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PREPARATIONS AT THE REGIONAL LEVEL

Reports of regional preparatory meetings

Addendum

Report submitted by the Economic Commission for Africa*

* Report has been reproduced as received.

PART I - INTRODUCTION

Opening of the Meeting (item 1)

1. The Regional Preparatory Meeting on New and Renewable Sources of Energy, organized under the auspices of the United Nations Economic Commission for Africa, was held at Addis Ababa, Ethiopia, from 12 to 16 January 1981.
2. The Meeting was opened on 12 January 1981 by a representative of the Executive Secretary of ECA. After welcoming participants, he pointed out that the Meeting was of prime importance for many African States because it dealt with a fundamental issue for the survival of the region, namely the formulation of measures, in the context of preparatory work for the United Nations Conference on New and Renewable Sources of Energy to be held at Nairobi in August 1981, for concerted action to promote the development and use of such sources in order to help to meet the future over-all energy requirements of Africa as part of efforts aimed at accelerating the development of African countries.
3. He emphasized the disastrous situation of African States since independence and the pessimistic outlook for economic and social development. In the past ten years neither foreign trade nor aid, nor technical assistance nor loans had enabled a single African country to make a start in self-reliant and self-sustaining development and economic growth. The African region was now facing an economic crisis of horrifying dimensions. Recent studies conducted by ECA, the World Bank and other institutions had indicated that if the 1970s had been bad, the 1980s would be even worse. For example, food imports for 1980 alone were estimated about \$US 5.6 billion and oil imports of non-oil-exporting countries would reach 7.4 billion for the same year. By adding estimated debt payments to those figures, a total of 15 billion would be reached or 61 per cent of the year's exports. That situation could persist and continue to determinate during the 1980s in the absence of strong measures to reverse those trends.
4. He underscored the importance of the Lagos Plan of Action as a means of saving African countries from the long-term danger of economic disaster and their need for vast energy resources to implement the Plan.
5. Since supplies of fossil fuels were becoming more expensive and the demand for energy to meet all new needs in the various sectors of national economies exceeded the growth rate of the gross national product, it was clearly necessary to develop other energy sources, and in particular the new and renewable ones.
6. In that connexion he stressed the importance of the document dealing with the need for a strategy and a plan of action for the development and utilization of new and renewable sources of energy in Africa. From among the long list of practical proposals put forward in that document, he drew the attention of participants to the importance of seminars, workshops and study tours both for technologists and for policy makers and of conducting pilot experiments.

7. Similarly, since a large number of African countries has enormous geothermal resources he suggested that a multinational institute to develop the Rift Valley should be set up as a matter of priority.
8. In conclusion, offset one of the major weaknesses of the Plan of Action, he reminded participants to specify in their recommendations who should do what, when and how.
9. The representative of the General Secretariat of the Organization of African Unity then welcomed participants and thanked the Executive Secretary of ECA for having invited OAU to participate in that important meeting in the spirit of co-operation which governed their relations.
10. After referring to the negative value of externally oriented global development strategies for Africa and the decision which the Heads of State and Governments had therefore taken to adopt a wide-ranging approach based on collective self-reliance, he stressed that with agriculture, transport and communications energy came among the primary factor that would generate collective self-reliance on the continent.
11. The development of energy would in fact help to intensify national development, modernize agriculture, speed up industrialization and improve people's living conditions. To that end, the Lagos Plan of Action set out measures which would solve Africa's energy problems. In particular it recommended that African Energy Commission should be created which would in particular define and implement a short-, medium- and long-term continental policy for new and renewable sources of energy. The OAU General Secretariat considers the establishment of the commission as a sectoral approach which was possible in the immediate future. He therefore called on participants at the meeting and put forward specific proposals to promote the prompt establishment of the African Energy Commission.
12. The Executive Secretary of the United Nations Conference on New and Renewable Sources of Energy apologized for his Secretary-General's absence and explained the importance of the African Regional Meeting in the preparatory work for the Nairobi Conference being carried out by the various regional commissions. He praised the African contribution to activities conducted at the world level by technical groups of experts, specialized groups of experts and the Intergovernmental Preparatory Committee of the United Nations Conference.
13. In his opinion, one of the major problems the meeting would encounter was the wide diversity of issues covered in the mandate given by the United Nations General Assembly. The 14 sources of energy identified ranged from those that were at the experimental stage, such as ocean energy, to the more traditional ones which needed little technological input and research and development, such as energy from draught animals and fuel wood.
14. However, if there was keen interest in those various sources of energy in both developed and developing countries, it was mainly because their development called for a new approach at a time when a global energy policy at the national level was being drawn up. The enhanced role played by draught animals in India, was cited as an example, as was peat, which could currently be exploited on the basis of co-operation and a sharing of experience.

15. He therefore underscored the concern of the secretariat of the United Nations Conference to step up international co-operation at the global level in various fields such as research and development, the transfer of technology, the dissemination of information, education, training and, naturally, financing. As a result, the plan of action drawn up by the present meeting should reflect a real political will to undertake future action in those fields.

16. At the national level, he noted that few African countries had prepared a national paper. Fortunately, the present meeting would permit participants to compare what was being done there and elsewhere through their documents and the reports provided by ECA and other delegations. Moreover, regional advisers would soon be sent to all States members of the Commission to step up preparations for the United Nations Conference.

17. After informing participants about the final preparations for the Nairobi Conference, he hoped that the Regional Meeting would adopt recommendations defining the measures African States would have to take to meet their development needs.

Election of officers (item 2)

18. The Meeting unanimously elected the representatives of Ethiopia, Kenya, Algeria and Benin as Chairman, First Vice-Chairman, Second Vice-Chairman and Rapporteur respectively.

19. A drafting committee was set up consisting of the representatives of the Sudan and Egypt (North Africa), Nigeria (West Africa), the United Republic of Cameroon (Central Africa) and Malawi (Eastern and Southern Africa).

20. The following ad hoc committees were also set up:

Hydropower and ocean energy: Algeria, Egypt, Ethiopia, Liberia, Guinea, Malawi, Nigeria, Rwanda and the United Republic of Cameroon.

Geothermal energy, peat, bituminous shales and tar sands: Algeria, Djibouti, Ethiopia and Kenya.

Biomass, fuelwood, charcoal: Burundi, Ethiopia, Kenya, the Sudan and the United Republic of Cameroon.

Solar energy, wind energy: Algeria, Egypt, the Ivory Coast, Liberia and Nigeria.

Draught power: Egypt, Ethiopia and the United Republic of Tanzania.

Meeting of those committees were open to all delegations.

Participants

21. Representatives of the following States members of ECA attended the meeting: Algeria, Angola, Benin, Burundi, Djibouti, Egypt, Equatorial Guinea, Ethiopia, Guinea, the Ivory Coast, Kenya, Liberia, Malawi, Nigeria, Rwanda, Senegal, the Sudan, the United Republic of Cameroon, the United Republic of Tanzania and Zaire.

22. The Executive Secretary of the United Nations Conference on New and Renewable Sources of Energy was present and the following specialized agencies were represented: International Labour Organisation (ILO), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO), and United Nations Food and Agriculture Organization (FAO).

23. The African Development Bank (ADB), Arab Bank for Economic Development in Africa (BADEA), West African Development Bank (BOAD), West African Economic Community (CEAO), Economic Community of the Great Lakes Countries (CEPGL), International Livestock Centre for Africa (ILCA), African Industrial Property Organization (OAPI), the Union of Producers, Conveyors and Distributors of Electric Energy in Africa (UPDEA) and the Energy Organization of the Great Lakes countries (EGL) were also represented.

Adoption of the agenda and organization of work (item 3)

24. The Meeting adopted the following agenda:

1. Opening of the Meeting
2. Election of officers
3. Adoption of the agenda and organization of work
4. Information on the state of progress of preparations for the United Nations Conference on New and Renewable Sources of Energy (Nairobi, August 1981)
5. Status, problems and prospects in the field of research, exploitation and co-operation for utilization of new and renewable sources of energy
6. Consideration of the document on hydropower
7. Consideration of the document on geothermal energy
8. Consideration of the document on biomass (including fuelwood and charcoal)
9. Consideration of the document on solar energy
10. Consideration of the synthesis document on new and renewable sources of energy in Africa
11. Elaboration of a plan of action for the development and utilization of new and renewable sources of energy including the definition of policies and priorities at national, subregional and/or regional levels
12. Definition of common policy for African countries within the framework of the United Nations Conference on New and Renewable Sources of Energy
13. Consideration and adoption of the recommendations of the Meeting
14. Other matters
15. Consideration and adoption of the report of the Meeting
16. Closure of the meeting

25. It was decided that, apart from the work of the ad hoc committees established to prepare the recommendations and of the Drafting Committee responsible for preparing the draft report of the meeting, all the agenda items would be considered in plenary.

PART II - CONSIDERATION OF AGENDA ITEMS

Information on the state of progress of preparations for the United Nations Conference on New and Renewable Sources of Energy, Nairobi, 10-21 August 1981 (item 4)

26. Under this agenda item, a member of the secretariat introduced document ECA/NRD/E/80/INF.9 on preparations for the United Nations Conference.

27. The document indicated that a Regional Seminar on Solar Energy had been held in Niamey from 8 to 13 January 1979, and three technical panels of experts on hydropower, geothermal energy and biomass (including fuelwood and charcoal) respectively had, in addition, been held in Addis Ababa from 20 to 25 October 1980 in preparation for the present meeting.

28. Regional advisers had been sent on mission to several States members of the Commission to inform the leading national officials concerned of the scope and aims of the Nairobi Conference, and to persuade Governments to establish liaison centres, to assess the state of preparations, to provide all necessary technical assistance in the preparation of country papers and to define the fields in which more technical assistance would be required over and above the preparations for the conference.

29. As a result, 29 national focal points had been established and five countries had requested additional assistance; in addition, most of the countries visited by the regional advisers had begun to prepare their country documents.

30. During the discussions, it was emphasized that there was a need to proceed rapidly with the establishment of the Regional Solar Energy Centre, which had been proposed at the Niamey Seminar and where constitution had been approved by the Conference of Ministers and was open for signature by States. Nine had already signed. Before convening the meeting to establish the Centre, ECA wanted to have considerably more signatories.

Status, problems and prospects in the field of research, exploration development, information and co-operation for utilization of new and renewable sources of energy in Africa (item 5)

31. Under this item, the representatives of some member countries and of international organizations made brief statements emphasizing their interest in the development and utilization of new and renewable energy resources.

32. The representative of CEAO introduced the project for the establishment, with the assistance of various funding institutions and in co-operation with CILSS, of a multinational solar energy centre, and appealed to all the other African agencies for a more concerted approach and for co-ordination of the work. The representative of BADEA said that his organization was ready to finance the integrated rural development projects which were in the pipeline or being implemented throughout the continent to develop new and renewable energy sources. The representative of OAPI informed participants that there was a documentation and information centre

on patents in OAPI. The representative of UPDEA recalled the various joint activities undertaken by its member electricity companies in West and Central Africa, with particular emphasis on the recent Symposium on Solar Energy and Public Electricity Supply in Africa, held at Dakar from 6 to 9 January 1981.

33. In general, the representatives of member States indicated what had been done in their respective countries, in the light of their known or assessed potential of new and renewable sources of energy, to improve the living conditions of people in rural areas.

34. The principal difficulties many African countries had to face included a lack of in-depth knowledge of national energy endowments, a shortage of qualified staff and the difficulties encountered in financing activities for the exploitation of energy resources.

Consideration of the document on hydropower (item 6)

35. The Chairman of the Technical Panel of Experts on Hydropower, which had met at Addis Ababa from 20 to 25 October 1980 introduced document E/CN.14/NRD/E/33/Rev.1.

36. The document dealt primarily with the role of hydropower stations in the economic development of African countries. In view of the constant increase in the price of fossil fuels, hydropower stations, while ensuring a steady supply of local energy, helped to reduce significantly outflows of foreign exchange which contributed to the development of other sectors of the economy. In addition to electricity generation, hydropower stations often performed other functions, such as irrigation leading to increased agricultural production, the regulation of waterways to improve their navigability and consequently transport networks, flood control, fish breeding, etc. They also contributed to the rapid training of national cadres at all levels in planning, construction and management techniques thus provided countries with the technologically trained manpower crucially needed in Africa.

37. At the conclusion of the ensuing discussion, the participants agreed that African countries should develop their hydropower potential because of its obvious strategic importance, in terms of progress toward national energy self-sufficiency, a significant increase in food supplies through large-scale irrigation, a long-term improvement in the balance of payments as costs would be much lower than the costs of oil products which would have to be imported if there were no hydropower stations.

38. Hydropower should be developed rapidly as each lost year meant that additional thermal production capacity had to be installed to meet the increased demand for electricity. Such new installations were almost a complete waste since new thermal stations, which were more costly to operate, would be put on standby when the new hydropower stations started to operate.

39. Finally participants underscored the interest of African countries in promoting subregional co-operation for the rational development of hydropower

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stations, since African rivers often served as boundaries or flowed through several countries. In evaluating any hydropower project, account should be taken of long-term water needs and ways of filling them. Consequently, it was essential to set up a comprehensive project for the river basin as a whole and in some cases it could even be helpful to consider the hydrographic needs of adjacent river basins.

40. Various papers given by participants indicated that, although the inventory of Africa's hydropower potential was still incomplete and imprecise, it represented more than one third of the world's technically exploitable hydroelectric potential. That potential was unevenly distributed as shown in the figures below. If Africa was divided into regions corresponding to the ECA Multinational Programming and Operational Centres (MULPOC), the Central African subregion would contain about 46 per cent of the potential, Southern Africa, 27 per cent, East Africa, 12 per cent, West Africa, 10 per cent and North Africa, 5 per cent. However that subregional distribution obscured a major difference in the hydroelectric potential of African countries and in their level of development. Moreover, although in some cases remarkable hydropower schemes had been carried out or were under study, the shortage of hydropower stations in Africa was regrettable.

41. In addition to the document of the Technical Panel of Experts, two background documents were distributed to participants for consideration under the present agenda item. The first analysed possibilities for co-operation in hydropower development in Africa (ECA/NRD/E/80/INF.10); the second was the Lagos Plan of Action for the Implementation of the Monrovia Strategy.

42. After considering the major obstacles to the utilization of hydropower in Africa and ways to overcome them, participants assigned to the ad hoc committee the task of analysing and amending the recommendations of the Technical Panel of Experts. The conclusions reached by the ad hoc committee were discussed and adopted in plenary session under item 13.

Consideration of the document on geothermal energy (item 7)

43. The Chairman of the Technical Panel on Geothermal Energy, which had met at Addis Ababa from 20 to 25 October 1980, introduced document E/CN.14/NRD/E/34/Rev.1.

44. The document described the geothermal activities undertaken by various African countries. It also studied the technological and economic problems of exploiting geothermal resources, and specifically difficulties related to drilling methods and the inadequacy or lack of infrastructure at drilling sites. Finally, attention was drawn to utilizations other than the generation of electricity such as the heating of buildings or pools, spa treatments, mineral extraction, water supply in arid regions, etc.

45. During the ensuing discussion, participants agreed that the capital investment required for geothermal power generation and operating costs were generally lower than for hydropower. Because of its various possible applications it might even become more economical. Participants considered obstacles to the development of geothermal resources in Africa, which consisted basically in a lack of information on its advantages and especially a shortage of funds and skilled manpower.

46. A background document dealing with the problems of the utilization of geothermal energy in the Rift Valley in East Africa (ECA/NRD/E/80/INF.12) was made available under the present agenda item.

47. The Meeting then requested the ad hoc committee to study the recommendations of the Technical Panel of Experts on Geothermal Energy taking into account the conclusions of the discussion and the background document distributed to participants. The results of the ad hoc committee's deliberations were submitted to the plenary session and amended under item 13.

Consideration of the document on biomass (including fuelwood and charcoal) (item 8)

48. A member of the ECA secretariat introduced the report of the Technical Panel of Experts on Biomass (including fuelwood and charcoal) which had met at Addis Ababa from 22 to 25 October 1980.

49. The document (E/CN.14/NRD/E/35) described the current status of the utilization of biomass in Africa. Fuelwood and charcoal were considered to be extremely important fuels since the majority of the urban and the rural populations depend on them to meet their energy needs. However, attention was increasingly accorded to the problem of deforestation which had become severe in some places because of the low efficiency of the methods used to produce and utilize fuelwood and charcoal. Reforestation programmes had been launched and attempts made to introduce new energy sources to try to check deforestation. Research and development on biogas production had also been undertaken in some countries.

50. During the discussion on the document, participants stressed the need to step up research work in order to improve the output of biomass conversion equipment and especially of the kilns traditionally used in Africa. One of the advantages of methane production from biomass was that it made use of animal and vegetable wastes. The main obstacles to the development of that technology lay in equipment costs, the absence of a manufacturing infrastructure and the problem of adapting procedures to local conditions.

51. Two background documents were distributed under item 8, one on charcoal (ECA/NRD/E/80/INF.11) and the other on biogas production from animal and vegetable wastes (ECA/NRD/E/80/INF.13).

52. The Meeting requested the ad hoc committee to study the recommendations of the Technical Panel of Experts on Biomass (including fuelwood and charcoal). The conclusions of the deliberations of the ad hoc committee were discussed and amended in plenary session under item 13.

Consideration of the document on solar energy (item 9)

53. A member of the ECA secretariat introduced document (E/CN.14/NRD/E/36) on the current situation of and prospects for the development and utilization of solar energy in Africa.

54. In his introductory comments, he said that Africa was in a privileged geographical situation as far as exploiting solar energy was concerned. Straddling the equator, the continent was exposed to sunshine almost year-round. Among the possible utilizations of solar energy in Africa, he underscored agricultural and industrial uses after having drawn attention to the priorities set by the Regional Seminar on Solar Energy in Africa, organized by ECA at Niamey from 8 to 13 January 1979. The document also referred to research and development conducted in some African countries. Information was given on the Solar Energy Society of Africa which was now being set up and which would bring together African researchers, engineers and technicians.

55. During the ensuing discussion, participants focused on the Regional Centre for Solar Energy whose establishment had been recommended by the fifth meeting of the ECA Conference of Ministers held at Rabat in March 1979. Nine countries had already signed the constitution of the Centre and an appeal had been made to other countries to obtain more signatures so that ECA might convene an inaugural meeting as early as possible. Representatives of financial institutions expressed their interest in integrated rural development projects using solar and wind energy.

56. A background document was made available to participants on the utilization of solar energy in East Africa (ECA/NRD/E/80/INF.14).

57. The ad hoc committee was requested to study the draft programme of action, policies and priorities on the development and utilization of solar energy in Africa, taking into account the conclusions of the Regional Seminar on Solar Energy held at Niamey. The Meeting considered and amended the recommendations of the ad hoc committee in plenary session under agenda item 13.

Consideration of the synthesis document on new and renewable sources of energy in Africa (item 10)

58. A representative of the ECA secretariat introduced document E/CN.14/NRD/E/37 dealing with the development and utilization of the 14 sources of energy which the United Nations Conference had been requested to consider. The document stressed in particular draught animal power, oil shales, tar sands, peat, ocean energy and wind energy.

59. In the search for new sources of energy it was expected that such major non-conventional hydrocarbon reserves as oil shales and tar sands would be increasingly exploited, particularly in Morocco, Madagascar and Zaire. The inventory of African peat resources was far from being complete, and numerous activities still had to be undertaken to develop the deposits discovered in the States of the Economic Community of the Great Lakes Countries in particular. As far as ocean energy was concerned, it was pointed out that no installation using the thermal gradients of the oceans was yet in operation, even though prospects were bright, particularly in the Ivory Coast as a result of the sophisticated offshore techniques developed by the petroleum industry. The exploitation of wave energy remained difficult to foresee because of the variability in time of this type of energy and because of the excessive cost of the installations to be

built, as shown by the study done at Casablanca, where the average swell was high. Finally, tidal energy, while only minimally exploited at the world level, was potentially a major source of energy in Africa.

60. In support of the background document dealing with draught animal power (ECA/NRD/E/80/INF.18), a representative of the International Livestock Centre for Africa gave a statement on the potential use of draught animal power in tropical Africa.

61. The document contained technical and economic data about the use of draught animal power for farming. It showed the relation between agricultural yield and labour factors, and stressed the limits of worker labour inputs. Mechanization would bring about a considerable increase in agricultural yield, and the use of draught animals could be encouraged in African countries because of its greater flexibility, and because it required fewer technical qualifications than other types of farming, such as tractor farming.

62. The statement of the ILCA representative also contained an analysis of the potential and conditions of use of draught animal power in Africa and a brief study of the constraints to its more widespread application. The infrequent use of draught animals in Africa could be explained basically by two facts: the presence of the tsetse fly and trypanosomiasis in sections of West and Central Africa, and the fact that livestock raising was traditionally separate from other agricultural activities. According to ILCA estimates, the total number of draught animals in tropical Africa was close to 10 million head, distributed in the following manner: 64 per cent in Ethiopia, 13 per cent in the Sahel, 12 per cent in southern Africa and 11 per cent in East Africa. Draught animals constituted little more than 7.5 per cent of the total number of cattle in tropical Africa. Other figures illustrated the extent to which farming in Africa was dependent on manual labour: from 90 to nearly 100 per cent in non-Sahelian West Africa and Central Africa. That consequently put limits on the possibilities for the development of agricultural production which could only be progressively pushed back by one form of mechanization or another. After having analysed to what extent draught animal farming might meet the needs for mechanization in tropical Africa, the ILCA representative stressed the problems that would arise from accelerated mechanization of African farming instead of a rapid implementation of the potential of draught animal farming.

63. The Meeting retained the various reports and statements presented as working documents for the ad hoc committees established with a view to drawing up recommendations. Of particular importance were the background documents on wind energy (ECA/NRD/E/80/INF.16), ocean energy (ECA/NRD/E/80/INF.17) and oil shales and tar sands (ECA/NRD/E/80/INF.19).

Elaboration of a plan of action for the development and utilization of new and renewable sources of energy, including the definition of policies and priorities at the national, subregional and/or regional levels (item 11)

Definition of a common policy for African countries within the framework of the United Nations Conference on New and Renewable Sources of Energy (item 12)

64. The participants decided to combine agenda items 11 and 12.

65. The background document (E/CN.14/NRD/E/38), supplemented by a note on the development of new and renewable sources of energy in Africa, was introduced by a representative of the secretariat.

66. During the discussions, participants stressed the fact that the current energy crisis called for the immediate establishment of a new world energy order, with new concepts, new technical and economic points of reference, new attitudes and new quantitative methods. The energy situation was of even greater concern in Africa, and it was clear that the directions being taken in the energy policies of African States should be reconsidered, rethought and speedily corrected.

67. The Lagos Plan of Action adopted by the Heads of State and Government of the Organization of African Unity on 28 and 29 April 1980 had already stressed the seriousness of the problem and the necessity for finding adequate solutions to it over the short, medium and long terms. Participants agreed to attach highest importance to the rapid implementation of the recommendations and resolutions already adopted concerning energy problems. They consequently decided to annex to the Meeting report the objectives, priorities and recommended measures dealing with those problems contained in the Lagos Plan of Action.

68. Participants felt that those directives called for the development and implementation of a comprehensive energy policy in Africa which would of necessity cover all energy resources. Such a policy could be based only on prior knowledge of those resources and on rigorous planning for their development. It was therefore necessary to list existing or anticipated needs for various types of energy and to establish a catalogue of the energy sources most likely to meet those needs as economically as possible.

69. Taking into account the great variety of available or potential energy resources, participants felt that the cataloguing of those resources should be done methodically, and that the equally complex problems of energy development, management and economics should be dealt with at the national, subregional and regional levels.

70. Concerning the new and renewable sources of energy that the Meeting was given to consider, participants analysed and defined measures to be taken in the following areas:

- (a) Research and development;
- (b) Training of a qualified labour force;
- (c) Development of possibilities for local manufacture and marketing of materials, equipment and spare parts;
- (d) Mobilization and redeployment of financial resources;
- (e) Establishment of local markets;
- (f) Economic co-operation at the multinational, subregional and international levels, etc.

71. The various actions to be taken were grouped together in the third part of the Meeting report under the heading "Plan of action for the development and utilization of new and renewable sources of energy".

72. Participants decided that the Meeting report and the annexed recommendations would constitute the common position of African countries at the United Nations Conference on New and Renewable Sources of Energy. However, they wished to stress that the energy policy recommended therein to African States should take into account local realities so as to ensure that priorities were accorded in a logical manner.

Consideration and adoption of the recommendations of the Meeting (item 13)

73. The five ad hoc committees set up to prepare the recommendations of the Meeting submitted the results of their deliberations.

74. After the draft recommendations had been considered and amended they were adopted by the Meeting. However, the ECA secretariat was assigned the task of putting the texts under discussion into final form.

75. As far as the terms of implementing the Plan of Action for the Development and Utilization of New and Renewable Sources of Energy were concerned, the Meeting gave ECA the responsibility for determining, in collaboration with OAU, the most appropriate ways and means of rapidly implementing the plan of action and subsequently monitoring it at the national, subregional and regional levels. The Meeting adopted a special resolution to develop immediately the energy resource units of ECA and OAU with a view to enabling them to assist member States effectively in the implementation of their programmes to develop the potential of new and renewable sources of energy.

76. The Meeting unanimously adopted three other resolutions annexed to the report.

Other matters (item 14)

77. No other matters were raised.

Consideration and adoption of the report (item 15)

78. After having been considered and amended, the final report was adopted by the Meeting.

Closure of the Meeting (item 16)

79. After the adoption of the resolutions and the final Report, the Director of the Natural Resources Division of ECA and the OAU representative thanked participants for the helpful information provided about each of the agenda items and for the positive results of the Meeting. The First Vice-Chairman then proclaimed the Regional Preparatory Meeting on New and Renewable Sources of Energy closed.

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PART III - PLAN OF ACTION FOR THE DEVELOPMENT AND UTILIZATION OF NEW AND RENEWABLE SOURCES OF ENERGY IN AFRICA

GENERAL CONSIDERATIONS

80. The plan of action set out below is based on the fundamental assumption of the Lagos Plan of Action, which is itself based on two major principles: (a) self reliance, i.e. the substitution of domestic for imported materials and factor inputs in development and economic growth processes in Africa; and (b) self-sustaining growth, i.e. self-dependence in material stimuli for development and economic growth. These two principles basically refer to the transformation of domestic, multinational and regional markets and their exploitation by the Government and peoples of the region.

81. The Lagos Plan of Action also recognized that there is an impending foreign exchange crisis to which energy imports have substantially contributed in the past and will continue to do so in the future unless prompt and effective action is taken to economize on such imports and to find substitutes for them.

82. It is noteworthy that in 1980 the hydrocarbon import bill of non-oil-exporting countries reached \$US 7.4 billion. Together with food imports of the region as a whole estimated at \$US 5.6 billion and external debt payments of \$US 2 billion, the region will have paid a total of \$US 15 billion, i.e. 61 per cent of the estimated export earnings for 1980 leaving 39 per cent of such earnings for all other imports including capital goods and services. It is expected that the situation will worsen in the 1980s if this trend continues.

83. The implementation of the Lagos Plan of Action will obviously depend to a large extent on initiatives taken at the national level based on the interpretation of the Plan's principles, guidelines and over-all targets in terms of national objectives and resources and taking account of the special advantages of multinational co-operation.

84. Accordingly, the energy component of the Lagos Plan of Action, including the development and exploitation of both new and renewable sources of energy and non-renewable sources of energy will have to be determined at national and multinational levels. In view of the recognition of short-term measures to mitigate the effect of the anticipated continuing energy crisis and of longer-term measures as called for in the Lagos Plan of Action, i.e. measures which could be taken as early as possible and those which could be taken later, the recommendations on specific forms of new and renewable sources of energy, set out in subsequent paragraphs below, have been presented under these three categories of actions.

85. Common to all aspects of energy problems in Africa are the following weaknesses and deficiencies which require concrete and urgent rectification at the national level:

(a) The absence of national energy policies and development programmes integrated in national development plans. Unless this weakness is corrected, any attempt to implement the Lagos Plan at the national level will intensify current energy problems.

(b) The insufficient capabilities, human and institutional, for drawing up and using inventories of all energy resources and particularly of the new and renewable sources of energy.

(c) The lack of capability for planning and the composite exploitation of all available energy resources taking into account projected development by sectors and changes of technology in the exploitation of different forms of energy. This weakness is often reinforced by weaknesses in the organization and execution of technological and economic feasibility studies and in the design, planning and management of projects. In view of the dominance of the rural sector (which contains the majority of the African population, the bulk of the energy and other natural resources and raw materials and where most production possibilities lie and most of the transformed domestic market as well as the employment opportunities will be located) the problem of planning and of project design and execution will require a considerable reorientation from its present urban bias.

(d) The lack of adequate manpower for the evaluation, extraction and processing of all forms of energy including new and renewable sources of energy, for the design (including standardization), manufacture and marketing of equipment components and spare parts and for research and development, is fairly known but is likely to be seriously intensified by the energy requirements of the Lagos Plan of Action at the national and multinational levels and particularly by the need to exploit new forms of energy in respect of which the technologies and economies are still in the process of change.

(e) In regard to research and development the region tends to use technologies from developed countries. This means in practice that whenever developed countries alter the emphasis of their use of particular forms of energy and therefore of the pattern of the R and D, the region is obliged to follow this shift irrespective of the relative abundance and availability of different forms of energy. For example, the shift of advanced countries from the use of meagre hydropower resources not yet exploited to petroleum resources tended to be reflected in a similar shift in the region. It is probable that a shift in advanced countries from the use of petroleum to coal and nuclear energy will be reflected in a corresponding shift in the region, unless the African countries collectively take decisions on the R and D to be conducted and find measures to undertake these studies on the basis of the relative availability of various sources of energy.

(f) Inconsistencies in policies planning and programme and project designs and execution, and a lack of information at national and multinational levels on achievements made in the development and utilization of new and renewable sources of energy, possibilities of equipment using such sources, its limit actions, etc.

(g) The need to orient energy development policies and therefore the mobilization and the redeployment of financial resources in favour of small-scale development projects to meet the needs of rapid development (in agriculture, industry, transport, etc.) in the rural sector as against large-scale projects requiring large investments of foreign exchange which are unlikely to be available in the 1980s. Such reorientation will favour simpler technologies, skills that

are easily acquired and the large-scale production of equipment components and spare parts based on local raw materials. Thus, there will take place a gradual shift in industrialization from dependence on external financial resources to the mobilization of domestic financial resources. This orientation does not necessarily exclude all large-scale projects.

(h) The inadequacy of co-operation between technical institutions concerned with resources inventory and planning, and joint feasibility studies and multinational enterprises responsible for production, standardization and marketing R and D, manpower development, market surveys, etc. The emphasis here is not on administrations, although co-operation is necessary among multinational policy makers, but on instruments of co-operation.

GENERAL RECOMMENDATIONS

86. Considering those deficiencies, the Regional Preparatory Meeting on New and Renewable Sources of Energy accorded priority to the actions listed below.

87. African policy makers should implement a comprehensive and co-ordinated energy policy taking into account the special situation of individual countries and the continent's available or potential energy resources.

88. Such a policy must be based on as complete an inventory as possible of all energy resources, their potential and possibilities for their development and use. To formulate the policy, it will be necessary to chart current or planned energy needs and catalogue energy sources able to meet those needs under the best socio-economic conditions. Energy development plans for the short, medium and long terms should be drawn up at national and subregional levels and integrated into national development plans.

89. Such a global approach, however, requires that there should be a permanent technological and political structure responsible for energy problems as a whole at both the national level and the regional and subregional levels.

90. It is thus recommended that national services should be set up in each country to design, plan and manage energy projects, that co-ordination machineries and bodies should be established at the subregional and regional levels and that these institutions should be given adequate funds and manpower to carry out their activities efficiently.

91. It is also recommended that generally African consultancy firms should be set up, upgraded and promoted to draw up and use the inventories of the continent's energy resources.

92. The training of skilled staff at all levels and in all spheres to develop, exploit and utilize energy resources (exploration, evaluation, planning, exploitation, R and D, design and manufacture of equipment to exploit and utilize energy resources, etc.) should be considered a prerequisite and therefore be given absolute priority.

93. Special attention should be given to the development of science and technology and steps should be taken to collect, classify and disseminate this scientific and technological information more efficiently than is now the case. Researchers and inventors should be given encouragement by being offered honorary titles and monetary or material awards.

94. Additional seminars, study tours and advanced training courses should be organized and possibilities should be increased for African decision makers from national and intra-African institutions concerned with the energy sector to exchange information and share experience.

95. The energy future of African countries will depend to a large extent on their ability to organize, implement and develop their own scientific and technological capacity. Specialized institutions, open to all member States, should be set up or strengthened at the national, subregional or regional levels. Support should be given to existing technological and economic documentation centres and a data bank should be set up to reclassify all information with a view to its preservation and widespread dissemination.

96. Although it might still be difficult to evaluate the specific contribution made by new and renewable sources of energy in various African countries in the context of a global economic approach, it is nevertheless clear that these sources of energy can and should play an important role in improving the living conditions of the population and the rate of development of rural areas.

97. These sources of energy, because of the numerous possible or potential ways in which they can be used in a decentralized manner, will make it possible to delay or avoid the setting up of a complex energy production, transport and distribution system modeled on the pattern of energy growth in industrialized countries. Such a system does not seem suited to Africa since many of the continent's energy needs are limited in quantity and scattered geographically.

98. The utilization of new and renewable sources of energy is moreover of strategic interest for the development of African countries in that it contributes significantly to national energy self-sufficiency and to a long-term improvement in the balance of payments since the energy costs involved would be much lower than for the costs of installing and operating thermal power stations or than the costs of oil products which would have to be imported if these energy resources were not developed. The construction of hydropower stations also helps to improve food supplies by increasing areas such as irrigation.

99. The current state of the technological development and economic profitability (in the classical sense of the term) of projects varies greatly according to the types of utilization planned and the various sources of new and renewable energy considered. In many cases, R and D may still be necessary before adequate installations can be built.

100. However, it would be dangerous if, given the efforts that must be made to develop and utilize these energy resources, African countries reacted passively by expecting everything at the scientific, technical and industrial levels to come from external sources.

101. On the contrary African countries should view the promotion of R and D as a priority through a policy clearly aimed at strengthening existing centres, creating new centres if necessary and promoting the prompt utilization of new and renewable sources of energy.

102. The financing of energy development and utilization projects is a major investment for many African States. External assistance may therefore be necessary even if partial financing can be sought and obtained at the national, subregional and regional levels. It is recommended that African decision makers should insist on special efforts on the part of African financial institutions and request larger contributions on the most favourable terms possible from international and government assistance funds and financial institutions.

103. To complete the general recommendations, specific recommendations have been drafted for concrete measures to be taken in the short, medium and long terms concerning the sources of energy considered at the Meeting.

SPECIFIC RECOMMENDATIONS

104. Hydropower

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa.

Noting that hydropower has a leading role to play in finding solutions to energy problems in Africa,

Considering the importance of the existing hydropower potential that has not yet been exploited,

Recommends that:

In the short term

(a) Special attention should be given to the development of these resources taking into account the water required for the population, animals and agriculture as well as the impact of, hydropower projects on the environment;

(b) International financing institutions and government bodies should make full use of the services of genuinely African firms and give priority to the building of small hydropower plants in rural areas in order to develop the rural sector by providing it with reliable and low-cost energy;

(c) General standards and specifications should be drawn up and enforced at the national, subregional and regional levels to promote the establishment of industries and construction firms;

In the medium and long terms

The capital equipment and voltages of hydropower stations should be standardized to permit the joint construction of power stations and the interconnexion of power grids of neighbouring countries.

105. Ocean energy

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Having noted that, in their search for new sources of energy, industrialized countries are interested in the use of ocean energy which is now scarcely exploited in spite of the technological success of some experiments,

Observing that several African countries have not yet given due attention to the evaluation and exploitation of their ocean energy resources, taking into account the high risk which its use now seems to involve and uncertainties with respect to its development prospects,

Recommends that ongoing research and experiments on the possibilities of exploiting ocean energy should be pursued in Africa and that research on technologies needed to utilize these forms of energy should be promoted.

106. Geothermal energy

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Noting the keen interest shown by African countries in evaluating their geothermal resources and having analysed the major problems posed by the rapid development,

Considering that geothermal energy is a natural resource which can be exploited through technologies that have already been developed and are competitive,

Taking into account the possible uses of geothermal resources, not only for electricity generation but also for applications requiring heat sources at different temperatures, such as the drying of agricultural products and fish, heating, spa treatments, tourism, etc.

Having noted previous recommendations adopted at ECA and OAU meetings and in particular those in the Lagos Plan of Action,

1. Recommends that African countries should, at the United Nations Conference on New and Renewable Sources of Energy, reaffirm their commitment to:

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- (a) Step up geothermal prospecting through modern exploratory methods:
 - (b) Urgently undertake the exploitation of geothermal resources, in particular to meet the needs of rural populations;
2. Further recommends to African countries:

In the short term

The expansion of institutions specialized in geothermal energy, which generally receive support from the United Nations, so that they may train the specialists needed to develop and exploit Africa's geothermal resources;

In the medium and long terms

- (a) The establishment as a matter of priority of a geothermal energy institute in East Africa, which possesses vast resources, to:
 - (i) Assist African countries in planning and carrying out geothermal exploration;
 - (ii) Provide countries with the necessary personnel and equipment to undertake such activities;
 - (iii) Organize in-service training, study tours and seminars for specialists and technicians;
 - (iv) Collect and disseminate information;
 - (v) Ensure project co-ordination and co-operation;
 - (vi) Carry out research and development on the exploration and development of geothermal resources;
- (b) Improvement of the rural infrastructure of areas containing resources;
- (c) The establishment, separately or jointly, of a seismological and vulcanological monitoring system by countries planning or implementing geothermal projects.

107. Peat

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Having noted that peat is widely available in some African countries,

Considering that peat briquettes for household use can replace fuelwood and charcoal and thus help to check the rate of deforestation,

Considering that peat is a well-known resource with multiple uses,

1. Recommends that African countries should urgently request technical and financial assistance from regional and international agencies in exploiting known deposits and developing this source of energy;
2. Further recommends that African countries with peat resources should provide training courses for a larger number of technicians.

108. Oil shales and tar sands

The Regional Preparatory Meeting on New and Renewable Sources of Energy held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Observing that the oil industry, faced with the increasing demand for hydrocarbon is considering the exploitation of deposits of bituminous shales and tar sands,

Noting that the exploitation of these resources requires major and costly technological contributions from industrialized countries which have already acquired some experience in the area,

Considering that the inventory of these resources in Africa is far from being complete,

Recommends that African countries should urgently evaluate these resources and carry out cost-benefit analysis of their exploitation.

109. Biomass, including fuelwood and charcoal

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Noting that fuelwood and charcoal play and will continue to play a basic role in meeting Africa's energy needs,

Observing however the marked deficit in firewood in some African countries as a result of overgrazing, shifting cultivation and population growth,

Considering the modest results of measures taken in the past (reforestation, introduction of improved cookers, etc.) to remedy the situation, even though in some cases basic actions taken were successful, in order to improve the living conditions of the rural population (use of solar pumps, windmills, digesters, etc.) and to make use of vegetable wastes (production of electricity from bagasse, groundnut shells, etc.).

Recommends that African countries should:

/...

In the short term

- (a) Determine current and future consumption by sector and ways to meet consumption needs;
- (b) Formulate land-use plans;
- (c) Exploit forest reserves efficiently by determining consumption priorities and using simple, low-cost improved burners;
- (d) Undertake intensive reforestation of forests which were exploited every year and of semi-arid zones and other regions with a wood production on deficit;
- (e) Draw up educational and training programmes making use of schools and the media and promoting the use of the most efficient and least costly system to meet the population's energy needs;
- (f) Ensure that any changes proposed in the formulation of energy policies in rural areas are consistent with the social concerns of the population and with environmental considerations;
- (g) Foster on-the-job training of technicians and extension workers;
- (h) Offer as many financial incentives as possible to overcome financial obstacles which hamper the development and utilization of improved systems of biomass conversion.

In the medium and long terms

- (a) Use agroforestry techniques to increase the production of agricultural products as well as fuelwood and charcoal;
- (b) Develop new biomass conversion systems with a good cost effectiveness ratio;
- (c) Build the necessary infrastructure to produce biogas and develop low-cost gas storage systems and low-cost gas appliances which can be manufactured locally;
- (d) Conduct advanced research individually or jointly to develop fast-growing drought resistant species which can be used specifically in semi-arid areas and formulate national and interregional reforestation programmes using the selected species;
- (e) Develop relations of co-operation among African States primarily in the following areas: dissemination of information on experience, objectives and problems in the use and conversion of biomass, technical assistance through the transfer of technology, joint research and development projects in several countries. Similarly, in exploiting heavily wooded areas account should be taken of the shortage of fuelwood in neighbouring countries.

110. Solar and wind energy

The Regional Preparatory Meeting on New and Renewable Sources of Energy, held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Considering with satisfaction that a number of African countries have already successfully undertaken major work to develop and popularize windmills and solar appliances, such as water heaters, dryers, stills and low-power solar motors for supplying water to pasturelands and villages and for electricity generation,

Considering however that much remains to be done in order for the output and economic competitiveness of the installations to be satisfactory,

Aware of the various types of difficulties hampering the development of applications and their optimal use as energy sources in Africa,

Having noted the recommendations and resolutions previously adopted at intra-African meetings on solar and wind energy,

Recommends that African countries should:

In the short term

Establish a network of modern measuring stations to evaluate solar and wind potential by using, as much as possible, existing meteorological stations and specialized international centres;

Ratify the constitution of the African Regional Centre for Solar Energy if they have not yet done so with a view to making the Centre operational as soon as possible.

111. Draught animal power

The Regional Preparatory Meeting on New and Renewable Sources of Energy held at Addis Ababa, Ethiopia, from 12 to 16 January 1981 under the auspices of the United Nations Economic Commission for Africa,

Considering that in the majority of African countries the economy is dominated by the agricultural sector and that the larger part of their population depends primarily on agriculture for its existence,

Aware of the fact that one of the major objectives of the socio-economic development of African States is to increase income as a means of improving the standard of living, particularly that of the rural population,

Having followed with interest the statement presented by the International Livestock Centre in Africa (ILCA) which highlighted the predominance of traditional farming in tropical Africa, where few countries have attained a high degree of mechanization,

Having taken note of the recommendations of the Lagos Plan of Action concerning the priority role of mechanization in increasing agricultural production and modernizing farms, which stress that in the agricultural mechanization process particular attention should be paid initially to the use of draught animals,

Recommends that African countries should adopt the following measures for developing the utilization of draught animal power whenever possible:

In the short term

(a) Education of farmers and extension workers through appropriate training programmes on the utilization of draught animal power in farming;

(b) Improvement of the output and performance of draught animals through better farming methods;

(c) Promotion in collaboration with FAO, of the co-ordination of activities such as the standardization of farm equipment and tools undertaken by organizations concerned with agricultural development;

In the medium term

(a) Promotion of the use of improved and diversified farm tools;

(b) Upgrading of draught animal quality through better breeding techniques and the introduction of trypano-resistant breeds;

(c) Eradication of the tsetse fly and control of trypanosomiasis;

Over the long term

(a) Diffusion of improved and integrated packages for increased agricultural production;

(b) Mass production of better designed and more adaptable farm tools using local resources.

GUIDELINES FOR IMPLEMENTATION

112. It is obvious that the implementation of the recommendations of the Regional Meeting on New and Renewable Sources of Energy is primarily contingent on the will of member States to promote real co-operation and solidarity.

113. The success or failure of the measures called for in the recommended plan of action depends on their translation into national programmes by the States, and on the political and material support of the States for the activities to be undertaken at the subregional and regional levels.

114. It should also be noted that most plans of action drawn up at similar meetings could not be implemented, or were done so belatedly, because the recommendations they contained were addressed to Government without any reference to the principal institutional agents and instruments responsible for implementing them, and without any time-table being established even for the initial phase.

115. The following paragraphs briefly list the actions to be undertaken over the short, medium and long terms by the different parties involved in the implementation of the plan of action at the national, subregional and regional levels.

116. At the national level actions may be classified as follows:

Immediate and short-term actions

- Evaluation of existing techniques and local capacities for developing and utilizing different sources of energy with a view to determining the specific support measures and promotional activities which would enable these sources of energy to play their role fully; for example, the establishment of special sections within national offices of geology, mines, hydrology, energy, forestry, agriculture, livestock, meteorology, etc. which would be responsible for listing and evaluating energy resources within their sphere of competence;
- Establishment or strengthening of a body responsible for the development, planning, co-ordination and implementation of a national energy policy in collaboration with the different ministries concerned;
- Estimate of staffing needs by category and area of specialization for the next 10 years so as to be able to readjust in advance both the number of State grants and technical assistance policies in the area of education and training;
- Organization of study tours to universities and other research and development institutions, particularly those located in countries with socio-economic conditions similar to those of African countries and with easily adaptable technology;
- Comprehensive and sectoral studies of energy supply and demand for the next 10 years, taking into account the planned sectoral development contained in the Lagos Plan of Action, the role of new and renewable sources of energy in the transformation of the rural sector, etc.

Medium and long-term actions

- Establishment and development at the local level of the infrastructure required to manufacture and market equipment accessories and spare parts for the development and utilization of new and renewable sources of energy.

117. At the subregional level, starting with the ECA Multinational Programming and Operational Centres (MULPOC), or international organization such as the Economic Community of West African States (ECOWAS), and at the regional level, actions may be classified as follows:

Immediate and short-term measures

- Evaluation of existing education and training resources within the subregion or region with a view to strengthening and developing them and rendering them as effective as possible;
- Study of the possibilities for organizing and developing research and development within a regional context;
- Study of the possibilities for interconnecting electrical networks and for the joint implementation and operation of hydro-electric facilities;
- Establishment of institutional infrastructure and technical associations responsible for co-ordinating and supporting activities for the development and utilization of new and renewable sources of energy;
- Centralization and diffusion of information on equipment, its uses and its limits;
- Establishment of demonstration centres with a view to sensitizing decision makers and the general public of the advantages of developing and utilizing new and renewable sources of energy;
- Organization of technical meetings, seminars, conferences, study tours, etc. with a view to facilitating and developing exchanges of information and experience on the utilization of new and renewable sources of energy.

Medium and long-term measures

- Establishment and development of specialized training institutes in the areas of new and renewable sources of energy;
- Contribution to the establishment of multinational enterprises for the local manufacture of equipment, accessories and spare parts and for their marketing;
- Establishment of pilot installations;
- Establishment of a bank (or fund) to finance projects for the development and utilization of new and renewable sources of energy.

118. It has been decided at the regional level that the African Regional Centre for Solar Energy and a Geothermal institute should be established immediately in East Africa.

119. Once it has been established, the African Energy Commission will deal with most of the activities mentioned above, taking into account the objectives set for it in the Lagos Plan of Action.

Annex 1

The Regional Meeting on New and Renewable Sources of Energy,

1. Realizing that energy constitutes an important factor in the development of African economies in the coming decade,
2. Realizing that urgent need to implement programmes of action and strategy to develop the African potential in the field of new and renewable sources of energy.
3. Realizing the need of African countries to be assisted in the assessment of their energy potential,
4. Considering that the Energy Resources Unit of both ECA and OAU is limited in staff and finance,

Recommends that everything should be done urgently to develop the ECA and AOU Energy Resources Units to be able to adequately assist member States in the programmes of developing their potential in new and renewable sources of energy.

Annex 2

VOTE OF THANKS TO THE PROVISIONAL MILITARY GOVERNMENT
OF SOCIALIST ETHIOPIA

The Regional Preparatory Meeting on New and Renewable Sources of Energy in Africa,

Deeply grateful to the Provisional Military Government of Socialist Ethiopia for the warm hospitality and physical facilities offered to the participants,

1. Convey their gratitude to the Provisional Military Government of Socialist Ethiopia and to the Ethiopian people;
2. Decide that this motion shall be communicated to the Provisional Military Government of Socialist Ethiopia by the Executive Secretary of the Economic Commission for Africa.

Annex 3

VOTE OF THANKS TO THE SECRETARIAT OF THE ECONOMIC
COMMISSION FOR AFRICA

The Regional Preparatory Meeting on New and Renewable Sources of Energy in Africa,

Considering the efforts made by the secretariat of ECA and the satisfactory results noted at the close of the deliberations of the Meeting,

Considering also the number, quality and usefulness of the documents prepared and submitted to the representatives of African States and the observers,

Bearing in mind the magnitude and complexity of the tasks assigned to the secretariat and carried out by its members,

Conveys its sincere and heartfelt congratulations to the Executive Secretary and its staff, including the interpreters and translators, for their tireless devotion and excellent contribution to the success of the Meeting.

Annex 4

CONGRATULATIONS TO THE OFFICERS OF THE MEETING, THE MEMBERS
OF THE DRAFTING COMMITTEE AND THE AD HOC COMMITTEES AND THE
CHAIRMAN AND RAPPORTEUR

The participants of the Regional Preparatory Meeting on New and Renewable
sources of Energy in Africa,

Aware of the heavy responsibilities assumed by the Chairman, the Vice-Chairman
and the Rapporteur in guiding it in its work,

Also aware of the responsibilities imposed on the members of the Drafting
Committee and the Ad Hoc Committees in the course of their work,

Noting with satisfaction the results which have been obtained thanks to the
devotion, diligence and dignity with which they all carried out their difficult
tasks,

Expresses its heartiest congratulations and sincere gratitude to the Chairman,
Vice-Chairman and Rapporteur and to the members of the Drafting Committee, of the
Ad Hoc Committees and the Chairman and Rapporteur.

Annex 5

SUMMARY OF ENERGY CHAPTER IN "LAGOS PLAN OF ACTION"

1. Taking into account the major problems encountered by African Governments in the energy sector, the Lagos Plan of Action established the following objectives with a view to finding adequate short, medium and long-term solutions to them:

(a) The availability of energy resources in Africa should be rapidly increased and in increasing quantities so as to ensure indigenous and self-sustained development;

(b) Energy sources should be diversified;

(c) A solution should be found quickly to the problems of the supply of hydrocarbons so that the existence of the most disadvantaged African countries as sovereign States is not threatened;

(d) Better living conditions should be provided for the rural areas by making better use of energy resources and by achieving self-sufficiency in food.

2. Taking into account the above-mentioned objectives, the Lagos Plan of Action outlined the following priorities:

(a) Development and utilization of fossil fuels (hydrocarbons, coal, lignite and peat);

(b) Increase in utilization of the continent's hydropower resources;

(c) Development of new and renewable sources of energy (solar, wind, geothermal, biomass and others);

(d) Utilization of nuclear energy.

3. The Lagos Plan of Action then recommended various measures in order to ensure, in the short term, stable and guaranteed supplies of oil to African countries and to increase, in the medium and long term, the development of fossil fuels and new and renewable sources of energy and the utilization of nuclear energy.

4. As far as new and renewable sources of energy are concerned, the following are proposed:

Development of hydropower resources

(a) Inventory of hydropower resources in all African countries taking into account their integrated utilization such as electricity production, irrigation, fisheries, navigation, etc.;

(b) Surveys of hydroelectric power plants and master plans at the scale of whole river basins for an optimum exploitation of the resources, which should include rural electrification;

(c) Development of economically attractive small-scale hydroelectric power schemes for rural areas;

(d) Need for neighbouring countries to exploit hydroelectric installations jointly. In that connexion, certain commonly neglected parameters should be taken into account such as the need to protect the environment, health problems and the relocation of the people who have had to be moved;

(e) Evaluation of the needs to be satisfied since the investment required is large. As far as the conveyance of energy over long distances was concerned, the advantages of direct current should be considered in the future;

(f) Study on internationalizing the status of installations from the point of view of ensuring safe supplies of electrical energy;

(g) When finance is being sought, projects should be given a subregional and possibly regional character so as to make better use of the priority often given to undertakings of that type;

(h) In the search for solutions to the energy problem, priority should be given to sites with great hydropotential, since their enormous potential would make it possible to consider interconnecting a large number of African countries;

(i) Establishment of national boards for rural electrification;

(j) Promotion of standardization in power supply equipment and expansion of interconnexion of grids (including a decrease in number of existing voltage levels);

(k) Manufacture of electrical equipment suitable to the needs of African countries by utilizing local raw materials.

Development of new and renewable sources of energy

(a) Intensification of geothermal exploration with the use of modern exploration methods;

(b) Continuation of scientific and technological research for industrial application of geothermal resources as a source of generating electricity, for heating, cooking processes, extraction of minerals and production of water and steam;

(c) Establishment of geothermal power-generating pilot plants;

(d) Surveys of the possibilities and feasibilities of harnessing tidal waves and ocean thermal energy including research into the techniques to be used for such forms of energy;

(e) Intensification of research on economic conversion of solar energy into mechanical or electrical energy; examination of potentialities of solar heating systems and solar distillation of saline water; development of instruments for measuring solar radiation and establishment of modern stations;

(f) Establishment of subregional and regional machinery for co-operation and co-ordination of solar energy activities in Africa.

5. In order to rapidly and efficiently implement the Plan of Action, the following is recommended:

(a) Urgent establishment of an African Energy Commission responsible for:

(i) Co-ordinating all activities being undertaken in the field of energy in Africa, assisting African States in the formulation and co-ordination of energy policies and programmes and in disseminating of data and information pertaining to the energy on the continent;

(ii) Promoting the preparation, as a matter of urgency, of an exhaustive inventory of all energy resources on the continent;

(iii) Promoting the establishment of an African Nuclear Energy Agency with a view to following developments in nuclear technology, formulation and harmonizing nuclear energy development programmes in Africa and providing manpower training in the nuclear field;

(iv) Promoting the establishment of a Regional Geothermal Energy Centre, to assist African countries to explore and exploit their geothermal resources;

(v) Establishment of an appropriate framework for the implementation of recommendations made at earlier meetings in the field of energy;

(b) Possible establishment of an African Energy Development Fund designed specifically to finance the implementation of energy projects in Africa;

(c) Urgent establishment of a Regional Solar Energy Centre the objectives of which are outlined in the constitution; already approved by the fifth meeting of the ECA Conference of Ministers, held in Rabat in March 1979. In this connexion it is urgent to invite the member States to accelerate the signature of the said constitution in order to make the Centre operational as soon as possible;

(d) Particular attention should be paid to renewable energy resources, such as solar energy, wind energy, biomass and geothermal energy, and research and development in these fields should be intensified;

(e) Special attention should be given to reforestation following the intensive use of wood for heating and of charcoal as the main sources of energy;

(f) The highest priority should be given to the use of hydroelectric resources, particularly by developing small hydroelectric power stations;

(g) National arrangements for controlling and managing activities involving hydrocarbons should be strengthened;

(h) African countries should take joint action to develop and use the energy resources available in the continent, through co-operation and solidarity, with a view to safeguarding their economic development and survival;

(i) Priority should be given to the rapid implementation of the recommendations and resolutions already adopted on energy problems.
