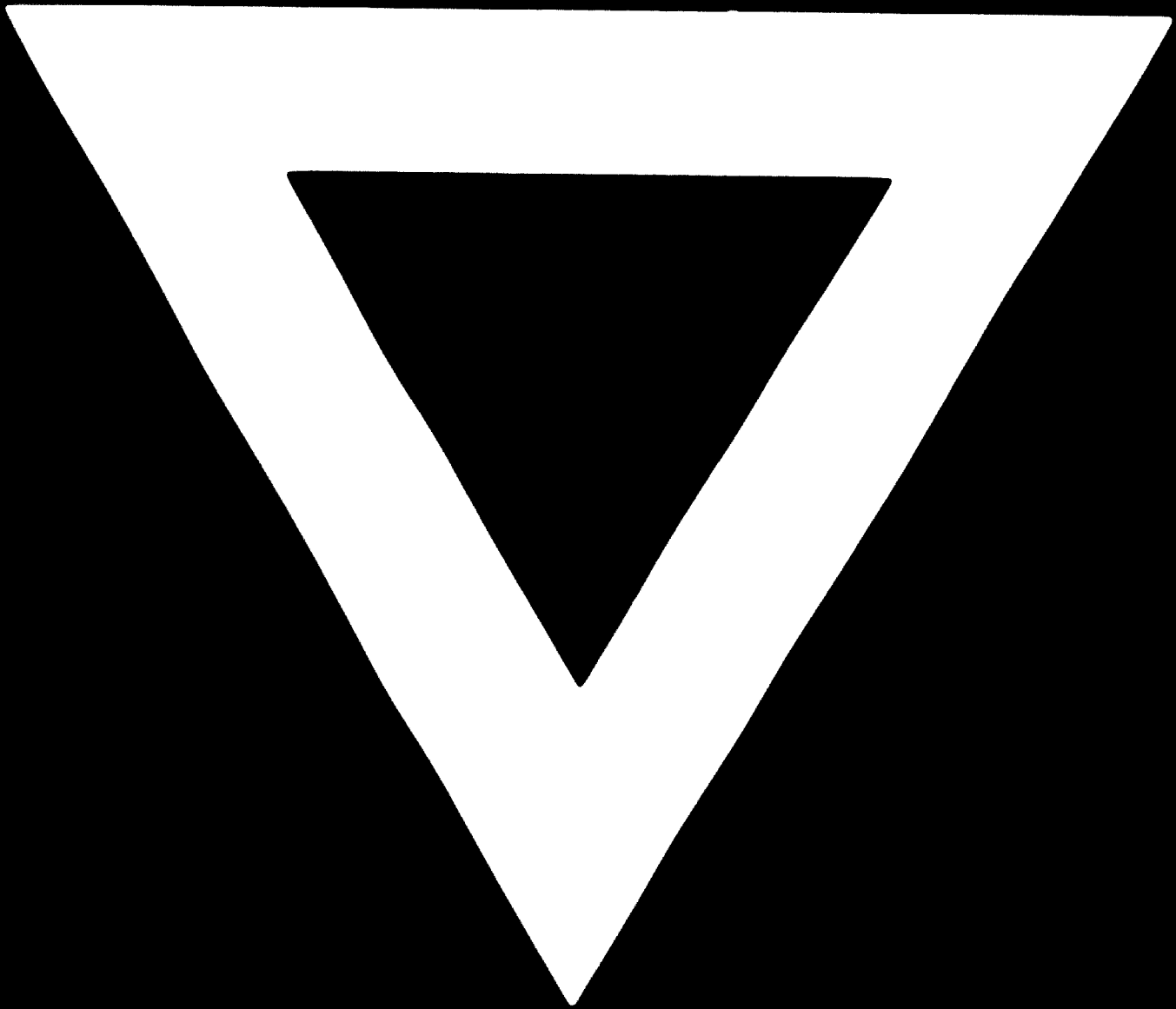
The Gambia is interested in examining the possibilities of further processing locally of the zircon concentrates into more advanced and diversified products, facilitating marketing of this material.

The main application for zircon is as a moulding sand, particularly in steel foundries. Considerable quantities are used in this field of precision castings as finely ground zircon "flour" and the same product is also used in the ceramics industry as opacifier. This requires, however, specific know-how and equipment to ensure that no or very little contamination takes place during grinding and pulverization.

A study by an expert, fully qualified in this field of industry, is requested to be commissioned by UNIDO for the Government of The Gambia, which would include the following:

- Evaluation of the zircon concentrates which may be produced from heavy mineral sands of The Gambia taking into account quality requirements as a pre-condition for development of more advanced products;
- Description of conditions of producing, from the Gambian zircon, finely ground flour or powder with a purity meeting international requirements;
- Elaboration on types and sources of specific technological know-how equipment and on investment and production costs and their structure for zircon flour and powder under local conditions;
- Assessment of the international market situation from aspect of possibilities for The Gambia to export the more advanced products in consideration.

The data and information required for preparing the above study may be obtained from the report on laboratory investigation of a representative Gambian mineral sands sample, prepared in 1971 through UNIDO and also by correspondence. Therefore, no visit by the Expert to The Gambia is envisaged.



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