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ORGANIZATION OF RESEARCH AND TRAINING IN AFRICA IN RELATION TO THE STUDY, CONSERVATION AND UTILIZATION OF NATURAL RESOURCES IMPLEMENTATION OF THE LAGOS PLAN

(Document prepared by the secretariat of UNESCO)

1. The question of the organization of research and training in Africa in relation to the study, conservation and utilization of natural resources, was discussed by an international conference organized by UNESCO in co-operation with the Economic Commission for Africa, which was held in Lagos from 28 July to 6 August 1964, at the invitation of the Nigerian Government. This Conference brought together governmental and scientific leaders from 28 African countries and observers from 13 non-African States and 19 international organizations. It was the first UNESCO conference on scientific research and training in Africa, and may be compared in this respect to the first intergovernmental African Conference on Education, held in 1961 in Addis Ababa. Like the 1961 Conference, it adopted a long-term programme, extending from 1965 to 1980, to be known as the Lagos Plan for Scientific Research and Training in Africa.^{1/}

2. It may be recalled that the Economic Commission for Africa, on receiving at its third session a Review of the Natural Resources of the African Continent^{2/} prepared by UNESCO at its request, had noted with

^{1/} Outline of a Plan for scientific research and training in Africa; UNESCO, Paris, 1964.

^{2/} Paris, UNESCO, collection "Natural resources research", 1963, 437 pages.

interest the proposal then made for holding such a conference.^{1/} The proposal also had the backing of the plenary working party of ECA's permanent Committee on industry and natural resources which recommended that the UNESCO Conference should review the question of research and training in the light of the following principle: "The policies of African Governments on technical training and research should be co-ordinated in order to utilize, to the fullest extent, existing facilities as well as funds available for the establishment of additional local training and research institutes in Africa".

3. It may also be recalled that the United Nations Conference on the application of Science and Technology for the benefit of the less developed areas brought to light the importance of scientific research and training with a view to increasing the role of natural resources in the development plans.

4. The Lagos Conference based its work on the recognition of natural resources as "the national heritage of each country, representing as they do, riches to which the peoples of Africa have a permanent and inalienable sovereign right". The Conference held that this right made it advisable that "plans for the wise exploitation and utilization of natural resources, and in particular renewable resources, should not use up more than the capital which they represent can produce and that, consequently, they should include measures for the conservation of natural resources, fauna and flora".

5. The Conference further agreed to limit its scope to scientific research - fundamental, oriented, applied and developmental, and its immediate infrastructure - notably scientific and technical documentation. This delimitation grew out of the fact that science teaching at all levels, and science education for Africa, has been dealt with exhaustively at the 1961 Addis Ababa Conference on African Education, and at the 1962 Tananarive Conference on Higher Education in Africa. The Lagos Conference thus addressed itself to two areas hitherto not dealt with: the development of scientific research and the implantation of science in African society

^{1/} Resolution 34 (III) 52nd session, 17 February 1961.

6. The Conference established, in its survey of African research, that 80 per cent of the countries had no national machinery for co-ordinating and directing scientific research, had no national research budget, suffered from a serious shortage of scientists and research workers and possessed hardly any infrastructural services. All countries, however, were on the point of making national plans or programmes for the development of scientific research. In adopting the Lagos Plan, they therefore established guide-lines for their own declared purposes.

7. The Lagos Plan for the development of scientific research and training in Africa represents a long-term programme extending from 1965 to 1980, the period covered by the Addis Ababa educational plan. It involves action at three levels: national regional and international.

National action

8. Under the Lagos Plan, each country undertakes to carry out seven major actions, as part of its national plan for economic and social development.

8.1. A national research organization for planning, directing and co-ordinating scientific research in the country, in the form of a National Research Council or National Research Centre of Academy of Sciences, is to be established.

8.2. A national research budget, based on the work of a scientific research committee attached to the planning authority of the country, is to be created and made available to the national research organization. As a guide-line, 0.5 per cent of the gross national product is to be set aside for research, of which 20 per cent or 0.1 per cent is already included in the provisions for research in higher education established at Addis Ababa and Tananarive. This involves for Africa as a whole an allocation of \$160,000,000 in 1970, increasing to \$260,000,000 in 1980, outside the provisions made for fundamental research in universities, with the proviso that this low allocation is to be reviewed by 1970.

8.3. National or sub-regional multidisciplinary institutes for scientific and technical research on national resources are to be created or brought into being by the reorganization of existing independent institutes and centres. Such institutes will undertake pre-investment studies on the natural resources of the country or region and conduct research on their use, through pilot projects. This network is to be supported by scientific and technical documentation centres, of which at least three are to be established in Africa.

8.4. Action is to be taken to expand rapidly the number of scientists and research workers in Africa, with a target guide for the continent of 200 university science teachers and research specialists working at universities per million population. This would mean increasing the number of such scientists in Africa, now computed at between 5,000 and 10,000, to 55,000 by 1970, and 65,000 in 1980. This target is modest in relation to the Tananarive Plan which calls for a 60/40 ratio of science to non-science student enrolment in universities, with a total enrolment of 110,000 in 1970 and 238,000 in 1980. Within this framework, each country will establish its own scientific manpower register of resources and requirements, and subject this register to continuing review in order to carry out this decision.

8.5. A statute for scientific research personnel is to be developed in each country, assuring a career service for research scientists, regulating their recruitment, upgrading their salaries and ensuring their promotion. Special financial and other inducements will be offered to science students and teachers to increase their numbers and maintain them in their specialized field.

8.6. Rapid action is to be taken to expand educational and science institutions and to reform science curricula at all levels of education, with particular reference to the natural resources of the country, as set forth in detail in the Addis Ababa educational plan and the Tananarive higher education programme. The Conference placed special emphasis in this connexion on the need to introduce, at the national level, new approaches

to the teaching of science making more use of realistic methods for practical and experimental work and for the production of new textbooks suited to local conditions.

8.7. National action is envisaged to create public science consciousness in each country. Such action would be undertaken with government encouragement and through concentrated use of press, radio, television and films, of primary and secondary schools, of extension, adult education and literary services, and of national and local science clubs and associations, libraries and book-mobiles, science museums and exhibitions.

8.8 In application of Resolution 13 C/2.113 given in annex, assistance given by UNESCO to African Member States in relation to the organization of research at a national level will be carried out by means of temporary missions for studying particular national conditions on the one hand, and by providing consultants on science policy on the other hand. Some of these consultants who will be recruited under Technical Assistance, will be called to remain permanently at the Governments' disposal. The assistance supplied will aim in particular at making a census of the permanent superior staff actually taking part in activities of scientific and technical research of all kinds, and to estimate available manpower and needs for this category of personnel; this assistance will also aim at establishing harmonization between the programmes of pure and applied research and objectives of economic and social development. It is understood that this problem is the major problem to be solved for obtaining efficacious research in particular in the field of natural resources.

Regional action

9. The Conference made four major recommendations to be acted upon during the next 15 years.

9.1. The Organization of African Unity is asked to establish a Scientific and Technical Committee on Natural Resources in Africa. This Committee, with the support of UNESCO and the co-operation of the Economic Commission for Africa (ECA) and other United Nations bodies, would harmonize the

methods of terminology and basic maps in natural resources research employed in the national programmes; help compare the results of national research programmes and standardize weights and measures used; arrange regional programmes in the earth and life sciences; and establish co-operation with the international scientific community.

9.2. The 1933 Convention on the flora and fauna of Africa is to be brought up to date and its scope extended by the Organization of African Unity, which will entrust the preparation of a preliminary draft to the International Union for the Conservation of Nature and Natural Resources, assisted by UNESCO and FAO.

9.3. Research institutes and centres in each African country are to set aside a certain part of their facilities for nationals of other African States, as a means of pooling limited training resources and making maximum possible use of them. Further programmes of inter-African exchange of science professors and research specialists are to be put into operation.

9.4. Inter-African institutes are to be established, covering some 23 fields of natural resources including cartography, hydrology, energy resources, arid zone research, savannah zone research, humid tropical zone research, geophysics and seismology, mining and economic geology, volcanology, soil sciences, irrigation and drainage, oceanography and marine biology, plant pests and diseases, forestry, taxonomy and ecology, flora and fauna including wildlife management, veterinary science, range management, limnology, tropical and sub-tropical medicine and parasitology, cancer research, building materials and documentation. These institutes will involve the expansion and re-organization of existing centres of the creation of new ones spread over the continent as a whole.

International action

10. The Lagos Plan calls for international co-operation along three specific directions.

10.1. The Conference recommended that a formal agreement between the Organization of African Unity, which has a Scientific, Technical and

Research Commission, and UNESCO should be concluded at an early date. Such an agreement would permit the acceleration of international co-operation with African scientists and the harmonization of UNESCO and OAU activities in the field of scientific research in Africa.

10.2. The Conference also recommended that UNESCO undertake studies on the scientific manpower needs and resources of the African countries; on existing research budgets and their desirable expansion; and on the relation of scientific research to economic development. It asked that UNESCO aid African countries, at their request, in the planning and organization of scientific research, in the establishment of institutes of applied research in natural resources and in the planning and realization of inter-African institutes in 23 fields of natural resources as indicated above (paragraph 9.4).

10.3. In addition, the Conference invited non-African Member States, the Economic Commission for Africa, FAO, other United Nations agencies including the Special Fund and Expanded Programme of Technical Assistance, as well as international non-governmental professional organizations to provide African countries with increased technical and financial assistance during the forthcoming decade and a half, in order to assist the implementation of the Lagos Plan for the development of scientific research and training in Africa.

Decisions taken by the General Conference of UNESCO at its 13th session.

11. The General Conference of UNESCO, during its thirteenth session (Paris, 20 October - 20 November 1964) adopted as its own the recommendations of the Lagos Conference, as well as the resolution 13 C/2.113 of which a copy is attached, inviting African Member States, non-African Member States, the United Nations, its Economic Commission for Africa and its specialized agencies as well as other international organizations dealing with African questions, to co-operate in view of the implementation of the "Lagos Plan".

12. On the other hand, during this same session, the General Conference of UNESCO authorized the creation of a UNESCO Regional Centre for Science and Technology for Africa. This Centre will shortly be opened in Nairobi (Kenya). One of its main activities will be the implementation of the Plan. In particular it will centralize the data on the personnel and equipment resources attributed to scientific and technical research, this international action replacing in this respect the help given at a national level.

ANNEX
RESOLUTION ADOPTED BY THE UNESCO GENERAL CONFERENCE
AT ITS 13TH SESSION ON 20 NOVEMBER 1964
AND CONCERNING THE IMPLEMENTATION OF
THE LAGOS PLAN

(Development of scientific research and training
of scientific and technical personnel in Africa)

Resolution 13.C/2.113

- I -

Member States and Associate Members in Africa are invited to take all necessary steps to implement, at the national and regional level, the recommendations set forth in the Plan for Scientific Research and Training in Africa, adopted by the Lagos Conference, in August 1964, and in particular to:

- (a) Establish a national research organ and national research budget to plan, co-ordinate and direct scientific research in the country;
- (b) Establish national research manpower registers and a national research service;
- (c) Plan and establish national or sub-regional institutes of natural resources;
- (d) Ensure the expansion of science education and science consciousness of society;
- (e) Co-operate together in the establishment of an African Committee on Natural Resources, in revising the African convention on conservation and in the development of a network of African research institutes;

- II -

Member States and Associate Members outside Africa, United Nations and Specialized Agencies and international non-governmental organizations

are invited to co-operate with African countries in the implementation of the Plan by providing them with financial and technical assistance;

- III -

The Director-General is authorized, in co-operation with the United Nations and the Economic Commission for Africa, the Specialized Agencies and the Organization of African Unity, the Special Fund and the Expanded Programme of Technical Assistance, to assist, at their request, the Member States and the Associate Members in Africa in the implementation of the Plan, within the framework of the resources, provided in this chapter, and with the help of extra-budgetary resources, in particular:

- (a) By undertaking studies on scientific and research manpower needs and resources, research budgets and the relation between research and economic development in Africa;
- (b) By aiding in the planning and organization of science, national research organs and budgets at the national level;
- (c) By assisting in the planning and operation of the national and sub-regional institutes of natural resources and other centres of scientific research;
- (d) By orienting the programme of the African Centre of Science and Technology so as to aid in the active implementation of the Plan.

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