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AGRICULTURAL RESEARCH CO-OPERATION THROUGH AGRICULTURAL RESEARCH
PROGRAMMES ON ECOLOGICAL BASES - BASIC PRINCIPLES AND GENERAL
MEASURES FOR STRENGTHENING CO-OPERATION

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Agricultural Research Co-operation through Agricultural Research
Programmes on Ecological Bases - Basic Principles and General
Measures for Strengthening Co-operation

1. The development and the improvement of co-operation and co-ordination of technical and financial aid in the field of agricultural research are problems of primary importance for agricultural development in Africa. Agricultural progress achieved in the more advanced countries has been obtained by continuing efforts in research and its application. A similar approach must be adopted by governments of developing countries and supported by the technical assistance agencies helping them.
2. Developing countries, well aware of the importance of research, are making valuable efforts to increase their scientific development. Owing to the large number of problems they have to solve, however, it becomes more difficult every day for the research services to provide answers to all the enquiries raised.
3. The development of agricultural research is facing two main problems. One is concerned with the availability of trained and experienced manpower and the other with the different aspects of the organization and the co-operation of research, including measures for ensuring that the results of research get into the hands of the field services in a form in which they can be put to practical use.
4. Lack of qualified personnel is certainly one of the major obstacles to research development. Even if funds and material allocated to research were tripled, this would not alter the fact that there are not enough research workers available. Of course, the financial and physical aspects (infrastructure) appear to be the other main barriers to the expansion of research activity, but it is mainly the lack of qualified personnel which limits its development. It is much easier to build and equip a research station than to find the necessary research staff. The demand for qualified research workers far surpasses the available supply, particularly for those possessing tropical research experience.
5. The number of projects and amount of technical aid in various fields has considerably increased during the last ten years, without having so far established a more effective pattern of co-operation and co-ordination. There is a pressing need to avoid competition and duplication through closer co-operation between developing countries, between developing and developed countries and between bilateral, multilateral and international aid to agricultural research.
6. Research is international and particularly agricultural research and biological problems which never follow administrative and political boundaries. The geographical distribution of many agricultural problems and related research activities, follows bio-geographical limits and

concur with agro-bioclimatic areas within the frame of large ecological zones. ^{1/} These zones, within which the combined action of certain environmental factors induces a relative homogeneity to biological facts and agricultural activities, extend over countries' political boundaries. Because of similarity of agricultural problems between countries sited in similar environments, it is highly desirable to strengthen agricultural research co-operation on a regional basis framed within large ecological zones.

7. Many measures can be taken to increase the efficiency of agricultural research, but it is suggested that the first should be to make better use of trained and experienced personnel already available and to reorganize existing activities, as much as possible, in research programmes through inter-governmental agreements.

8. Countries with similar problems should not duplicate and repeat research already conducted elsewhere unless scientifically justified or required for local adaptation. The proposed solution for strengthening agricultural research and intensifying methods of co-operation is to establish Regional Agricultural Research Programmes in each of the major ecological zones as a framework for inter-governmental action, supported by bilateral and multilateral assistance. The desired goals are:

- (a) to organize research according to ecology, since most agricultural problems of an applied biological nature, are more likely to be the same between countries having similar environmental conditions;
- (b) to approach agricultural research problems on a multi-disciplinary basis and within their whole bio-geographical area;
- (c) to encourage the development of various research projects, their implementation being shared out among the main research institutes existing in the countries of the ecological zone involved;
- (d) to stimulate co-operation in research through a closer working relationship between countries, institutions and individuals having similar scientific interests and carrying out studies and research activities on the same problems; (Catalogue of Agricultural Research Projects in Africa);
- (e) to conduct research in co-operation with and according to the order of priority of regional interest on problems of increasing the quantity and quality of food and agricultural productivity;

^{1/} See map in annex.

- (f) to facilitate co-operation in research among universities and research institutions between developed and developing countries through engagement of scientific staff in joint projects and the organization of meetings, seminars, etc., on scientific and technical subjects pertinent to these projects;
- (g) to develop and maintain intensive exchange of agricultural research information, data and results and to facilitate the shifting of scientific staff throughout the zone so as to give research workers opportunities to become better acquainted and prepared to extend their knowledge and experience far beyond the boundaries of their research station area;
- (h) to concentrate a portion of the resources devoted to agricultural research on key topics selected on the bases of regional priorities in order to speed up the development of new knowledge, the arrangements for the transfer and adaptation of research findings and the application of research results;
- (i) to focus the attention of the international scientific community, research institutions, the scientific associations and other organizations, directly or indirectly involved, on specific requirements insofar as fundamental research is needed for the development of applied research in the developing countries;
- (j) to stimulate and promote co-operation in the implementation of research by encouraging the establishment of partnership agreements and the pairing of research institutions;
- (k) to make optimum use and to strengthen existing national research institutions and stations with a view to building up within the ecological zones concerned, a network of multi-disciplinary agricultural research stations;
- (l) to avoid as far as possible unjustified duplications and unnecessary competition in the field of agricultural research in general, particularly for those research activities to be performed within the regional framework of ecological zones.

9. It would be unrealistic and presumptuous to attempt to deal with all the problems of agricultural research, or even too many different research topics at the same time, in a regional programme. Firstly, many research activities do not fit within a regional approach; and secondly, all problems arising from agricultural development and submitted to research, do not have the same over-riding priority for all the countries involved. Most of the agricultural research activities are

covered by national programmes and it is essential to preserve and to intensify agricultural research at the national level. The proposed regional programmes will never replace national programmes, but on the contrary are intended to strengthen them. The whole of applied research, development work and adaptive research which represents around 75 per cent of all research activities must be carried out at the national level as the different local environmental conditions and various social, economic and political factors of each nation have to be taken into account. It is therefore important to make a clear distinction between research topics suitable for a regional approach on an ecological basis, and those which do not fit within such an approach, being subordinated to specific national conditions and particular local requirements.

10. While a regional agricultural research programme on an ecological basis concerns applied as well as basic research, its primary objective is for practical results to be obtained for accelerating agricultural development. It is particularly relevant to include in a regional programme for an ecological zone, the research activities which fall under the following criteria:

- (a) research which must be carried out in the entire biogeographical area of a given theme;
- (b) research which requires technical and financial means exceeding those of each individual state;
- (c) research, the results and practical application of which, could be extended to the largest possible agro-bioclimatic areas or easily adapted to different local conditions;
- (d) research concerned with agricultural problems directly under the control of one or several dominant environmental factors;

11. A regional programme should not be too ambitious as it is far better to start on a modest scale and have success with fewer but important problems, than to embark upon an enterprise which is too heavy and complex and which will never supply the expected positive results in time. A regional programme should only be concerned with high priority topics which, by their nature and common interest to several neighbouring countries, require regional co-operation.

12. The implementation of a regional programme should be flexible, open to any kind of co-operation and permit use of all possible ways and means to achieve its objectives. One of the more forceful justifications for this concept of organizing agricultural research, lies in the strengthening of existing national bodies with the aim of building up multi-disciplinary institutions and research stations on a national basis, able to work on both national and regional agricultural research programmes. It must be recognized as a basic principle that the ultimate purpose of foreign assistance is to help the developing countries reach the level

of self-sustaining development; therefore regional programmes must be designed to be implemented as far as possible in local institutions; better co-ordination and co-operation of external aid efforts organized within the framework of regional programmes should make it possible to build up gradually a strong network of multi-disciplinary national research institutions. The implementation of a regional research programme to be shared out among several national research institutes and stations and supported by the various sources of external aid, would both strengthen national research programmes and facilitate concerted action. This concept of organizing research need not affect any government prerogatives nor any bilateral or multilateral technical assistance arrangements within countries.

13. A regional research programme would not only promote closer co-operation between countries, but also foster and increase external financial aid to support agricultural development. In fact, a regional programme established jointly could serve as a guide and streamline part of the external technical assistance to cover the key priority problems agreed upon and pool dispersed efforts on research topics of common interest to several countries. It would help in the formulation of a better strategy of aid to research by using to the fullest extent possible, the available resources in multi-disciplinary and complementary research activities.

14. The establishment of a regional research programme on an ecological zone basis to strengthen the exchange of information and promote co-operation and co-ordinated action for a limited number of common problems, will result in technical meetings being held to deal with each of the priority problems selected. These meetings will bring together the interested parties to make a complete inventory of results acquired, evaluate the result of their practical application and decide on the research to be pursued. With this information, joint plans of action would be prepared including the necessary joint measures for their implementation.

15. The concept of organizing agricultural research on an ecological basis has many other advantages if applied on a world-wide scale. A world plan of action for the application of science and technology for development, recommended by the Advisory Committee of the Economic and Social Council of the United Nations, must be divided up in several regional programmes. In the field of agriculture and renewable natural resources, the way in which problems should be solved depends largely on the prevailing environmental conditions in which they occur. Although the continents of Africa, Latin America and Asia are diverse in themselves, in the field of agriculture, research and applied knowledge are more similar between homologous ecological zones across these continents, than between the different ecological zones within a continent itself.

An "Inter-Tropical Agro-Ecoclimatic Analogue Survey" could be jointly implemented by FAO, UNESCO and WMO in co-operation with scientific institutions and governments concerned. The joint FAO/UNESCO/WMO Agro-Climatology Project of West Africa, south of the Sahara, should be used as the background study for a first approximation of such a survey in the Sudanian Zone in Africa and its counterpart homologues in the tropics. The introduction of agro-ecoclimatic analogue data in directories of agricultural research stations and catalogues of agricultural research programmes and projects, prepared with electronic computers, would enormously facilitate the exchange of information and international co-operation in all scientific and technical subject matter fields of agricultural research and development.

16. Ecological principles which form the basis of agricultural practice have been used intuitively by farmers and scientists alike a long time before the word "ecology" came into use. ^{1/} The landscape vegetation, the flora, the fauna, the type of crop farming, etc., in a given geographical region is the true image of the combined effect of the environmental factors. There is a great diversity of climate, environment and form of agriculture throughout the world, but the understanding of the evaluation of environments and biological processes relationships allows the discovery of ecological affinities between very distant geographical areas. The survey of agro-ecoclimatic analogue areas throughout the main world ecological zones can make a definite contribution to the development of international relationships in the field of agriculture and particularly in agricultural research organizations. The establishment of close co-operation or even a simple information link between similar ecological areas may lead to savings in time, effort and cost. It may also bring about a more rational and wider utilization of the scientists' contributions and a more intensive exchange of mutual experience and information between those who are faced with similar difficulties and who try to solve similar problems.

17. The establishment of agricultural research programmes on an ecological basis, the adoption of a standard system for cataloguing research programmes and projects by electronic computers and the study of agro-ecoclimatic analogues, are the means proposed to promote inter-country co-operation, widen the use of science's contribution to development and rationalize agricultural research organization on a world-wide basis.

18. We all know very well the difficulties to overcome when dealing with co-operation and co-ordination between individuals, institutions or States. In the field of science and technology, however, no country alone is able to fend for itself. It is our duty, and in our interest, to seek the ways and means to better know, understand and co-operate with each other.

^{1/} Ernest Haeckel, 1866.

19. The recommendations on agricultural research co-operation adopted by the meeting of the Foreign Ministers of the Eastern and Central African Group at Dar-es-Salaam in February 1969 and endorsed by the Heads of State's Meeting at Lusaka, in April 1969, are in line with the basic principles of regional co-operation set out above. The only difference is that the Eastern and Central African member countries do not overlap exactly with the ecological zones boundaries, in particular those of the Guinean Zone. Nevertheless, this is not an obstacle to initiate regional co-operation within and between the Eastern Zone and the Central part of the Guinean Zone.

20. In order to fulfil its objectives the "Agricultural Research Consultative Committee" recommended at the Dar-es-Salaam meeting should first compile a complete inventory of all agricultural research activities carried out in each of the research stations, as well as a manpower survey of research personnel within the member countries concerned. On the basis of this information and agreed criteria for the selection of national and regional research priorities, the Committee would be in a position to:

- advise on specific agricultural research projects of regional interest;
- suggest co-operation and co-ordination measures for their implementation; and
- promote regular exchange of information between agricultural research workers and institutions among participating countries.

21. A conference for the Establishment of an Agricultural Research Programme on an Ecological Basis in Africa - Sudanian Zone was held in Rome in November 1968 and similar conferences are planned for the other ecological zones of Africa. Provision has already been made for the Guinean Zone in the 1970/71 Programme of Work and Budget of FAO. The report of the above-mentioned Conference for the Sudanian Zone is submitted to the attention of the "Agricultural Research Consultative Committee" as an example of what could be achieved between the member countries of the Central and Eastern African Group.

22. In order to speed up an action programme within the field of agricultural research, it is suggested that the Directors of Research attending the Agricultural Research Consultative Committee Meeting, in addition to the lists of agricultural research stations and their present research projects, submit concrete proposals on a limited number of research topics of key importance for both national and regional agricultural development, which, according to their overriding interest across national boundaries, call for inter-country co-operation and co-ordination.

23. Within the available means at its disposal and in the light of the recommendations of its African Regional Conferences, FAO is ready to assist member countries of Eastern and Central Africa in promoting food and agricultural research co-operation.