



UNITED NATIONS
GENERAL
ASSEMBLY



Distr.
GENERAL

A/36/277
10 November 1981

ORIGINAL: ENGLISH

Thirty-sixth session
Agenda item 72 (b)

SPECIAL ECONOMIC AND DISASTER RELIEF ASSISTANCE

Assistance to the drought-stricken areas in the Sudan

Report of the Secretary-General

1. In its resolution 35/90 of 5 December 1980, entitled "Assistance to the drought-stricken areas in Djibouti, Somalia, the Sudan and Uganda", the General Assembly, inter alia, requested the Secretary-General: (a) to assign, as early as possible, and in consultation with the Administrator of the United Nations Development Programme and other organizations concerned within the United Nations system, the responsibility for assisting those countries in the region to the appropriate body, within the system, which will be funded from voluntary contributions, will be responsible for the co-ordination of the activities of the United Nations system in support of the recovery and rehabilitation efforts of the countries concerned and will also provide direct assistance to the Governments of those countries in co-ordinating inputs from donor sources and in strengthening their national and regional capabilities to mitigate the effects of future droughts and promote sustained economic and social development; (b) to mobilize international assistance for the populations affected as a result of drought and other natural disasters in the four countries concerned; (c) to send, as a matter of urgency, a multiagency mission to Djibouti, Somalia, the Sudan and Uganda to assess the medium-term and long-term needs of the Governments of those countries for their drought-afflicted populations; and (d) to report to the Economic and Social Council at its second regular session of 1981 on the results of the multiagency mission concerning the medium-term and long-term needs of the Governments concerned and also to the General Assembly at its thirty-sixth session on the progress achieved in the implementation of the resolution.

2. In implementation of General Assembly resolution 35/90, the Secretary-General on 23 December 1980 sent communications to Member States and relevant international financial institutions referring to the report of the missions which visited these countries in September/October 1980 in response to Economic and Social Council resolution 1980/70 and appealing for international assistance to deal with the immediate impact of the drought. The communications also drew attention to

paragraph 7 of Assembly resolution 35/90 and informed Member States that arrangements have been made with the Administrator of the United Nations Development Programme for a unit within his Programme to be assigned responsibility for assisting the affected countries in the region and for co-ordinating the activities of the United Nations system in support of recovery and rehabilitation in these countries. Further, the Secretary-General appealed for voluntary contributions to meet the operational costs of such a unit.

3. A multiagency mission was organized which visited Uganda from 25 to 30 September; Somalia from 1 to 8 October; Djibouti from 8 to 15 October; and the Sudan from 15 to 24 October 1981. The report of the interagency mission to the Sudan is annexed to the present report. The other country reports of the mission have been issued as separate documents: Uganda (A/36/274), Somalia (A/36/275) and Djibouti (A/36/276).

ANNEX

Report of the multiagency drought mission to the Sudan
(17-24 October 1981)

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I. INTRODUCTION

1. At the thirty-fifth session in 1980, the General Assembly heard the statement made by the United Nations Disaster Relief Co-ordinator before the Second Committee on 3 November 1980 about the grave effects in Djibouti, Somalia, the Sudan and Uganda of successive years of drought and the resulting shortage of food-stuffs, fodder and water (A/35/SR.36). The problems related to drought in the Sudan are complicated by the immense size of the country and the poor transport situation, which makes the rapid transfer of food and fodder from surplus to deficit areas extremely difficult.
2. Because of those problems, and the serious erosion and pasture degradation in drought-prone areas of the Sudan, the General Assembly adopted resolution 35/90, on 5 December 1980, in which it requested the Secretary-General, inter alia, (a) to mobilize international assistance for the populations affected as a result of drought and other natural disasters in the four countries concerned; (b) to send, as a matter of urgency, a multiagency mission to assess the medium-term and long-term needs of the Government for its drought-affected population.
3. The Secretary-General designated an Assistant Secretary-General to lead the multiagency mission, which visited the Sudan from 17 to 24 October 1981. The mission comprised representatives of the United Nations, the United Nations Development Programme, the United Nations Sudano-Sahelian Office, the United Nations Children's Fund, the Food and Agriculture Organization of the United Nations, the World Food Programme, the World Health Organization, the World Meteorological Organization, the United Nations Educational, Scientific and Cultural Organization and the Economic Commission for Africa. A list of mission members is shown in the appendix to the present report.
4. The terms of reference of the mission, as agreed to by the Secretary-General, were as follows:
 - (a) Survey the drought-stricken areas of the country;
 - (b) Assess the medium-term and long-term needs of the Government in the situation;
 - (c) In carrying out this work, the mission would consider the policies and programmes which the Government had adopted to deal with the threat and consequences of drought;
 - (d) Review the status of implementation of recommendations made by previous missions, particularly the drought emergency mission led by the UNDRO Co-ordinator in 1980;
 - (e) Examine measures which could be implemented on a country basis;

(f) Discuss the role and possible programme of the intergovernmental body mentioned in General Assembly resolution 35/90;

(g) Take into account previous or ongoing activities in its recommendations;

(h) Consider the amount and type of assistance which would be needed from the international community and evaluate the possible ways such additional assistance might be obtained.

5. The mission leader held discussions with the First Vice-President, the Ministers for Foreign Affairs, Irrigation and Health and the State Ministers of Agriculture, and National Planning. The mission as a whole also had extensive group and individual meetings with representatives and technical advisers from all Ministries concerned. Visits by air and road to drought-prone areas in the West, East and South enabled members of the mission to meet officials of the Governments of the Eastern, Kordofan, Darfur and Southern Regions at their respective headquarters in Kassala, El Obeid, El Fasher and Juba. In addition to overflying large areas of the country by light aircraft and travelling by road to Kassala and Torit, the mission constructed a reconnaissance flight over Eastern Equatoria Province. Upon completion of the work, a briefing on tentative findings and recommendations was given to the Government.

6. The mission wishes to express its sincere appreciation for the assistance received from His Excellency the First Vice President and from the Ministers and staff of the Government, the Resident Representative of the United Nations Development Programme and his staff, as well as the representatives and experts of the United Nations agencies.

II. SUMMARY OF MAIN CONCLUSIONS AND RECOMMENDATIONS

7. In considering medium-term and long-term measures against drought, the mission found it difficult to separate them from the more general measures of economic development. There are some differences, however, which are referred to later in the present report. The general economic difficulties through which the Sudan is still passing inhibit much of the action which needs to be taken against drought.

8. The Sudan's great potential for development was clearly summarized in the Government's presentation to the United Nations Conference on Least Developed Countries in September 1981. The Sudan has a high ratio of land to people, and, although 50 per cent of the population is concentrated in 15 per cent of the total area, the remaining land has an agricultural potential that has not as yet been utilized. Bearing in mind the increase still possible in the use of Nile water for irrigated agriculture, with a large area that might be developed in the rainfed sector, there is every reason, in principle, to believe that the Sudan could become a major food exporter in the long run.

9. The Government reports that population is growing at a rate of approximately 2.5 per cent per year, so that at least for the time being there is little pressure of population on the resources. Despite the good training facilities that exist, the critical factor is the severe shortage of trained people, which is the result of emigration to other countries, especially in the Gulf region. The shortages are met throughout the life of the country and at every level of skill.

10. The Government told the mission that a formal drought policy had not been adopted, although the six-year plan (1977/78-1982/83) covers a number of activities which respond in various ways to drought problems. The absence of a drought policy in earlier years may well have been one consequence of the broadly optimistic prospect sketched above, and it is only in more recent times that the drought problem has taken on a new dimension in the context of a global energy crisis, an adverse balance of trade, a slowing down of the disbursement of external aid and a combination of external and domestic financial difficulties which have adversely affected the pace of development. In this combination of circumstances, drought became a more threatening factor in the life of the country.

11. The State Minister of Agriculture explained to the mission that, generally speaking, drought areas are remote from food production areas, transport facilities are not adequate to link the two areas and there are not enough storage facilities. Farms in drought areas tend to be scattered and therefore difficult to assist through existing extension and other services, for example, by supplying them with the kinds of seed appropriate to the present climatic and soil conditions. The Minister also noted the danger of desertification as a consequence of the accumulating effect of drought.

12. The Ministry of Irrigation has a master plan for the use of Nile waters over the next 20 years, which includes developments in irrigation, conservation and hydropower generation. The plan promises great benefits for the country, but has only modest relevance to the problems of the drought-affected areas in that, according to the Minister, a certain number of people might be moved from drought areas and be resettled on irrigated plots. There is not yet a plan covering such resettlement.

13. The mission learned from the Ministry of Irrigation that, on occasions in recent years, there had been a marked effect on some irrigation schemes from the shortage of water caused by drought conditions. This is a vitally important consideration for a country which depends so much on irrigated agriculture as the major source of food, both for domestic consumption and export.

14. The Ministry of Irrigation said that among the foods available from irrigated plots which would be useful for drought areas were groundnuts, oil seed from cotton and a certain amount of sorghum although sorghum was not usually grown on irrigated land in view of its relatively low financial return. In all cases, there remained the immense difficulty of transporting the food to the drought areas.

15. The State Minister of Planning told the mission that the Sudan might have been able to handle the drought problem without external assistance had it not been for a series of major crises, internal and external, which affected the country at the same time. They included military and security problems in the region; the rocketing cost of energy (imports for 1973 totalled \$US 17 million and, for 1980, \$US 500 million); the fall in the value of the pound; a fall in cotton production; etc.

16. The mission concluded that drought appeared in different places, under different circumstances and with different consequences. To make one set of comments on the drought throughout the Sudan was not possible, nor would one set of responses be relevant.

17. In the mission's view, this complex set of problems could only be tackled successfully on the basis of a well-ordered and formal policy on drought, which would facilitate the task of focusing and integrating the range of responses required, in order to mitigate the consequences of future drought as well as to meet drought crises when they arose. The process of formulation of a policy would generate the rethinking of the drought problem, which was necessary, in the opinion of the mission, and which should advance the subject on the priority list for attention and action. The policy should be reflected in a programme covering the medium-term and well into the future, and should: address itself especially to the questions of how to achieve results within the limits, which seem likely to exist for sometime, of a shortage of trained and experienced people, and of funds.

18. In considering ideas for drought mitigation policy and programmes, the mission met the same difficult problem the Government is facing - a severe shortage of or sometimes a total lack of information. The information that was available appeared to be somewhat deficient. Evidently, much work has to be done to build up the factual basis for good programming, but the lack should not inhibit the taking of some actions now, and suggestions are made below regarding a number of practical steps.

19. The present report goes into many problems which follow the shortage of rain, but, generalizing rather freely in order to make the situation clearer, it may be said that the main consequences of drought emerge as follows:

(a) Through the destruction of ground cover vegetation, which then facilitates the spread of desertification, as in Northern Darfur and Kordofan Provinces, driving out the population;

(b) In the reduction of the volume of water available from the Nile for irrigation. This is a combined effect of the shortage of rain in the various countries where the tributaries of the Nile have their origin. The result in the Sudan is the reduction of the areas being irrigated;

(c) Through even small reductions in rainfall in areas where there is hardly enough at the best of times and farmers always have to struggle. This kind of problem occurred in the south-east (Eastern Equatoria Province) in the latter part of last year.

20. In considering the steps to be taken to mitigate the effects of drought, the most important of all, in the view of the mission, is to cease to treat drought as an emergency to be tackled as and when it arises. It should be seen as a recurring phenomenon, against which preparations should be made well in advance and as part of the national development programme. Such a change of attitude is essential at every level, if people are not to continue suffering because they are overtaken by the surprise of a new drought.

21. Apart from measures for improved fact-finding, planning and management referred to elsewhere in the present report, the mission proposed the following actions:

(a) Intensification and acceleration of measures against desertification. These will require the combined efforts of the Government and the donors (detailed comments appear in sect. G below);

(b) Improvement of the Meteorological Service and full utilization of the available data for drought-planning purposes;

(c) Establishment of self-help schemes in areas where farmers are settled, which would require a build-up of food reserves in each area, and the introduction of more appropriate systems of crop production and animal husbandry, together with extension services and a drought-warning system. Assuming external assistance in a number of ways, such as the provision of storage facilities, an effective scheme of such a kind could, within a period of two to four years, obviate the need for help from abroad for such areas, as well as eliminate the problem of transport of relief food within the Sudan. The mission attaches much importance to the application of the self-help idea.

22. The State Minister of Planning and the mission agreed that there was need for better co-ordination among donors and among the relevant ministries of the Government, as well as between donors and the Government, in dealing with the drought problem. The mission was pleased to learn of the initiative being taken by the Government to establish a national co-ordinating body, with a permanent secretariat provided by the Ministry of Planning.

23. In the face of such problems in a country as large as the Sudan, the mission's contribution can only be a modest one. Continuing efforts will be needed in order to formulate a comprehensive response to drought and its consequences.

III. GENERAL BACKGROUND

24. The Sudan has a potential for rapid economic development not usually found in other least developed countries. With 2.5 million sq kms of land, it is the largest country in Africa and among the least developed countries. The most striking feature of the Sudan's economic potential is its high land/man ratio. There is a population of close to 19 million, which gives the country a low population density of about 7.6 persons per sq km, even though 50 per cent of the population is concentrated in 15 per cent of the total area, particularly around Khartoum.

25. The concentration of the population in a relatively small area does not obscure the agricultural potential that remains unutilized. Land, the foremost natural resource of the Sudan, is only exploited to a limited extent. It is generally accepted that out of nearly 600 million acres, 200 million are suitable for cultivation. Yet, only 20 million acres, or 10 per cent of the available land, are at present under cultivation. The actual area under crop at any given time is about 16 million acres. The main cereal crop is sorghum (durra). It is the staple food in the country and is grown mainly under rainfed conditions. The country normally produces sufficient durra to satisfy its domestic requirements. While 4 million acres are under irrigation with a large cotton production, the remaining 12 million acres are under rainfed agriculture. The large area of land that remains unused or underutilized provides a great potential for development in the 1980s and thereafter.

26. Livestock are owned by almost half of the inhabitants and, as one of the most important segments of the rural sector, this has a significant impact on the country's economy. A rough calculation shows a country-wide stocking rate of one animal unit per 5 hectares. The known deterioration of natural grazing areas, accelerated also by recent drought occurrences, and the apparent rapid increase in livestock population nationwide, indicate the seriousness of this intensive stocking rate. In order to protect the natural rangeland from further deterioration, the country has the option either to balance and control in some way the growth rate of the national herd and/or supply fodder from rainfed and irrigated agricultural schemes during the dry season and drought periods.

27. Any description of the Sudan should start with the Nile River, since it is so vital to the Republic. The Nile enters the Sudan from Uganda in the south and is fed by a number of streams draining the south-west area of the country. The White Nile drains the Sudd Region northward, though half of the flow is lost by evaporation in the Sudd. The Blue Nile drains a large part of the Ethiopian highlands and joins the White Nile at Khartoum. The two rivers are very different. The Blue Nile floods in August, normally rising 7 metres above its low level, and at that time produces nearly 90 per cent of the discharge at Khartoum. Normally, at low water, the White Nile produces 83 per cent of the discharge. North of Khartoum the Nile is the focus of most of the agricultural activity, and pump irrigation along its banks provides a fertile strip through the desert.

28. The Sudan has a range of tropical, continental climates, with a marked climatic gradient from south to north and from the Ethiopian plateau towards the north-west. In the south, the rainy season lasts from five to eight months (April to November) producing from 750 to 1,800 mm of precipitation, while in the central and northern areas the rainy season lasts from one to five months (June to October) and the rainfall varies between 700 to 25 mm in the very north.

29. The economic potential of the Sudan is not confined to agriculture and agro-based industries, although agriculture is now and will remain the predominant sector of the economy. Mineral resources are gradually assuming importance, and their exploitation is capable of providing a strong impetus to the growth of the economy. Current mineral production is confined to small amounts of chromite, gypsum and anhydrite, manganese, mica and talc. In the past, the contribution of those minerals to the Sudanese gross domestic product was negligible. Recent surveys have indicated a potential for mineral exploitation in the Sudan. In particular, the copper deposit at Hofrat en Hahas in south-west Sudan may offer enhanced economic potential for the future. In addition, both on-shore and off-shore exploration for oil and gas is now in progress. Oil deposits have already been discovered in the south-west and a small refinery to process the crude petroleum is about to be constructed.

30. With respect to human resources, the potential is somewhat limited, at least in the short run. The realization of the potential depends on the Government's ability to make optimum use of the country's labour force in a manner commensurate with the requirements of the large unutilized areas. The population is now growing at a rate of about 2.5 per cent per year. Open unemployment is still insignificant in the Sudan, although underemployment is more pronounced in some parts of the country. In fact, the Sudan suffers from a shortage of labour, particularly during the cotton-harvesting season, and often labour from neighbouring countries is employed on a seasonal basis. It is the trained manpower situation which is most critical. The country has good training facilities, as well as training opportunities abroad. However, emigration to other countries, especially in the Gulf region, has assumed very serious proportions. While the remittances from the Sudanese working abroad is an important source of foreign exchange, the manpower requirements for the country's own development programmes, which encompass the public sector, the private sector and the joint ventures, require specific and careful consideration.

31. In addition to agriculture and industry, there is a burgeoning construction sector, a large financial sector, including many international banking organizations, and the services sector, which will continue to grow propelled by, and in support of, the development of agriculture and industry.

32. Economic constraints continue to hamper the Sudan's ambitious development programme. Financing oil imports, which now cost \$500 million per annum, and servicing a \$2.5 billion external debt are expected to consume an estimated 80 per cent of its export earnings. Commodity shortages have been particularly severe in the southern region because of the disruption of normal supply lines from Mombasa and the sudden influx of refugees from Uganda.

IV. FOLLOW-UP OF PREVIOUS UNITED NATIONS
DROUGHT EMERGENCY MISSION

33. The response to last year's mission recommendations (A/35/561) was limited to food aid through the World Food Programme, which was approved on 30 December 1980 for 50,000 persons affected by drought in the Eastern Equatoria Province in Southern Sudan. The quantity of food allocated amounted to 2,417 metric tons of wheat flour, 210 metric tons of milk powder and 107 metric tons of vegetable oil at a cost of \$US 1,071,600. The distribution of emergency drought food was completed on 30 September 1981.

V. PRESENT SITUATION AND PROPOSED MEDIUM-TERM AND LONG-TERM
MEASURES TO MITIGATE EFFECTS OF DROUGHT

A. Planning

34. The Sudan has a relatively long tradition in planning. During the first Five-Year Plan 1970-1975, extended to June 1977, the economy grew at a rate of 4.5 per cent annually in real terms. A Perspective Plan 1977/78-1994-95 has proposed a rather ambitious objective of increasing the income per capita by 6 per cent annually, placing emphasis on the development of agriculture, especially by integrating the traditional agriculture into the modern sector, and stressing the need for a regionally balanced type of development.

35. Within the framework of the Perspective Plan, the main features of the Six-Year Plan (1977/78-1982/83) are the following:

- (a) Modernization of the traditional agricultural sector;
- (b) Self-sufficiency in selected food commodities;
- (c) Consolidation and expansion of basic infrastructure (power, transport, storage);
- (d) Emphasis on development of retarded areas;
- (e) Regional planning to reflect the potentialities and needs of every region and to bring about specialization and complementarity.

36. In spite of the importance attached by the Plan to the latter aspect of regional planning, it is only recently that a decentralization process has been initiated, with the setting up in each of the five regions of a Planning Committee, which is expected, in particular, to cater for the implementation of development projects. The region should manage its own investment budget and receive special responsibility for the co-ordination of rural development programmes.

37. Pending the effective functioning of that scheme, planning activities are carried out by the Ministry of National Planning in Khartoum. The Ministry is

assisted by a team of six advisers (under UNDP/IBRD project SUD/80/016), who deal with each of the main sectors of the economy. Planning Units exist in every technical Ministry. The Plan is executed through intersectoral programmes under the supervision of Interministerial Committees, which are set up on an ad hoc basis.

38. No official document refers to the problem of drought as such and the Government's presentation to the United Nations Conference on the Least Developed Countries 1/ in Paris does not mention it. The appropriate machinery does exist to cope with the problem, but no policy has been defined so far by the Government. The mission had an opportunity to discuss with Sudanese officials alternative approaches, keeping in mind that: (a) the Sudan has the potential for producing food for everyone in the country; (b) drought is a "local" phenomenon which may strike many parts of the country, but never the whole country at the same time.

39. Two options seem to be open: to provide self-sufficiency in food at the regional level (rural development approach); or to foster national complementarity, shifting food from the surplus to the shortage areas. The two approaches are not necessarily mutually exclusive, the problem being rather to decide on the proper mix, taking into account the advantages and drawbacks of each one of the formulae. Advantages and disadvantages should be carefully looked into, with due attention paid to the physical constraints of development in some marginal areas, and to the medium-term and long-term consequences of each approach. Admittedly, both will rely on some improvement of the human resources, and the latter will depend heavily on transport facilities which do not yet exist.

40. The mission wishes to suggest that the Government should take the appropriate steps to study as soon as possible the best strategy to cope with drought. The mission trusts that, if necessary, the international community, more precisely the United Nations system, could provide the additional technical expertise which might be required.

B. Food

41. Cereals provide the starch base of all diets in the Sudan. In some parts of the Southern Region, mainly Equatoria Province, cassava and yams are of considerable importance for this purpose.

(a) Dura (sorghum) is the staple food of the vast majority of the population. It occupies around 6 million acres, mostly under rain-fed cultivation. The yields fluctuate sharply, depending on the amount and distribution of rainfall, and the total harvest for 1979-1980 was estimated at 2.2 million tons. Dura is the subject of an active trade from surplus to some deficit areas, and of exports, covering a marketable surplus estimated at about 20 per cent of the production in

1/ For the report of the Conference, see A/CONF.10⁴, 22 and Add.

in normal years. The exports of dura, mainly to countries across the Red Sea, are estimated at around 286,000 tons in 1980. It must be noted that some quantities of dura, unofficially marketed within the border trade with Ethiopia and Chad, remain unrecorded.

(b) Production of millet is mostly concentrated in the savannah belt of the north-western part of the country. The production is estimated at around 400,000 tons and is the subject of a less extensive and more localized trade. Export of millet probably does not exceed 10,000 tons.

(c) Wheat has been traditionally cultivated on the banks of the Nile River in the Northern Province. Recent trends of income and cultivation patterns have increased the demand for wheat. Most of the production is now concentrated in the Gezira and New Halfa irrigation schemes and channelled through the flour mills in Gezira Province and Khartoum. The production is estimated at around 266,000 tons, while the local consumption is most likely substantially higher requiring imports amounting to close to 300,000 tons in 1980.

Grain reserve

42. One of the preliminary recommendations of the FAO Food Security Mission, which visited the Sudan in early 1981, was that a strategic grain reserve, composed of dura, should be built up over the next five years to a target of 105,000 tons. This would, by 1984/85, represent one month of marketed consumption.

43. The mission further recommended that the target should be reached in practice through the application of two criteria:

(a) The estimation of emergency requirements, particularly in the known deficit regions;

(b) The analysis of the best strategically placed locations, having access to transportation facilities which could permit the movement of stocks to other areas, including the market dependent populations in major urban areas.

This would be a beginning, although not yet likely to meet the needs of those in remoter rural areas, unless linked to self-help type schemes.

44. Following the application of the above-mentioned criteria, the mission recommended that the strategic reserve should be sited as follows: Kosti 65,000 tons, and Juba 40,000 tons. Warehouses should be constructed at two proposed places, suitably designed for long-term storage.

45. The main difficulties being encountered in WFP-assisted projects relate to the internal transportation and distribution of food commodities to the final beneficiaries. Both the railways and the road networks are insufficient to cover the needs of the country and, particularly, of the remote areas. As a consequence, food commodities delivered by WFP could not be transported on time, and on some occasions, considerable amounts of WFP food were piling up in Port Sudan owing to

an inadequate number of available rail wagons, especially to western provinces. Despite repeated efforts, the Sudan railways could not keep pace with the volume of food requested by the Government for WFP-assisted projects.

46. As part of a special effort for the least developed countries, WFP is contributing up to 50 per cent of internal transportation costs of its food in the Sudan, which means an annual average WFP payment of about half a million United States dollars.

47. A new project, related to desertification control, is currently being formulated by the Government with the help of UNSO. It deals with the replanting of the gum belt. The main objective of this project is to supply food aid as an incentive.

C. Agriculture and livestock

48. The Sudan is essentially an agricultural country with 80 per cent of the population in the rural areas, and agriculture contributing 95 per cent of the foreign exchange earnings. While irrigation plays an important and expanding role, the mainstay of the agriculture sector is rain-fed agriculture and, as such, is subject to the effects of drought over large areas of the country.

49. In the dry areas, nomadic pastoralism is the traditional way of life. Under balanced conditions, it is the most effective way of using the potential of the grasslands. In fact, the recent Rangelands Mission of the United Nations Sudano-Sahelian Office (UNSO) found that the major cause of desertification was the spread of dry farming cultivation into the low rainfall areas, which has resulted from pressure of increasing population, together with the success of dryland farming in those marginal areas in the years of better rainfall in the 1960s.

50. The traditional symbiosis between pastoralists and farmers, most of whom also kept some livestock in the dry areas, is now threatened by the increase, not only in human, but also in animal population. The situation would look ominous were it not that the Sudan is still, even now, relatively lightly populated in relation to its area and, taking the country as a whole, it was estimated by an FAO Programming Mission in October 1980, that the potential area suitable for rain-fed farming, under good management, was between three and six times the present cultivated areas for the main rain-fed crops of sorghum, millet, sesame and groundnuts.

51. This is not to say that there are not very serious drought problems in the Sudan, but they are due not to drought alone, but to the fact that the recent droughts have struck the country at a time of great vulnerability. The harmful effects of drought vary greatly from area to area, but are basically a result of a number of factors mentioned earlier. Given these conditions, long-term planning to meet drought emergencies - which may last for a number of years in succession -

is vital, together with co-ordination of all programmes and projects in this field. That co-ordination is particularly needed between the centre and the regions, and among the regions themselves, as well as between research and development, and between different ministries and departments at the centre. The mission was encouraged to learn that the Government intends to set up a co-ordinating mechanism (see para. 22 above).

1. Rain-fed crop agriculture

52. Yields of rain-fed crops have declined dramatically over the past 10 years. This has been due to a number of factors other than drought: for example, previous expansion into areas that were too dry and poor management. The expansion of large-scale mechanization in the past 15 years was hailed as the key to successful dry-farming agriculture. But the ecosystem of these dry areas is delicate and, without prolonged fallow, it does not maintain its fertility. The result is soil degradation. There is no doubt that vast areas of the Sudan are highly suitable for mechanized agriculture; but good management on long-term conservation principles is needed if the effects of drought are not to become disastrous.

53. In the areas of traditional small-holder farming in the west, the long-term need for conserving the land potential is critical. Farming pressure on the land must be reduced and extremely dry areas left to seasonal grazing only. This poses problems of resettlement of the people there. They are indeed already accustomed to the need to migrate in hard times, but Government guidance will be needed to assist effective resettlement in higher rainfall areas further south, and to minimize the risk of social tensions.

54. Drought in the late 1960s and early 1970s struck the gum arabic belt particularly hard, with trees dying in some areas and production falling to less than half. The Government is active in restoring and replanting the gum arabic area, with assistance from the Netherlands, UNSO and the World Bank.

55. Research related to drought problems is being undertaken by several institutes, and it is clearly a primary need in all drought-related problems. While useful results are being obtained, for example, from the project on sorghum and millet assisted by the UNDP and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), there is need for an over-all review of the value and applicability of much of the current research efforts. Co-operation and exchange of information with neighbouring countries, for example, on the ICRISAT-supported project in Kenya, may be helpful. The mission detected a certain frustration among technical agricultural staff in some of the regions of the Sudan from the fact that the centrally directed national research effort was not related closely enough with their perceived needs. This could profitably be one of the areas for improved co-ordination. Research should also include the use of trees, to provide fuel, fodder and timber as part of the rehabilitation of dry areas. This can be combined with the trial of improved farming practices to conserve soil moisture and cropping patterns to ensure that resilient crops are also included. The value

of "famine" crops in drought-prone areas was repeatedly brought to the attention of the mission. The African Development Bank has recently approved a loan of \$US 14 million to continue and expand the Seed Multiplication and Certification Programme established by the Government in conjunction with UNDP/FAO.

56. Closely related to research should be the extension service, if the results of research are to be applied in the field. The mission was told very frankly by Government officials that the extension service barely exists. The problems are formidable with the great distances and difficulties of transportation. It was agreed by all those with whom this question was discussed, however, that mobility is a first requisite. Other problems relate to the low prestige of an extension post in a remote area and the disinclination of trained staff to go to such hardship posts. These are human problems that the Government is well aware of and intends to tackle.

57. The spread of co-operatives is a most encouraging feature of Government activity. Co-operatives and extension clearly should have close links, and it may be here that some form of solution to the extension problem may be found. The World Bank and USAID are providing useful support in this area that will have a direct value in mitigating the effects of drought.

58. The improvement of water supplies is another drought-related activity. Great efforts are being made by the Government, assisted by UNICEF, to rehabilitate old excavated ponds and to provide water for domestic and livestock use from boreholes. The possibility of using water stored in the sandy bed of seasonal rains merits investigation, possibly in co-operation with similar projects in neighbouring countries such as Kenya and Somalia.

59. The need for alternative sources of energy that did not require imported machinery and fuel was mentioned on several occasions. Animal implements have not yet been widely accepted but would offer great advantages if the initial reluctance could be overcome. The use of wind energy and, in due time, of solar energy for pumping, requires more research, but could be introduced slowly on a trial basis.

60. The need to minimize reliance on external aid, or supplies requiring foreign currency, was a constant theme for discussion. It was felt by many officials with whom the mission talked that the need for food aid in times of drought could be greatly reduced by storage of local surpluses in times of plenty, and of the distribution of such reserves to the drought-prone areas. There is no doubt that greatly improved facilities to minimize losses can be established at all levels - farm, village, district, province and region. The Norwegian Church Aid Programme in the Southern Region is assisting in this regard, and co-operation with FAO programmes for the prevention of food losses and for food security is expected. This also needs to be considered in the framework of a national food security policy, on which assistance from FAO may also be sought. The application of the FAO Global Early Warning System for Food and Agriculture, and a proposed FAO/WMO assistance in agrometeorology, are also under discussion.

61. International co-operation will also be most valuable in the fields of disease and insect control, both for livestock and crops. Assistance will also be needed to control the watermelon bug in North Kordafan. This is directly a drought-related programme, as the watermelon stores as much as 600 cubic metres of water per hectare and provides food and moisture for people and livestock for several months in the dry season, while the dried seeds provide a valuable support crop.

2. Livestock and rangeland

62. Half of the Sudan's population receives the major share of its income from livestock, which is almost exclusively raised and kept in the traditional manner of nomadic transhumance. Animals are kept in order to feed the owner and his family, as an expression of wealth, and also as a source of cash and financial security. Precise figures of the actual animal population are difficult to obtain, but estimates made by the Ministry of Agriculture, Food and Natural Resources, as well as the results of an aerial survey in the late 1970s, indicate a rapid increase of livestock since 1969. The animal increase for cattle over eight years amounts to 2.7 per cent, making a total of nearly 16 million head in 1977. Sheep increased to over 15 million in the same period, with average annual increases of 4.7 per cent. The number of goats grew to 11.6 million at an annual growth rate of 4.6 per cent. Only the number of camels grew at a slower pace to a total of 2.8 million in 1977. The growth of the national livestock herd appears to have continued steadily despite the severe drought period of the early 1970s and has reached a total of approximately 44 million head. The increase in livestock number seems to have surpassed considerably the average annual population growth, thus giving reason to believe that animals may be kept increasingly for purposes of prestige.

63. The shrinking annual rainfall over the past years in the main grazing areas of the north-west and north-east, together with a constant increase of animal numbers, has had a detrimental effect on pasture conditions. Reduced amounts of fodder and severe water shortages have forced the nomadic herdsmen to migrate earlier and further to the south in the dry season, interfering more frequently, and sometimes violently, with crop farming of small holders who, in turn, had moved northward in search of additional arable land. The central and northern belt of rangeland receiving limited amounts of rain, totalling between 200 and 400 mm, is as an ecological zone highly susceptible and sensitive to overgrazing as well as to rain-fed cultivation. Vegetation, especially around waterpoints, tends to disappear when animals and crop farmers converge, leaving desertified spots all over the country.

64. The situation of over-stocking is aggravated by the fact that the extension service for livestock is practically non-existent, except for a few animal health or veterinary assistants. The relatively successful disease control campaign over the past 20 years had, of course, helped to multiply the livestock numbers. To balance this development, unfortunately, no comprehensive programme of nomadic education in animal husbandry, nutrition and livestock economies, combined with marketing and alternative safe investment opportunities yet exists in the country.

3. Recommendations

65. The mission noted that some of the recommendations of the United Nations Emergency Drought Mission in September 1980 were of a medium-term nature; many had not been fulfilled and were still valid.
66. The mission recommends a detailed study of the productive capacity of the various ecosystem lands and the formulation of a policy of rangeland and dryland farming control and development that will both provide a stable long-term eco-balance and be acceptable to the land-users themselves. In this connexion, the mission was encouraged by and endorsed the policy of the Desert Encroachment Control and Rehabilitation Programme (1976) that "the land user will become the backbone of the programme because its success depends upon his participation".
67. The mission noted the many activities of Government already in hand in the dryland areas, including the Western Savannah Development Project assisted by Saudi Arabia, Abu Dhabi, the United Kingdom of Great Britain and Northern Ireland and the World Bank; the Livestock and Meat Corporation Project in Darfur and Kordofan, assisted by the United Kingdom and the World Bank; assistance from the United States of America in co-operative development; assistance from the Federal Republic of Germany in the Nuba Mountains; assistance from the European Economic Community and the United States in the restocking of the gum arabic belt; and assistance from the United States, the Swedish International Development Agency and the World Bank to research related to the dry areas. The mission also noted that inadequate planning and co-ordination can lead to a waste of resources. The mission therefore recommends that the dryland development and control policy discussed in the last recommendation should be followed by the formulation of an over-all framework plan into which all present and future projects would fit. This could be one of the first tasks of the multidisciplinary drought co-ordinating unit which, the mission was informed, is to be established in the Ministry of National Planning.
68. In addition to and within the scope of the over-all planning and co-ordination already discussed, there is a clear need for a careful re-evaluation of the country's research effort in agriculture and other drought related fields. The recent decentralization of responsibilities to the regions, which will put a heavy strain on the insufficient resources of trained manpower available, makes it imperative that research should be clearly related to the priority needs as perceived by the regional Governments.
69. Regarding specific projects, the mission recommends that the efforts by Government to reduce the great loss each year of grazing owing to fires should be reinforced; that fodder reserves should be established by the fencing of certain areas and the bailing of hay; and that stock routes should be established, with adequate water and forage, to enable the migration of people and livestock to proceed without destruction of crops and consequent conflict between different tribal groups. The project to protect the watermelon crop in Darhun from pests is also highly recommended and, provided some modest external assistance could be made available, falls well within the scope of the idea of self-help.

70. The desperate need for effective extension services was noted by the mission. The difficulties in such a huge and diverse country are great, but high priority must be given to overcoming the problem and establishing effective links between government policy based on research and practical application in the field.

71. The mission was encouraged by the growth of the co-operative movement and sees this as a tangible expression of the often heard determination to build on self-help.

72. Another area of potential improvement closely related to drought is through the establishment of a national food security policy, with storage, particularly in drought prone areas, at all levels - regional, provincial, district, village and farm. Assistance is already being given by FAO at the national level, and can also be given at the farmers' level in the form of advice on storage structure's and the prevention of food losses.

73. Many ideas with regard to livestock development already exist and people are aware of the problems, but lack of effective policies and legislative procedures make it difficult to implement projects and programmes. The activities suggested in the following paragraph, which could make the livestock sector less vulnerable to further droughts, do not appear in order of priority, but are indicative of the type of actions to be taken as a package in order to show maximum impact.

74. Establishment of exact livestock figures, herd movements and maximum herd size per nomadic family, will be important features of a future attempt to formulate and implement a coherent livestock policy. It would be useful to assess the subject of ownership of livestock in order to minimize hardships with possible herd reductions.

75. In addition to veterinary extension programmes, it would be very important to assist the nomads with animal nutrition, training in livestock economies, processing of animal products, such as cheese-making, tanning, soap production, etc., marketing and diversification of livestock production. Most important will be the creation of awareness that their natural environment and basis of existence - the rangeland - is a most vulnerable asset (see earlier sections of the present report). The schemes mentioned below could be framed in a carefully considered policy and strategy of long-term livestock development:

(a) Indicative plan of movements of livestock established by the proposed drought monitoring unit;

(b) Development of stock routes with sufficient water points and storage of fodder reserves;

(c) Reseeding programme for pasture land coupled with creation of grazing reserves;

(d) Strategic fencing of crisis fodder reserve areas and expansion of firebreak lines;

(e) Large seeding and planting programme of *prosopis chilensis* or tamarugo and *acacia senegalensis* in areas of lowest rainfall and advanced degree of desertification providing soil stabilization, water retention and animal fodder with its nutritional pods;

(f) Arrangement of fodder production and baling of roughage in rain-fed and irrigated agriculture for emergency conditions and alternative feeding and fattening programmes;

(g) Building and expansion of strategic slaughter facilities;

(h) Improvement of marketing channels.

D. Water resources

76. The persistent and prolonged periods of slow precipitation had a marked effect on the availability of water, and many water points, such as dug wells and natural ponds, dried up, giving rise to great suffering among the rural communities.

1. Present activities

77. One major project, the Water Resources Relief Programme, started by the Government, has the following objectives: (a) to spread the water yards along the stock routes; (b) to reduce the density of livestock per water yard; (c) to explore new grazing lands; (d) to reduce the southern migration of nomads from the northern districts.

78. Present international support is given by UNICEF, FAO, WHO, WFP, as well as by the World Bank, Arab funding institutions and a few bilateral technical assistance programmes with foreign Governments. In Eastern Equatoria, the Norwegian Church Aid is undertaking a borehole drilling programme. Most of these inputs are directed towards tackling the immediate effect of the drought through the provision of water and food for settled communities.

2. Long-term and medium-term plans

79. The main supply systems which provide water for the human and animal populations in rural areas are:

(a) Water yards, or deep bore wells, fitted with diesel-engine pumps and large overhead storage tanks;

(b) Hafirs or excavated reservoirs which collect surface water during the rains. These water sources proved to be useful especially in areas with hard crystalline non-water-bearing strata;

(c) Open dug wells are traditionally known sources of water for small village communities, and along routes traversed by nomads in Kardofan and Darfar. Water is usually extracted by bucket and rope, but hand-pumps are sometimes installed;

(d) Exposed seasonal water sources. Natural depression and seasonal water courses provide water during the short rainy season.

80. The medium-term plans prepared by the Government are mainly directed towards two objectives:

(a) The rehabilitation of the existing but defunct water points;

(b) Creation of new water yards, which would entail the drilling and digging of additional bore holes and open wells, and the installation of the necessary water-extracting system, storage tanks and distribution facilities. Such water

yards are meant for the provision of large quantities of water for village communities and gathering points along the routes of nomads. Such a project has been started by the National Water Administration and UNICEF in southern Kardofan.

81. Seasonal water courses are numerous in southern Darfar and southern Kardofan and very few are being utilized. The plan is to make use of such dry valleys through: (a) construction of earth dams for water storage; (b) water spreading for increased natural recharge and infiltration to the water table. Shallow dug wells would be suitable means of water provision from such areas. These water sources would support limited cultivation schemes.

82. Programmes of water storage, which have already been started, aim at the provision of water through artificial underground storage and rain harvesting. As water percolation does not allow full utilization of potential pastures in such areas, the programmes intend to stop water seepage from depressions by terracing and binding the bottom of each depression with suitable material. This programme is in the experimental stage which, if successful, would require additional international assistance at the subsequent implementation stage. Such water-harvesting schemes, if they were successful, could have a real impact on the over-all situation of the pastoral areas of the Kardofan and Darfar.

E. Transport

83. The transport network assumes special importance in a country like the Sudan in view of its large size, its pattern of population distribution and the localization of supply and demand points. In its current development plan, the Government emphasizes that the transport system has to satisfy two requirements: (a) to link the regions to the Khartoum area; (b) to allow for transport to the seaports and for the continued participation of the country in international trade.

84. Over the last decade, the transport system has undergone considerable change, with a major shift from rail and river to road transport.

85. The railway (4,760 km single-track, narrow-gauge), offers the most economical mode of transport and serves the key centres in the north, the east and the west of the country. Its performance, however, leaves much to be desired and the operations of the State-owned Sudan Railway Corporation are hampered by lack of spare parts, insufficient rolling stock and poor management. The Corporation has not adjusted to the competition of other modes of transport and remains more an administrative body than a commercially oriented organization.

86. The Nile River, because of the rapids and navigation problems, is traversed only between Karima and Dongola (290 km) in the north and between Juda and Kosti (1,400 km) in the south. The parastatal River Transport Corporation operates some 20 barges for freight and passenger services. The river transport is very slow and its great potential has still to be realized.

87. Since 1970, the road system has been steadily developed, but remains sparse. Out of 10,000 km of roads, 1,500 are asphalted (essentially in the Khartoum/Port Sudan area) and the rest are gravel roads and earth tracks, which are mostly impassable during the rainy season. The total of licensed vehicles in 1979 amounted to 137,000, including some 43,000 buses and lorries. The fleet is relatively efficiently operated by the private sector. Actually, trucks can reach every place in the country, however remote, but at a prohibitive cost.

88. At present, transport remains a severe bottle-neck to development with the insufficient freight capacity resulting in long delays and increased costs. Several programmes are under way for the improvement of the existing infrastructure, but this is admittedly a long-term effort requiring a fair amount of investment.

89. A UNDP United Nations project assists the Ministry of Transport in a better planning of the railway operations. The Sudan Railway Corporation and the Arab Fund are financing a project to rehabilitate the railroad and increase its capacity by the improvement of workshop facilities, training, the import of new locomotives and doubling the track between Port Sudan and Haya. In addition, WFP assists the so-called "Crash Rehabilitation Programme" of the Corporation by providing food to some 12,500 workers (Project SUD 2509). Norway finances the acquisition of new barges for the River Transport Corporation.

90. New roads are under construction, with the help of various Arab States, funds and the World Bank, particularly in the central part of the country (White Nile region) and in the west. Kosti is expected to become the major transport centre, where the navigable section of the Nile from Juba meets the railroad from Port Sudan and, in time, will meet the asphalted road from Khartoum. The oil refinery, to be completed in Kosti by 1986, will reduce the price of fuel in the west and the south, improve the load-capacity of the lorries and result in a decline in the distribution costs by road.

91. The drought-stricken areas are unevenly served by the national transport system. The railway links Port Sudan to Nyala in Darfur Province, (2,419 km) and the section Babanouna/Nyala (415 km) will be entirely reconstructed. A road is under construction between Nyala and El Fasher. Kordofan is relatively well served by rail and by road. The south is linked to Kosti by the Nile River, to Wan (end of the railroad from Port Sudan, 2,460 km) by the Juba-Wan gravel road, and receives part of its supply from the port of Mombasa by lorries, through Kenya or Uganda, at very high prices.

92. The implementation of the various projects mentioned in the different chapters of the present report and focusing on rural development of the areas stricken by drought depends to a large extent on the establishment and proper maintenance of a system of feeder-roads for moving goods and people from the villages to the main transport line (river, main road or railway). The condition of the existing feeder-roads is often deplorable, resulting in exorbitant transportation costs. Feeder-roads fall now within the responsibility of the six regional Governments, which should formulate master plans for the feeder-roads network in their regions and establish priorities. Funds would be made available from their own financial resources, based on local taxes and supplemented, as appropriate, by the central budget in order to maintain a fair distribution of funds among the regions.

93. The mission recommends that assistance be provided to the drought-stricken regions to assist them (a) through technical advisers, to formulate their master plan for feeder-roads; (b) through projects, such as "Maintenance of essential roads in the south", financed by UNDP, to create the nucleus of a road-improvement and maintenance organization, with road equipment, a spare parts store, repair workshops and training facilities; and (c) through WFP "Food for work" projects to promote labour-intensive maintenance techniques and participation of the local population.

F. Meteorology and operational hydrology

1. Nature of the problems

94. An analysis of the rainfall data over the last 11 years clearly shows a general decline of the mean annual rainfalls as compared to the climatological normals calculated for the period 1941-1970. This decline has been more pronounced in the provinces of southern Darfur and southern Kordofan, as well as in the region of Khartoum. In fact, all provinces have been stricken by drought spells of one to three years' duration, but at no time has the country in its totality been affected by drought.

95. At the time of the mission, the rainy season was not over and, from the data available at the Meteorological Department, it could be seen that some regions had received more rain than in normal years, while others had recorded serious rain deficits. In general, it seems that the rainy season had started with a delay of some 15 days with a slight deficit up to the month of June, while the July rains had been very good.

96. The mission had no time to study the distribution of the rainfall over the cropping season. Such an analysis would certainly show a worse situation than that described above, as it is well known that a lack of water at certain crucial moments of the plant growth can create serious damage to the crop, even if the total amount of rain for that year appears to be adequate.

2. Present situation

97. The climatological section of the Meteorological Department issues rainfall data every five days during the rainy season for 20 stations, which communicate with the headquarters through radio or telephone links. Every 10 days these data are also transmitted to the FAO Global Information and Early Warning System on Food and Agriculture. The data from the other 1,000 rainfall stations in the Sudan are sent by mail and published in a monthly agrometeorological bulletin. A large amount of meteorological data exists in the Meteorological Department, but the data have been published in a format which is not suitable for further analysis and investigation. The lack of processing facilities is severely felt.

98. The mission learned that the Meteorological Department had not been consulted in the preparation of two projects submitted to UNDP for funding and for which the meteorological data would be an important input. These two projects are the Drought and Natural Crisis Monitoring Unit and the National Desertification Control, Co-ordinating and Monitoring Unit.

99. In operational hydrology, discharge and water-level measurements are made on the White and Blue Nile, as well as on their tributaries, by the Directorate for Nile Water under the Ministry of Irrigation. Hydrological yearbooks are published and special investigations are carried out in connexion with irrigation projects. In the western provinces, hydrological investigations are carried out by the Ministry of Agriculture in connexion with agricultural development schemes. No use has yet been made of the mathematical model prepared under the UNDP/WMO project "Hydrometeorological Survey of the Lakes Victoria, Kioga and Mobutu Sese Sebo" for the rational utilization of the White Nile water.

3. Regional aspects

100. In the field of operational hydrology, there is strong regional co-operation with Kenya, the United Republic of Tanzania, Uganda and Egypt, and it seems that this co-operation will be further strengthened with the creation of the Nile Waters Commission, which was under discussion in Cairo at the time of the mission. In meteorology, with the exception of some arrangements with Egypt for the training of meteorological technicians, there seems to be very little or no co-operation with neighbouring countries. The Meteorological Department was informed of the intentions of the World Meteorological Organization to strengthen the Meteorological Institute for research and training in Nairobi, particularly in the field of agrometeorological technicians' training.

101. In this context, reference was made to the interagency meeting for the preparation of the UNDP 1982-1986 regional programme for Africa (Addis Ababa, April 1981), where several projects in support of the drought-stricken countries in eastern and southern Africa were retained in the priority list of WMO proposals. Discussions are currently taking place with UNDP concerning the availability of funds for some, or all, of the projects proposed.

4. Recommendations

102. To permit a systematic and continuous study of drought occurrences, severity and frequency in the Sudan, the following measures should be taken:

(a) The number of rainfall stations reporting in real time to headquarters through the provision of radio equipment should be increased;

(b) The processing of agrometeorological bulletins should be done more quickly;

(c) A meteorological data bank equipped with data-processing facilities should be established;

(d) Permanent liaison between the Meteorological Department and Ministries of Agriculture and Irrigation should be established;

(e) A programme for research and investigations in applied meteorology should be established;

(f) Meteorological data and expertise available in the Meteorological Department should be utilized in any national project for drought monitoring or desertification control;

(g) Regional training facilities in Nairobi should be utilized for the training of meteorologists of all grades;

(h) Participation should be organized in the proposed UNDP/WMO project "Assistance to the drought stricken countries in eastern and southern Africa in the fields of meteorology and hydrology".

G. Drought and desertification

103. The principal areas subject to drought are north Kordofan and north Darfur provinces and portions of the six provinces of the southern region. In north Kordofan and north Darfur, which are semi-arid in climate and are within the 200-500 isohyet range, the problems of drought are exacerbated by the susceptibility of the land to the processes of desertification, which has already caused significant damage.

104. The Government is alert to the dangers of desertification and included a number of desertification control projects in its recent presentation at the United Nations Conference on the Least Developed Countries.

105. The Government also initiated a number of antidesertification measures, including a major project financed by the Netherlands through the United Nations Sudano-Sahelian office, for the replanting of the Acacia Senegal tree in north Kordofan province. The tree, which grows well in a semi-arid climate, will inhibit desertification and also provide a cash crop for the farmer, fuelwood, forage and a source of foreign exchange earnings. The Government has also identified a number of other desertification control projects for north Kordofan and north Darfur provinces, including a project for the management of grazing resources around permanent water supplies, which is being financed by the Government of Sweden. Additional desertification control projects, which have been identified, but require financing are the following: fire-line construction; integrated-village development; rehabilitation of severely degraded rangelands; feasibility study for the application of water-harvesting techniques in the San el Ma'am Basin; and a public education campaign in desertification control. The mission is of the firm conviction that the implementation of those projects (and other desertification-

control project proposals which time did not permit the mission to consider in detail), would also strengthen the ability of the Government to cope with the adverse effects of drought. Such projects warrant the support of the international community.

106. As regards the southern region, the mission noted that desertification was not a consequence of drought. Nevertheless, sufficient evidence was observed, and mentioned by local officials, of desertification owing to overgrazing as to warrant some concern. It is much more difficult and costly to rehabilitate land which has been desertified than to prevent its degradation. The mission urges that the national and regional Governments take special measures to control grazing in the affected areas.

107. The mission believes that, although the anti-desertification activities of the Government are useful, considerable further benefits could be derived by the formulation of a national policy on desertification control. This would serve to provide a comprehensive strategy for anti-desertification efforts and to focus attention thereon.

108. Policies on drought mitigation and desertification control should be closely integrated and their implementation well co-ordinated at both the national and regional levels. The need was felt for improved co-ordination on matters related to both drought and desertification.

H. Health

Current situation

109. The enormous physical obstacles in the Sudan, coupled with its poor infrastructure, vast distances and harsh climatic conditions, produce extremely serious problems for the Government's determined efforts to improve conditions of health. Periods of drought simply aggravate and overstress the already precarious situation.

110. Statistics for the Sudan, and health statistics in particular, are difficult to obtain, and even where information was available, it was not always accurate.

111. It is the view of the mission, however, that priority needs in the drought-affected areas are similar to those in other remote rural areas. Delivery of basic social services, such as immunization, safe water, and latrine facilities, is extremely limited.

112. Sudden migration caused by drought has adverse effects on health. Movement of population towards rivers infested by the vector of onchocerciasis increases the risks of blindness. Shifts, temporary or permanent, from rural areas to urban centres only overburden the already fragile health infrastructure and produce sharp deterioration of sanitary conditions. In several cities in the Sudan, water becomes periodically unavailable or is unsuitable for human consumption. Gastroenteritis, dysentery and skin and eye diseases, such as trachoma, are rampant.

113. Malnutrition is also an additional major factor, because it influences the high mortality rate of many other diseases.

114. The "cold chain" necessary to maintain suitable vaccines is extremely difficult to establish, since temperatures are constantly high, transport is not always reliable, and refrigeration is erratic, even in towns.

115. It is the aim of the Government to upgrade the population's deficient health status through an effective network of health care services. The medium-term objective is the implementation at the base of the network of one Primary Health Care Unit (PHCU) for 4,000 people. Considering nomads as the population mostly affected by drought, the Health Department wants to focus attention on their specific problems. When the nomadic community health workers receive training with the settled health workers, many of them are apt to stay in urban areas where they were trained, rather than go back to their communities. Therefore, separate training centres and dispensaries should be established urgently in areas where nomadic communities meet.

116. Lack of supervision is one of the main problems facing the Primary Health Care Programme and this is mostly owing to lack of transportation.

VI. REGIONAL CO-OPERATION - THE VIEW OF THE GOVERNMENT

117. The Government regards favourably the idea of regional co-operation, referred to in General Assembly resolution 35/90, and is already co-operating with various neighbour Governments through bilateral and tripartite commissions for specific purposes. An expansion of co-operation on a wider multilateral basis could be helpful, in the Government's view, in addressing problems of drought and other natural disasters and in dealing with the problems of medium-term and long-term recovery and rehabilitation.

118. The Government would like to see an organization established for this purpose, with its seat in Khartoum. The body should tackle practical problems of the kind referred to above and, specifically, should try to formulate, inter alia, some regional policies and programmes to deal with drought, as well as to provide intercountry co-ordination in such programmes.

119. This section summarizes the Government's views on regional co-operation. Elsewhere in the report are comments by the mission on problems which might usefully be the subject of common action.

APPENDIX

Participants in the multiagency drought mission to the Sudan

(17-24 October 1981)

Mr. John Saunders	Assistant Secretary-General and Head of Mission
Mr. F. W. Mumm von Mallinckrodt	United Nations Development Programme and Rapporteur
Mr. Leonard Maynard	United Nations Sudano-Sahelian Office and United Nations Environment Programme
Mr. A. Saleh	Food and Agriculture Organization representative in the Sudan
Mr. T. Essayem	World Food Programme Deputy Representative in the Sudan
Mr. Harry Underhill	Food and Agriculture Organization
Mr. Marc DeBruycker	World Health Organization
Mr. Claude Joffroy	United Nations Department of Technical Co-operation for Development
Mr. B. Legarde	World Meteorological Organization
Mr. Abdalla H. Ishag	United Nations Educational, Scientific and Cultural Organization
Mr. Dunstan Njau	Economic Commission for Africa
Mr. B. M'Boya	United Nations Children's Fund, Sudan
