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SUPPORT

OTHER FUNDS AND PROGRAMMES

UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

Annual report of the Administrator for 1983

Summary

This report describes the activities of the United Nations Revolving Fund for Natural Resources Exploration in 1983 and is submitted in compliance with Economic and Social Council resolution 1762(LIV), paragraph 1(o). The report describes progress and effectiveness in field activities, in pre-investment follow-up and in the evaluation of new project requests. It also informs on progress towards selecting the first geothermal project.

Continued financial constraints are again brought to the attention of the Council, while the Fund's management policies in focusing its resources on the most promising activities are highlighted.

The attention of the Governing Council is directed to the recommendations of the Administrator as set forth in paragraph 46.

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INTRODUCTION

1. The United Nations Revolving Fund for Natural Resources Exploration continued to make good progress in all its activities during 1983. The thrust of the Fund's work was directed to four main areas: (a) pre-investment follow-up design and assistance to countries where positive mineral finds have been made; (b) effective management of the operational projects in the mineral sector and continuing appraisal of information emanating from them; (c) programme regeneration through pre-project evaluative and development work; and (d) intensive project evaluative work in the geothermal sector with the identification of highly promising projects. While excellent progress was made in each of these areas as described in the body of this report, the Fund's limited financial resources will soon prevent it from responding adequately to the growing demands of the developing countries. There is, consequently, an imperative need for substantially increased financial support, particularly from the industrialized countries. Given its present financial constraints, the policy of the Fund is directed to making the best use of its technical and financial resources in order to secure the maximum effectiveness of its assistance.

2. In the minerals sector an excellent success record was maintained. With 11 projects completed by the end of 1983 over an interval of six years, seven discoveries can be recorded. In the geothermal sector, the carefully planned two-year review and evaluation of potential projects has led to the identification of several very promising targets.

I. PROGRAMME

A. Mineral resources

3. While continuing careful project monitoring, evaluation and development, special attention was given to assisting the Governments of Argentina, Benin, Congo and Ecuador in promoting investment follow-up. Activities came to a close in Guyana and Liberia and were being wound down in Kenya, Suriname and the Upper Volta.

4. The start-up of the project in Haiti, and the ratification of the Peru Project Agreement proceeded on schedule. Considerable advance was made in project development work in Sierra Leone leading to the signature of the Agreement which is expected to be ratified shortly. This project (SIL/NR/82/001) is now presented for the Council's approval. A new project for phosphate exploration, both onshore and near-shore, was designed for Chile. After detailed pre-project evaluatory work, it is possible that progress will allow this project also to be presented to the Council in 1984.

5. Although 1983 showed an overall reduced portfolio from 11 to 8 operational projects, considerable development activity continued to provide a

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stream of projects meeting the Fund's selection criteria. In all cases, and as covered by the management chapter of this report, the quality of the Fund's programme continued to take precedence over quantity, in accordance with the Fund's mandate.

6. In a further effort to assist Governments, the Fund has initiated an exercise to develop a documentation package which Governments will be able to use to attract follow-up investment. A broad survey is being conducted of private mining groups, the public sector, private and international financing institutions, and regional and national banks in order to establish a cross-section of opinion on matters affecting mining development. The results of this survey will bring to the attention of user Governments factors critical in obtaining financing and know-how in a difficult and complicated investment environment.

7. In Argentina, preparatory feasibility study work was completed by the Fund and infrastructural requirements were provided by Government. The efforts to attract investment for precious and base metal discovery at Huemules brought a positive response and a proposal for further exploration/feasibility studies and mining development was made by a major private company. The new Government is now taking stock of the situation and a dialogue has been established with the Fund to re-examine all further work requirements and investment options.

8. In the Congo, the second phase of offshore phosphate exploration in the Pointe Noire sector was implemented and successfully completed on site towards the end of the year. Industrial application studies on bulk samples are under way and a feasibility study requirement is foreseen for 1984. The co-financing arrangements reported to the Council in 1982 were successfully negotiated and funds were obtained from the United States Trade Development Programme for the second phase exploration work. The Fund is vigorously seeking co-financing interest for any subsequent activities.

9. During the continued follow-up activity aimed at obtaining investment for the development of the San Bartolome silver mine in Ecuador, a careful re-appraisal was made of end-product concentrate possibilities. Additional tests are required before assisting the Government in the development of an up-dated economic feasibility analysis. Should results be promising, promotional assistance will recommence.

10. All scheduled testing work on the Benin kaolin deposit near Ketou was completed and the final report is being compiled. Tests show that materials can be applied to various industrial uses for both the local and export markets. Discussions with the Government are under way which may lead to further limited work, including industrial application and market studies and the possibility of an increased definition of mineable reserves.

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11. Work was concluded in Guyana with project emphasis being placed lately on the detailed evaluation of disseminated low-grade gold mineralization along an extension of the old Peter's Mine. Unfortunately, results did not prove sufficient potential reserves for consideration as an economic mining proposition. Work was stopped, therefore, with the exhaustion of total authorized funding and the final report is under preparation.

12. While encouraging results for gold continued to be obtained in Liberia, the final analysis of all information showed a situation similar to that in Guyana. Insufficient reserves were indicated even though some gold mineralization of ore-grade was discovered. As further work could not be justified, the project was terminated and the final report is being prepared.

13. In the expanded exploration area in Kenya, interesting mineralization was discovered and intersected at Wire Hill. Grades of approximately 3 per cent copper and 3 ounces of silver per ton are indicated. Even though this mineralization is considered to be sub-economic under present market conditions, it constitutes an exploration success in an area where no previous mineralization was known to occur. In addition, kimberlitic rock (host rock for diamonds) was discovered and its potential was being initially evaluated. Financing for this project will be exhausted early in 1984 and at the Government's request for continuation of exploration activities by the Fund, a careful appraisal will be made of results in the present exploration area as well as of other areas being proposed. Should analysis be positive, every effort will be made to develop another project.

14. After completion of work in the Bakhuis Mountains (Area 1) in Suriname, work was concentrated at Lawa (Area 2) and ore-grade gold in quartz veins was discovered in a zone known as EL50. By the end of the year, three distinct sub-zones had been identified and, after the completion of detailed soil sampling, trench sampling was well advanced. Initial evaluative work has indicated limited tonnage (some tens of thousands of tons) with an average grade of about 0.75 ounces per ton of gold. This is well above the economic cut-off level. Due to the normally expected discontinuous nature of this type of mineralization, the area may be amenable to a small scale operation whereby gold can be recovered while underground exploration through actual mining can proceed simultaneously.

15. In the Upper Volta, work was expanded over the additional area as reported last year, and the results of geological mapping, geochemical soil-sampling, trenching and ground geophysical work led to a drilling programme which was nearing completion at the end of the year. The most promising results were obtained from a zone known as Kwadamen II where gold is associated with quartz stringer veining. Specialized consultancy work, combined with a careful appraisal by the Fund, unfortunately suggests that insufficient grades and tonnage exist to make the area economically attractive. Two or three more drillholes will be completed early next year to

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test the base-metal component of the project (zinc and copper). If results of this work are negative, the project will be terminated. If results are positive, sufficient funding is available to effect preliminary evaluative work. Even though sulphide mineralization was intersected in several holes drilled to test geophysical IP anomalies, predominantly uneconomic pyrite was encountered. Due to this consistent pattern, the prognosis is not favourable.

16. The first full season of field work was satisfactorily completed in Mali. Detailed mapping of the Immanal area fully defined the areal extent of the carbonatite host rocks and an initial drilling programme showed that pyrochlore (niobium-bearing mineral) zones of potential economic grade exist in the area. In addition, the associated industrial minerals fluorite and apatite were encountered in economic grades. The extent and thickness of these mineralized horizons, will be investigated by a second-stage drilling programme scheduled for early 1984. Investigations relating to the tungsten component of this project in the Tessalit/Kidal area started on schedule at the end of the year.

17. The Haiti project started up immediately after ratification of the Agreement and is still in its early stages. A considerable amount of reassessment of known potential areas of interest has now been completed. The project will soon be in a position to determine the optimum detailed exploration approach and whether there may be a need to modify the exploration areas. Some geophysical test work is being implemented over known gold-bearing and massive sulphide mineralization. To assist in this overall appraisal, specialized consultancy services were utilized to evaluate the tectonic setting in relation to the mineralization in Northern Haiti to assist in this overall appraisal.

18. As indicated above, project development work advanced well and resulted in new potential projects for Chile, Honduras and Sierra Leone. In Chile the Government had outlined potential phosphate-rock in two bays of the sea north of Antofagasta and requested the Fund to proceed on project development work. If sufficient tonnage is outlined then local phosphate production would result in significant foreign exchange savings. The overall economic and technical parameters were judged to be favourable for Fund involvement, and it is hoped that agreement on a project can be reached before this report is presented to the Council.

19. Similarly, in Honduras, specialized Fund evaluatory work led to the design of a project for gold and base-metal exploration over three areas in the west-central part of the country between Tegucigalpa and San Pedro Sula. Partially outlined copper, zinc and silver mineralization at Quita Gana and known and suspected low-grade gold mineralization at Vueltas del Rio/El Oro and Chanton will be explored and evaluated.

20. In Sierra Leone, various evaluative missions led to the selection of an area in the centre of the country known as the Sula Mountains-Kangari Hills belt considered to be promising for both hard-rock and alluvial gold. The Government worked closely with the Fund in the development of this project allowing design work and negotiations, as well as the signature of the Agreement, to be completed well within the year. The Minimum Work programme was approved by the Administrator and, in anticipation of early ratification, pre-project organizational activity was begun.

21. The Peru project approved in 1983 was signed and ratified by the Government and plans are well advanced for implementation in the first quarter of 1984. Major equipment is on order designed and selected after a variety of tests on the geological materials in the project area. Contract specifications for the intensive and complex work at very high altitude in the San Antonio de Poto area (15,000-16,000 feet above sea level) were being defined with assistance from specialized consultants and equipment manufacturers.

22. Evaluations of potential projects in Bolivia, Costa Rica, Egypt, Morocco and the United Republic of Tanzania were negative. The case of the United Republic of Tanzania involved detailed geophysical test work. In all these instances it was decided that project selection criteria were not met. Further efforts to develop a project in Burundi have not yet resulted in the definition of a suitable area, but it is hoped that positive progress will be made next year. Initial evaluatory work in Guatemala will lead to further limited assessment before a firm project decision is made. Initial assessment of potential in Rwanda was positive and detailed evaluative work is scheduled for 1984.

23. Under the constant project generation cycle which the Fund continues to maintain at a high level, initial contact missions were fielded to Ethiopia, the Ivory Coast, Malaysia, Pakistan, Thailand, Uganda, Zambia and Zimbabwe. It is hoped that the Council will be informed of positive developments in some of these countries next year. Discussions on project possibilities will be reopened with Brazil early next year and both Ghana and Iraq have also requested initial discussions. Both Colombia and Cuba are considering a request and some materials have already been made available to the Fund for initial appraisal.

B. Geothermal energy

24. Since late 1981 the Fund has continued to carefully review the status of high-enthalpy geothermal energy development and exploration. To date, more than 33 missions have visited 21 countries in all parts of the world to effect this review. A comprehensive data base has been established which will facilitate future geothermal work by the Fund. Installed capacity continues

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to grow at an encouraging rate in the developing countries, almost doubling from an estimated 670 MW in seven countries at the end of 1981 to 1200 MW in nine countries at the end of 1983. Further investigations in the past year indicate that there are 38 countries with established and probable high-enthalpy geothermal resources suitable for electricity production and another 26 countries with indicated potential where reconnaissance work still has to be completed.

25. As reported last year, in the project identification process, evaluation was focused on those countries where pre-feasibility studies had indicated targets ready for drilling large-diameter exploratory holes. Of the 14 such countries, 10 have shown interest in Fund financing and 8 were initially evaluated. At the time of writing, the Las Planillas prospect near Guadalajara in Mexico appears to be technically promising. It is hoped that further negotiations with the Government will allow this project to be presented to the Council. Other project possibilities were identified in the Philippines, St. Lucia and Turkey.

26. During the evaluative work, not only were the relative technical merits of the prospects considered, but also the urgency with which recipient Governments intended to develop any newly discovered resource. Speed of development, in turn, depends to a large extent on the proximity of an established power grid, technical capacity, and, of course, a shortfall of electric power which cannot be met competitively from other sources within the country. Unlike mineral projects, where the value of the commodity produced is dependent on the international market price, the negotiation of geothermal projects involves initial agreement with the Government on a Fair Market Price for the electricity likely to result from a successful project.

27. In the case of some countries, it is expected that production from a successful project could start within a period of two to three years by means of inexpensive trailer-mounted 5-10 MW turbine-generator units.

28. The Fund has established and maintained contacts, both technical and financial, with national laboratories and research organizations, international and regional banks and funding organizations, and has co-operated actively with UNDTCD and the Energy Office of UNDP in pursuing the Programme of Action of the Nairobi Conference.

29. Initial efforts are being made to secure a total funding package from various sources for any geothermal project undertaken by the Fund before any Project Agreement is signed. This is intended to take a successful prospect from discovery to production in the shortest possible time.

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II. MANAGEMENT AND FINANCE

A. Management

30. Total management control over all aspects of programme operations, aimed at the effective utilization of technical and financial resources, remained a strong point of the Fund. As its own executing agency with direct line decision-making authority, the Fund is in a position to evaluate technical results quickly and to take the required actions for the management of fieldwork. The work programmes and the expenditure requirements for all operational projects were evaluated at predetermined intervals by the Fund's Technical Evaluation Group and Budget Group which facilitated an integrated approach to overall resource allocation and project budget distribution. The phased approach to project development maximized the impact of the evaluation process as an effective management mechanism.

31. The prevailing concern is to assure that resources are utilized most effectively and are being applied to those areas with the greatest possibilities of success. Several project requests could not meet the Fund's mandated selection criteria and had to be declined. For those new projects which met the selection criteria, the complex process of approving and ratifying Projects Agreements was handled effectively by the participating Governments resulting in, or leading to, the timely start-up of work in Haiti, Peru and Sierra Leone.

32. The phased approach to project execution makes it possible for the Fund to spend less than the maximum approved allocation if results obtained do not justify further work. The rigorous implementation of this policy was a disappointment to some recipient Governments which would have liked the Fund to continue its exploration work even with poor prospects of economic returns. The quality of the programme, however, always took precedence.

33. A parallel concern was to keep administrative costs in line. The Fund was able to maintain a tight control over all such costs under its direct authority. Administrative costs remained the same as for the prior year.

34. Of continued importance in the organizational structure of the Fund is its advisory body, the Joint Operations Group (JOG). During the year, JOG was informed periodically of project developments and all major decisions were brought to the attention of its members (UNDP, UNDTCD and the World Bank).

35. The Fund, as part of a larger network of institutional assistance in the field of natural resources development, actively strengthened its association with other entities in 1983. The co-operation of the World Bank continued, providing the Fund with specialized technical and legal advice, free of charge. Co-operation with the United Nations continued on several fronts. Its specialized expertise was utilized in Fund-supported mineral projects and

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in geothermal project development. The co-operative reimbursement arrangement of the past two years was extended through 1985. There were also frequent exchanges of information on respective project developments which provided opportunities to both parties for co-operating more effectively with the developing countries.

36. Contacts with regional institutions and other governmental bodies were promoted by the Fund during the year in order to identify areas of mutual interest and collaboration. These contacts included the Latin American Organization for Energy Development (OLADE), the Inter-American Development Bank (IDB), the Asian Development Bank (ASDB), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Nordic Investment Bank, the Arab Organization for Mineral Resources and Arab Mining Company.

37. Recognizing the importance of attracting the interest of the mining sector for the feasibility/investment stage, the Fund, at the request of respective recipient Governments, was able to generate interest of important government and private mining groups in North America and Europe in the Argentina, Benin, Congo and Ecuador projects.

38. To further promote the goal of attracting mining companies and other groups to invest in the development of mineral discoveries made by the Fund, a documentation package, as previously noted, is being prepared which will be sent to a large number of parties. It is considered that a better understanding on the part of developing countries as to the requirements of potential investors and vice versa, as well as a more complete presentation of information required to evaluate a proposal, will work to the benefit of all concerned parties. For the geothermal sector, as noted in chapter I above, contacts were established with funding institutions in order to link potential discoveries to investment follow-up.

39. The Fund's niche in the broader picture of the exploration and development cycle is outlined in annex IV. With limited immediate rewards, the Fund is providing meaningful longer-term benefits. It will be seen that the Fund is in a position to supply developing countries with very high-risk exploration financing and moderate-risk financing for the follow-up feasibility study. At this latter stage and at the time of investment, traditional market forces operate, providing a wide scope of participation from the private sector, Governments and banking institutions.

B. Financial position

40. The \$2.1 million in expected voluntary contributions for 1984 is again inadequate to assure funding availability for new approvals on the continued and sustained basis necessary for the sound development of the programme. The status of contributions and resource allocations is summarized in annexes II and III respectively. The Fund's cumulative expenditure on completed projects

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and programme commitments was \$32.1 million, which includes an estimate on an actuarial basis for subsequent work. Funding availability for additional programming, excluding expected pledges and amounts due, was estimated at \$10 million as of December 1983. Programme expenditures in 1983 are estimated at \$4.8 million, a decline of \$1.6 million from the prior year. This can be mainly attributed to reducing or terminating work on several projects, and to the cyclical character of the programme.

41. As noted above, there is a short-term funding availability of \$10 million for new approvals anticipated by the Fund during the next year to cover two or three new mineral exploration projects, possible co-financing participation in one or two feasibility studies and a first geothermal project. It will be seen by the Council from both chapter I and annex I of this report that more projects are being presented to the Fund than can possibly be financed. Assuming project approvals proceed as planned this year, and that the level of annual contributions remains the same, there would be sufficient funds available for only one new project approval each year.

42. The present financial resource inadequacy will, therefore, seriously inhibit the Fund's response to new projects. As has also been emphasized in past reports to the Council, project development work requires considerable expenditure, time and effort on pre-project assessment and evaluation. From the outset negotiations with Governments include complex and sensitive issues such as the selection of the most promising target areas and the ceding of exploration areas to the Fund. New projects cannot be developed or accepted by the Fund unless there is a reasonable expectation of forward-funding.

43. Owing to the continued depressed mineral market, there is a very low level of interest on the part of the industrialized countries in mining exploration worldwide. Major natural resources groups in the industrialized world have dramatically reduced their high-risk exploration funding particularly in the developing countries. While short-term prospects for major expansion in minerals production are, therefore, unattractive, it needs to be recognized that (a) developing countries need to know their exploitable mineral deposits for their development planning purposes; and that (b) it is necessary to have a pipeline of discoveries ready for investment and production as and when market conditions improve. Recognition of this situation by the developing countries continues to generate further interest in the Fund. The total number of countries indicating their formal acceptance of the Fund's Operational Procedures and Administrative Arrangements (DP/142/Rev.1), now stands at 37, while over 40 countries have informally expressed an interest in using the Fund.

44. Given the gestation period in bringing successfully completed projects to the pre-investment stage, it is important that donor contributions to the Fund continue and expand. If contributions to the Fund are only forthcoming when the international minerals market improves, there would be a danger that the

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Fund would revert to its status during the first years of its operation when considerable funds were available but projects were not ready for implementation.

45. While the Fund's financial position is generally unsatisfactory, there is an encouraging development to report with regard to project co-financing. In 1983 the Fund, as stated earlier, was successful in obtaining its first co-financing participation from the United States Government for the second phase of the offshore phosphate exploration work in the Pointe-Noire sector of the Congo. It is hoped that this will be the first of many co-financing agreements for both the minerals and the geothermal sectors.

III. RECOMMENDATION

46. In light of this report, the Administrator recommends that:

The Governing Council,

(a) Approve the projects submitted under the series DP/NRE/PROJECTS/REC subject to the availability of funds;

(b) Recognize the unique role and the continuing importance of the Fund as a source of high risk financing for natural resources, particularly at a time of an alarming reduction of other traditional international sources;

(c) Express concern about the deteriorating financial capacity of the Fund to meet the demand of the developing countries for their natural resource exploration and development activities;

(d) Appeal strongly to Member States to support the Fund with significant voluntary contributions in order for it to fulfil its mandate; and

(e) Request the Administrator to pursue vigorously co-financing as a means to increase the resources of the Fund available to developing countries under the authority granted in decision 80/29.

Annex I

UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

Status of projects as of 31 December 1983

1. Minerals sector

A. Completed projects

Country and project number	Principal target minerals	Expenditure (thousand of US dollars)		Status
<u>Argentina</u> ^{a/} ARG/NR/77/001	Copper, lead, zinc, gold, silver	3 297	Field work completed: 05/82	Preparatory feasibility study work was successfully completed revealing additional high grade gold and silver values in collected rock samples. The new Government is re-examining feasibility study requirements and investment options.
<u>Benin</u> ^{a/} BEN/NR/80/001	Kaolin clay	294	Field work completed: 10/82	Final Report under preparation. Preliminary industrial application tests on the kaolin clay deposit indicate suitability for local and export markets.
<u>Cyprus</u> CP/NR/77/001	Copper, base metals and gold	1 110	Field work completed: 07/82	Final Report completed and submitted to Government (three gold/ copper Reported Mineral Discoveries).
<u>Ecuador</u> ^{a/} ECU/NR/76/001	Silver, gold, lead, zinc	2 072	Field work completed: 07/79	The potential end product, a silver concentrate, is being reappraised to promote investment interest in this discovery.
<u>Guyana</u> GUY/NR/78/001	Phosphate, rare earths, niobium, massive sulphides, gold	2 692	Field work completed: 12/83	Final Report being prepared. Discovered gold mineralization contains insufficient tonnages of ore-grade material for economic exploration. No reported mineral discoveries.

Country and project number	Principal target minerals	Expenditure (thousand of US dollars)	Status	
<u>Liberia</u> LIR/NR/78/001	Precious metals	2 560	Field work completed: 08/83	Final Report being prepared. Indicated grades and/or tonnages of discovered gold deposits considered insufficient to warrant further testing. No Reported Mineral Discoveries.
<u>Panama</u> PAN/NR/77/001	Porphyry-copper, gold	992	Field work completed: 12/80	Final Report completed. A small gold deposit claimed as a Reported Mineral Discovery.
<u>Philippines</u> PHI/NR/79/001	Copper, zinc, lead, precious metals	587	Field work terminated: 04/82	A Work Completed Report was submitted to the Government in April 1983.
<u>Sudan 1</u> SUD/NR/75/001	Gold and base metals	217	Field work completed: 04/78	Final Report submitted to Government. Only minor mineralization discovered. No Reported Mineral Discovery.
<u>Sudan 2</u> SUD/NR/78/001	Diamonds	429	Field work completed: 11/81	Final Report submitted to Government. No indication of diamondiferous deposits or potential host rocks found during Minimum Work. Additional work not considered justified.
<u>Suriname</u> SUR/NR/76/001	Copper, zinc, gold, tungsten	1 374	Field work completed: 12/83	Final Report in preparation. An area containing a number of high grade auriferous quartz veins being claimed as a Reported Mineral Discovery. Full potential of veins best-tested by small scale (profitable) mining. No further work by Fund programmed.

B. Operational projects (continuing through to 1984)

Country and project number	Principal target minerals	Commitment (thousand of US dollars)	Key dates	Status
Congo PRC/NR/80/001	Offshore phos- phate	MW ^b / 165 SW ^d / 700 865	GC approval: 03/81 Signature: 01/81 Project effective: 12/81	Second phase offshore phosphate work concluded with favourable indications of grade and tonnage. Upon completion of industrial application studies a Final Report will be prepared and a feasibility study requirement will be evaluated with the Government in 1984.
Haiti HAI/NR/82/991	Copper, gold	MW 1 000 SW 1 500 2 500	GC approval: 06/83 Signature: 10/82 Project effective: 01/83	Field work was initiated in all four zones. Areas of potential being evaluated.
Kenya KEN/NR/78/001	Copper, lead, zinc, gold, silver	MW 1 100 SW 1 500 2 600	GC approval: 01/79 Signature: 10/79 Project effective: 08/80	Interesting gold and copper mineralization was discovered which however appears to be sub-economic under present market conditions. Kimberlitic rock (host rock for diamonds) was also discovered but available funding was insufficient to proceed with further evaluation. A Final Report is under preparation and the appraisal of all results should lead to the development of another project.
Mali MLI/NR/80/001	Rare earths, niobium, tin, tungsten, tantalum	MW 1 300 SW 1 500 2 800	GC approval: 06/81 Signature: 10/81 Project effective: 02/82	In the course of the Minimum Work programme pyrochlore (niobium-bearing mineral) and phosphate zones of potential economic grade were found in the Immanal and Anezrouf sectors (Area 1), and further drilling is scheduled. Exploration for tin-tungsten was initiated in Tessalit/Kedal (Area 2).

Country and project number	Principal target minerals	Expenditure (thousand of US dollars)	Key dates	Status
Upper Volta UPV/NR/78/001	Lateritic nickel and gold	MW 650 SW 2 000 <u>2 650</u>	GC approval: 03/80 Signature: 10/80 Project effective: 05/81	The most promising results were obtained in area (Kwadamen II) where gold is associated with quartz stringer veining. There appears to be insufficient grade and tonnage for a viable mining operation. Upon receiving the results of the additional drilling for massive sulphides early in 1984 a decision will be taken as to the future of the project.

C. Pre-operational projects

<u>Peru</u> PER/NR/82/001	Gold, base metals	MW 1 700 SW 2 700 <u>4 400</u>	GC approval: 06/83 Signature: 07/83 Project effective: 02/84	With the signing of the Project Agreement and its ratification, preparation is under way to start up field activities in early 1984.
<u>Sierra Leone</u>	Gold	MW 970	MW approval: 11/83 Signature: 11/83	Start-up of field operations is anticipated in early 1984.

D. Project development activities: requests/pipeline

Country	Principal objective	Status
Argentina (2)	Various	Considerable possibilities for second project but Government and Fund agree that first priority is assistance towards development of Huemules.
Bolivia	Base metals	Project area proposed by Government was negatively assessed by Fund.
Brazil	Gold and other metals	Discussions with Government taking place in January 1984.
Burundi	Gold	Strong interest expressed by Government for Fund project. Identification work continues.
Chile	Offshore and onshore phosphate	Two evaluatory missions were completed resulting in the design of a Project Recommendation, presently being studied by Government.
China	Various	Original projet area negatively assessed by Fund. Additional proposals will be considered.
Colombia	Gold and base metals	While Fund is awaiting acceptance of DP/142 from Government, it is reviewing technical information on several project areas as proposed.
Costa Rica	Precious and base metals	Project area proposed by Government evaluated negatively. Government informed.

Country	Principal objective	Status
Cuba	Chromium, base metals	Initial mission requested for 1984.
Dominican Rep.	Precious and base metals	Awaiting further action by Government.
Ecuador (2)	Copper, lead, zinc, silver	Priority given to investment follow-up for San Bartolomé (Ecuador I).
Egypt	Gold, copper	Project area negatively assessed by Fund.
Gambia	Various	Request for mineral inventory not within mandate of Fund.
Ghana	Various	Contact renewed with Government and mission planned for early 1984.
Honduras	Gold, copper, lead, silver	Positive evaluation and negotiation of Project Agreement is under way.
Iraq	Various	Identification mission requested for 1984.
Ivory Coast	Gold and base metals	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
Malaysia	Various	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
Morocco	Silver	Re-oriented project proposal negatively assessed by Fund.
Pakistan	Various	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
Rwanda	Gold	Consultancy mission planned for January 1984 to evaluate project request.

Country	Principal objective	Status
Senegal	Lignite (coal)	Results of exploration work by other organizations not yet available.
Thailand	Various	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
Uganda	Base metals	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
United Republic of Tanzania	Nickel	Project area negatively assessed by Fund after completion of extensive test work.
Zambia	Base metals, precious metals	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.
Zimbabwe	Gold, tungsten, base metals, nickel	Initial mission completed in 1983 and Fund awaits project proposal and acceptance of DP/142.

2. Geothermal sector

Detailed project evaluations during 1983

<u>Country</u>	<u>Area</u>	<u>Outcome</u>
Guatemala	Zunil/Cerro Galapago	More pre-feasibility work required in target area.
Mexico	Ixtlan and Los Negritos, Michiocal Las Planillas, Jalisco	Temperature on the low side. Positive initial evaluation. Negotiations with Government in 1984.

Initial evaluations

Argentina	Copahue	High cost drilling, low megawatt output, already discovered.
Colombia	Volcan Machin	Other areas more favourable.
Philippines	Burauen, Leyte	Development problems in connection with submarine cable to Luzon. Other possibilities being sought.
St. Lucia	Qualibou Caldera	Positive. Continuing dialogue.
Turkey	Cumali-Tuzla	Positive. Detailed mission to be fielded early 1984.

Contacts with other countries

Bolivia	2 areas	Detailed DTCD mission in early 1984 will report to Fund.
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Other missions

Costa Rica	General	No current possibilities for Fund.
Ethiopia	Corbetti Caldera	Possible Fund involvement following completion of current UNDP project.
India	General	No current possibilities for Fund.
Kenya	General	No current possibilities for Fund.
United Republic of Tanzania	General	No current possibilities for Fund.
Vanuatu	Teuma-Takara	Assisting Government to continue pre-feasibility studies.

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- a/ Pre-investment follow-up
 - b/ MW: Minimum Work
 - c/ GC: Governing Council
 - d/ SW: Subsequent work (maximum)

Annex II
UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

Status of contributions as of 31 December 1983
(US dollars)

Country	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	Pledges for 1984	Total pledges	Payment received	Amount due
Bangladesh	-	-	-	-	-	-	-	-	1 000	1 000	1 100	3 100	2 033	1 067
Belgium	-	-	405 405	909 091	166 667	-	-	110 497	102 041	90 909	90 909	1 875 519	1 693 701	181 818
Canada	-	-	1 500 000	-	-	-	-	-	-	-	-	1 500 000	1 500 000	-
Chile	-	-	-	-	-	-	-	-	5 000	5 000	5 000	15 000	10 000	5 000
Dominican Republic	-	-	-	-	-	-	2 000	-	-	-	-	2 000	2 000	-
Indonesia	-	-	-	-	-	10 000	10 000	10 000	-	10 000	10 000	50 000	40 000	10 000
Iraq	-	-	10 000	-	-	-	-	-	11 290	-	-	21 290	-	21 290
Italy	-	-	-	-	-	-	840 336	-	-	-	-	840 336	840 336	-
Japan	1 500 000	3 500 000	3 500 000	3 500 000	3 000 000	3 000 000	-	2 000 000	2 000 000	2 000 000	a/	24 000 000	24 000 000	-
Mali	-	-	-	-	-	-	-	450	-	-	-	450	450	-
Netherlands	-	411 523	374 532	403 226	-	-	-	-	-	-	-	1 189 281	1 189 281	-
Norway	-	-	-	-	-	-	-	-	422 535	-	-	422 535	422 535	-
Panama	-	-	-	-	-	-	1 000	1 000	1 000	1 000	-	4 000	3 000	1 000
Uganda	-	-	-	-	-	-	-	51	-	-	-	51	51	-
United States of America	-	-	-	2 500 000	983 423	-	-	-	-	b/ 150 000	-	3 633 423	3 633 423	-
Zambia	-	-	-	-	-	-	-	-	-	-	3 731	3 731	-	3 731
	1 500 000	3 911 523	5 789 937	7 312 317	4 150 090	3 010 000	853 336	2 121 998	2 542 866	2 257 909	110 740	33 560 716	33 336 810	223 906

a/ To be announced.

b/ Co-financing

Annex III

UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

Cumulative resources, commitments and additional programming availability
estimated as of 31 December 1983

(Millions of US dollars)

I.	<u>Cumulative resources</u>	
A.	Contributions paid	33.3
B.	Interest income (as of 31 December 1982)	12.8
C.	Estimate of interest income for 1983-84	3.5
D.	Total	49.6
II.	<u>Cumulative programme commitment</u>	
	<u>Complete projects and projects for which fieldwork completed:</u>	
E.	Maximum approval by Governing Council	19.8
F.	Actual expenditure	15.6
G.	Funds returned to central resources for further programming (E minus F)	4.2
	<u>Operational and approved projects:</u>	
H.	Maximum approval by Governing Council	15.8
I.	Indicative expenditure schedule ^{a/}	9.7
J.	Maximum further work (H minus I)	6.1
K.	Estimate of further work ^{b/}	3.6
L.	Total indicative expenditure and estimate of further work (I + K)	13.3
M.	Pre-project development (including estimated 0.4 for 1984)	2.2
N.	<u>Pre-operational projects</u> Minimum work approved by the Administrator ^{c/}	1.0
III.	<u>Administrative costs</u>	
O.	Cumulative administrative costs (through 1983)	6.2
P.	Estimated administrative costs for 1984 (including overhead costs to UNDP)	1.3
IV.	<u>Balance available for additional programming^{d/}</u> Cumulative resources total (D) minus the sum of the cumulative programme commitment (F + L + M + N) and administrative costs (O + P)	10.0

a/ Cumulative actual and projected cost to complete present phase of work plans.

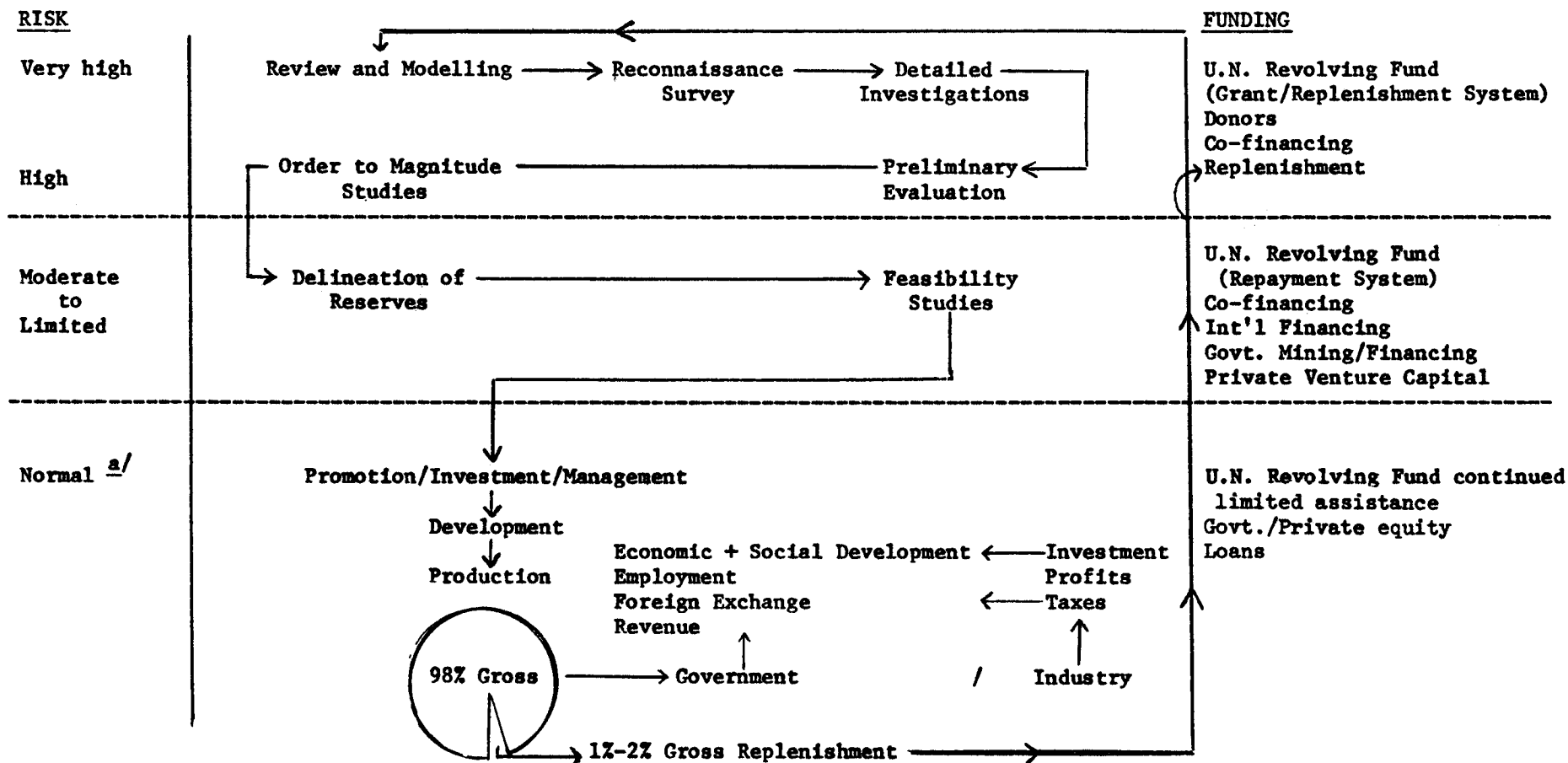
b/ Based on the assumption that approximately one third of all approved projects expend their total allocations, one third expend only the Minimum Work commitment and one third expend an amount equal to Minimum Work plus half of the remaining amount allocated. Based on an average duration of subsequent work of 1.5 years, these calculations include an estimated increase due to inflation of 10 percent per annum.

c/ \$970,000 for Sierra Leone (approved in 1983).

d/ Excludes outstanding pledges.

Annex IV

THE EXPLORATION, INVESTMENT, PRODUCTION, REPLENISHMENT CYCLE



^{a/} Dependent upon financial, market and political forces.