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UNITED NATIONS ECONOMIC COMMISSION FOR AFRICA
ECA/UNESCO Regional Symposium on the Utilization
of Science and Technology for Development in Africa
Addis Ababa, 5-16 October 1970

WORKING GROUP III

REVISED REPORT

TOPIC **IV**: Natural Resources Survey, Research and Development

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M70 - 2294 / S&T 100
M70-2294

- A.1 Summary of Working Papers
- A.2 Summary of Background Papers
- A.3 Summary of Relevant Parts of Country Papers
- A.4 Summary of the Discussions of the Working Group

The topic of Natural Resources was discussed by Working Group 3 during the morning of 12 October. The Chairman was Mr. Abdelmalek Guessous (Morocco), and the rapporteur Mr. M.S. Shanta (Libya).

At the invitation of the Chairman, UNESCO again briefly reviewed its working paper WP/8 (see section A.1 of this topic report). ECA, on its part, brought in their experts on topography, mineral resources, and water resources who summarized ECA's plans for future activities in these areas. The observer from the FAO briefly introduced his organization's "World Plan of Action for the Application of Science and Technology to Development (FAO, PAB: Misc (70/1))".

As a starting point for the organization of the discussion, five questions had been prepared (see Annex), but the participants were invited to also give their views on other subjects, an invitation which was enthusiastically accepted. The following main points were made.

There was general agreement with the suggestions by UNESCO and ECA that further cartographic and topographic surveying of the African continent was an indispensable prerequisite for the exploitation of natural resources, although it was stressed that in this field - as in so many others - various African countries had reached different stages of development. Some countries had been able to conduct surveys and draw the maps but had been prevented from publishing them by the high cost of printing; assistance by the international organizations would be particularly useful in this connection.

The fundamental importance of the geological sciences for the exploitation of mineral and other natural resources was stressed by several speakers. With respect to mining itself, the need to bring ores up to prescribed world standards of concentration was emphasized. While everyone agreed that it would be desirable to have all aspects of the field of mineralogy in the hands of Africans, there was disagreement whether this was feasible at the present stage of development. It was felt that, if a choice had to be made, the

fundamental research and development should be carried on by African scientists and engineers, while the actual exploitation could, with proper safeguards, be left, faute de mieux, in the hands of foreign companies.

The importance of the further identification and improvement of groundwater resources was mentioned by a number of participants and the desirability of sub-regional co-operation in the development of river basins was noted.

On the question of the exploitation of uranium resources, there was some disagreement. One or two speakers felt that atomic energy should be vigorously promoted in Africa at this time, while others thought the conventional fossil fuels should first be fully exploited. In any case, the attention of the meeting was called to the fact that known, economically exploitable conventional world wide energy reserves, fossil as well as uranium, are likely to be exhausted early in the 21st century and that therefore attention should be paid now to the development of new and unconventional energy sources. Among these, wind energy, geothermal energy and, most of all, solar energy, were of particular interest to Africa. The latter was important not only as a potential source of power (say, for operating machinery on a small, isolated farm), but also for the purification and desalting of water, the growth of algae as a source of food, and applications in high-temperature metallurgy. Several delegates therefore proposed the establishment, with UNESCO's assistance, of an international centre (or centres) for research in solar energy and called for the convening of a working party of experts to study the problem and make definite proposals. Such a centre (or centres) could be modeled after the Trieste Centre for Theoretical Physics.

Other suggestions made were the intensification of fundamental research in agriculture, including: attention to the improvement of the soil; the establishment of techno-economic councils in those countries where they do not yet exist; the training of high-level staff and technicians for the evaluation and exploitation of natural resources; and the continuous upgrading of the knowledge of professionals and technicians in these fields.

One general problem which surfaced throughout the discussion was the limitation imposed on the exploitation of natural resources by the shortage of trained African scientific and technical manpower. Not only did this situation call for a strengthening of and an increase in national and regional training institutions, but it was also essential that bilateral and international assistance programmes should have as an integral part the training of national counterparts, and their proper utilization by the governments concerned after the departure of the experts.

The session was concluded by a brief review of UNESCO's current activities in the field of natural resources by Mr. O. Ibukun. These included the training of both high level and technical manpower in the earth sciences as well as in related fields, the establishment of institutes of mining in several African countries, the promotion of the International Hydrological Decade (1970), the International Programme for geological correlation (to begin in 1973 and to be concerned mainly with a study of pre-Cambrian Formations) and the work of the Intergovernmental Oceanographic Commission. African countries were invited and urged to participate in all these activities.

On the basis of these discussions, as well as of the paper submitted to the symposium, the Plenary Meeting adopted the following recommendations in the field of Natural Resources:

B. Recommendations

Recommendation 1:

All the African countries which have not yet done so, should undertake cartographic and topographic surveys, using modern methods, such as aerial photography, and should publish appropriate surveys. The completion of an ordnance survey for the entire continent on the scale of 1 : 50,000 should also be undertaken. Sub-regional centres for the training of personnel in cartography and related fields should be established. Where necessary, the assistance of UNESCO and of other international organizations should be sought in carrying out these programmes.

Recommendation 2:

High priority should be given by the African Governments and by the international organizations to the training of specialists and the conduct of research in such fields as geology and hydrology, which are directed towards the development of mineral, water, and other natural resources.

Recommendation 3:

An increased effort should be made to improve the quality and production of mineral ores. In so far as possible, mineral research and exploitation should be put into the hands of African scientists and technicians.

Recommendation 4:

While research in the harnessing of all forms of energy should be increased, solar energy has a particularly great potential for Africa. A working party of experts should be convened by UNESCO, in co-operation with other international organizations, to study the establishment of an international centre (or Centres) for research in solar energy. The research conducted there should be applied as well as fundamental and should be directed towards the such uses of solar energy, as food production, water purification and desalinization, industrial applications, as well as for the production of power.

Recommendation 5:

In the development of Africa's natural resources - as in all other forms of development - the essential importance of trained national manpower should be recognized by all governments, African as well as foreign. The training of national counterparts should therefore be a central feature of all assistance programmes, and their proper utilization after the termination of these programmes should be a central responsibility of the African governments.