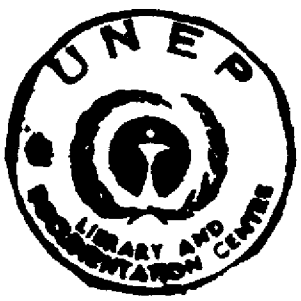
FINANCING ANTI-DESERTIFICATION PROGRAMMES

UNITED NATIONS – UNITED NATIONS ENVIRONMENT PROGRAMME

REPORT of
The Secretary-General

Studies Requested by
General Assembly
Resolution 44/172
on the

IMPLEMENTATION OF THE PLAN OF ACTION TO COMBAT DESERTIFICATION



Nairobi, October 1991

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ABBREVIATIONS

ACP	African, Caribbean and Pacific Countries
ACSAD	Arab Centre for the Study of Arid Zones and Drylands
ADALCO	African Deserts and Arid Lands Committee
AMCEN	African Ministerial Conference on the Environment
CFCs	Chlorofluorocarbons
CGIAR	The Consultative Group on International Agricultural Research
CGIF	Concept of a Global Infrastructure Fund
CILSS	Inter-State Committee for Control of Drought in the Sahel
DESCON	Consultative Group for Desertification Control
DESCONAP	Regional Network of Research and Training Centres on Desertification Control in Asia and the Pacific
DOEM	Designated Officials on Environmental Matters
EC	European Community
ESBs	Earth Saving Bonds
ESCAP	Economic and Social Commission for Asia and the Pacific
ESMAP	Energy Sector Management Action Programme
FAO	Food and Agriculture Organization of the United Nations
FRG	Federal Republic of Germany
GEF	Global Environmental Facility
GNP	Gross National Product
IAWGD	Inter-Agency Working Group on Desertification
IBRD	International Bank for Reconstruction and Development
ICARDA	International Centre for Agricultural Research
ICASALS	International Centre for Arid and Semi-Arid Land Studies
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
IDA	International Development Association
IDRC	International Development Research Council
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IGADD	Inter-Governmental Authority on Drought & Desertification
ILCA	International Livestock Centre for Africa
IMF	International Monetary Fund
LDCs	Least Developed Countries
NGOs	Non-Governmental Organizations
NOVIB	Netherlands Organization for International Development Awareness Creation
ODA	Overseas Development Administration
OECD	Organization for Economic Co-operation and Development
OPEC	Oil Producing and Exporting Countries
PACD	United Nations Plan of Action to Combat Desertification
R & D	Research and Development
SADCC	Southern Africa Development Co-ordination Conference
SAREC	Swedish Agency for Research Co-operation with Developing Countries

SDR	Special Drawing Rights
TDRP	Tropical Diseases Research Programme
TFAP	Tropical Forestry Action Plan
UNCED	United Nations Conference on Environment and Development
UNCOD	United Nations Conference on Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNSO	United Nations Sudano-Sahelian Office
USAID	United States Agency for International Development
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WRI	World Resources Institute

FOREWORD
BY THE EXECUTIVE DIRECTOR OF UNEP

The United Nations General Assembly and the UNEP Governing Council have been concerned since 1977 with means for mobilizing resources for the implementation of the Plan of Action to Combat Desertification (PACD). The United Nations General Assembly requested a series of expert studies on financing the PACD and on modalities for ensuring the flow of resources on a sustained basis. Three of these studies were carried out in 1978, 1980, and 1981. Achievements remained modest and by Resolution 44/172 of 19 December, 1989 the United Nations General Assembly expressed its deep concern about the inadequacy of financial resources available for the implementation of the PACD.

Two important points must be emphasized. There is a need to mobilize political will in both the developing countries affected by desertification and the donor community so as to give the programme of desertification control its due priority. Second, desertification is a world-wide problem as it affects some 100 countries in all continents (including Australia, the USA, the USSR and some countries in Southern Europe) and not just a Sudano-Sahelian problem of the continent of Africa. Its consequence on world food supply, climate (changes in ground albedo, increase of particulate materials in the atmosphere) and on genetic biodiversity (many crop and fodder plants have their origin and their wild relatives in the arid and semi-arid regions of the world) make desertification one of the major global problems. Desertification should be recognized as making a significant contribution to the recognized issues which require a global response, such as biodiversity loss and climate change. All such issues call for an approach based on global interdependence, reflected for example in the sharing of knowledge (technology transfer), and they require equitable sharing of cost. This is illustrated by the recently established Global Environmental Facility (GEF). GEF is a pilot programme limited in its scale, but national and regional initiatives to combat desertification should qualify for funding by it (and by any future financial resources appropriated for global environmental purposes).

The drylands of the world cover more than one third of the land surface of the earth (ca.52 million km^2, excluding hyper-arid natural deserts) and are home for one sixth of the world's population. Environment and development interactions in these vast territories comprise four inter-related processes:

1. Insurance against natural hazards of recurrent drought;
2. Halting degradation of productive lands (including preventive measures);
3. Reclaiming desertified lands; and
4. Ecologically sound development of land-and-water resources in drylands.

Programmes for combating desertification integrate all the four elements. Such programmes often require long gestation periods and their rates of return are low. They

cannot compete with other demands in the market. (We may remember that agriculture in developed areas still requires heavy government subsidies). For these reasons, the developing countries affected by desertification require support in financing their national programmes; this support needs to be long-term, adequate and sustained.

General Assembly Resolution 44/172 requested that seven topics be covered. The outline of the studies were set by an expert group (Geneva, July 1990); drafts were revised and elaborated by a second group of experts in international financing who met in Nairobi, 21-23 February 1991, examined at a high level meeting in Geneva, 10-12 July 1991, and finally reviewed by IAWGD at its eighteenth meeting (Geneva, 9-10 September 1991), and by DESCON at its eighth session (Geneva, 11-12 September 1991).

The issues which were in the background of the consideration of the groups of experts included the following :

1. The place of combating desertification (implementation of the United Nations Plan of Action to Combat Desertification) on the international agenda for actions related to environment and development of land-and-water resources of the world (food security and the satisfaction of basic needs of the increasing population of the world);

2. The cost of implementing a world-wide programme for combating desertification, and the financial and technical assistance required to support the implementation of national programmes in developing countries;

3. The sources of funds that could become available for global environment-and-development programmes, and the share of such resources that could be allocated to the combat of desertification;

4. The new mechanism(s) that could be created, or existing mechanisms developed, to manage the process of mobilizing the financial and technical resources required to address global environment-and-development issues including issues related to the world drylands.

It has been the endeavour through these meetings to make the studies self-contained in responding to the request of the General Assembly. Reference may, however, be made to other technical studies carried out by UNEP, namely the Assessment of the world-wide extent and severity of desertification, Evaluation of the United Nations Plan of Action to Combat Desertification (PACD) and Assessment of its implementation during the 1977-1991 period, and Means and Guidelines for enhancing world-wide endeavour to combat desertification.

The Executive Director of UNEP acknowledges the invaluable inputs of the groups of experts and the high level meeting which contributed to the preparation of this study (list of participants in annex).

EXECUTIVE SUMMARY

1 In response to General Assembly Resolution 44/172 of 19 December 1989, a set of seven issues have been considered in this report, as follows :

- Studies carried out by experts since the United Nations Conference on Desertification (UNCOD 1977) on the possibility of utilizing new methods to finance anti-desertification programmes;
- The current state of implementation of the PACD and evaluation of additional resources needed in order to achieve its minimum objectives;
- Research into and development of technologies to combat desertification as well as procedures for the transfer of such technologies on favourable terms in particular to developing countries;
- Possibilities for obtaining loans on concessionary terms;
- Role of mechanisms involving the cancellation or reduction of external debts;
- Possibilities for strengthening and co-ordinating of funds established in various international institutions;
- Prospects of the active participation of NGOs, Foundations and individuals in the financing of training and scientific research programmes for combating desertification, including afforestation and re-afforestation.

2 The past studies, particularly the United Nations studies in 1978, 1980 and 1981 have been summarized and their main thrust and objectives underlined. All recommendations stemming from these studies, including the one on the establishment of an Independent Financial Corporation that could provide finances on concessionary bases to anti-desertification programmes were presented to the General Assembly in 1980 and 1981 but were not acted upon.

3 In addition to the mechanisms and modalities identified in the past studies, new mechanisms and bodies recently established or proposed within the United Nations system have been examined. These include :

(a) The Tropical Forestry Action Plan (TFAP);

(b) The Energy Sector Management Action Programme (ESMAP);

(c) International Fund for Agricultural Development (IFAD);

(d) The Tropical Diseases Research Programme (TDR);

(e) The Consultative Group on International Agricultural Research (CGIAR);

(f) The Interim Multilateral Ozone Fund;

(g) Technical Assistance for the Mediterranean Countries;

(h) Japanese Trust Fund at the World Bank;

(i) The Lome Convention;

(j) Global Environment Facility (GEF).

4 Attention has also been drawn to a large number of proposals currently under discussion:

(a) Tax on Fossil Fuel Consumption;

(b) Proposal on Ecotourism in the International Conservation Financing Project Report prepared jointly by UNDP and the World Resources Institute (September 1989);

(c) Concept of a Global Infrastructure Fund (GIF); a proposal from the Mitsubishi Research Institute (Tokyo 1990);

(d) Proposal by the Italian Foreign Minister (1990) that the level of EC financial resource transfers to developing countries and Eastern Europe be raised to one per cent of GNP;

(e) There has been continuing discussion in academic circles about the possibility of introducing Earth Saving Bonds (ESBs).

5 A survey of the activities of funds established in various international institutions for addressing world-wide environmental issues shows that financial and other resources available to them are meager, not adequate for anti-desertification programmes.

6 The current initiatives which deserve attention include:

A IFAD's approach to the internalisation of ecological concerns into its lending operations;

B. FAO's International Scheme for the Conservation and Rehabilitation of African Lands;

C The Global Environment Facility established to deal with the environmental problems by the World Bank, UNDP and UNEP. Although the GEF was initially proposed to deal with climate change, ozone depletion, international waters and biodiversity, it is recognized that desertification as a global ecological problem qualifies to be included;

D Financing under Lome IV Convention.

7 The Global Environment Facility is the first collective funding mechanism which can blend grants for global purposes with other sources of funds (of varying degrees of concessionality). Other mechanisms are in the offing (and will be discussed for example in the preparations for UNCED), but it is doubtful whether the needs for desertification will be met as effectively through a "miscellaneous funds" approach as through a single "portmanteau" fund. Compared to the special purpose funds negotiated to serve individual

legal agreements (such as the Montreal Protocol), a single fund could take a more receptive approach to grants. In many such programmes, a specific sustainability criterionmoving away from financial cost-benefit analysis, discount rates etc.must be adopted so that complementary measures are taken in hand to realise a given environmental objective.

8 The general conclusions of six chapters of this study may be summarized as follows:

CHAPTER 1 (Sections I and II)

9 The conclusion that emerges in considering the proposals formulated within the United Nations system for utilizing new methods of financing programmes of multilateral organizations at the global level, is that the global community faces a complex reality, and that it is necessary to determine the close inter-linkages that exist between poverty, international trade, transfer of technology, macro-economic policies in developing countries and the process of desertification. This is made explicit in the New International Development Strategy for the fourth decade as adopted by the General Assembly. There are thus global and non-global issues in the financing of anti-desertification programmes. The formulation of the needs of the PACD requires to be so designed as to attract funding, but at the same time approaches based on aid and charity must be replaced by clear understanding and expectancy of shared global responsibility and international co-operation.

10 As regards the design of the needs of PACD, it will be helpful to make (a) the concept of desertification better defined than it is at present so that public opinion would have less problems with it, (b) an estimate of the minimum costs of assisting countries prone to desertification, and (c) breakdown of the "costs" into their different components, and (d) target high priority areas.

11 It will be worthwhile to explore all the available modalities and sources–aid, trade, encouragement of corporate initiatives and of co-operative ventures with the private sector, application of taxes, charges, users' fees, incentives and disincentive systems on the use of natural resources. In this exploration, two tasks are of particular importance:

(a) To identify the need for additional financing to protect investments (in land productivity, irrigation works, rangeland management systems, etc.) and to contain the risks that new investments may pose to sustainable resource use and to environmental functions; and

(b) to identify a cross-sectoral framework to guide investment plans which will reflect specific institutions, physical andabove allpolicy interventions that obtain in a desertification prone country so as to avoid *ad hoc* actions which can only compound costly mistakes made over time in different sectors.

12 It is clear that the totality of funds available in different institutions for anti-desertification activities is meager and inadequate for the needs of an integrated programme.

CHAPTER 2

13 A comparison of costs as estimated in the 1980 assessment with those as estimated in the 1991 assessment showed that the cost increase varied from 95% for rangeland to 357% for irrigated land and 135% for rainfed cropland.

14 The percentage increase in the desertified area to be rehabilitated is 25 per cent while immediate total cost of a 20 year rehabilitation programme has increased by 179 per cent. These costs are escalating rapidly, reflecting the fact that in dealing with environmental damages it is highly desirable to take early action.

15 The benefits, even on the 1991 figures, (estimate damage inflicted represented in income losses per year of $42.3 billion) are much higher than the cost of corrective measures (approximately $10.6 billion per year); it will, however be misleading to attempt a financial cost-benefit analysis because the time profiles of the costs and benefits are different. Anti-desertification programmes have a long gestation period and benefits do not appear till many years later.

16 It may be worthwhile to scale down the figures of costs, and thus of the need for financing assistance, to manageable amounts by dealing with shorter time horizons (5 years instead of 20 years, for instance), high priority activities as against lower priority ones, use of available technology rather than imported ones, etc.

CHAPTER 3

17 A number of technologies can be identified that appear to hold significant promise in desertification control. Potentially, all the following are applicable to land uses in rangeland, rainfed arable agriculture, irrigated crops and orchards, and woodlands:

- Agroforestry;
- Soil conservation techniques;
- Water conservation, water conveyance and water harvesting;
- Soil fertility enhancement;
- Alternative income sources;
- Renewable energy sources;

18 World wide effort and resources need to address the following inseparable issues:

(a) to assist developing countries to develop national capabilities in fields of science and technology as pertaining to desertification control and the development of land resources in drylands and renewable energy resources';

(b) establish (or develop existing) international institutions that would be capable of assisting developing countries with the technical and managerial problems related to technology transfer, and

(c) to provide within resources to be made available for implementing the PACD, clearly defined appropriations for assistance in fields of science and technology.

(d) conservation of nature, including the establishment of biosphere reserves.

CHAPTER 4

19 The GEF is the first approximation to a financing mechanism that blends concessionary and non-concessionary financing but other mechanisms are also in the offing. It is necessary to take a more receptive approach to grants and concessionary financing for anti-desertification programmes. In many such programmes, a specific sustainability criterionmoving away from financial cost-benefit analysis, discount rates, etc.must be adopted so that complementary measures are taken in hand to realize a given environmental objective.

CHAPTER 5

20 The international debt strategy could be improved and there are several policy initiatives currently under discussion, which should be encouraged. In realistic terms, however, the linking of debt cancellation with the financing of programmes to redress desertification suffer from a number of constraints. First, many of the desertification prone countries are in such severe state of economic and financial impoverishment that any relief from debt is normally ear-marked for actions on a long list of priorities. It is necessary that funds released from debt cancellation would lead to the provision of greater resources to protection of the environment, re-habilitation of land productivity, improvement of rangelands, extension of irrigation facilities, etc. which are all high priority development actions. Secondly, desertification-prone countries are often willing to allocate funds which become available to them to development purposes which include these activities. Thirdly, the central issue in the financial management of these countries is one of evaluation of emerging needs. In the calculus of needs and benefits (often essentially short term), projects and programmes would have to justify themselves as major and urgent concerns if they are to be given a high place in the list of priorities. Finally, it must be kept in mind that many OECD countries, the principal sources of bilateral assistance, have announced their willingness to treat debt reduction or cancellation more sympathetically when linked to natural resources conservation.

CHAPTER 6

21 NGOs in developing countries have a special role to play. First, many NGOs at the developing country level constitute effective pressure groups in favour of environmental action. Secondly, through community groups at the local level they act in favour of natural resources conservation, including measures that have a direct bearing on land degradation and desertification. Thirdly, the NGOs, because of their knowledge of local conditions and

specific eco-systems, could make a substantive contribution in the implementation of anti-desertification activities. Finally, the total package of resources needed for anti-desertification programmes must include a number of components apart from funds. These are human resources, time given to protection of the environment, operational activities in the field, etc. It is this last components in which NGOs are most effective.

22 Foundations have played an important role in supporting activities of organizations that contribute to anti-desertification technologies, such as contributing to ICRISAT and funding research by the CGIAR. Such involvement by foundations in training and research could be further strengthened and co-ordinated to ensure more effective contributions to anti desertification measures.

23 Individuals could participate, as has been the case with UNICEF activities through such lending their personal prestige, influence and financial resources to anti-desertification efforts, as well as such mechanisms as the Earth Saving Bonds (which would be more open to the general public than other financing possiblities).

INTRODUCTION

A BACKGROUND

1 The United Nations Conference on Desertification (UNCOD), held in 1977, established that desertification was one of the major environmental and natural resource degradation problems of the globe and that its costs in human, social and economic terms were extremely high. UNCOD adopted a Plan of Action to Combat Desertification (PACD) of which Recommendation 28 dealt with financial mechanisms. Briefly a twenty year world-wide programme to arrest further desertification was estimated (1980) to require about $ 4.5 billion a year of which developing countries in need of financial assistance would require $ 2.4 billion a year or $ 48 billion for twenty years.

2 The current perception of desertification is that it is land degradation in arid, semi-arid and dry sub-humid areas resulting mainly from adverse human impact. This perception sets desertification within a broader frame of the world-wide degradation of land resources. Land includes soil and water resources, land surface and vegetation or crops. Degradation implies reduction of resource potential.

3 There has been of late some mixing up between two different processes, the one called "desertification" the other called "exapnsion and contraction of the desert". Desertification is often related to the incidence of drought: failure of rainfall or rainfall less than annual average. It is important, however, to recognize that desertification is a discrete process of land degradation throughout the drylands and quite separate from the phenomenon of observed cyclic oscillations of vegetation productivity at desert fringes. The latter often leads to what is commonly termed "expansion or contraction" of the desert as revealed by satellite data and related climate fluctuations. But this is a completely different phenomenon from that of desertification.

4 All over the world extensive areas of productive land are subject to ecological degradation. Damage is primarily due to excessive use. Exploitation beyond the carrying capacity of the rangelands, cutting forest trees at rates faster than rates of regeneration, and over-dosing farmlands with irrigation water or agrochemicals are examples of unsustainable use. Reduction of plant cover leads to accelerated soil erosion and other forms of deterioration of the physical, chemical and biological attributes of soil and of the productive capacity of the land.

5 In summary, desertification is a form of ecological degradation of the productive land-and-water systems that is due to a combination of (a) inherent fragility of the systems and (b) overtaxing exploitation. This is a significant failure in resource management and it relates to world capabilities to produce food and other basic requirements for the escalating numbers of mankind.

6 Desertification like other forms of land degradation can be stopped. There is enough scientific knowledge and technological means to allow the implementation of programmes

for combating desertification in the field in most instances. Residual research needs relate to a limited number of gaps in knowledge or to exploration of novel means that may make the combating of desertification and utilization of arid land resources more economically attractive and sustainable. Certain countries, mostly in the developed industrialized world, have the technical, managerial and financial resources that enable them to cope with the menaces of desertification. For instance, the arid, semi-arid and sub-humid territories of the USA faced in the 1930s hazards of desertification that were manifested by the events of the dust bowl. This typical incidence of desertification was the result of a combination of excessive pressures of ill-advised land-use systems (human impact) and the onset of years of drought (natural vulnerability). The management packet that enabled the same territories to face similar drought in the 1950s without much noticeable damage combined government control (legal instruments), government guidance (land-use-policy), government financial assistance ($15,000 million in federal subsidies to menaced areas from 1935 to 1975), national development schemes (railways, roads, water reservoirs, etc.) and application of science and technology (soil conservation, new pumps for tapping deep groundwater aquifers, new breeds of cattle, etc.).

7 Developing countries are hard hit by desertification, and would need both technical and financial assistance to enable them to (i) develop their national capabilities, (scientific, technological and managerial) to cope with its hazards and (ii) implement programmes for combating desertification and ensuring sustainable development of land resources. In many of these countries desertification stands as the principal environmental hazard. It undermines the life support systems and exacerbates the chronic food shortages. In this context desertification assumes importance and urgency as a major environment and development problem warranting the special attention of the international community.

8 Like all serious environmental hazards, desertification has its local on-site manifestations related to loss of productive land and its off-site impacts far beyond. Food shortages (famine, in the extreme situations), may drive people to other areas within the country or across national borders. These environmental refugees have been the cause of civil strife and international political strains. Political instability often diverts attention from development activities that combat, or reduce the impacts of desertification hazards, and the situation worsens.

B BENEFITS OF ANTI-DESERTIFICATION PROGRAMME

9 As it spreads world-wide, desertification has a number of adverse global impacts. These impacts constitute the cost of desertification. The **first,** cost relates to reduction of global food production and the impacts on socio-economic status of people, contributing to poverty among other undesirable effects. There is evidence that food production in those countries most in need of food supplies will be seriously disrupted. **Second,** is its impact on local and global climate. Desertified territories are sources of atmospheric dust that modifies the scattering and absorption of solar radiation in the atmosphere. Its effect on temperature would depends on the altitude at which it is borne. Desertified lands have a much increased albedo. (less absorption of solar radiation by the ground). This causes less heat transfers to the atmosphere which in turn causes air subsidence and less rainfall. As the total areas of

climatic deserts and degraded lands (desertified) amount to 45 million km2 which is about 40% of the earth surface, the climatic impact of the increased albedo will be inescapble.

10 The extensive areas of dryland territories (natural deserts and semi-deserts + desertified lands, c.40% of the world land area) have little or no part in the global sinks for carbon dioxide. They provide space available for programmes of afforestation and other forms of plant growth. The greening of these non-vegetated or poorly vegetated areas would enhance the global sinks for greenhouse gases, the economic feasibility of this enterprise may be more attractive than some of the proposed actions for abatement of carbon dioxide emissions.

11 The **third** cost relates to the off-site (environmental) impacts which includes air pollution, floods, etc.

12 The **fourth** cost, as desertification entails the destruction of vegetation and the diminution of many plant populations and their associate biota, is loss of species. It will be remembered that many crops (wheat, barley, sorghum, millet, etc.) and fodder species, that form the backbone of world agriculture and pasture husbandry, have their origins in arid and semi-arid territories that are prone to desertification. For instance many cereals, legumes and clovers have their origins in the east Mediterranean region. Loss of populations of these plants and their wild relatives represents loss of valuable and irreplaceable genetic resources. The impact of desertification on loss of germ plasm resources may, from an economic and food security stand point, be close to the impact of deforestation.

13 These costs are the damage costs inflicted by the process of desertification on the local communities, national economies, and the global well-being. The abatement of these costs constitute the **benefits** derived from anti-desertification programmes.

14 Programmes for combating desertification and land reclamation in arid regions will require substantial financial subsidies, at least in the initial years. This is the reason for the need to increase the flow of resources available to assist the countries menaced by desertification in implementing their national plans of action to combat desertification.

15 In 1975, the General Assembly had adopted resolution 3362 (S-VIII) which reads in part:

> "Concessionary financial resources to developing countries need to be increased substantially, their terms and conditions ameliorated and their flow made predictable, continuous and increasingly assessed so as to facilitate the implementation by developing countries of long-term programmes for economic and social development".

The Plan of Action to Combat Desertification (PACD) adopted by the United Nations Conference on Desertification (UNCOD, 1977) requested a study of additional measures and means of financing including "fiscal measures entailing automaticity". This was based on the reasoning that if long-term programmes for economic and social development needed concessionary financial resources on "predictable, continuous and increasingly assessed" terms, major environmental threats such as desertification clearly deserved similar support.

C CORRECTIVE COSTS AND COSTS OF INACTION

16 Budgetary resources available to multilateral organizations at the global level are becoming increasingly constrained. This applies equally to UNEP, which is charged with the co-ordination of the implementation of the PACD. It is not feasible to envisage a realistic and effective contribution to the total financial requirements of the PACD, which was estimated in 1980, as noted earlier, at $4.5 billion a year. This figure is to be seen in the context of the loss of productive capacity (income foregone: $ 26 billion a year). The figure for income forgone has now risen in terms of the 1991 Assessment to $42.3 billion.

17 The global direct annual loss (income foregone) of US $42.3 billion is a rough average estimate as the actual figures vary greatly from country to country and from continent to continent. This figure shows an order of magnitude of the loss involved. It also shows that the cost of inaction over the next 20 years will be of the order of US$ 850 billion as compared with the earlier estimate of US$ 520 billion.

18 Activities undertaken to combat desertification (corrective measures in damaged land or preventive measures in productive lands) are inseparable from actions of resource development and management in the drylands. Schemes that aim at arresting degradation of rangelands, rainfed and irrigated croplands, sand dune stabilization, establishment of large-scale green belts, introduction of soil and water conservation systems in resource management, or reclamation of new areas for productive use are likely to be costly. In the majority of the developing countries fully or partly dependent on their dryland resource base and having accumulated problems of poverty and underdevelopment, the costs will be higher. The rehabilitation projects are generally non-competitive in terms of market values, especially when compared with prevalent rates of interest. Investments in land rehabilitation projects commonly do not pay well financially, but their social and humanitarian values as means of ensuring food security and participation in production are immense.

19 The costs of direct corrective measures in areas affected at least moderately by desertification (in million US$) could be calculated as follows:

	Area to be reclaimed as a first priority, in million hectares	**Average cost of reclamation per one hectare, US$**	**Total cost of reclamation, million US$**
Irrigated land	43 (100%)*	2,000	86,000
Rainfed cropland	151 (70%)*	400	60,400
Rangeland	1,667 (50%)*	40	66,680
Total	**1,861**		**213,080**

* % of the affected area

20 As compared with the estimation in 1980 of US $ 90 billion, the present estimate of US $ 213 billion is 2.4 times higher, mainly because of more accurate land degradation assessment and increase of world prices and costs of reclamation. If the present programme of first priority direct corrective measures is to be implemented within the next 20 years, it will cost US $ 10.6 billion a year in comparison with the US $ 4.5 billion a year estimated in 1980. Of this amount of US $ 10.6 billion, the developing countries in need of financial assistance would require about $6.5 billion a year.thus the cost of corrective action is high but the cost of inaction is still higher. As stated in paragraph 16 above it amounts to US $ 42.3 billion a year.

D SOURCES OF FINANCING AND NATURE OF FINANCING MECHANISM(S)

21 It is useful to look at a spectrum of sources of assistance if international effort for implementing the PACD is to be organized on the basis of global needs and a sense of a global partnership. Such international support should consist of:

- Multilateral and bilateral assistance, preferably on the basis of grants and concessional loans;
- Provisions of technical assistance on a needs basis;
- A regional approach to anti-desertification programmes has been found to be promising so that existing arrangements on these lines should be developed further and new avenues explored;
- Development of appropriate anti-desertification technologies and technology transfer to the needy countries on favourable terms;
- Monitoring and co-ordination of the anti-desertification campaign at a global level;
- Information exchange;
- International legislation.

22 The sources of financing the PACD could thus vary and may include *inter alia* the following:

- National budgets;
- Funding by national private and cooperative, state and local financial institutions;
- Debt-for-PACD swaps;
- Funding by major international financing agencies like the World Bank, IFAD, WFP, the regional development banks;
- Bilateral aid agencies;
- Funding and in-kind participation of international, regional, national and local NGOs;
- Funding and assistance from major international agencies like UNDP, FAO, UNEP, UNESCO, WMO, WHO, etc. in respective fields of their interests;
- Additional funds mobilized by the world community specifically for the PACD implementation;
- Global Environmental Facility of the World Bank/UNDP/UNEP.

23 In connection with global assessment of cost, there is need to carry out a set of case studies in a representative group of countries, this would permit the identification of more accurate figures of the level of financing required for anti-desertification programmes. Countries address desertification problems in a variety of ways and in different sectors, such as agriculture, human settlements, soil and water conservation, irrigation, range management, food production, etc. These activities account for both direct financial and indirect contributions by the countries affected by desertification. In addition, people at the local level–farmers, community groups, local bodies–contribute a great deal.

24 It would also seem now appropriate and timely to explore possibilities for attracting investment capital, which can play a major role, in locations which provide opportunities for such investments. One prospect which definitely needs further exploration is ecotourism. Another relates to the exploitation of high value potential of certain regions and localities, e.g. game ranching, wildlife products, etc.

25 It is necessary to give thought to innovative financial mechanisms which will permit the raising of new and additional resources for major global problems. This would permit the different activities which constitute an effective programme for combating of desertification to be undertaken, give the process a momentum in keeping with its urgency, and orchestrate a wide ranging and purposeful effort.

E REQUEST OF THE UNITED NATIONS GENERAL ASSEMBLY (Terms of Reference of The Study)

26 The General Assembly, in terms of its resolution 44/172 of 19 December 1989, requested the Secretary-General, in consultation with the Executive Director of the United Nations Environment Programme, to submit to the Conference (United Nations Conference on Environment and Development), through its Preparatory Committee, a report containing relevant expert studies on, *inter alia*, the following topics:

(a) Relevant suggestions and proposals formulated within the United Nations system on the possibility of utilizing new methods to finance the programmes of multilateral organizations at the global level, over and above regular budgets and conventional extra-budgetary resources;

(b) The state of implementation of the Plan of Action to Combat Desertification, objectives and courses of action to further the struggle against desertification, including an evaluation of the additional resources needed in order to attain the minimum objectives of the struggle against desertification;

(c) Ways and means of promoting, in particular in the developing countries, research into and development of existing and potential technology to combat desertifi-

(d) Possibilities for obtaining loans on concessionary terms from Governments and other sources of financing to combat desertification;

(e) Possibilities for reducing the impact of desertification, including re-afforestation, through mechanisms involving the cancellation or reduction of external debts;

(f) Possibilities for strengthening and co-ordinating the activities of funds established (for that purpose) in various international institutions;

(g) Ways of encouraging the active participation of non-governmental organizations, foundations and individuals in the financing of training and scientific research programmes of combating desertification, including re-afforestation.

27 The present report is structured on the basis of the above 7 topics. It takes into full consideration the three expert studies carried out on these and related topics in 1978, 1980 and 1981 under General Assembly guidance and the new initiatives in regard to them that have emerged since then.

CHAPTER 1

Section I: UN Proposals to Finance Global Programmes

Proposals formulated within the United Nations System for utilising new methods to finance the programmes of multilateral organisations at the global level, over and above regular budgets and conventional extra budgetary resources

A GENERAL ASSEMBLY RESOLUTION ON THE RECOMMENDATION OF UNCOD

1 The situation described in paras 15-20 of the Introduction (the inadequacy and unavailability of financial resources that permit a meaningful implementation of the PACD) represents a compelling reality that exists not only for the PACD but all other large environmental programmes that are inherently not self financing or require a threshold level of capital for effective action. Paragraph 104 of the PACD reads:

> "(e) Additional measures"
> "The General Assembly should be invited to request the Governing Council of UNEP to have prepared, by a small group of high-level specialists in international financing of projects and programmes, a study of additional measures and means of financing for the implementation of the Plan of Action as adopted by the Conference, such as funds-in-trust, fiscal measures entailing automaticity, and an international fund, and to submit a final report on the subject of additional measures of financing to the General Assembly at its thirty-third session, through the Economic and Social Council".

2 It was in this context, that the General Assembly adopted resolution 32/172 on the recommendations of the UNCOD. The resolution, among other recommendations,

> "Calls upon all countries, in particular developed countries, as well as multilateral financial institutions and non-governmental donors, to provide and increase their assistance to countries suffering from desertification, especially for the financing of their subregional and regional programmes and projects within appropriate consortium arrangements, such as those pertaining to the Sahel green belt, and urges developing countries to give due priority to desertification problems in their development assistance requests."

B UNITED NATIONS STUDIES IN 1978, 1980 AND 1981

3 The General Assembly also decided to have prepared, by a small group of high level specialists in the international financing of projects and programmes, a study of **Additional Measures and Means of Financing the Implementation of the PACD (1978)**. After consideration of the study, and as part of its continuing search for a solution to the problem of financing, the General Assembly requested a second study to deal with the following aspects of funding:

(a) A complete inventory of relevant ideas and proposals put forward in the United Nations System of possible new ways and means to finance programmes of multilateral organizations at the world level, additional to regular assessed budgets and conventional extra-budgetary resources;

(b) A financial plan and analysis outlining the components and costs of a programme to stop further desertification and identifying what is already being financed and what additional resources may be needed to meet the minimum objectives of stopping the spread of desertification;

(c) Methods for the mobilization of domestic resources;

(d) The practicality of obtaining loans from Governments and world capital markets on a concessionary basis;

(e) The feasibility of the creation of a public international corporation which would attract investments from countries as well as institutions and would provide financing for suitable anti-desertification projects with non-commercial rates or return;

(f) The means for encouraging the active participation of foundations in the financing of anti-desertification training and research programmes.

4 The second study (1980) was presented to the General Assembly at its 35th session. After a discussion of the study, the General Assembly requested the Secretary-General to prepare:

(a) Feasibility studies and concrete recommendations for the implementation of the additional means of financing deemed practicable by the Secretary-General, including those providing for a predictable flow of funds;

(b) The detailed modalities of obtaining resources on a concessionary basis;

(c) A full feasibility study and working plan for the establishment of an independent operational financial corporation for the financing of desertification projects.'

5 The third study on **Feasibility Studies on and Detailed Modalities for Financing the PACD** was presented to the General Assembly at its 36th session in 1981.

6 The three successive studies have attempted an evaluation of the **feasibility** and **practicability** of the specific proposals for new and innovative means of financing mooted from time to time within the United Nations System. The major proposals and suggestions put forward in the three studies are briefly summarised in the following sections.

7 It will be seen that the second study is similar in a number of aspects to the present study that the General Assembly is now requesting: certain elements are de-emphasised and certain other elements are brought forward as deserving of greater attention. These latter elements are:

- An evaluation of the present state of implementation of the PACD, "including an evaluation of the additional resources needed in order to attain the minimum objectives of the struggle against desertification";
- Research into potential technology to combat desertification and its transfer on favourable terms to developing countries;
- Impact of reduction of external debt on desertification, including re-afforestation;
- Strengthening and co-ordinating the activities of funds established in international institutions, so as to contribute to anti-desertification programmes;
- Active participation of NGOs, foundations and individuals in financing of training and scientific research programmes for combating desertification, including re-afforestation.

I Study of Additional Measures and Means of Financing the Implementation of the PACD (1978)

8 The study concentrated on external (as opposed to domestic) sources of financing for the PACD, making a distinction between (a) funds supplied or raised specifically for anti-desertification projects and programmes and (b) a possible share of new sources of financing established for general development and environmental purposes which may be allocated for anti-desertification purposes.

(a) Funds Provided Expressly for Anti-desertification Programmes

(i) **Assistance from developed countries affected by desertification:** It was considered that many of these countries had the experience, knowledge and capital resources to deal effectively with anti-desertification programmes and could be expected to take the initiative in accelerating a global effort;

(ii) **Increase in ODA:** It was considered that not only the overall levels of ODA from donor countries should increase but that given the importance of anti-desertification activities, a higher priority should be assigned to such activities in the establishment of expenditure guidelines based on requests from desertification-prone countries to demonstrate this priority;

(iii) Loans from national governments and world capital markets: Government lending must come from the developed countries and from rich countries

with substantial financial assets derived from petroleum, etc. Lending would need to be on concessionary terms because:

— Anti-desertification projects often have long gestation periods and benefits are not necessarily in the form of cash flows applicable to the repayment of principal and interest; and
— Most developing countries affected by desertification have limited debt-servicing capacities.

Established international financial institutions mobilize resources by selling securities in world capital markets, and they could raise additional resources in this manner to help finance anti-desertification programmes. The funds thus obtained, however, would involve commercial terms in their interest rates and repayment periods, and would not, therefore, meet the development financing requirements of the majority of the countries concerned, which will need outright grants. In a few special situations, anti-desertification projects will produce cash incomes or increases in land values that could be taxed to yield funds which would better enable the governments concerned to service external loans. However, the benefits of anti-desertification measures often do not appear in the form of readily identifiable and taxable cash flows. Further more, most of the countries severely affected by desertification already face serious balance-of-payments difficulties. Their ability to service foreign loans would not be significantly increased by collecting betterment charges from beneficiaries of anti-desertification projects.

(iv) **Equity investment:** Private investing, based on immediate and high rates of returns for investors, has not been looked upon in the past as a substantial source of funds for anti-desertification programmes per se which are mainly in the public sector. There are, however, multi-purpose programmes with anti-desertification aspects in which the private sector participation could be useful. Similarly, there will be anti-desertification programmes with components in which the private sector can clearly play a useful role (e.g. in the marketing of livestock and agricultural products).

(v) **Foundations:** Foundations could play a useful role but their resources are limited and are usually devoted to special purposes, mainly in research and training. They could be encouraged to play a catalytic role and participate in financing training and research programmes, for example, in the development of drought-resistant and salt tolerant crops, solar stoves, sand-dune fixation and the like.

(b) Share of New Sources of Financing Established for General Development Purposes

9 International needs are of two types, namely:

(i) The need to transfer resources to the developing nations to assist them in improving the living standards of their people; and

(ii) The need to meet the financial requirements of various agreed international programmes.

10 The PACD is clearly an international programme of action that should have a share of new sources of financing identified for general development purposes. Such new sources of financing could be based on **"the exploitation of the international commons, taxation of defence expenditures and arms transfers, a development link with SDR**, and **the taxation of international trade flows."**

11 The study noted that the burden of the different sources of financing either in total magnitude or in relation to the GNP, would not be equal on all countries but concluded that (a) differential burden was an "unavoidable attribute of all workable revenue systems, both national and international", and (b) the burden should be directly related to the level of economic growth (e.g, the poor countries may be permitted to retain part or all of the funds they collect for international purposes, as in the case of trade taxes), or by selecting sources of revenue, which by their nature fall more heavily on the rich than on the poor countries (as in the case of the SDR-Link).

12 The study also gave thought to the consequences which would arise from a decision by the international community to establish new sources of financing for global programmes of development or for environmental protection, involving the principle of automaticity. These consequences[1] would include:

(i) Provisions for the generation and collection of the funds will have to be agreed upon by international treaty;

(ii) Secondly, the governments will, except in the case of the SDR link, have to act as agents for the collection of funds and for channelling them to some central international authority;

(iii) Thirdly, there will be need for a central international mechanism for the collection of funds;

(iv) Fourthly, some kind of policy board would be needed for allocating the funds among the different agencies, sectors and fields of activity; and

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1 It is interesting to note that many of these elements now find expression in the Global Environment Facility. For example: the GEF has set up a Global Environment Trust Fund for the collection of funds, and an Implementation committee has been established consisting of the World Bank, UNDP and UNEP to tetermine the allocation of funds between the three agencies, sectors and fields of activities.

(v) Finally, an appropriate inter-governmental body will have to be assigned the responsibility for the programming and expenditure of the share of such general development funds allocated for anti-desertification measures.

II Study on Financing the Pacd (1980)

13 In a summary of findings, the study noted that most of the funds required to carry out the financial plan to combat desertification would have to be raised externally and that initial requirements for external assistance will of necessity be met exclusively from conventional sources, principally grants and concessionary loans from governments and international finance institutions. But as the scale of anti-desertification effort grew other sources of finance will be needed. Loans from international capital markets would require the services of an intermediary. The intermediary could be the World Bank or one of the regional development banks. If existing institutions were unwilling to undertake this task a public international corporation could be chartered independently or it could be established as an affiliate of an existing institution. However, because the ability of the affected developing countries to service even concessionary loans was limited borrowings in capital markets could only be a small part of the answer. New means of financing would need to be found. Such new means of financing should be "administratively feasible, create no severe inequities, and possess a degree of automaticity."

(a) Inventory of Means of Financing Involving Automaticity Proposed in the United Nations System

14 The following inventory is in accordance with a functional classification and not in order of importance.

(i) International taxation of trade flows, revenue taxes:

- General trade tax;
- Specific traded commodities including oil and other exhaustible materials;
- Invisibles.

(ii) Tax on reverse transfer of technology;

(iii) Tax on surpluses in balance of trade;

(iv) Consumption taxes;

(v) Income from the use of the international commons:

- Ocean resources;
- The moon;
- Telecommunications and satellites in geosynchronous orbits;

— Taxes on polluters of the marine environment.

(vi) Revenues from off-shore resources.

(vii) Military taxes:

— Taxation of military expenditures;
— Taxation of arms transfer;
— Tax on possession of military weapons.

(viii) Savings from disarmament;

(ix) Special drawing rights (SDR)-development link;

(x) Proceeds from IMF gold sales;

(xi) Commodities Stabilization and the Common Fund;

(xii) Other fiscal measures involving automaticity (including the establishment of a world-wide lottery under the sponsorship of the United Nations and a "tax-like" proposal for the introduction of special contributions by multi-national corporations operating in developing countries).

15 In an evaluation of the inventory, the 1980 study concluded that "among the large number of proposals listed in this inventory, several appear to be feasible, practicable or attainable in the near future. These measures could raise funds for any agreed international purpose, including combating desertification". Measures found to be most likely to be attainable in the near future "in terms of timeliness, practicability and feasibility" were the system of gold sales by the IMF, SDR development link, Integrated Programme for Commodities, including the International Commodity Agreements, and the Common Fund, exploitation of non-living ocean resources, international trade taxes, and the charging of fees for "parking slots" of satellites in geostationary orbit.

(b) The Practicality of Obtaining Loans from Governments and World Capital Markets on a Concessionary Basis

16 As far as bank loans from foreign government sources are concerned, the study notes that competing demands on these resources does not permit much optimism for the successful funding of desertification control projects.

17 On loans from world capital markets, it is pointed out that the use of an intermediary finance institution was essential whether such an institution was an existing one (for example, the World Bank, IDA and regional development banks) or a new entity (e.g. an international public corporation).

18 For a more detailed examination of the subject see Chapter 4.

(c) A Proposed Public International Corporation for Financing Anti-Desertification Projects

19 The study pointed out that the feasibility of establishing such a public international corporation depended on whether donor countries and organizations were willing to provide the necessary resources for its establishment. Its primary purpose will be to finance projects which for the most part were incapable of bearing interest costs, even on the highly concessionary terms which are presently available through IDA and similar financing institutions. The Corporation would have to be run with funds provided on an interest-free basis. Different possibilities of establishing the Corporation either as an affiliate or subsidiary of an existing institution or as an independent institution were explored. The conclusion reached was that if the proposed new financial institution were established in the form of a public international corporation, it would have the flexibility in operation, and would encourage the efficiency in management, that would commend its activities to potential suppliers of funds. Assuming efficient managerial leadership, a public international corporation should readily attract a nucleus of uniquely-qualified and competent staff with a degree of specialized expertise in the anti-desertification field. It should not, therefore, be precluded from extending the range of its services to include projects which are capable of being funded on a basis which will assure over time a return of capital and even, in some cases, modest interest charges. To the extent that the corporation were able to establish a sound record of managing such projects, it would be reasonable to expect that it would attract funds from sources which would not be interested if the activities of the corporation were confined exclusively to undertakings which could be financed only on a full grant-in-aid or interest-free loan basis.The establishment of such a corporation as an affiliate would have the advantage of lending it the reputation, facilities and expertise of the established institution. In this way, it would also benefit from a shortening of the proving period. By a decision of the competent organ of the intergovernmental financing organization, combined possibly with an agreement with donor governments and institutions, the proposed corporation could be established. A corporation which is established as an affiliate of an existing institution could also have the advantage of eligibility (in determined circumstances) for the supply of capital from the parent institution as well as from donor members. If none of the organizations cited above would be willing to establish an affiliate organization the proposed corporation could be established as an independent institution. The feasibility of its establishment will depend on the willingness of the international community to provide the necessary capital. The political will to this effort has not materialized in the General Assembly so far.

(d) Increasing the Role of Foundations in Anti-Desertification Research and Training

20 The study comes to the conclusion that although foundations, if properly approached, may play a certain role in providing resources for undertaking research and training, their contributions were not likely to be sufficient to cover all the needs of the countries affected by desertification.

21 The study also dealt with other subjects, such as, a Financial Plan for Combating Desertification and Methods for the Mobilisation of Domestic Resources.

III Feasibility Studies on Detailed Modalities for Financing the PACD (1981)

22 The study takes as its point of departure the two earlier studies and attempts to evaluate the different proposals put forward in them on the basis of their feasibility and practicability.

(a) Feasibility Studies and Concrete Recommendation for the Implementation of the Additional Means of Financing

23 The following additional measures of financing are singled out for special attention:

- Generalized trade taxes;
- IMF gold sales and Trust Fund reflows;
- Link between SDR and development finance;
- The Common Fund for commodities;
- International revenues for sea-bed mining;
- Taxes on "parking fees" from geostationary communications satellites.

(b) Detailed Modalities of Obtaining Resources on a Concessionary Basis

24 This subject is treated in Chapter 4.

(c) Feasibility Study and Working Plan for the Establishment of an Independent Financial Corporation for the Financing of Desertification Projects

25 The feasibility study was carried out under the following subject headings:

- Equity of the corporation;
- Research fund;
- Operating expenses;
- Management of the corporation;
- Demand for loan funds;
- Estimate of potential supply;
- Availability of loans from the corporation;
- Funding of research and experimentation;
- Terms of the loans;
- Responsibility for the loans;
- Comparison with IDA and IFAD concessionary loans;
- Project implementation, control and monitoring;
- Procedure: establishment of the corporation.

A draft charter of the Corporation, in the form of 41 Articles of an Agreement, was also presented.

C NEW OPERATIONAL METHODS/MECHANISMS FOR FINANCING NATURAL RESOURCES MANAGEMENT ESTABLISHED OR PROPOSED WITHIN THE UNITED NATIONS SYSTEM

I Established Methods/Mechanisms for Financing Natural Resource Management

26 As distinct from the very important classical sources of funding, such as, the regional development banks, UNSO and others, the new operational methods/mechanisms for financing natural resources management may be grouped into those already in operation and those which are still under discussion. Among those already established are the following:

(a) Tropical Forestry Action Plan (TFAP):

This is a co-operative arrangement between the World Bank, FAO, UNDP and the World Resources Institute, which acts, with FAO in the lead role, on the basis of a defined Action Plan. There is provision for a small secretariat of six professionals in FAO's Forestry Department since 1985. The essential function of TFAP is that of a clearing-house of national plans of action with funds coming from donors on a case by case basis. Projects range from training of foresters to establishing forestry research facilities to actual reforestation and forest based industries with a total estimated cost of over $400 million. Projects have emerged from the process.

(b) The Energy Sector Management Action Programme (ESMAP)

In 1983 the World Bank and UNDP jointly launched the ESMAP as a pre-investment facility. The principal objective in creating the ESMAP in the wake of the oil crisis was to identify viable economic projects for multilateral funding. The ESMAP secretariat is located in the World Bank (with a core contribution of $3 million in terms of staff provided). It has no less than 55 full-time professional staff with a budget of approximately $16 million in 1990 (of which 11% is for overhead expenses). Since its initiation (a period of seven years) ESMAP has done well with: (a) pre-investment and pre-feasibility studies in 60 countries, (b) provision of technical assistance and policy advise on energy sectors to developing countries, (c) financing of modest efforts to improve stoves, expand fuelwood forests and introduce new types of renewable energy. It is to be noted, however, that of a total obligation of $23 million (1989) for 80 on-going activities, no less than 80% is devoted to policy and planning activities and the rest (20%) to actual projects for energy efficiency and conservation. Donor

funding of ESMAP activities has remained small and uncertain. Equally lacking is commitment on the part of developing countries to follow through on the initiatives. This lack of critical interest on the part of both donors and recipient countries probably explains the relatively weak capital investment activities.

(c) International Fund for Agricultural Development (IFAD)

Created in 1977 as an United Nations agency to cater to the unmet needs of the small farmers and the landless poor in developing countries, it is funded almost equally by OECD and OPEC countries and the voting power is tripartite (OECD, OPEC and developing countries). In the relatively short time since its inception, IFAD has done remarkably well with a secretariat of 231 (of which 98 are professionals) and operating costs at around $44 million. Special Programming Missions to identify problems and possible projects have been undertaken and a large number of projects actually launched. Most of the projects are co-financed with the World Bank and the regional development banks. IFAD also depends on FAO's Investment Centre for technical advice and consultancy. Donors, notably USAID and FRG, have carried out favourable evaluations and are generally satisfied with IFAD's performance (and so are apparently the recipient countries) both as to the raising of funds and carrying out of projects (medium sized projects of between US$12-25 million each) aimed at grassroots agricultural development to raise food production through activities that generate income. The replenishment of IFAD's funds is, however, coming increasingly under pressure as the OPEC income weakens.

(d) The Tropical Diseases Research Programme (TDR) Co-sponsored by the World Bank and UNDP

Co-sponsored by the World Bank and UNDP, the TDR was launched in 1975 to intensify research on the major tropical parasitic diseases. It is managed by a Joint Co-ordinating Board of (a) 30 members representing donors, (b) 12 members representing affected countries and (c) co-sponsors. The donors retain control and, in effect, have contracted WHO to perform specific functions. There are various elements in the functioning of the TDR which could be of interest to the financing of anti-desertification programmes. These include:

- Various scientific, advisory and steering committees which help WHO in executing research programmes (similar arrangements to assist UNEP for anti-desertification research and implementation could be envisaged);
- The TDR has developed a sophisticated information management system and widely disseminates the research results (UNEP could do likewise);
- There is a rigorous schedule of review and accountability built into the system (a definite plus for the TDR);

- TDR undertakes more than 650 activities a year (which is increasing in recent times) for which developing countries contribute over half of the funds (another important lesson for anti-desertification programmes);
- In its first decade of activity, the TDR enlisted the participation of a wide range of institutions and attracted more than $200 million in voluntary contributions;
- TDR's budget has risen sharply since its establishment to an average of nearly $30 million between 1980-1986 of which a modest 9% is allocated for administration, 66% for research and development, and the rest for strengthening institutions and training.

(e) The Consultative Group on International Agricultural Research (CGIAR)

Established in 1971 as an informal association of (a) over 40 countries (b) international and regional organisations and (c) **private foundations** with the objective of supporting international agricultural research centres, the CGIAR has now 13 centres in the system (mostly in developing countries). There is no formal governing charter but the World Bank, FAO and UNDP are co-sponsors and the secretariat is located in the World Bank which manages financial affairs (with a technical advisory committee whose secretariat is located at FAO in Rome). Based on annual pledges, total contributions in 1988 came to $261 million (with the USA, Japan and Canada as the largest donors). It will be seen that CGIAR's relevance as a model is in the provision of research and not in the design and implementation of anti-desertification programmes and projects.

(f) The Interim Multilateral Ozone Fund

The Contracting Parties to the Montreal Protocol (1987) decided at their second meeting in London in June 1990 to establish an Interim Financial Mechanism for the three year period from 1 January 1991 to 31 December 1993. The Interim Financial Mechanism is established for the purposes of providing financial and technical co-operation, including the transfer of technologies, to the Parties operating under paragraph 1 of article 5 of the Montreal Protocol to enable their compliance with the control measures set out in the Protocol. The Financial Mechanism is expected to meet all agreed incremental costs of such Parties incurred in the process of their compliance. The Interim Financial Mechanism includes a Multilateral Fund of $160 million, which could be raised by another $80 million during the three year period "when more countries become parties to the Protocol".

The Multilateral Fund shall:

(i) Meet, on a grant or concessionary basis as appropriate, and according to criteria to be decided upon by the Parties, the agreed incremental costs;

(ii) Finance clearing-house functions to:

— Assist Parties operating under paragraph 1 of Article 5, through country-specific studies and other technical co-operation, to identify their needs for co-operation;
— Facilitate technical co-operation to meet these identified needs;
— Distribute, as provided for in Article 9 of the Protocol, information and relevant materials, and hold workshops, training sessions and other related activities for the benefit of Parties that are developing countries; and
— Facilitate and monitor other multilateral, regional and bilateral co-operation available to Parties that are developing countries; and

(iii) Finance the secretarial services of the Multilateral Fund and related support costs.

The Multilateral Fund shall operate under the authority of the Parties who shall decide on its overall policies.

The Parties established an Executive Committee to develop and monitor the implementation of specific operational policies, guidelines and administrative arrangements, including the disbursement of resources for the purpose of achieving the objectives of the Multilateral Fund.

(g) Technical Assistance for the Mediterranean Countries

The World Bank and the European Investment Bank are providing support for regional efforts in the Mediterranean. The objective of the technical assistance envisaged is to expand the scope for investments in collaborative international action programmes.

(h) Japanese Trust Fund at the World Bank

A basic constraint in the development of environmental projects in the World Bank has been lack of funding for preparatory work. To meet this situation, a Technical Assistance Grant Programme for Environment was initiated in 1989 to fund the technical preparation of projects that would otherwise be a cost to the recipient countries. The new grant programme is designed to accelerate the preparation of innovative environmental project by the World Bank. With seed funds provided by the Government of Japan, the technical assistance programme will hopefully have a positive impact on the number and quality of the environmental projects of member nations. The programme places special emphasis on such areas as:

- Strengthening environmental policies, institutions, information systems and education, via investment and adjustment operations;

- Land management, including land/resource surveys;
- Forestry projects which have afforestation and prevention of deforestation as a major objective;
- Conservation and protection of natural heritage, biodiversity and cultural property;
- Urban and industrial pollution control and waste disposal.

The seed funds agreed to be provided in principle by Japan are expected to be about US$5 million for the International Development Association borrowers and about US$10-15 million for the International Bank for Reconstruction and Development borrowers. Other bilateral sources have also expressed interest in providing funds for the programme. All member developing countries are eligible for assistance, and approval of specific proposals depends on whether the proposed projects are consistent with the overall environmental priorities for the countries concerned. Such priorities are established after discussion with the country concerned (on the basis of Environmental Issues Papers) or through the Environmental Action Plans which countries undertake with Bank support. The normal limit for each individual technical assistance activity is between $100,000 and $1 million. The lower limit is intended to avoid the possibility of time and resources being dissipated on a large number of projects with only relatively minor environmental components. The upper limit is meant to ensure a reasonable geographic and sectoral spread of activities.

(i) The Lomé Convention

The fourth Lomé Convention, which was signed earlier in 1990, commits the European Community to a package of grant aid and other forms of financial assistance (amounting to approximately $14 billion over the next 5 years) to the African, Caribbean and Pacific (ACP) countries which, enjoy special aid and trade relationship with the EC. The first three Lome Conventions (starting in 1973) shared a common objective: "to restore and preserve ecological balances". The Third Convention in 1984, placed special emphasis on combating soil erosion and desertification, a problem given added urgency at the time by the Sudano Sahelian droughts. The present one explicitly recognizes a concern for environment in the form of a new Environment Title which encourages governments to draw up long-term plans for placing environmental concerns in the centre of the national development strategies.

(j) Global Environment Facility (GEF)

The World Bank has been asked by a number of its donors to explore mechanisms for mobilizing and managing a Global Environment Facility (GEF). Specifically, it has been asked to explore the possibility of a GEF that would finance programmes in developing countries that address global environmental objectives. In response to this request, the World Bank has proposed the creation of a tripartite facility (to be managed jointly by the World Bank, UNEP and UNDP) that would fund programmes in four areas of global environmental concern:

- Protection of the ozone layer;
- Reduction of greenhouse gas emissions that causes global warming;
- Protection of international water resources; and
- Protection of biodiversity and maintaining natural habitats.

The GEF is based on broad agreement that developing countries would need concessionary funding to address these global problems because benefits accrue mostly to the world at large while the country undertaking the measures bears the cost. The GEF as a core multilateral fund (in the amount of approximately 1 billion SDR) is set up as a pilot over three years. The underlying principle of the GEF is additionality: for developing countries, for donors, and for the Bank. The second principle of the GEF is cost-effectiveness, in that operations that achieve environmental benefits at the lowest unit cost will qualify for GEF grant funding. To qualify for GEF funds, countries would need to have or be willing to develop a sound overall policy and regulatory and institutional frameworks relating to the four areas of global concern as appropriate. Under specific projects, the GEF would fund technical assistance, training, and studies needed to strengthen the framework. The eligibility criteria for GEF operations is expected to be further developed with time. In this respect flexibility is considered an essential element. As a first step, three types of investments are identified:

Type 1. The benefits that can be clearly assessed and that are obtained by the implementing country are sufficient to justify the costs to be incurred by the country. These projects would normally not be eligible for GEF financing, unless a compelling case can be made thatdespite the attractive cost-benefit outlookthe operation in question would not proceed without GEF involvement.

Type 2. The investment is not justified in a country context if the full costs are borne by the implementing country. But if part of the costs can be offset by concessional assistance from the GEF, then overall substantial global environmental benefits can be realized. The projects would be eligible for GEF funding if they meet the required cost-effectiveness criteria.

Type 3. The investment is justified in a country context, but modifications in project design would yield substantial global environmental benefits. The projects would be eligible for GEF funding if they meet the required cost-effectiveness criteria.

II Methods and Mechanisms for financing natural resource management under discussion

27 A large number of initiatives are currently under discussion. Amongst these are the following:

(a) Tax on Fossil Fuel Consumption

The International Conference on Changing Atmosphere (Toronto, Canada, 27-30 June 1988) called upon Governments to "establish a World Atmosphere Fund, financed in part by a levy on fossil fuel consumption of industrialized countries, to mobilize a substantial part of the resources needed for implementation of the **Action Plan for the Protection of the Atmosphere**[2]". This idea was echoed in statements of several statesmen world-wide under the title of "carbon tax".

(b) Proposal on Ecotourism in the International Conservation Financing Project Report Prepared Jointly by UNDP and the World Resources Institute (September 1989);

The number of domestic and international tourists currently visiting national parks and other nature conservation sites shows a dramatic increase. In 1965, for example, fewer than 10,000 people visited Nepal, but by 1967 the numbers had increased to 240,000. In fact, the tourism and travel industry is generating today more than $30 billion per year from visits to developing countries. Ecotourism, as currently practiced, raises two concerns. First, in the absence of an overall strategy for conservation, the cultural and natural resources of many tourist destinations may be adversely affected. Secondly, while many developing countries are deriving substantial income from such tourism, few fully capture the potential resource "rents" from their unique locations and natural advantages. According to a World Resource Institute/UNDP study, "most countries allow the bulk of the tourist revenues to remain in the hands ofoften foreignhotel, travel, and tour operators, and even offer generous investment incentives and tax holidays to these international companies. Such policies not only deprive local governments of badly needed funds with which to maintain their resource base, but also encourage the excessive developments that ultimately despoil it."

(c) Concept of a Global Infrastructure Fund (GIF); a Proposal from the Mitsubishi Research Institute (Tokyo 1990);

The concept of a GIF is being developed by the Japanese business community (with the Mitsubishi Research Institute playing an important role) as a way to promote the

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2 Conference Proceedings-The Changing Atmosphere- WMO No.710 page 298

development of global infrastructure (mega-scale public works projects). The first in a list of "exemplary" super projects is "greening of the deserts". Other project proposals include the repair of destroyed environments, construction of flood control systems, development of international transport communication networks and of water resources etc. These types of proposals were in the category of projects and programmes not considered creditworthy (because of the size or cost) so far. Each such project is expected to be of over $10 billion.

(d) Proposal by the Italian Foreign Minister (1990) that the Level of EC Financial Resource Transfers to Developing Countries and Eastern Europe be Raised to One Per Cent of GNP;

During 1990 Italy proposed that starting from 1993 the level of financial resources that the EC transfers to developing countries and to Eastern European countries be raised to one per cent of the Twelve's GNP. In the period between 1993 and 2000, this would represent an average annual flow of $62 billion. It was suggested, further, that 25% of these funds be directed to the countries on the southern shores of the Mediterranean, 25% to countries in East Europe, and the balance of 50% to the remaining developing countries.

(e)There has been Continuing Discussion in Academic Circles about the Possibility of Introducing Earth Saving Bonds (ESBs).

ESBs have been proposed as a means of raising funds for environmental protection and resource management. Available to both individual and institutional investors, the ESBs:

- Would be redeemable in all currencies used to purchase them;
- Pay interest to all investors;
- Their value would be linked to one of the world's major currencies (Dollars, Yen, DM, British Pound etc);
- If the bond yielded 9%, the first half (4.5%) of the yield would be tax free for the investors and the second half would be transferred automatically to an international fund devoted to environmental protection and resource management on a global basis. As against the second half, the investor would be allowed to have a tax deduction in that amount against gross income.

An international environment fund, the beneficiary of the ESB scheme, would have tax exempt status.

D NEW SOURCES OF FINANCING

28 In addition to the above-mentioned financing mechanisms, there may be new sources of financing that could adequately cover anti-desertification programmes. In this connexion, it is worthwhile to note that several developing countries have initiated new schemes and proposals for financing of environmentally sound development activities (e.g. the employment generation scheme in Maharashtra, India). Many NGOs, both in the North and South, have made proposals for better automaticity in funding for environmental concerns.

29 Both the OECD and the EC have been active in establishing a Group of Experts on economic instruments for environmental protection and certain important conclusions are emerging. Such instruments could be applied to a wide range of environmental issues. Moreover, they could create new public funds for environmental protection and natural resource management and at the same time encourage behavioral changes towards development sustainability.

30 These charges (Polluter Pays Principle, discharge taxes, users' fees, proportional taxation relief, R & D subsidies for environmentally benign products, pricing adjustments, rebates, etc) have a number of aspects. First, they serve as a disincentive to pollution generation and over-use of natural resources. In this respect, they have been generally successful wherever applied. Secondly, and more importantly, although, in certain cases regulations (e.g. when dealing with human health), have an important role to play , the use of market based incentives have certain specific advantages from the point of view of public policy -for instance they could further the development of "clean" technologies and help to tilt prices in favour of environmentally acceptable products, processes and chemicals. Finally, there is a growing perception that on the basis of the twin criteria of **simplicity** and **practicability** the most attractive of these instruments appear to be the imposition of fees on the use of the environment.

31 It is generally agreed that new modalities of financing should be administratively feasible, create no severe inequities in terms of burden-sharing , and raise no insuperable problems of collection. Although the coordination of different national sources of funds to finance environmental needs raise complicated issues, it would seem that users' fees meet the three criteria reasonably well, particularly as the important and over-riding objective must be to ensure that procedures adopted remain as simple as possible.

32 The importance of proposed arrangements for users' fees lies in the fact that it reflects a new approach based on global partnership. A new order of priorities based on such partnership is needed. It must be an order in which everyone, from all parts of the globe, pay their shares in a common pool of resources to combat natural resource and environmental dangers. It is this aspect that is likely to make users' fees acceptable to people in developing as well as in developed countries.

E CONCLUSIONS

33 The conclusion that emerges in considering the proposals formulated within the United Nations system for utilizing new methods of financing programmes of multilateral organizations at the global level, over and above regular budgets and conventional extra budgetary resources, is that the global community faces a complex reality.

34 **First,** it is necessary to place in perspective the environmental priorities of the developing countries. The priorities of the South are and will continue to be different from those of the North. Water and land resources are the keys to the concerns of the South. The concerns of both North and South find expression in the sense of global interdependence and the feeling of global partnership that interdependence engenders. It is important, therefore, that whatever financial mechanism is established it should be based on universal participation and not subject to weighted voting or veto. One conclusion that was drawn was that institutions such as the World Bank should have a more limited role and the UN (with a broader membership) a more active one.

35 **Second,** it is necessary to determine the close inter-linkages that exist between poverty, underdevelopment, trade, transfer of technology, macro-economic policies and the process of desertification. This is made explicit in the New International Development Strategy for the fourth decade as adopted by the General Assembly. There are thus global and non-global issues in the financing of anti-desertification programmes. The formulation of the needs of the PACD requires to be so designed as to attract funding, but at the same time approaches based on charity must be replaced by clear understanding and expectation of shared global responsibility and international co-operation.

36 As regards the design of the PACD, it will be helpful to make (a) the definition of desertification clearer than it is at present so that public opinion would have less problems with it, (b) an estimate of the minimum costs of assisting countries prone to desertification, and (c) breakdown of the "costs" into their different components, such as, the implementation of macro-economic policies by the countries concerned, the need for financial resources, technical and manpower resources, training and education, transfer of technology[3],etc.

37 **Third,** it will be worthwhile to explore all the available modalities and sources–aid, trade, encouragement of corporate initiatives and of co-operative ventures with the private sector, application of taxes, charges, users' fees, incentives and disincentive systems on the use of natural resources. In this exploration, two tasks are of particular importance:

(a) To identify the need for additional financing to protect investments (in land productivity, irrigation works, rangeland management systems, etc.) and to

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3 Transfer of technology is a critical parameter which requires a distinction between the transfer of technology as such (the programme) and the transfer of the know-how (which will enable one to build the technology locally), the availability of technology, its costs and sources of financing would differ accordingly.

contain the risks that new investments may pose to sustainable resource use and to environmental functions, and

(b) To identify a cross-sectoral framework to guide investment plans which will reflect specific institutions, physical andabove allpolicy interventions that obtain in a desertification prone country so as to avoid *ad hoc* actions which can only compound costly mistakes made over time in different sectors.

Section II: Strengthening and Coordinating Established Fund Activities

Possibilities for Strengthening and Coordinating the Activities of Funds Established for that Purpose in Various International Institutions.[4]

38 Regional bodies and approaches have proved to be the most effective in dealing with anti-desertification programmes. Regional programmes with practical goals that have proved to be a success include those developed by the Arab League through the Arab Centre for the Study of Arid Zones and Dry Lands (ACSAD), by the African Ministerial Conference on the Environment (AMCEN) through the African Deserts and Arid Lands Committee (ADALCO) and the Inter-governmental Authority on Drought and Desertification (IGADD), by the Asian NGO Coalition for Agrarian Reform and Rural Development (ANGOCO), by the Inter-State Committee for Control of Drought in the Sahel (CILSS), by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) through the Regional Network of Research and Training Centers on Desertification Control in Asia and the Pacific (DESCONAP), by the Southern Africa Development Co-ordination Conference (SADCC). This experience should be fully utilized and further developed. The CILSS and IGADD have been performing an effective co-ordinating role which could be replicated with advantage.

39 As noted, a number of funds, or facilities, have been established or proposed in recent years in different international institutions.

40 Although strengthening and co-ordinating the activities of all these funds would be helpful, it is useful to concentrate attention on a number of them that appear most promising. Amongst them are the Global Environment Facility, the new FAO initiative, funding under the Fourth Lome Convention and the Bilateral Assistance orchestrated by the Development Assistance Committee of the OECD.

41 The need for strengthening existing funds, and increasing the flow of financial resources is a major issue and has been discussed in different chapters. Co-ordination can be done at **policy level** to accord higher priority to land degradation, soil loss, rangeland deterioration, and anti-desertification programmes generally, as well as at the **operational level** where regional or national structures can be set up to ensure or encourage coherence, co-operation and compatibility in the use of international funds.

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4 Para 7 of the GA resolution 44/172 is not clear as to what sub-paragraph (f) means by the phrase "established for that purpose". If it refers to the purpose of the previous sub-paragraph (e), it is referring to "mechanisms involving the cancellation or reduction of external debt". If it is referring to the general purposes of the resolution then "for the purpose" could be taken to mean "possibilities for reducing the impact of desertification, including re-afforestation". It is the second interpretation which is followed in this chapter.

42 Co-ordination must be based on an exchange of data and information on the different agencies' activities. This is not an easy task both in terms of coverage of the programmes to be examined and points of convergence to be identified and the mechanisms set up (as the experience of the Designated Officials on Environmental Matters (DOEM) and of the Inter Agency Working Group on Desertification has shown) for the purpose. The question perhaps is one of political will i.e. will at the level of the governing bodies and of the heads of agencies. One possible way could be to identify common goals with different components and emphasize the utility and importance of reaching those goals through the achievement of the individual (though interrelated) components.

43 The current initiatives which deserve particular attention are (a) IFAD's approach to the internalization of ecological concerns into its lending operations, (b) FAO's International Scheme for the Conservation and Rehabilitation of African Lands, and (c) the Global Environment Facility established jointly by the World Bank, UNDP and UNEP.

A IFAD's EVOLVING APPROACHES

44 President of IFAD presented a report on Environmental Sustainability and Rural Poverty Alleviation: Operational Issues for IFAD (IFAD Document GC 13/L/2) to the IFAD Governing Council at its 13th session in 1990. Amongst other matters the report suggested that it will be worthwhile "to consider the modalities of establishing a financial mechanism to channel net additional resources on highly concessional or grant terms towards certain environmental elements of IFAD projects which, although central to IFAD's mandate of rural poverty alleviation, cannot justifiably be financed on current lending terms." This approach has clear points of convergence with the objectives of the PACD and it will be useful to strengthen the initiative (it is not known whether it is to be followed up by IFAD) and to attempt to co-ordinate activities in terms of GA Resolution 44/172.

B FAO's INTERNATIONAL SCHEME FOR THE CONSERVATION AND RE-HABILITATION OF AFRICAN LANDS

45 This is an ambitious scheme to develop a conservation strategy for the entire African continent. As the Director General of the FAO points out:

> "Land cannot be reclaimed or conserved through sporadic efforts or short-term projects; what are needed are long-term programmes, backed by sound land-use policies, and strategies to catalyze their development. To succeed, these programmes must be founded on the concept of participation; ultimately African land can be conserved and rehabilitated only by those who make their living from it.

> The purpose of the International Scheme for the Conservation and Rehabilitation of African Lands is to provide a means by which African countries can develop their own programmes to fight land degradation. The Scheme is specifically designed to enable countries to tailor these programmes to meet their individual needs.
>
> Currently, African nations face severe financial constraints and lack enough trained workers and inputs to undertake programmes of the scale required. Fortunately, technical assistance and financing agencies are keen to help providing they can do so within programmes likely to enjoy long-term success. This Scheme therefore includes a mechanism which enables African governments and these organizations to work in partnership."

46 If land mismanagement has a central role to play in the spread of desertification ("removing too much, returning too little and cultivating, grazing or cutting too frequently ....Yet land degradation can be prevented and even reversed. Soil conditions can be improved, and productivity restored"[5]) See FAO publication **The Conservation and Re-habilitation of African Lands**, Rome, 1990.), the efforts to combat such mismanagement deserve priority support in the broad scheme of the PACD. The FAO emphasizes that cooperation in the raising of the resources for the scheme should be controlled by recipient governments but they must seek outside support from an early stage from donors, financing agencies and NGOs.

47 FAO's scheme is based on the need to mobilize local, national and international resources for the purpose. It is not clear how the financial and technical resources of the magnitude necessary will be raised. The presumption is that new schemes identifying new approaches to sound land use management would attract the necessary resources at the local, national and international levels. Research and advanced training ("but addressed regionally"[6]) would play a strong supportive role.

C THE GLOBAL ENVIRONMENT FACILITY

48 As presently constituted, the Global Environment Facility (GEF) is a billion-dollar-plus pilot programme providing grants and low interest loans to developing countries to help them carry out programmes to relieve pressures on the global environment. The facility also contributes to improved international environmental management and the transfer of environmentally benign technology. The three-year pilot programme is a co-operative venture between national governments, the World Bank, the United Nations Development

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5 See FAO publication **The Conservation and Re-habilitation of African Lands**, Rome, 1990.

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6 Ibid

Programme (UNDP) and the United Nations Environment Programme (UNEP). The facility addresses four environmental concerns. All are critical to the management of emerging planetary problems. These are to:

- limit emission of greenhouse gases which cause global warming;
- preserve the earth's biological diversity and restore natural habitats;
- protect international waters from pollution;
- prevent further depletion of the ozone layer.

49 Donor countries recognize that they must contribute to developing countries' efforts to limit global warming and to save fragile ecosystems (of which desertification control is a prime example). While the financial and technological means to tackle the problems are concentrated in the industrialized world, the need to take action is urgent and must be global if it is to succeed. Funds provided through the global facility, which are additional to regular development assistance, offer developing countries the opportunity to demonstrate how development can take place in harmony with global environmental concerns.

50 To qualify for funding from the Facility a project must relate to at least one of its four specific areas of concern (the economic impact of desertification on the loss of biodiversity is recognized). A further qualification is that a project would not be economically viable in the particular country without support from the Facility. There is also a provision that only nations which are parties to the Montreal Protocol on ozone-depleting substances are eligible for GEF funds requested for ozone-protecting projects.

51 The Facility has a Trust Fund managed by the World Bank. Projects supported by the facility are carried out by the developing country recipients, with support from the three co-operating agencies. Each is responsible for specific tasks which relate to their comparative advantages. A range of non-governmental, regional and specialized organizations will also play an important role.

52 UNEP provides scientific and technological guidance in identifying and selecting projects. A Scientific and Technical Advisory Panel, gives advice on overarching scientific and technical issues under the auspices of UNEP. Experts from industrialized and developing countries serve on this Panel. As part of its scientific and technological support, UNEP also co-ordinates research and data collection.

53 UNDP co-ordinates and manages the financing and execution of pre-investment and, along with UNEP, of technical assistance activities. Through the Resident Representatives in its 112 field offices, UNDP plays a key role in identifying pilot projects, communicating with the governments, and co-ordinating with donors at the country level.

54 The World Bank administers the Trust Fund and is responsible for GEF investment projects. It undertakes project identification, appraisal and supervision with the participation of UNDP and UNEP. As the world's largest source of support for development projects, the Bank uses its global experience in exploring cost-effective approaches to project design and implementation. In countries where governments seek support for their national

environment plans the Bank, in addition to its regular lending, considers funding for the four areas covered by the GEF.

55 To qualify for financial support from the Global Environment Facility (GEF), both the recipient country and the project itself must meet strict criteria. The three partner agencies review each proposal. As part of this process they consult with other specialized organizations, including NGOs.

56 As a result of their review the three agencies determine whether a project qualifies for GEF support and ensure that, in a cost-effective, technologically sound way, it protects the global environment and respects the interests of the country's people. A project should also contribute to the understanding of global environmental problems and their solutions which is a particular responsibility of UNEP. Training and other human resource development activities are another focus of the Facility.

57 Only developing countries with per-capita Gross Domestic Product at or below US$4,000 in 1989 are eligible for GEF investments. With GEF investments come a range of support. Within the financial limits of the Trust Fund, these may include technical assistance, pre-investment studies, information from the scientific community, and training. GEF support is intended to strengthen environmental policies and to reinforce the institutions that implement them in recipient countries. Indeed, GEF funds may directly support the strengthening of policies and institutions to help achieve and sustain improvements in the global environment. Establishing eligibility for projects is complex. The basic idea is that GEF grants and low-cost loans should support a country's programmes and activities which, while they benefit the environment of the world as a whole, would not otherwise be economically viable for that country.

58 The GEF complements, but does not substitute for, action under existing programmes to achieve its objectives. Thus, a project would not normally qualify, even when it offers significant global benefits in GEF areas of concern, if it is economically viable on the basis of an analysis of domestic costs and benefits. An exception might be made if, despite an attractive rate of return, the operation could not go ahead without GEF involvement.

59 The world's ecosystems and diversity of species represent an invaluable global resource. They contribute a wide variety of goods and services, ranging from medicine through genetic resources for food production, to the regulation of climate and rainfall patterns. Yet many of these ecosystems and species are under serious threat of disruption and extinction. The richest remaining sources of biodiversity are in developing countries. The Global Environment Facility (GEF) will support the efforts of developing countries to preserve specific areas to ensure the protection of their ecosystems and biodiversity. A number of proposals to protect biodiversity were made for early consideration by the GEF. These range from the protection of small island ecosystems, watersheds, and forests to proposals to halt desertification and preserve wetlands. Also included are plans to study possibilities for agricultural-ecological zoning.

D CONCLUSIONS

60 It is currently fashionable to assert that desertification is not a problem that can be solved by having money, large amounts of money, thrown at it. Improved design, appraisal, and, above all, effective implementation of desertification control programmes and projects are as important. This assertion is only partially true. The experience of the post-UNCOD (1977) period has shown that in spite of improvements in approach, the PACD has not progressed as intended and that the main limitation remains the lack of funds.

61 In this context, the modality developed by IFAD for approaching land degradation through the poorest segments of the population in the rural areas and the large conservation strategies of FAO are useful but they need strengthening and co-ordination (with other efforts) if the potentials are to be fully and effectively realised. The need for an integrated approach, such as that in the PACD, remains as valid today as it was in 1977. It remains to be seen how far developments in the context of GEF's project eligibility criteria could cope with the demands of this approach.

62 One other conclusion which emerges clearly is that budgetary allocations for anti-desertification programmes in different funds and financial mechanisms is meager and totally inadequate for the purposes of PACD. Clearly more resources for carrying out concrete programmes are needed which will strengthen such funds and financial mechanisms. Both IFAD and FAO proposals deserve larger and more sustained financial support. Desertification is a global environment-development problem and it should have its place in global programmes and its share of international resources (funds) established or to be established for supporting global plans of action.

63 Activities related to the implementation of the PACD carried out by different international institutions both within the UN System and outside, need to be co-ordinated and hence made more effective. The IAWGD which is an appropriate vehicle to secure coordination needs to be strengthened and made strongerboth in terms of working agenda and the secretariat as well as the level of participation of member agencies.

CHAPTER 2

PACD: State of Implementation and Resources Needed

The state of implementation of the Plan of Action and objectives and courses of action to further the struggle against desertification, including an evaluation of the additional resources needed in order to attain the minimum objectives of the struggle against desertification

1 This chapter considers two sets of evaluations:

(a) An assessment of the state of implementation of the PACD and objectives and courses of action to further the struggle against desertification; and

(b) An evaluation of additional resources needed in order to attain the minimum objectives of the struggle against desertification.

2 In 1984 a general assessment of the status and trend of desertification showed that:

- The scale and urgency of desertification as presented to UNCOD (1977) and addressed by the PACD were confirmed;
- Desertification had continued to spread and intensify despite efforts undertaken since 1977; efforts were too modest to be effective;
- Areas of productive land affected by at least moderate desertification included 3 100 million hectares of rangeland, 335 million hectares of rainfed croplands and 40 million hectares of irrigated land;
- Rural populations in areas severely affected by desertification numbered 135 mil.

3 In 1980, it was estimated that a 20-year world-wide programme to arrest further desertification would require about $4.5 billion a year; developing countries in need of financial assistance would require $2.4 billion of this amount (i.e. $48 billion in the 20 years).

4 UNCOD (1977) had concluded that the process of desertification made a significant contribution to the degradation of life-sustaining biogeochemical cycles, spread abject poverty and loss of human life and that the losses in productive capacity (income foregone) because of these amount to nearly $26 billion per year.

5 In their Introduction to "Desertification: Financial Support for the Biosphere"[7] (1987) the editors had noted:

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7 Edited by Yusuf J. Ahmad and Mohamed Kassas, Hodder and Stoughton, London, 1987.

> "Actions of combatting desertification are inseparable from actions of resource development and management in arid and semi-arid lands. Schemes that aim at checking land-degradation in pasturelands, rainfed farmlands and irrigated agricultural lands; at sand-dune stabilization; at establishing large-scale green belts; at introduction of soil and water conservation systems in resource management; or at reclaiming new areas of arid and semi-arid lands, are apt to be costly. Projects involving irrigation schemes are particularly expensive. Such projects are generally non-competitive in terms of market values, especially when compared with prevalent rates of interest. Investments in land-reclamation projects commonly do not pay well financially, but their social and humanitarian values as means of ensuring food security and participation in production are immense."

> "This situation represents compelling reality that exists not only for the PACD but for all large environmental programmes which are inherently not self-financing or where a threshold level of capital is needed for effective actionsuch programmes as the World Soils Policy, the Global Plan of Action for Marine Mammals, GEMS, environmental health programmes to deal effectively with malaria, schistosomiasis, cotton pests and others, pollution of the oceans and of the atmosphere and yet others."

6 An update of the findings reached by the 1991 assessment indicates that the status of global desertification in rangelands has deteriorated still further.

7 Assessment of desertification costs carried out in 1991 were based first, on estimates of the amount of irrigated, rainfed cropland, and rangeland in each of the countries in the drylands. Land use data were taken from the 1986 FAO Production Yearbook. For many countries, estimates of irrigated and rainfed cropland had to be made for the amount of such land in the drylands only. For the second step, the amount of land in each desertification class (slight or none, moderate, severe, and very severe) in each country, by major land use (irrigated, rainfed, rangeland), was estimated. This step was the most subject to error because there are practically no good data available. Reliance was placed on opinion of informed persons and a variety of indirect sources such as local maps, traveller's observations, and experimental plot data. Estimates of the productivity loss of land in each productivity class were as follows: slight desertification represents a potential productivity loss of less than 10 per cent, moderate desertification represents 10-25 per cent loss, severe presents 25 to 50 per cent loss, and very severe represents a potential productivity loss of 50 to 100 per cent. On the average, for most countries the productivity loss that has already occurred on desertified land probably is close to 40 per cent.

8 Cost of agricultural production foregone due to land degradation in the drylands was estimated globally from data taken largely from published figures for Australia, Canada and the United States. The best data were from Australia. It is recognized that the dollar figures for loss of income will differ by the crop grown, government subsidies, marketing policies and other factors. It was impossible to take all those factors into account in this analysis.

9 Calculating an average cost of rehabilitating desertified land is also complicated by a number of factors related to differences in country economies. In addition, it is difficult to extract

meaningful cost figures for most development projects that have a desertification control component. Rehabilitation costs are rarely identified clearly. Estimates were made after consulting project documents and interviewing knowledgeable persons in agencies such as the World Bank, FAO, IFAD, USAID, UNSO, etc. Distinction could be made between cost of corrective measures that address desertified lands and cost of preventive measures that address productive land or lands that are not desertified or are only slightly desertified.

10 Off-site (downstream) costs of land degradation can easily equal or exceed on-site (direct) costs. Flooding of agricultural and urban areas; sedimentation of waterways and reservoirs; pollution of water supplies with pesticides, fertilizer, and heavy metals; air pollution with suspended particulate matter, obstruction of transport routes; increasing the rate of global atmospheric change are some of the off-site effects of land degradation. It has been impossible to assign a meaningful financial figure to such costs.

11 The figures on Table 1[8] give estimates of world wide desertification in the three principal land uses: irrigated land, rain fed croplands and rangelands.

12 The area of hyperarid climate zone in the world is 980 million ha, and the total area of potentially productive drylands (arid, semi-arid and dry sub-humid climatic zones) is 5,200 million ha. The 1991 assessment shows that 3 600 million ha of these drylands (70%) are degraded: 30% of the irrigated farmlands, 47% of the rain-fed croplands and 73% of the rangelands.

13 As against an estimate of $26 billion per year reflecting losses in productive capacity arrived at in 1980, the current (1991) and more realistic and broadly based figures, show loss of income due to desertification as $42.3 billion per year of which no less than $23.3 billion (or more than half) comes from rangeland degradation. This is estimated on the basis of a modest $7 per hectare for rangeland at least moderately desertified (as compared to $250 per hectare for irrigated land and $38 per hectare for rain-fed cropland, both at least moderately desertified). The loss is the highest in Asia ($20.9 billion), followed by Africa ($9.3 billion), North America ($4.8 billion), Australia ($3.1 billion) and South America ($2.7 billion).

14 Desertification economic losses include: the cost of production lost because of human-induced land degradation and cost of rehabilitating land already desertified. Table 2 shows how much income was forgone annually in 1991 due to desertification (see also paragraph 17). Rehabilitating desertified land is a costly process as shown in Table 3.

15 Most developing countries need external financial assistance to combat desertification. Of the 99 countries in this study, 18 were believed to be in a position to finance their own rehabilitation costs. Table 4 divides the global area of desertified land into two categories: desertified land in countries not requiring outside financing and in countries that do require outside funding. About 53 per cent of the land fits into the second category. The actual area to be urgently

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8 Data for 1980 assessment in UNEP document GC.12/9,1984, and Environmental Conservation, Vol. 11-2, 1984; data for 1991 based on special studies by Prof. H. E. Dregne (Texas Technical University, Lubbock, USA) and Prof. B. Rozanov (Moscow University, USSR), revised by a group of experts (April 1991).

Table 1. Global desertification in drylands*

	IRRIGATED LAND			RAINFED CROPLAND		
	Total	**Degraded**		**Total**	**Degraded**	
	m. ha	**m. ha**	**%**	**m. ha**	**m. ha**	**%**
Africa	10.42	1.90	18	79.82	48.8	661
Asia	92.02	31.81	35	218.17	122.28	56
Australia & NZ	1.87	0.25	13	42.12	14.32	34
Europe	11.90	1.91	16	22.11	11.85	54
North America	20.87	5.86	28	74.17	11.61	16
South America	8.42	1.42	17	21.35	6.64	31
Total	**145.50**	**43.15**	**30**	**457.74**	**215.57**	**47**

	RANGELAND			ALL DRYLANDS		
	Total	**Degraded**		**Total**	**Degraded**	
	m. ha	**m. ha**	**%**	**m. ha**	**m. ha**	**%**
Africa	1342.35	995.08	74	1432.59	1045.84	73
Asia	1571.24	1187.61	751	881.43	1311.70	70
Australia & NZ	657.22	361.35	55	701.21	375.92	54
Europe	111.57	80.53	72	145.58	94.28	65
North America	483.14	411.15	75	578.18	428.62	76
South America	390.90	297.75	76	420.67	305.81	73
Total	**4556.42**	**3333.47**	**73**	**5159.66**	**3592.19**	**70**

* "Drylands" refers to arid, semi-arid, and dry sub-humid regions (excluding hyperarid regions), as shown on 1977 UNESCO "Map of the World Distribution of arid Regions".

rehabilitated is listed in the last column of the table. It is assumed that all irrigated land can repay the costs of rehabilitation (c.$2000/ha), 70 per cent of the affected rainfed cropland can repay rehabilitation costs (c.$400/ha), and only 50 per cent of the desertified rangeland can profit enough from rehabilitation to pay the costs (c.$40/ha) of doing so. For both rainfed cropland and rangeland, the principal reason why rehabilitation would not be cost effective is because part of the lands are only marginally productive. The marginality derives from the land being in areas too dry for good yields or with soils that are too sandy or too shallow.

The 1980 and 1991 assessments made a distinction between desertified lands in developed countries that would not require external financial assistance (1,710 million ha in 1980 and

Table 2. Income foregone due to desertification, annually, in million $

Continent	Irrigated land[1]	Rainfed cropland[2]	Rangeland[3]	Total
Africa	475	1,855	6,966	9,296
Asia	7,953	4,647	8,313	20,913
Australia	63	544	2,529	3,136
Europe	474	450	564	1,488
North America	1,465	441	2,878	4,784
South America	355	252	2,084	2,691
World	**10,785**	**8,189**	**23,334**	**42,308**

Total income foregone = $42,308,000,000/yr due to desertification

[1] = $ 250 per hectare for land at least moderately desertified.
[2] = $ 38 per hectare for land at least moderately desertified.
[3] = $ 7 per hectare for land at least moderately desertified.
(Source: H. E. Dregne, 1991)

Table 3. Cost of rehabilitating desertified land

Programmes of Land use	Total area to rehabilitate million ha	Total 20 year of corrective measures million $*
Irrigated land [1]	43	86,000
Rainfed cropland [2]	151	60,400
Rangeland [3]	1,667	66,680
Total	**1,861**	**213,080**

[1] = $ 2000 per hectare for rehabilitation of desertified irrigated land.
[2] = $ 38 per hectare for rehabilitation of desertified rainfed cropland.
[3] = $ 7 per hectare for rehabilitation of desertified rangeland.
* 1990 Dollars
(Source: H. E. Dregne, 1991)

Table 4. Area of desertified land+, by major land use, in countries requiring and not requiring external financial assistance for land rehabilitation, (million ha)

Land Use	Total area desertified	Area not requiring external assistance	Total area requiring external assistance	Area to be rehabilitated with external assistance*
Irrigated land	43.1	14.6	28.5	28.5
Rainfed Cropland	215.6	72.8	142.8	100.0
Rangeland	3,333.5	1,573.7	1,759.8	880.0
Total	**3,592.2**	**1,661.1**	**1,931.1**	**1,008.5**

\+ In arid, semi-arid, and dry sub-humid climatic zones, at least moderately desertified.

* Area to be rehabilitated in developing countries requiring external financial assistance
100% of desertified irrigated land
70% of desertified rainfed cropland
50% of desertified rangeland (Source: H. E. Dregne 1991)

1,660 million ha in 1991) and lands in developing countries that would require external financial assistance (1,560 million ha in 1980 and 1,930 million ha in 1991), see Table 4.

16 It should be noted that there may be good social or political reasons for expending funds on the rehabilitation of marginal lands. Table 5 which shows the picture for the developing countries affected by desertification, reflects repayment feasibility, (benefit: cost is 3:1). Rehabilitation costs for the desertified lands that are believed to be capable of repaying the costs are presented in Table 5. These figures list total direct costs of rehabilitation over 20-year period, a staggering $131,000 million. Neither has any attempt been made to discount the costs at various interest rates. The unadjusted annual costs of the 20-year costs are listed in Table 6 (total cost divided by 20). Income foregone is estimated at $342,000 million. This is the direct cost if no rehabilitation is undertaken, indirect costs that are not included here may be more.

17 The above estimates relate only to the rehabilitation measures in all drylands that are at least moderately desertified (Table 3) or in part of these lands (Table 5). They do not include costs of preventive measures that would avoid deterioration in non desertified drylands or stop it in slightly desertified drylands (up to 10% loss of productivity in irrigated and rainfed croplands and up to 25% in rangelands). Table 7 gives global estimates of cost of a comprehensive programme that would include:

Table 5. Estimated total cost and benefits of twenty-year programme of basic measures to rehabilitate desertified lands in developing countries requiring external financial assistance

	Desertified area to be rehabilitated+ (million ha)	Medium cost of programme of basic corrective measures (million U.S.$)*	Income forgone if no rehabilitation undertaken (million $)*
Irrigated land	28.5	56,000	142,500
Rainfed cropland	100.0	40,000	76,000
Rangeland	880.0	35,200	123,200
Total	**1,008.5**	**131,200**	**341,700**

\+ In arid, semiarid, and dry subhumid climatic zones, at least moderately desertified: 100% of desertified irrigated land, 70% of desertified 'lrainfed cropland and 50% of desertified rangeland.

* 1990 dollars. (Source: H. E. Dregne, 1991)

(a) preventive measures in productive drylands that show 0 - 10% loss in productivity in croplands and 0 - 25% in rangelands;

(b) corrective measures in productive drylands that are moderately desertified (10 - 25% loss of productivity in croplands and 25 - 50% in rangelands);

(c) rehabilitation measures in drylands that are severely desertified (25 - 50% loss of productivity in croplands and 50 - 75% in rangelands) or very severely desertified (50 - 100% loss of productivity in croplands and 75% - 100% in rangelands.)

18 Differences in cost estimates in Table 3 and 5 on one hand and Table 7 on the other hand relate to measures addressed:preventive measures not included in Tables 3 and 5; and areas addressed. Estimates in Table 3 do not cover areas that are not desertified and areas that are slightly desertified (30% of the total productive drylands). Estimates in Table 5 address only part of the drylands which are desertified at least moderately (100% irrigated land, 70% rainfed cropland and 50% rangeland), estimates in Table 7 cover the total area of productive drylands and a comprehensive programme of preventive, corrective and rehabilitation measures.

19 A programme for financing the implementation of a world wide direct action to combat desertification in 81 developing countries that require assistance (both technical and financial) may be based on one of the following three options:

(a) provide support for programmes of direct preventive measures in productive drylands that are not desertified or only slightly desertified (about 30% of the

Table 6. Comparison of 1980 and 1990 costs of rehabilitating desertified lands in developing countries requiring external financial assistance

Land use	Desertified area to be rehabilitated million ha	Medium total cost of 20-y. rehabilitation programme million $	Medium annual cost of 20-y. rehabilitation programme million $
Irrigated land			
1980	16.4	12,262	613
1991	28.5	56,000	2,800
Change	+12.1 (+74%)	+43,738 (+357%)	+2,237 (+365%)
Rainfed cropland			
1980	68.0	17,008	850
1991	100.0	40,000	2,000
Change	+32.0 (+47%)	22,992 (+135%)	+1,150 (+135%)
Rangeland			
1980	722.6	18,066	903
1991	880.0	35,200	1,760
Change	157.4(+22%)	+17,134 (95%)	+857 (95%)
All land uses			
1980	807.0	47,336	2,366
1991	1008.6	131,200	6,560
Change	+201.6(+25%)	+83,864 (+177%)	+4,244 (+179%)

(Source: H E Dregne, 1991)

productive drylands); total cost estimate: $ 0.8 - 2.4 billions/per year. (This will not save territories that are moderately desertified from further deterioration);

(b) provide support for the above programme plus programme of direct corrective measures in productive drylands that are moderately desertified (areas with 10 - 25% loss of productivity in croplands and 25 - 50% in rangelands), total cost estimate: $ 2.2 - 6.6 billions/year;

(c) provide support for a comprehensive programme of direct measures to combat desertification in all productive drylands (preventivecorrectiveehabilitation), total cost estimate $ 6.0 - 14.6 billions/year.

20 In any of these three options the following considerations are relevant:

(a) Implementation of PACD rests with governments of the countries menaced by desertification. Developing countries need international support to compliment national resources mobilized for the execution of the programmes of actions.

Table 7. Ranges of annual costs* to combat desertification in the drylands of the world for a 20-Year programme in billion US $

To stop desertification	**Protective measure in non-affected or slightly affected lands**	**Corrective measures in moderately affected lands**	**Sub-TOTAL**	**Rehabilitation cost in severely and very severely damaged lands**	**Grand TOTAL**
Cost to 18 industrialized and other countries not requiring external assistance	0.6 - 1.8	1.0 - 3.0	**1.6 - 4.8**	2.4 - 3.0	**4.0 - 7.8**
Cost to 81 developing countries requiring external assistance	0.8 - 2.4	1.4 - 4.2	**2.2 - 6.6**	3.8 - 8.0	**6.0 - 14.6**
Total global cost	**1.4 - 4.2**	**2.4 - 7.2**	**3.8 - 11.4**	**6.2 -11.0**	**10.0 - 22.4**

* The costs are calculated on the basis of (a) the costs of relevant direct measures at different degrees of land degradation per 1 hectare in each of the land use categories (irrigated croplands, rainfed croplands and rangelands) and (b) the areas of each of the land use categories affected by different degrees of land degradation (none to slight, moderate, severe and very severe), both for two categories of countries concerned (18 industrialized and 81 developing countries) and for the world. These costs are based on averages taken from site-specific programmes. The variations indicate that they are not depending on the status of development of the country concerned but rather on the nature of the site treated within each country.

National contributions may be modest (especially in the least developed countries) or may be substantial.

(b) A UN study carried out in 1980 (referred to in Chapter 1, Section II of this report) surveyed the flow of aid resources to projects in developing countries that are menaced by desertification. Although there were no projects explicitly addressing desertification the study estimated that some $0.6 billion/year provide aid for activities related to combating desertification. This figure may suggest a comparable estimate of $ 0.85 billion/year at present available to activities related to desertification.

(c) These cost estimates as a whole do not cover costs of a programme for insurance against recurrent drought as outlined in Recommendation 17 of the UN PACD.

CONCLUSION

21 A comparison of costs as estimated in the 1980 assessment with those as estimated in the 1991 assessment is shown in Table 6. The cost increase varied from 95% for rangeland to 357% for irrigated land and 135% for rainfed cropland.

22 It is necessary, firstly, to draw attention to the fact that the percentage increase in the desertified area to be rehabilitated is 25 percent and the increase in the immediate total cost of a 20 year rehabilitation programme is increased by 179 per cent. Second, these are enormous costs which are escalating rapidly reflecting the fact that in dealing with environmental damages it is highly desirable to take early action.

23 Secondly, although the benefits, even on the 1990 figures, (i.e. the avoidance of damage inflicted represented in income losses per year of $42.3 billion) are much higher than the cost of corrective measures (approximately $10,6 billion per year) it will be misleading to attempt a financial cost-benefit analysis because the time profile of the costs and benefits are different. This is the result of the fact that anti-desertification programmes have a long gestation period and benefits do not appear till many years later. It is also necessary to determine whether the estimates used represent average or total costs and try to compute, on the basis of more information, additional or marginal costs.

24 Thirdly, a 20-year world-wide programmeif successfully implemented would:

(a) Add to the world capacity for producing food and reduce hazards of famine as those that menaced Africa in the 1980s;

(b) Stabilize the otherwise fragile ecosystems in arid and semi-arid territories of the world, and hence minimize their impacts on global climate;

(c) Be economically cost effective.

25 Fourthly, the international costs of anti-desertification programmes should be predicated on the package of national macro-economic policies to be pursued. There was a functional relationship between the two and costs could not be estimated without reference to the other side of the equation.

26 A final conclusion reached by the group of high level experts (Geneva, 10-12 July 1991) was that it may be worthwhile to scale down the figures of costs, and thus of the need for financing assistance, to manageable amounts by dealing with shorter time horizons (5 years instead of 20 years, for instance), high priority activities as against less priority ones, use of available technology rather than imported ones and better estimate of what the countries concerned, both the Government and the people, were contributing in funds and services to drylands management.

CHAPTER 3

Promoting Technology Research and Transfer

Ways and means of promoting, in particular in the developing countries, research into and development of existing and potential technology to combat desertification and procedures for the transfer of such technology on favourable terms, in particular to developing countries.

A TECHNOLOGY DEVELOPMENT AND ITS TRANSFER

1 There is general agreement that lack of technology is not currently a major impediment to anti-desertification measures. For desertification control many of the applicable technologies are already in the public domain. For example, water harvesting techniques, vegetative control of dunes and soil conservation methods are unconstrained by patents and potentially available to all countries. In this view, an undue emphasis on research into and development of new technologies may divert attention from the most serious constraint: the lack of application and the poor applicability of the wide array of technologies that are presently available. Lack of application, in this context, refers to the large number of technologies that:

- Exist in the international literature;
- Are locally known ("indigenous technical knowledge");
- Have been experimented within previous projects and programmes.

To fail to utilize these sources effectively could lose years of accumulated experience. The main obstacles impeding ability to use available technologies appear to be:

- Absence of short-term benefits;
- Lack of awareness of what is available;
- The vast array of sources of relevant information;
- The scarcity of experts with the necessary breadth of knowledge;
- Site-specific character of desertification control methods (e.g. trees adapted to one site are not adapted to another);
- Preference for high-technology imported solutions, and neglect of known, simple techniques.

2 It is necessary to emphasize the role of poor applicability in this regard. Poor applicability arises where technologies;

- Are transferred with little regard to human, social and site differences in the recipient region;

- Are implemented solely by technical personnel;
- Fail to address livelihood considerations of the local people who are expected to implement them and whose effective participation is an essential element of success.

3 It is also discouraging but an undeniable fact that many projects, although well-meaning, attempt to implement technologies on the narrow disciplinary experiences ofl the project designers rather than on a balanced assessment of local human and environmental conditions.

4 These considerations underline the special value of assisting the desertification-prone developing countries to develop their indigenous scientific and te1chnological capabilities that would enable them to manage the various aspects of technology transfer and adaptation.

B NEED AND IMPORTANCE OF APPROPRIATE TECHNOLOGY AND ITS TRANSFER TO DEVELOPING COUNTRIES

5 The PACD (1977) had drawn attention to the need for research into and development of technologies to combat desertification. It had noted:

> "Action is required to] give due attention to the modification of technologies to suit local conditions, taking into account social, cultural and economic factors, and ensuring a proper combination of local and imported technology" (Para 75).

6 PACD had also stressed the integration of anti-desertification measures into comprehensive development plans, and presented a broad holistic view of the promotion of technical measures within the context of the human conditions of the people in the affected areas, and of the capacity of agencies and national and international institutions to address multi-sectoral issues. Technological improvements in crop production, whether low-input or high-input, can ease needs of new lands by increasing production on the better-endowed, less fragile lands. The Green Revolution whatever its faults, has done that in many countries. France and the United Kingdom, for example, now are concerned about unceded farm land and excess food production. In addition, PACD had mentioned that attention to socio-economic causes has lagged behind. However, it did not specifically address **how** desertification control measures might be designed, and **how** the necessary breadth of thinking could be fostered in technical specialists who are expected to play a key role in the fight against land degradation. In practice, despite some efforts to promote integrated analysis of technological, social and developmental issues, the situation remains largely unchanged today.

7 The experience of the post-war years has shown that the selection and use of appropriate technology must be given high priority in the quest for agricultural productivity. In this context, sustainable development of land resources, including the choice of appropriate technology must be defined not only in terms of labour and capital endowment of a country or a region, but from a three dimensional point of view in terms of environmental, economic and social aspects.

8 The emerging agricultural technologies exhibit certain encouraging features. Preliminary studies indicate that the new technologies are in general likely to have a benign impact on the environmental functions and the natural resource base for two reasons. First, most of the technologies are expected to increase productivity and thus reduce the pressures that may jeopardize prospects for meeting future agricultural and food needs. Second, most of the technologies are biological and informational and not mechanical and chemical (which has caused so much damage in the past). Some technologies may also provide the potential for reducing costs and capital requirements (per unit of output) at the producer level.

9 There are certain disquieting aspects related to the accessability of the new technologies as well. Because of the Research and Development costs have a likely higher degree of proprietary protection than their predecessors, there is likely to be increased concentration of firms in industry as well as in agriculture which may push input prices upwards to the detriment of anti-desertification programmes. Such a development will be especially disturbing for areas with poor resource endowment where low cost inputs and technology are vital. The development and application of certain techniques also show a lack of appreciation of the complexities of the agricultural systems or indifference to smallholder conditions and exhibit a tendency to over value increases in output to the exclusion of socio-economic consequences. In the last analysis ecology must define the productive use of technology. Although the limits vary from one economic system to another, there are certain ecological imperatives which must be respected.

10 A strong policy effort is, thus, needed (a) to promote research into and development of existing and potential technologies to combat desertification, and (b) to counteract the adverse aspects in the transfer of such technology. Open access to the emerging technologies and the opportunities they embody to developing countries and to the poor farmers in them should be encouraged. The case for a regenerative and ecologically cleaner agriculture must be clearly stated. In most developing countries this is a role that only governments can undertake. International programmes should assist governments in this area.

11 Advances in the field of bio-technology present good prospects but have become costly. The Office of Technology Assessment (US Congress) forecasts the emergence of 150 bio-technologies in 28 different areas that range from plant to animal genetic engineering, plant growth regulators and animal reproduction, to monitoring and control technology and telecommunication. Many of these technologies are already in the market place, others are still in laboratories. Privatization of agri-biotechnologies and the associated restrictive patent property rights suggest the need for an international mechanism for technology transfer. Development and strengthening of the FAO Global System of Plant Genetic Resources may provide the required mechanism.

12 The selection of an appropriate technology from amongst the different alternatives available is not an easy task. The developing countries face in their agricultural and food production different endowments in terms of natural resources, customary and traditional agro-economic practices, patterns of cropping, institutional settings, credit systems, expertise levels, and social attitudes that should be taken into account in considering a technology that would be both environmentally and economically sound.

13 An international research programme in this field should incorporate the following features:

- Adequate financing;
- Dialogue and active co-operation with industry to help in R & D efforts to develop and introduce processes, chemicals and products that will lead to significant and rapid advance in the struggle against desertification;
- Dissemination of information and transfer of technological options, where substantial economies are involved, to desertification-prone countries;
- Identification of opportunities and constraints in attempting to achieve break-throughs in innovative technologies that are resource caring and environmentally sound;
- Further investigation and research into the economic and social consequences of land degradation and in what is involved in a transition to agricultural practice and approaches that help to maintain the carrying capacity of land.

C ACCESSIBILITY OF TECHNOLOGY

14 Accessibility to the right technology is a major constraint in anti-desertification programmes. This was also recognized in the PACD:

> "In many cases, technical solutions are available now, but their application can be impeded by social, legal and sometimes institutional factors because of lack of financial resources constitutes one of the greatest obstacles".

The challenge is the need to match accessible technologies to local circumstances. In the meeting of the challenge, FAO, UNDP, UNSO, UNIDO and others have made a critical contribution. The challenge demands that the implementing agency knows what technologies there are, understands the detailed local circumstances, and has clearly defined design criteria to match the two. These design criteria and how to build a decision-making structure that will choose the right technologies for the right circumstances: i.e. making the technology accessible to the problem it is intended to address, can be identified as follows:

- Technical effectiveness: have the technologies proved to be effective countermeasures in broadly similar environments?
- Adaptability: if technologies have been shown to be technically effective, can they be adapted for different environments? This requires a specific understanding of how the technologies work.
- Adoptability: are the technologies within the capability and resource-availability of land users and of the institutions that help them?
- Developmental: do the technologies support developmental goals, including most importantly the legitimate needs and aspirations of local communities?
- Environmental: are unintended environmental impacts likely to occur? For example, might additional pressure on adjacent environments cause problems there?

- Social and economic: are the measures acceptable to society as a whole? Some groups in society may be put at a relative disadvantage by the implementation of technologies; other groups may incur excessive costs.

15 These criteria set an agenda for research; for choice of technology; and for implementation. The objectives are to ensure the applicability and accessibility of all technologies to the people intended to implement them.

16 A useful way to integrate these criteria is to construct a multi-level set of explanations for the cause of land degradation. Such a "chain of explanation" contains nested explanations, commencing at the site with the physical symptoms such as falling crop yields or excessive soil erosion; it continues its explanation by broadening into land use practices that cause erosion such as overstocking; then it examines the resources, assets, skills and technologies of the land users in, for example, the impossibility of supplying additional family labour; widens further to the nature of agrarian society in, for example, distribution of land rights and the gender division of labour; continues with the nature of the state, including conservation laws, effectiveness of institutions and government policies; and finishes with the international world economy which may well in part explain desertification through foreign debt crises, oil prices and structural readjustment insisted upon by international banks.

17 It will be seen that these are not mutually exclusive explanations. However, each level in the "chain" may prompt possible interventions, the success of which in preventing desertification will depend on their compatibility with other levels in the chain. These "pressure-points" for attention should ensure a balanced addressing of the causes of the problem. A major problem in desertification control arises from the concentration of all interventions at the site on the physical symptoms of the problem and on the land users who are the immediate cause of the degradation, without at the same time addressing the wider factors along the chain which may provide no alternative to land users but to degrade their environment.

18 Implementation should begin with protecting high productivity lands (better climate, better soils, better water supplies). Those lands, when improved, can relieve pressure on marginal lands while increasing welfare (reducing poverty) as well as food and fibre production. Such lands have best potential for favourable benefit/cost ratio, making them more acceptable to countries and to donors.

D CONCLUSIONS

19 Subject to these considerations (germane to a problem as complex as desertification) a number of technologies can be identified that appear to hold significant promise in desertification control. Potentially, all the following are applicable to land uses in rangeland, rainfed arable agriculture, irrigated crops and orchards, and woodlands:

- Agroforestry: a number of specific practices has been developed or are already used in dry areas; e.g. shelterbelts, biomass transfer techniques, live fences,

fodder banks, fuelwood trees on range, fast growing trees, growing of fruit trees, reclamation forestry;

- Soil conservation: various mechanical structures such as bench terraces, contour drains, contour ditches, contour ridges; also biological techniques such as mulching, barrier hedges and conservation tillage;
- Water conservation: efficient systems of delivery, and water harvesting, broad-bed-and-furrow systems, ridging and tied-ridging, small dams, waterproof membranes;
- Soil fertility enhancement: use of organic residues and manures, inorganic fertilizers, green manures, crop rotations, rest periods and fallowing;
- Alternative income sources: small-scale rural industry, brick-making, crafts, etc;
- Renewable energy: vegetation-based fuels, solar power, wind power, pumping, tubewells and irrigation.

20 World wide effort and resources are needed to address the following inseparable issues:

(a) To assist developing countries to develop national capabilities in fields of science and technology and dissemination of technologies pertaining to desertification control, development of land resources in drylands, and in renewable energy sources;

(b) To establish (or develop existing) international institutions that would be capable of assisting developing countries with the technical and managerial problems related to technology transfer; and

(c) To provide within resources to be made available for implementing the PACD, clearly defined appropriations for assistance in fields of science and technology.

(d) Conservation of nature, including the establishing of biosphere reserves.

21 An international programme in the field of science and technology may include the establishment of an institution (fashioned along the CGIAR or within its framework) to develop a network of (5-6) regional institutes for training, research and development, technology transfer, monitoring and assessment, as related to combating desertification and development of land-and-water resources in arid and semi-arid territories.

22 Finally, there is a need for the diffusion of technology to farmers, extension workers, local NGO groups and others close to field operations. There is equally a need to establish data banks at national and regional levels, as appropriate. In order to complement and strengthen their activities it will be worthwhile to have Institutes devoted to agriculture in arid- and semi-arid regions on the pattern of ICRISAT and ICARDA.

23 The revival and use of traditional technologies is a subject to which wholly inadequate attention has been paid so far. Yet, in countries (for example in Syria) where such technologies have been used in dry lands management, they have yielded cost-effective results.

CHAPTER 4

Loans and Other Financial Sources

Possibilities for obtaining loans on concessional terms, from governments and other sources, to finance the struggle against desertification.

1 These possibilities have been a recurring theme in the consideration of the subject by the General Assembly. General Assembly resolution 34/184 of 18 December 1979 requested that the second of the three expert studies carried out should deal with the following among other issues:

> "The possibility of obtaining loans from governments and world capital markets on a concessionary basis".

.2 General Assembly resolution 35/73 of 5 December 1980, after considering the second study, requested a further study on:

> "The detailed modalities of obtaining resources on a concessionary basis".

3 It is instructive to consider the conclusions reached in the second and third studies on the subject.

A GENERAL ASSEMBLY STUDIES

4 The second study carried out in (1980) proceeded on the basis of a distinction between loans from foreign government sources and loans obtained from world capital markets.

5 In so far as the former was concerned it noted that concessionary assistance was generally given to the LDCs or to countries in certain regions because of the severity of their geographical problems (e.g. the Sudano Sahelian region) or because of special ties (e.g. the assistance programmes of Australia and New Zealand in the South Pacific and the French assistance programmes in various parts of Africa). The important factor in obtaining such assistance was the cost-benefit ratio of the particular programmes. Although in many countries attention was now being paid to social costs and benefits, the financial CBA calculations still remained critical to ensure that the project was technically and financially sound. Bilateral assistance programmes gave priority to desert-prone arid and semi-arid areas although they did not include desertification control as a separate sectoral classification. The fact that desertification control programmes involved rural populations and affected the poorest segments of the population was also taken into consideration.

6 In this situation, it was possible to envisage concessionary terms for anti-desertification projects that identified the favourable benefit-cost ratios and social benefits of anti-desertification programmes from a national point of view, "as well as the high priority that recipient governments accords them, reflected, to the extent possible by pledges of the necessary counterpart support".

7 The study identified the following points that should be highlighted in applying for concessionary loans:

(a) Desertification-control projects support priority objectives of bilateral assistance programmes, such as agricultural improvement, rural development, food production, water resources development and basic needs;

(b) Rates of return, even if not in the form of early financial profits, are often high. Studies undertaken for the UNCOD (1977) showed internal rates of return ranging from 14 per cent to 51 per cent for projects financed by the World Bank and the Inter-American Development Bank. Broad estimates also indicated potential benefit-cost ratios in order of magnitude of over 3;

(c) Desertification control projects are typically in rural areas and benefit the poorest segments of the population.

8 In regard to concessionary loans from world capital markets the study noted that:

> "By definition, there is an inherent paradox in obtaining loans from world capital markets on a concessionary basis. The reason is that the world's capital markets are commercial and profit-making in nature, so that they do not provide loans on concessionary terms. The principal means, therefore, by which concessionary terms could be obtained for the borrower would be through assistance from third parties through mechanisms such as guarantees of interest and principal, payment of part of the interest charges, advancing the amortization of the loan and blending concessionary and non-concessionary funds."

9 The third study (1981) was more concerned with the "detailed modalities" of raising funds on a concessionary basis than with the "practicability" of obtaining loans.

10 These modalities were discussed in the study in terms of:

(a) Resources mobilisable through combined subsidy-guarantee/collateral mechanisms;

(b) Alternative guarantee/collateral arrangements:

- *Ad hoc* guarantee arrangements;
- Incorporation in an anti-desertification institution/agency of a callable capital component;
- Collateral arrangement.

(These considerations are of specific relevance to the establishment of an independent public corporation for which there was no political consensus in the General Assembly)

B RATIONALE FOR CONCESSIONAL FUNDING

11 In practical terms, it is necessary to evaluate the environmental benefits of a project, or of its components, in more realistic terms than is done today in the rural/agricultural sector. Desertification-prone countries do not usually have the means to evaluate such benefits or they consistently undervalue them. This conclusion is reinforced by the fact that high discount rates act against activities undertaken to improve the environment, especially when the gestation period (as in the case of anti-desertification projects) is long. It is further reinforced by the fact that when benefits accrue to low income groups (the less-privileged with little or no political power), the costs of a project are often magnified and their benefits given little attention. There is a need here for a redressing mechanism based on distribution of benefits. In order to compensate for these elements, which constitute a complex reality, concessionary financing, particularly grants, is a useful and necessary tool of an effective financing mechanism.

12 The economic rationale for such an approach is to be sought in the effectiveness and efficiency criteria to be used for the allocation of scarce resources. If important benefits are not identified or are neglected then clearly the allocation criteria will produce less than optimal projects (and, of course, if environmental costs are not included then the priority granted to a given project cannot be justified).

13 Generally speaking, there appears to be a case for concessional or grant financing when anti-desertification activities exhibit certain specific characteristics:

- Where liquidity (cash flow) problems at the local government level may cause reluctance to undertake long term (but otherwise sound) land and water resource projects;
- When benefits to the poorest segments of the society are involved;
- Where there are global benefits (particularly to nationals of developed countries) from national or transboundary projects; and
- When there are high risks and uncertainty involved in non-action.

C RECENT DEVELOPMENTS

14 Recent developments have shown that it is possible to consider concessionary funding as an important element in desertification control programmes. The second study (1980) was correct in its assessment that (a) an intermediary development finance institutions would be necessary and (b) blending of grants and highly concessionary loans was a mechanism which needed further exploration.

15 The rationale of the GEF, that, as noted, developing countries need concessionary funding to address certain large (global) problems because benefits accrue mostly to the world at large while the country undertaking the measures bears the cost. Anti-desertification programmes qualify for inclusion in the categories of projects eligible for GEF[9] funding because of a number of reasons, including:

(a) The rate of desertification is now assuming such proportions as to have a significant global cost. The total area of once productive land lost in recent decades is estimated at over 9 million square kilometres, the present annual rate of loss being of the order of 60,000 square kilometres (which needs to be placed in comparison with the world's present food producing land area of only 13 million square kilometers). The global nature of desertification is underlined both by the fact that it affects some hundred countries directly and the remainder indirectly and that 20% of the world's population lives in vulnerable dry lands bordering the world's deserts. The majority of LDCs are suffering from desertification. As the 1978 study noted "desertification is one of the world's major problems involving extensive loss of human life, poverty and the degradation of a vital self-sustaining part of the environment. The annual production losses due to the effect of desertification amount to nearly $26 billion. Expenditures on the order of $400 million annually would be needed merely to achieve **zero increase in land degradation**";

(b) The countries suffering from desertification are so lacking in resources that they are unable to deal with the problem either in their own or global interest;

(c) The nature of anti-desertification programmes and projects is such that funds obtained on commercial terms (interest rates and repayment periods) could not be applied to them: outright grants or highly concessionary terms are clearly needed;

(d) Although anti-desertification projects may be seen as primarily in the national interest of the countries concerned, only in a few exceptional cases such investments will produce cash income or increase land value that could be taxed to yield funds that would better enable the governments concerned (many of them severely indebted and short of foreign exchange) to secure external loans. Indeed, (i) the national benefits of anti-desertification measures do not often appear in the form of readily identifiable and taxable cash flows and (ii) the prospects of collecting betterment charges from beneficiaries of anti-desertification projects are remote or non-existent;

(e) In one area, anti-desertification programmes have a specifically global provenance. This relates to research and field experiments in dealing with the problems of desertified lands that would benefit the affected countries but are clearly outside their financial and technical capacity to undertake in a purposeful manner.

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9 The latest indications (Donors Meeting on the GEF, Paris, November 1990) are that the GEF will be expanded to include additional environmental and resource management concerns.

16 Finally, the need to finance the PACD is no longer viewed by the international community in contrast to the practice a few years ago as a need to transfer to the developing countries resources to assist in the development process but as a means to meet the requirements of an urgent international programme. There is increasing recognition that desertification is a distinct and priority concern, calling for massive and sustained action at a global level. There is little justification either in conceptual or practical terms not to include anti-desertification programmes in the GEF.

D THE ROLE OF GRANTS AND LOANS ON CONCESSIONARY TERMS

17 It is possible to go one step further and to consider, now that the operational problems of identifying an intermediary mechanism and blending concessionary and non-concessionary funds have been tackled in the GEF (as they have been earlier in the case of revenue-raising mechanisms employed by national governments) the importance and necessary role that grants and loans on concessionary terms can play in dealing with resource management and environmental problems.

18 A basic element in anti-desertification programmes and projects is the reconciliation of the short term need, or survival strategies, of the rural poor with the long term requirements for a sustainable resource use i.e. the maintenance of the carrying capacity of land. The hinge between the two requirements lies in the development and transfer of appropriate, environmentally sound technology. Developing countries, particularly the desertification-prone countries, need assistance to meet the incremental costs involved in the process of transfer. Clearly, they cannot be met from either their own meager domestic resources or foreign assistance allocations ear-marked for essential and urgent economic and social development needs. In view of the burden of the external debt and lack of foreign exchange earnings the assistance must also be on the basis of grants or loans on highly concessional terms.

19 Apart from the question of transfer of technology, there are two basic economic issues that anti-desertification projects must face. The first is the question as to whether the resource management and environmental impact of projects should receive concessional terms. The second relates to the establishment of criteria which will allow such components to be identified. It will be seen that the financing mechanism envisaged (grants or loans) determine the selection of projects if implemented out of a given pipeline. Anti-desertification projects would continue to be neglected or ignored and their design ineffectively or inefficiently arrived at if the availability of financing is unmindful of environmental concerns. In other words, there is a strong case for grant financing if the environment/poverty conflict is to be satisfactorily resolved in terms of national policy.

E CONCLUSION

20 The GEF, is the first approximation to a financing mechanism that blends concessionary and non-concessionary financing but other mechanisms are also in the offing and should be encouraged. It is necessary to take a more receptive approach to grants and concessionary financing for anti-desertification programmes. In many such programmes, a specific sustainability criterionmoving away from financial cost-benefit analysis, discount rates etc.must be adopted so that complementary measures[10] are taken in hand to realize a given environmental objective. It is obvious that desertification control programmes qualify for consideration among the global issues to be supported by GEF.

21 The establishment of an international corporation for financing anti-desertification programmes on concessionary basis deserves consideration by international community. The corporation may be (a) an affiliate or subsidiary of an existing international financing institution, or (b) an independent institution. Past experience has shown that grants and concessional loans are not likely to be adequate or appropriate for the needs of anti-desertification programmes. The total amounts will remain limited and further constrained by the needs of Eastern Europe. What is thus needed is to seek to obtain surplus funds for capital investmentanti-desertification programmes cannot be viewed solely as assistance programmes, they need investment capital (e.g. the recently proposed Arab-Mediterranean Bank).

22 The implementation of a world PACD should be eligible to receive its share of support from future resources (and funds) established to finance global programmes related to environment and development.

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10 The World Bank defines the **grant element** of a loan as follows:

"The grant element of a loan seeks to measure the concessionality of aid funds, extended at a given set of terms, as compared to the same funds extended as a grant (the benchmark). There are five primary factors that dictate the degree of concessionality of a loan as compared with the benchmark: the loan's interest rate, maturity, grace period, volume, and the relevant discount rate. The traditional definition of grant element is the face value of the loan less the present value of debt service payments, divided by the face value of the loan. The grant element is defined here as the difference between the present value of disbursements (disbursements are assumed to be made over an eight-year period) and all debt-service payments, divided by the present value of disbursements."

CHAPTER 5

External Debt and Desertification

Possibilities for reducing the impact of desertification, including reafforestation, with the help of mechanisms involving the cancellation or reduction of external debt.

A INTRODUCTION

1 It is becoming increasingly clear that attempts to deal with economic problems in the short-term could lead to severe environmental damages which make structural and long term economic reforms more cumbersome and costly. Indeed, it can be argued that the present economic and financial crises besetting developing countries, and particularly the low-income desertification-prone countries, cannot be effectively addressed except with new, less wasteful and more environmentally sound resource use patterns. The external debt burden of these countries is an outstanding example. What is happening is that in the repayment of that debt the indebted countries are using much more than their economic surplusthey are making demands on their natural resources and land productivity systems that cannot be sustained and will lead eventually to critical ecological imbalances for themselves and the global economy as a whole. Unless desertification control practices are profitable (or economically profitable and have positive benefit/cost ratio) in the short term, there is little likelihood that poor countries and agriculturists will devote scarce resources to land conservation. Degradation will continue to reduce the land resources and to increase poverty.

2 In this context, it is worthwhile to compare the financial costs inflicted by the present levels of Third World debt (estimated at over $1.32 trillion) on the debtor countries and the costs of natural resources degradation and destruction, loss of the carrying capacity of land and the spread of desertification in the debtor countries. Are these costs commensurate? Could they be linked? In other words can the need for sustainable development be reconciled with the inimical conditions created by the increase in real interest rates, balance of payment difficulties, and unwise investment of borrowed funds?

3 A number of conclusions can be drawn. First that inevitably for many of the countries concerned the present debt servicing charges are unrealistic and unsupportable: repayment of the principal is not only in jeopardy but interest payments are also at risk.

4 Secondly that the debt overhang severely restricts the flow and rate of further investments (because the investments cannot be properly serviced unless the debt stock is reduced or economic performance sufficiently improved to reach a viable debt servicing capacity). Furthermore, debt servicing also diverts resources from investment purposes, including investment for environmental protection.

5 On a rising curve of concern is the degradation of the global commons, and particularly the rapid destruction of tropical forests, that play a vital role in the planet's life support systems. Conservationists see a direct link between the debt-servicing burden and tropical deforest-ationindeed most of the world's remaining forests are found precisely in those developing countries with the most crippling debt burdensand wish to seize the debt crisis as an opportunity to protect the global environment through "debt-for-nature" swaps.

6 It is interesting to examine the debt structure of the countries suffering from desertification and drought. A striking feature of the debt is that it is limited mostly to official creditors, governments and multilateral financing institutions, and only a small proportion to commercial entities. Table II shows the position of the total 1989 long term debt from (a) official and (b) private sources.

7 The present international debt strategy can be, and needs to be, improved through a number of innovative actions. These include:

(a) Writing-off by all creditor countries (including OPEC and socialist countries) of their official debt to low income countries suffering from desertification as a contribution to the PACD;

(b) A new institution has been proposed and should be created, preferably affiliated to the World Bank, to handle the debt programme of these countries;

(c) In this connection it is recommended that IMF apply their special provisions available under its Articles of Agreement to allow indebted desertification-prone countries longer periods for repayment of loans and the payment of charges in local currencies;

(d) Similarly, the long debated question on the allocation of SDRs should be re-examined in this lightwhen such allocations are resumed, industrial countries may consider giving up their share (or a part of it) in favour of the debt burdened low income countries suffering from desertification;

(e)The creditor countries could consider in their banking legislation generous provisions (taxation) in particular against bank exposure to the highly indebted desertification-prone countries as a net contribution to the PACD.

B NEW INITIATIVES

8 Two initiatives in the field of debt cancellation are worthy of note, one on-going and the other under discussion.

(a) **The Special Program for Debt-Distressed IDA only countries of Sub-Saharan Africa (SPA)** launched in December 1987 for a three year period, and extended recently for another three year period starting in 1991, is a comprehensive framework for the mobilization and coordination of official multilateral and

bilateral financing for countries undertaking adjustment programmes. Under the programme, financing is provided for multi-year structural and sectoral adjustment programmes from various sources accelerated IDA financing, donor co-financing and co-ordinated financing, IMF financing, relief on ODA and Paris Club debt and the Fifth Dimension scheme to provide debt relief to debt-distressed IDA only countries with outstanding IBRD debt. Co-ordination with donors under the SPA was intensified in the form of a "working partnership". Bi-annual consultations were held by IDA with SPA donors to discuss these issues, as well as the status of the programme and its funding requirements. IDA provided financial and operational status reports at each of these meetings.

(b) **Debt-for-Nature Lease Arrangements:** The essence of the proposal is that a percentage of the principal of the debt should be moved out of a borrowing nation's debit column into the credit column line and held in a credit escrow account. In principle the mechanism works by having the debtor country deposit in an (escrow) account the local currency equivalent of the amount of debt or debt service to be reduced (whether at face value or at a discount). The local currency fund is then used for environmental conservation/protection. The following is a case application:

Country A obtains a **debt-for-nature-swap** of [illegible] a $10 million loan $5,000,000 would become available in a **credit escrow account** to serve as the source of funds by the world community to LEASE certain hectares of virgin tropical forest for 5 years at $1,000,000 per annum. Country A's debt principal would be reduced automatically by $5,000,000, if Country A as the LANDLORD would agree to LEASE these site specific hectares for five years, thus realizing an equal or greater return on the forest than by cutting or burning it. Although country A would not receive the actual payments from the escrow account, interest payments would be cut in half thus releasing hard currency funds for domestic investments. These released funds could be used to (a) buy new technologies,(b) finance the development of a national environment management infrastructure to inventory and develop management tools for the LEASED area once the lease expired and (c) sustainable development projects including anti-desertification programmes. During the period of the LEASE, the international community would be allowed to audit the productivity of the leased area, develop income generating alternatives, assist country A in devising a management plan for arid and semi-arid lands, etc.

9 **Debt for Anti-Desertification or replacement of land resources programmes swap through the intermediary of the United Nations:** The group of financing experts considered a proposal presented by one of the participants, Senator Abel Salinas of Peru which would have the creditor countries donate to the United Nations the debt documents at a value less than the market value of the documents. UNEP would give these documents to the debtor countries, under the condition that these countries invest funds in local currency in the same amount, in programmes to combat or avoid desertification and/or improvement of the land resource.

10 The Governments of the debtor countries must make a commitment to establish, by law that, for instance, during the following 5 years, a percentage of their national budget be transferred to institutions of the Central Government, Regional and Local governments in order that they can prepare, equip and/or implement the programmes to fight against Desertification

11 The group was of the view that it was necessary to consider the proposal in three parts:

- Bilateral debt;
- Multilateral debt;
- Commercial debt.

12 In so far as bilateral debt was concerned, what was proposed could very well work. But multilateral debt and commercial debt could prove more difficult. For many developing countries the servicing of multilateral debt was a serious drain and political will was needed on the part of the major shareholders of these institutions in order that this type of debt could be treated in the same way as bilateral debt. More work was clearly needed in this area. In so far as the commercial debt was concerned the problem was more intractable and a different approach was necessary to induce the commercial banks to donate the debt documents. On present showing, only the least developed countries were acceptable candidates for such transactions.

C DEBT-FOR-NATURE SWAPS

13 In recent years considerable public attention has been focussed on debt-for-nature swaps and certain experiments in Latin America appear to have been a success.

14 An examination of the transactions show that in order to be successful they need the support of the World Bank/IDA in a meaningful way. During the course of discussions with donors about the replenishment of IDA 9, questions were raised about the possible role of the World Bank/IDA in support of debt-for-nature transactions. In the Report of the Executive Directors on IDA 9, donors urged IDA to "play a catalytic role in facilitating debt-for-nature transactions in support of sustainable development." A recent Note prepared by the World Bank explores issues involved in such assistance.

15 The following conclusions drawn by the Note are worthy of consideration:

"The Bank/IDA can be helpful in a number of ways in facilitating/promoting debt-for-nature transactions where they are a natural outgrowth of the Bank's lending and policy dialogue and are in line with its role as a development institution, including:

(i) working with governments through policy dialogue and economic and sector analysis to create favourable microeconomic, environmental, and possibly regulatory frameworks that would facilitate these transactions;

(ii) assisting in resource mobilization for debt-for-nature transactions where they are part of a larger program of environmental action or debt reduction in which the Bank has been involved;

(iii) providing information to governments on potential debt-for-nature opportunities, and possibly serving as an intermediary to bring interested governments, commercial banks, and NGOs together;

(iv) lending for operations coordinated or co-financed with debt-for-nature transactions that would serve to improve effectiveness or sustainability of environmental actions;

(v) where there are adjustment loans with environmental components, a portion of such loans may be set aside for debt and debt service reduction, within the guidelines for such operations. In IDA-only countries, Debt Reduction Facility funds could be used to finance these operations.

The scope for debt-for-nature transactions is likely to rem in limited, especially in IDA countries, in view of *inter alia* the limited size of the Debt Reduction Facility, the relatively small amount of eligible commercial bank debt, and the budgetary stringency of the debtors. Moreover, for the Bank there is a need to ensure that the instruments that link debt reduction and the environment effectively complement other instruments for pursuing environmental and debt reduction objectives."

16 The following Table (Dogsé and von Droste[11] 1990) summarizes debt-for-nature programmes established as of mid 1990.

11 Peter Dogsé and Bernd von Droste; Unesco MAB Digest No.6, 1990.

Table 1. Debt-for-nature programmes established as of mid 1990 in million US $.

A	B	C	D	E
Country	**Eligible debt-for-nature conversion**	**Actually exchanged**	**Eligible for conversion but not yet exchanged**	**Total bond generated by debt-for-nature conversion**
Costa Rica	113.50	79.25	34.25	42.33
Dominican Republic	80.00	0.58	79.42	0.58
Ecuador	60.00	10.00	50.00	10.00
Argentina	60.00	0.00	60.00	0.00
Peru	10.00 - 20.00	0.00	10.00 - 20.00	0.00
Madagascar	8.00	2.10	5.90	2.10
Zambia	2.27	2.27	0.00	2.27
Philippines	2.00	0.39	1.61	0.39
Sudan	0.80	0.80	0.00	0.80
Bolivia	0.65	0.65	0.00	0.25
Poland	0.05	0.05	0.00	0.05

17 It will be seen that while the total amounts involved are not high, especially when compared to the total of Third World debt which stands at a little over $ 1.3 trillion, the debt-for-nature swaps are becoming increasingly popular. There is need to have a greater focus and intensification in the operation aspects of the mechanism.

Table 2 Composition of long-term debt of some developing countries suffering from drought and desertification

Percentage of Total 1989 long-term debt

	Official Sources Bilateral	Official Sources Multilateral	Private Sources
Algeria	22	6	72
Egypt	70	12	18
Morocco*	57	20	18
Tunisia	43	29	28
India	24	35	41
Pakistan	57	37	41
Argentina*	11	8	81
Bolivia*	45	37	18
Brazil*	15	12	73
Chile*	8	25	67
Colombia*	16	37	74
Ecuador*	18	21	61
Mexico*	8	13	79
Peru*	33	14	53
Venezuela*	1	2	97
Ghana	27	65	8
Kenya	26	47	27
Liberia	44	39	17
Nigeria*	38	10	52
Senegal	60	34	6
Zambia	56	30	14
Ethiopia	51	37	12
Malawi	22	73	5
Niger	31	43	26
Sudan	61	17	22
Tanzania	60	34	6

* Indicates highly indebted country

Source: U.N. list of countries suffering from desertification and drought; World Bank, World Debt Tables, 1990-91.

D CONCLUSION

18 As noted earlier the international debt strategy includes several policy initiatives currently under discussion, which should be encouraged. Many OECD countries, the principal sources of bilateral assistance, have announced their willingness to treat debt reduction or cancellation more sympathetically when linked to natural resources conservation. In realistic terms, however, the linking of debt cancellation with the financing of programmes to redress desertification suffer from a number of constraints. First, many of the desertification prone countries are in such severe state of economic and financial impoverishment that any relief from debt is normally ear-marked for actions on a long list of priorities. It is necessary that funds released from debt cancellation would lead to the provision of greater resources to protection of the environment, re-habilitation of land productivity, improvement of rangelands, extension of irrigation facilities etc. which are all high priority development actions. Secondly, desertification-prone countries are often not willing to allocate funds which become available to them to development purposes which include these activities. Thirdly, the central issue in the financial management of these countries is one of evaluation of emerging needs. In the calculus of needs and benefits (often essentially short term), projects and programmes would have to justify themselves as a major and urgent concern if they are to be given a high place in the list of priorities.

CHAPTER 6

Role of NGOs, Foundations and Others

Ways of encouraging the active participation of non-governmental organizations, foundations and individuals in the financing of training and scientific research programmes to combat desertification, including reafforestation programmes

1 This chapter deals with the role of three broad categories of agents in the financing of (a) training and scientific research programmes to combat desertification, including, (b) reafforestation programmes. These three groups are:

- NGOs
- Foundations
- Individuals

2 Ways and means of encouraging the active participation of these groups is discussed in the following sections.

A NON-GOVERNMENTAL ORGANIZATIONS

3 A large number of non-governmental organizations are involved in the combat of desertification at the local and community levels. The more effective of these organizations are networks, the others are small bodies of concerned persons who do not have either the funding capacity or the organizational capabilities to take effective action and limit themselves to raising awareness of the problem.

4 NGOs, especially those from the South have been playing a key role in combating desertification in three ways:

(a) Advocacy of the environmental issues involved and raising of public awareness of the human, economic and ecological impact of desertification;

(b) Lobbying and campaigning against policies and projects that could have adverse ecological and social impacts; and

(c) Developing small scale anti-desertification and local environment improvement projects built upon principles of participatory management and equitable distribution of project benefits.

5 During the 1980s, as awareness of the adverse impact and extent of land degradation grew numerous NGOs in the South took up projects for improved land management. Several of these projects have today become models of community-based anti-desertification projects and have influenced national policies. There is a strong need to support a variety of NGOs in the South to strengthen and further their advocacy, public awareness raising, lobbying and communitybased field action roles. There is, thus, a need to support not just Southern urban-based, national NGOs but also small, community-based groups to develop anti-desertification projects. In India, for instance, it has been found that all successful NGOs with good land management projects were those who succeeded in creating or working with effective community-level groups. National NGOs in the South can definitely play an important role in developing training programmes for grassroots ecology management workers and in undertaking studies and analyses of how to integrate people's own traditional knowledge and practices with inputs of modern science and technology. In these activities, they have often received financial support from Northern NGOs, or church-based institutions like OXFAM, NOVIB and Community Aid Abroad.

6 There is also a need to stimulate interest and activity within the academic and research institutions of the South to undertake socio-economic and scientific research and training programmes. There is a reasonably large scientific and social science community in the South that needs to be mobilized urgently.

7 For the specific purposes of encouraging interest in the financing of training and scientific research programmes to combat desertification, it appears worthwhile to turn to the substantive and purposeful international NGOs, which are well funded, and involved in resource management and environmental quality improvement programmes.

8 It must be accepted, however, that generally speaking NGOs are not known or organized for financing training and scientific research programmes. Their rationale and main strength is for:

- Advocacy of environmental and resource management issues;
- Awareness building (south NGOs have not been fully utilized for this purpose so far); and
- Research and publication.

Secondly, NGOs provide good models for popular participation in environmentally sound development.

Finally, it is worth emphasizing that universities play an important role and they should expand their NGO-like activities in the field of scientific research. This potential needs to be further mobilized.

B FOUNDATIONS

9 Foundations were examined in two of the three studies carried out under General Assembly auspices. The first study (1978) considered Foundations under "Sources of Financing" and came to the conclusion that they could play a useful role but that their resources were limited and "mostly devoted to special purposes, mainly in research and training. Foundations have been successful as catalysts in these areas, and should be encouraged to participate in financing training and research programmes, for example in the development of drought-resistant crops, solar stoves, sand-dune fixation and the like"

10 In the second study (1980) more attention was devoted to Foundations and an entire section under the heading "Increasing the Role of Foundations in anti-desertification Research and Training" was devoted to them. The section considered the means of encouraging the participation of Foundations but limited itself to private Foundations only (of which most are in OECD countries). The data relating to the private Foundations (the total amounts of grants made by them, their numbers and areas of activity, etc) were related to 1978 figures and are not of much practical value today.

11 The study, however, noted that:

- A new kind of agency dispensing assistance for training and research have recently emerged (e.g. IDRC, SAREC, the US Appropriate Technology International, Inter-American Foundation, etc.) which were oriented towards indigenous research and training projects in developing countries with annual grant-making resources estimated at that time (1980) to be in the order of $100 to $150 million;
- There were a number of Foundations mostly established in the Middle East as non-governmental bodies "serving to express the philanthropic interests of their founders" (e.g. the Queen Alia Foundation, the King Faisal Philanthropic Foundation and the Philanthropic Trust of Kuwait). "There are no available estimates of their resources, but these Foundations could possibly be interested in financing research and training related to desertification control."

12 The distribution of grants made by Foundations located in Europe and the USA in 1978 showed that primary interest was in education, medicine, social welfare, etc. (international assistance received less than 10%) and anti-desertification research and training was not a priority subject area by any means. The study added that "the Foundations which are most likely to be associated with the anti-desertification effort were those which already have an interest in the environment. The possibility exists, however, that a few foundations whose interests lie in the fields of education and the earth sciences may be encouraged to participate."

13 The study went on to list the following international Foundations as among the better known ones "with an interest in the Third World":

- Ford, Rockefeller, Rockefeller Brothers Fund, Lilly Endowment, W.K. Kellogg, Carnegie Corporation, A. W. Mellon, E. M. Clark and Tinker in the U.S.A.;

- Alfred Krupp von Bohlen und Halbach, Kübel and Volkswagenwerk in the Federal Republic of Germany;
- NOVIB and NUFFIC in the Netherlands;
- Calouste Gulbenkian in Portugal;
- Juan March in Spain; and
- Toyota in Japan.

14 One further point made by the study is that the Foundations do not ordinarily prepare their own projectsthey prefer to contribute to the financing of projects brought to them with all the necessary documentation.

15 Finally, it was pointed out that the CGIARmembership of which includes Foundations as well as governments and international organizationsprovides substantial assistance to research and training institutes interested in arid and semi-arid areas, notably, ICARDA, ICRISAT, ILCA and the IFPRI.

16 A list of Private Foundations interested in resource management and environmental concerns is placed below:

The Aga Khan Foundation
The Allbritton Foundation
Atkinson Foundation
The American Conservation Association
Beldon Fund
The William Bingham Foundation
Botwinick-Wolfensohn Foundation Incorporated
Mary Flagler Cary Charitable Trust
Compton Foundation
The Nathan Cummings Foundation
Geraldine R. Dodge Foundation
The Gaylord and Dorothy Donnelley Foundation
Echoing Green Foundation
The Educational Foundation of America
The Folger Fund
The Ford Foundation
The Friendship Fund
General Service Foundation
The German Marshall Fund of the United States
The George Gund Foundation
The Luke B. Hancock Foundation
H. John Heinz III Charitable Trust
The William and Flora Hewlett Foundation
Hitachi Foundation
The International Foundation
W. Alton Jones Foundation, Inc.
The Joyce Foundation
The Kresge Foundation
Albert Kunstadter Family Foundation
Laird, Norton Foundation
The Lukas Foundation, Inc.
Luster Family Foundation, Inc.
John D. and Catherine T. MacArthur Foundation
Manitou Foundation, Inc.
Wallace Genetic Foundation, Inc.
Mariner Foundation Trust
Mars Foundation
Robert S. and Margaret C. McNamara Foundation
The John Merck Fund
Joyce Mertz-Gilmore Foundation
The Leo Model Foundation, Inc.
The Moriah Fund
Charles Stewart Mott Foundation
The Curtis and Edith Munson Foundation, Inc.
Jessie Smith Noyes Foundation
The Overbrook Foundation
The Frank Pace, Jr. Foundation
The Pew Charitable Trusts

Sidney and Joanna S. Poitier Foundation
Public Welfare Foundation, Inc.
Rockefeller Brothers Fund
Laurance Rockefeller Charitable Lead Trust
The Rockefeller Foundation
Sacharuna Foundation
Sasakawa Peace Foundation
Savitt Fund of the Tides Foundation
The Florence and John Schumann Foundation
Schumann Foundation
David Schwartz Foundation, Inc.
L. J. and Mary C. Skaggs Foundation
Alan B. Slifka Foundation
Summit Fund of the Community Foundation of Greater Washington
Surdna Foundation, Inc.
The Tinker Foundation Incorporated USA for Africa
Frank Weeden Foundation.

C INDIVIDUALS

17 It is not clear how and on the basis of which criteria the General Assembly expects the individuals it has in mind to be identified. Indeed, it is difficult to separate the dynamic and charismatic individuals who have often initiated NGO groupings or established foundations and identified with them from other personalities. Nevertheless, high caliber individuals could volunteer and play a catalytic role in the financing of the PACD.

D CONCLUSION

18 NGOs in developing countries have played a special role. This role is not so much in financing of projects and programmes but in several other respects which are equally important. First, many NGOs at the developing country level constitute effective pressure groups in favour of environmental action. Secondly, through community groups at the local level they act in favour of natural resources conservation, including measures that have a direct bearing on land degradation and desertification. Thirdly, these NGOs, because of their knowledge of local conditions and specific ecosystems, could make a substantive contribution in the implementation of anti-desertification activities. Finally, the total package of resources needed for anti-desertification programmes must include a number of components apart from funds. These are human resources, time given to protection of the environment, operational activities in the field, etc. It is this latter component of the package that confer an advantage on the NGOs.

19 Foundations have played an important role in supporting activities of organisations that contribute to anti-desertification technologies such as contributing to ICRISAT and funding research by the CGIAR. Such involvement by foundations in training and research could be further strengthened and co-ordinated to ensure more effective contributions to anti-desertification measures.

20 Individuals could participate, as has been the case with UNICEF activities through the lending of their personal prestige, influence and financial resources, as well as such mechanisms as the Earth Saving Bonds (more open to the general public).

ANNEX I

GENERAL ASSEMBLY RESOLUTION 44/172 A

Implementation of The Plan of Action to Combat Desertification

The General Assembly,

Recalling its resolution 32/172 of 19 December 1977, by which it approved the Plan of Action to Combat Desertification[1], and all its subsequent resolutions on the subject,

Recalling also its resolution S-13/2 of 1 June 1986, by which it adopted the United Nations Programme of Action for African Economic Recovery and Development 1986-1990, which identified measures to combat desertification as a priority,

Bearing in mind the draft resolution to be adopted at the present session[2], concerning the United Nations conference on environment and development, to be held in 1992, fifteen years after the adoption of the Plan of Action to Combat Desertification,

Deeply concerned that the problem of desertification, which has a global impact, is still on the fringe of the growing awareness on the part of the international community that it is imperative to combat environmental deterioration effectively within the framework of the inter-dependence of nations,

Gravely concerned by the continuing spread and intensification of desertification in developing countries, particularly in Africa, and the indescribable human suffering, economic and financial losses and social disruption caused by that scourge,

Aware that drought and desertification place a considerable burden on the economic and financial capacities of the developing countries affected and that the negative effects of the international economic environment impede their efforts to undertake effective and sustained programmes to combat desertification, for which they bear primary responsibility.

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1 Report of the United Nations Conference on Desertification, Nairobi, 29 August 9 September 1977 (A/CONF.74/36), chap.I.

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2 See Official Records of the General Assembly, Forty-fourth Session, Annexes, agenda item 82, document A/44/746/ADD.7, para. 55, draft resolution V. The draft was subsequently adopted as resolution 44/228.

1 **Takes note** of the report of the Secretary-General on the implementation of General Assembly resolutions 42/189 A, B and C of 11 December 1987[3] and of the relevant section of the report of the Governing Council of the United Nations Environment Programme;[4]

2 ***Expresses*** its deep concern about the inadequacy of financial resources for the implementation of the Plan of Action to Combat Desertification;

3 **Urges** Governments, in particular those of the developed countries, United Nations organizations and other intergovernmental bodies to increase and intensify their efforts to combat desertification and to accord the highest priority to the recommendations contained in the Plan of Action;

4 **Invites** the Executive Director of the United Nations Environment Programme to consult the principal international organizations, private foundations, individuals and the major media enterprises that finance or promote environmental protection activities in order to draw their attention to the compelling need to consider desertification on an equal footing with other current environmental issues;

5 **Invites** the United Nations conference on environmental and development, to be held in 1992, to accord high priority to desertification control and to deploy all means necessary, including financial, scientific and technological resources, to halt and reverse the process of desertification with a view to preserving the ecological balance of the planet;

6 **Invites** the Governing Council of the United Nations Environment Programme to contribute substantially to the discussion on desertification at the conference, *inter alia*, by undertaking a general evaluation, sufficiently in advance of the conference, of the progress achieved in implementing the Plan of Action;

7 **Requests** the Secretary-General, in consultation with the Executive Director of the United Nations Environment Programme, to submit to the conference, through its preparatory committee, a report containing relevant expert studies on, *inter alia*, the following:

(a) Relevant suggestions and proposals formulated within the United Nations system on the possibility of utilizing new methods to finance the programmes of multilateral organizations at the global level, over and above regular budgets and conventional extra budgetary resources;

(b) The state of implementation of the Plan of Action and objectives and courses of action to further the struggle against desertification, including an evaluation of

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3 A/44/351-E/1989/122

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4 Official Records of the General Assembly, Fourth-fourth Session, Supplement No. 25 (A/44/25), chap. VI.

the additional resources needed in order to attain the minimum objectives of the struggle against desertification;

(c) Ways and means of promoting, in particular in the developing countries, research into and development of existing and potential technology to combat desertification and procedures for the transfer of such technology on favourable terms, in particular to developing countries;

(d) Possibilities for obtaining loans on concessional terms, from Governments and other sources, to finance the struggle against desertification;

(e) Possibilities for reducing the impact of desertification, including reafforestation, with the help of mechanisms involving the cancellation or reduction of external debt;

(f) Possibilities for strengthening and coordinating the activities of funds established for that purpose in various international institutions;

(g) Ways of encouraging the active participation of non-governmental organizations, foundations and individuals in the financing of training and scientific research programmes to combat desertification, including reafforestation programmes;

8 **Decides** to close the Special Account to finance the implementation of the Plan of Action to Combat Desertification, and requests the Executive Director of the United Nations Environment Programme to take the necessary steps to do so;

9 **Also decides** that the Consultative Group for Desertification Control will meet every year until the conference on environment and development is held in 1992 and every two years thereafter, and reaffirms its mandate as contained in resolutions 32/172 of 19 Dec 1977 and 39/168 of 17 Dec. 1984;

10 **Calls upon** the Consultative Group, in cooperation with the Executive Director of the United Nations Environment Programme, to contribute to the enhancement of awareness of environmental issues and to intensify its efforts to mobilize additional resources, to exchange information on scientific research, national programmes and the implementation of the Plan of Action and to give its opinions on the actions to be undertaken in the battle against desertification;

11 **Urges** the Governments of countries affected by desertification to accord high priority, in their national development plans, to medium-term and long-term strategies and programmes for desertification control;

12 **Requests** the Secretary-General, together with the Executive Director of the United Nations Environment Programme and the Administrator of the United Nations Development Programme, to submit a report to the General Assembly at its forty-sixth session, through the Economic and Social Council, on the various provisions of the present resolution, and to ensure that it is submitted, immediately after publication, to the preparatory committee for the United Nations conference on environment and development.

83rd plenary meeting, 19 December 1989

ANNEX II

List of Participants to Meetings for Drafting Expert Studies on Funding Anti-Desertification Programmes

I. Meeting of Experts, Geneva, 9-11 July 1990

Participants

1.Mr. R. Moreno Jr
Senior Economist
World Bank

2.Mr. S. Morozov
Director
Centre for International Projects
UNEP/COM, Moscow

3.Mr. C. Rakotondrainibe
Resources for Development
Programmes, UNCTAD

4.Dr. M. Stocking
Director, Overseas Development Group
University of East Anglia
United Kingdom

5.Mr. T. A. Saiko
Deputy Chief
Terrestrial Ecosystems Branch
UNEP/COM, Moscow

Senior Advisors to the Executive Director
Dr Y. J. Ahmad (Chairman)
Prof. H. Dregne
Prof. M. Kassas
Prof. B. Rozanov

II. Meeting of Experts, Nairobi, 21-23 February 1991

Participants

1.Mr. S. Imai
Economist
Environmental Affairs Department
African Development Bank
Abidjan

2.Mr. F. Joshua
Economic Affairs Officer
UNCTAD, Geneva

3.Mr. C. Kahangi
Co-ordinator East Africa Region
Africa Devevelopment Bank
Nairobi

4.Mr. Jin Liqun
China-Delegation, World Bank
Washington D.C.

5.Mr. P. Ndegwa
Economist and fomer
Governor of the Central Bank
Kenya

6.Mr. A. Salinas
Senator
Peru

7.Mr. G. A. Brown (Chairman)
Governor
Bank of Jamaica

8.Ms. S. Drouilh
Regional Representative
UNSO, Nairobi

9.H. E. Juan Antonio Mateos
Ambassador of Mexico
to Kenya

10.Prof. S. J. De Canio
School of Economics,
University of California
Santa Barbara California, USA

11.Dr. A. Markandya
Economist
United Kingdom

Senior Advisors to the Executive Director
Dr. Y. J. Ahmad
Prof. H. Dregne
Prof. M. Kassas
Prof. B. Rozanov

III. High Level Meeting, Geneva, 10-12 July 1991

Participants

1.Dr. A. Agarwal
Director, Centre for Science
and Environment
New Dehli, India

2.Mr. G. A. Brown (Chairman)
Governor
Bank of Jamaica

3.Dr. D. Ghai
Director
UNRISD, Geneva

4.Dr. Mahbub ul Haq
Senior Advisor to the
Administrator of UNDP
New York

5.Dr. A. M. Hegazy
Former Prime Minister of Egypt
Cairo

6.Mr. K. Piddington
Special Advisor (Environment)
World Bank

7.Mr. H. Mule
Assistant President
IFAD, Rome

8.Hon. Prof. G. Saitoti
Vice-President and
Minister of Finance Republic of Kenya

9.Ambassador C. Thomas
Assistant Secretary-General
O.A.S., Washington

Observers

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Administrator - Development
Commission of European

F. Joshua
Economic Affairs Officer
UNCTAD , Geneva

Senior Advisors to Executive Director
Dr. Y. J. Ahmad
Prof. H. Dregne
Prof. M. Kassas
Prof. B. Rozanov

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