Thirty-fifth session
6 June-1 July 1988, Geneva
Item 8 (c) of the provisional agenda

OTHER FUNDS AND PROGRAMMES

Replenishment of the United Nations Revolving Fund for Natural Resources Exploration

Report of the Administrator

Summary

As requested by the Governing Council in its decision 87/38 of 18 June 1987, this report presents a review of the terms and conditions for the Fund's assistance with a view to seeing whether they can be made more attractive to the recipient countries without sacrificing the intention to build up a revolving fund from replenishments from successful projects. From an examination of the background to the establishment of the Fund, current terms of reference, its long-term objectives, past and present experience in the light of the character of mineral exploration, it is considered that the terms and conditions should not be changed.

This report deals only with mineral exploration projects and feasibility studies. With respect to geothermal energy exploration projects, the Fund is in the final stages of its first such project and only at the beginning of operations for its second project. With such limited experience in this field, the Administrator considers it premature to consider any changes to the existing replenishment condition.
I. INTRODUCTION

1. The object of this report is to present a review of the terms and conditions for the Fund's assistance with a view to seeing whether they can be made more attractive to the recipient countries, without sacrificing the intention to build up a revolving fund from replenishments from successful projects. The review is based on a consideration of the background to the establishment of the Fund, experiences of the Fund to date, and an analysis of the implications of modifying the replenishment conditions.

II. BACKGROUND TO THE FUND'S MANDATE

2. The Fund was established in 1973 with the fundamental objective to extend and intensify the activities of the United Nations system in the field of natural resources exploration in developing countries, utilizing for this purpose voluntary contributions and funds generated through the production of resources discovered or developed with the assistance of the Fund in such a manner as to ensure its revolving nature derived from the self-help principles for the mutual benefit of developing countries.

3. The Fund is distinguished from other forms of development assistance provided by the United Nations system by the revolving nature of the assistance provided. This stems from the requirement that replenishment contributions be made from successful exploration projects, based upon the proceeds of production.

4. The revolving nature of the Fund affects the operational principles with regard to: (a) the type of natural resources to be explored; (b) the criteria for project selection; (c) the types of services to be provided; and (d) the phased approach both to the design and the implementation of projects. Projects were to be selected on the basis of their technical and economic viability and, therefore, their potential for contributing to economic development and the ability to generate replenishment contributions to the Fund. At the same time, however, due consideration was to be given in selecting projects to the equitable distribution of the Fund's resources and to the special situation of the least developed countries (LDCs), consistent with the revolving character and objectives of the Fund.

5. Project operations are normally designed in phases. This enables the Fund throughout an exploration sequence to take the appropriate decisions to modify or reorient activities and to discontinue less promising avenues to avoid losses. By phasing and selective progression, the Fund's projects concentrate on those areas and activities that, in the light of intermediate project results, are considered most promising. Exploration activities may be initiated or terminated at any phase of the exploration sequence.

6. Replenishment contributions to the Fund are not intended to be repayment of loans but rather to provide the Fund, from its successful projects, with a share of the proceeds from resulting production. Governments requesting projects are
required to assume for a limited time an obligation to make such contributions to
the Fund (a) only for successful projects when the resulting mines come into
production and (b) at rates based on the value of the resources produced. These
obligations are set forth in a project agreement which is effective for a period of
30 years.

7. Replenishment contributions for exploration projects are at a uniform rate of
2 per cent of the value of produced minerals, for a period of 15 years from the
start of commercial production.

8. The 15-year period over which the 2 per cent is due is counted from the time
the mine commences commercial production and will be automatically suspended for
periods of non-production and extended accordingly. Where economically marginal
projects may be prevented from coming into production because of the 2 per cent
replenishment contribution (1 per cent for LDCs), the Government and the Fund may
agree to a lower percentage of replenishment based on the degree of economic
marginalities of the deposit.

9. When the Fund was established, it was felt that the application of a ceiling
to replenishment contributions based not only on the rate of replenishment
contributions but also on the Fund’s expenditures, would seriously impair the
attainment of the revolving character of the Fund. This in turn might deter
potential contributors from undertaking obligations to support the Fund. It would
also induce the Fund’s management to concentrate on the least risky projects.

10. The various aspects outlined above were embodied in the Fund’s Operational
Procedures and Administrative Arrangements (DP/142, dated October 1975). With
regard to replenishment conditions specific details were:

(a) In addition to replenishment contributions from successful projects based
on the proceeds of production, the Fund should also be entitled to "reimbursement
for feasibility studies carried out by the Fund";

(b) Replenishment obligations would be effective for a period of 30 years
from the effective date of the project agreement (40 years in document DP/53);

(c) A ceiling in the region of 15 times the original investment was suggested
as being appropriate.

11. In 1981, a working group of experts was appointed to assist the Economic and
Social Council in carrying out a comprehensive review of the functions,
institutional arrangements and repayment (replenishment) system of the Fund.

12. With regard to replenishment conditions the group recommended that "a uniform
rate of 2 per cent of the annual value of produced commodities, payable at this
rate for a period of 15 years ... be in principle maintained". It recommended,
however, that for LDCs the rate should be 1 per cent. This lowering of the
replenishment rate would respond to the general acceptance within the United
Nations system and elsewhere that the LDCs should receive a maximum of relief in
terms of the assistance extended to them. The Group believed that this lower rate
of replenishment would not violate the basic concept of revolvability of the Fund, and that its potential effects upon the Fund's replenishment could be taken care of if donors could also assume this share of the Fund's eventual income by making additional voluntary contributions in accordance with the benefits they derived from the discoveries made by the Fund.

13. With regard to a ceiling on replenishment payments, the Group concluded that 10 times the original investment, in constant prices, in the case of solid minerals, should be recommended, given present (1981) circumstances. Although a lower ceiling than 15 times may appear to reduce the opportunity for the Fund to achieve revolving status, it may on the other hand attract a greater number of quality projects, eventually permitting it to achieve a better success ratio.

14. Indirectly associated with receiving replenishment payments, the Group recognized that work undertaken by the Fund may only represent the first stage in a long and costly process of assessment leading to production. It noted that financing of further work could become available to certain user countries from the private sector and through bilateral arrangements, but in general the problem of attracting further investment on favourable terms will remain. It recognized that the lack of continuity in the diligent pursuit of economic assessment would adversely affect the mineral and hence economic development of recipient countries as well as undermine the revolving character of the Fund. The Group recommended that the Fund help obtain, through the United Nations system - including the World Bank and regional development banks - any assistance that may be required to bring the ore body to the production stage as early as possible, particularly in negotiating with the private sector. It is understood that the approach taken will be at the request of, and after consultation with, the recipient Government.

15. With regard to funding, the Group noted the lack of new pledges that would assure continuity of new projects, and that a reasonable exploration success rate would not be achieved without arriving at a steady level of approximately six new projects per year.

16. The Group supported the principle of co-financing as a means of attracting additional resources for project implementation which could have an effect on the amount of work which could be carried out in relation to the amount invested by the Fund.

17. The adoption of a 1 per cent replenishment conditions for LDCs and a ceiling of 10 times the exploration expenditures were incorporated in document DP/142/Rev.1, issued in 1983.

III. CRITERIA FOR ESTABLISHMENT OF THE REPLENISHMENT FORMULA

18. Prior to the establishment of the replenishment formula, very careful consideration was given by an international panel of experts to establishing the formula. The earliest available details dealing with the replenishment formula were prepared by Prof. P. J. Dhrymes in a 1974 report on the financing aspects of the United Nations Revolving Fund for Natural Resources Exploration. The basis for
the study was a consideration of the UNDP performance in exploration up to 1974. The study noted that out of 78 projects undertaken at a total cost of $84.5 million, 11 deposits with a total value of $32.712 billion had been discovered, which amounts to a success rate of one chance in seven. The study concluded that if approximately one in seven projects succeeded and if the Fund wanted to support exploration activity involving 20 projects annually (the revolving status aspect) then at least two successful projects out of each year's exploration programme must yield enough revenue in the form of royalties to support 20 projects. The study went on to state that royalties that amount to at least 10 times exploration costs must be received in order for the fund to have even a remote chance of attaining revolving status.

19. The study also showed that taking a royalty rate of 2 per cent as the absolute maximum rate that is politically feasible, a period of repayment of 15 years at 2 per cent will render the proposed fund self-sufficient. The study concluded that with an annual expenditure of $12 million expended on 20 projects and with an initial contribution of $200 million the Fund would be able to attain revolving status in the twentieth year. The study considered that revolvability could be speeded up only by increasing the exploration activity in the early years or by increasing the replenishment payment, but that based on UNDP experience, 2 per cent over 15 years was appropriate.

20. A 1975 study considered the combined effect of limiting replenishment to a finite number of years and a fixed multiple of expenditures, whereby replenishment contributions would be terminated whenever either of the two limits is reached. Joint application of these conditions would make the attainment of revolving status more difficult.

IV. VALIDITY OF ASSUMPTIONS USED IN ESTABLISHING REPLENISHMENT FORMULA

21. With regard to the study projections, these were based on UNDP performance in the discovery of iron, porphyry copper, bauxite, manganese and tin deposits which are large deposits and relatively easy and inexpensive to find but at the present world demand and prices of these types of deposits are of very limited economic interest. In fact, many of the deposits cited in the study as being economic have not turned out to be so to date.

22. For example, of the 11 deposits cited as being economic and worth $32.712 billion, at least four (Ecuador (Copper), Guinea (Iron), Panama (Copper), and the Upper Volta (Manganese)), having a value of $11.883 billion, have not been developed to date. Therefore, the figure of $32.712 billion given as the value of economic discoveries by UNDP needs to be adjusted in the light of subsequent experience. In addition, the cost of exploration over the same period will have more than doubled because of inflation. Thus, the conclusions of the study would appear to be of questionable reliability today. Further, the type of deposits currently of economic interest are typically smaller and more difficult and costly to find, such as precious metals deposits. Similarly, the Fund has not reached the optimum level of activity of 20 operational projects with an annual budget of $12 million, as proposed in the study.
V. PROBLEMS ENCOUNTERED BY THE FUND

23. A major problem faced by the Fund over the years had been its image with recipient Governments as a source of high-cost financing, a feature that has led to the Fund being offered less attractive exploration programmes that do not truly fulfil the Fund's mandate. In some cases, Governments have even seen the replenishment conditions as being unacceptable. However, other development projects in the United Nations development system may involve the host country in counterpart contributions or, in the case of international or regional development banks, there is an obligation by the recipient country to repay the loan with interest. In both cases, costs are incurred irrespective of the successful or unsuccessful outcome of the project. With regard to private sector investment, private companies would require a much higher share of the equity than that generated by the replenishment conditions of the Fund. In respect to the Fund, the recipient Government pays nothing if a project does not result in a mineral discovery. If the project is successful, the Government pays only a small portion of the returns from produced commodity. Viewed in strictly economic terms, therefore, the exploration assistance provided by the Fund cannot be considered expensive, and the developing country perception in this regard does not appear valid. With greater emphasis being placed on explaining the replenishment terms in proper context, the Fund has been gaining greater acceptance in the developing world. For example, of the more than one hundred developing countries considered to have mineral potential, most have now accepted the conditions laid down in the Operational Procedures and Administrative Arrangements (DP/142/Rev.1). This has resulted in an increase in the number of requests to undertake attractive projects.

VI. EXAMPLES OF POSSIBLE REPLENISHMENT

24. There is considerable variation in the size of deposits of the same type and different type for a given commodity. Copper deposits, for instance, are classified into seven types according to contained copper, from class 1, super giant, to class 7, small. The significant feature is that 84.8 per cent of known copper reserves are found in the 28.9 per cent of the known deposits that make up Classes 1, 2 and 3. The 2 per cent of the known deposits that comprise the highest class contain 25 per cent of the known resources. This feature highlights the occurrence of the great majority of world copper reserves in a small number of deposits and illustrates the high-risk character of mineral exploration, and the need, therefore, to be able to recover more than the exploration costs when a large deposit is found.

25. Assuming an average project expenditure of $3 million, and at the rate of 2 per cent replenishment, this expenditure can be recovered over 15 years with an annual revenue of $10 million. To reach the ceiling of 10 times the exploration expenditure, the mining operation must yield an annual revenue of $100 million in the course of 15 years. If one assumes the price of copper at $1 per pound, then a production of 75,000 short tons of copper metal will be required to generate total replenishment payments of $3 million. By the same token, a total replenishment payment of 10 times exploration costs ($30 million) would be generated by a production of 750,000 short tons of copper metal. Deposits capable of this size of
production are relatively few. Preliminary data for 291 significant Canadian base metal deposits also indicate that the average productive mine life is 13 years. Replenishment over a 15-year period would, therefore, not apply in the average case.

26. Turning to the case of gold, of 134 significant Canadian gold deposits discovered in Canada during the period 1946-1985, the average mine life is 8.6 years. The average total revenue is $190 million. Assuming that the Fund expends $2.5 million, on a gold project and is successful in locating a deposit, the future replenishment obligations can be determined, assuming varying sizes and production rates for the discovered deposit. Assuming, for simplicity, 100 per cent of the rated capacity was attained from the outset and that production remained constant throughout a 15-year period, then the division of revenue between the Government and the Fund, assuming a gold price of $400 per ounce would be as follows:

<table>
<thead>
<tr>
<th>Annual prod. ozs. gold</th>
<th>Annual revenue</th>
<th>Govt. share p.a.</th>
<th>Fund share p.a.</th>
<th>Cumulative Govt. share (15 years)</th>
<th>Cumulative Fund share (15 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 000</td>
<td>6.0</td>
<td>5.88</td>
<td>0.12</td>
<td>88.20</td>
<td>1.80</td>
</tr>
<tr>
<td>30 000</td>
<td>12.0</td>
<td>11.76</td>
<td>0.24</td>
<td>176.40</td>
<td>3.60</td>
</tr>
<tr>
<td>60 000</td>
<td>24.0</td>
<td>23.52</td>
<td>0.48</td>
<td>352.80</td>
<td>7.20</td>
</tr>
<tr>
<td>120 000</td>
<td>48.0</td>
<td>47.04</td>
<td>0.96</td>
<td>705.60</td>
<td>14.40</td>
</tr>
<tr>
<td>240 000</td>
<td>96.0</td>
<td>94.08</td>
<td>1.92</td>
<td>1 411.20</td>
<td>28.80</td>
</tr>
</tbody>
</table>

(Millions of United States dollars)

27. On the basis of the 2 per cent replenishment, the Fund recovers its investment of $2.5 million only in the event of a deposit being found that produces some 21,000 ozs. per annum over 15 years. This is 15 per cent higher than the 1985 production of the Prestea mine in Ghana, which is one of the important contributors to Ghanaian gold production (1985 production of 18,100 ozs. quoted in the Mining Annual Review, 1986). Ten times discovery cost is recovered within 15 years only if the project is successful in finding a deposit capable of a production approximating the current production of the Obuasi mine (1985 production of 255,642 ozs. - Mining Annual Review, 1986). Obuasi mine is considered the world's largest underground gold mine outside South Africa and the Soviet Union. The chances of the Fund's proposed project achieving this possibility are negligible in view of the small extent of the project area.

28. The above examples illustrate that there are not very many of the kind of deposits that would be required if the Fund is to recover its project costs; for the replenishment contribution to reach the ceiling of 10 times project expenditure within 15 years the Fund would have to make a discovery of a very rare type indeed. It is not only the tonnage and the price of the mineral that determines the replenishment of the Fund, but also the life of the mine, which rarely extends to 15 years.
VII. PERFORMANCE OF THE FUND TO DATE

29. Since the implementation of the first mineral exploration project in August 1976, in Ecuador, the Fund has to date completed 16 projects (Argentina, Benin, Burkina Faso, Congo, Cyprus, Ecuador, Guyana, Haiti, Kenya, Liberia, Mali, Panama, Philippines, Sierra Leone, Sudan and Suriname) while the projects in Peru and Honduras are programmed to be completed within 1988. To execute these 18 projects in a 12-year period, approximately $32 million will have been spent with eight projects resulting in successful discoveries (Argentina: gold and silver; Benin: kaolin; Congo: phosphorite and shells; Ecuador: precious and base metals; Haiti: gold; Honduras: silver and gold; Peru: gold; and Suriname: gold). The value of such deposits at current commodity prices would total over $1 billion, with a maximum possible replenishment to the Fund of some $20 million. In this context, the first replenishment payment, from the project in Ecuador, could be received during 1989 or sooner. This means that so far the Fund, in spite of an astonishing rate of success (44 per cent), is not close to achieving the projected revolvability. The main reason is that the number of projects (1.5 per year) the Fund has been able to finance has been much smaller than the 20 projects per year originally projected as required for the Fund to achieve revoluing status in 20 years, and only one quarter of the six new projects per year suggested by the Working Group of Experts in 1981. While the concept of replenishment from successful projects still remains valid and the first replenishment could start in the near future, it is clear from the experience gained so far that full revolvability will depend upon the ability of donor countries to contribute at the level of 10 to 12 million dollars per annum as projected by the study.

VIII. FEASIBILITY STUDIES

30. The Fund's basic mandate as approved by the Economic and Social Council specifically provides for "pre-investment studies, which may include feasibility studies" (resolution 1762 (LIV), paragraph 1 (k) (iii)), and logically so, since these are the natural outgrowth of successful exploration. However, because of the Fund's limited financial resources during its first few years of operations, feasibility studies were not being undertaken and at its twenty-sixth session, held in June 1979, the Governing Council authorized the Fund's involvement in financing feasibility studies with the proviso that the following criteria be observed:

(a) Ascertain that no other sources of financing are available to the requesting Government;

(b) Ensure that the requirements of a feasibility study are within the limitations imposed by the Fund's operational and financial capacity;

(c) Restrict its activity in this domain to solid minerals, at least initially;

(d) Develop policy and operational procedures for the financing of feasibility studies.
31. With respect to feasibility studies undertaken by the Fund for solid minerals and geothermal projects, replenishment shall consist of repayment to the Fund of its expenditures plus overheads. Such payment shall be made payable in equal annual instalments of principal over a period of five years with interest at the rate established by the World Bank for its regular operations at the time the agreement with the Fund was signed. This shall occur whether or not production ensues, with payment beginning six months after acceptance by the Government of the report covering those activities. Interest accruing until the repayment begins shall be capitalized and added to the principal outstanding.

32. As a follow-up to the successful Congo offshore phosphate exploration project, a feasibility study project was approved in 1985. The Congo project represents the only occasion thus far in which the Fund has been involved in a feasibility study project. It is planned that feasibility studies will be undertaken only where investment substantially in excess of the costs of the feasibility study can be foreseen.

IX. RECOMMENDATIONS

33. From this examination of information available on the establishment of the replenishment formula, it is apparent that considerable thought has been given to establishing an appropriate formula to meet the needs of the developing countries and the Fund's ultimate objective of becoming self-supporting. During the short life of the Fund, there have been dramatic changes in the mining industry in terms of levels of demand for different commodities. The original formula was developed with respect to deposit types that have entirely different characteristics from those of current economic interest. The replenishment formula has been adjusted during the life of the Fund in the light of recommendations of a review of activities and changing conditions. The changes made were in favour of developing countries and make the attainment of revolvability more difficult. The present mandate allows the Fund to assist a country to bring a marginal deposit into production whenever possible. As the long-term objective of the Fund is to become self-sufficient, this philosophy requires that countries that benefit from successful projects undertaken by the Fund accept the responsibility to repay to the Fund a portion of the value of the annual production for subsequent exploration.

34. The Administrator therefore recommends that the existing replenishment formula and ceiling for solid minerals exploration projects remain the same as they appear in document DP/142/Rev.1. Any further change in the replenishment rate or the ceiling would significantly weaken the prospects of making the Fund revolve. However, in the case of mineral discoveries of marginal economic value, the Fund should have the authority to change the rate of replenishment by mutual agreement between the Fund and the recipient Government based on the marginality of the discovery.

35. With respect to geothermal exploration projects, the Fund has one project in Saint Lucia nearing completion and another in an early stage. On this basis, the Administrator feels that there is insufficient evidence at this time to consider any revision of the existing replenishment formula for geothermal energy exploration projects.
36. Concerning the repayment provision for feasibility studies projects, the very limited response from recipient Governments to this type of project is related to the high interest charged for repayment. The Administrator therefore recommends that instead of interest, an annual service charge should be paid at the rate currently charged by the International Development Association, i.e., 0.75 per cent of undisbursed project funds.