UNITED NATIONS

ECONOMIC AND SOCIAL COUNCIL

Distr.
GENERAL
E/ESCWA/C.1/15/4/Add.9
12 March 1989
ORIGINAL: ENGLISH

ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

Technical Committee
Sixth session
13-15 May 1989
Baghdad

Item 6(a) of the provisional agenda

REPORT OF THE EXECUTIVE SECRETARY ON THE ACTIVITIES OF THE COMMISSION

PROGRESS MADE IN THE IMPLEMENTATION OF THE PROGRAMME OF WORK FOR THE PERIOD 1988-1989

Report on the

Promotion of co-operation in the field of science and technology

UN ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA
MAY 03 1989
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89-0301

1. The aim of this project is to establish a network of co-operation in scientific research among national scientific research councils and specialized Arab and regional research centres in order to deal with scientific problems that are common to a number of Arab countries. The project is being implemented in close co-operation with the Federation of Arab Scientific Research Councils (FASRC) and a number of Arab regional and national research centres.

2. The implementation of the project was conceived in three stages: the preparatory stage, in which the priority research areas were identified; the project formulation stage, in which concrete project proposals for conducting co-operative scientific research in priority research subjects were formulated; and the marketing stage, in which the project proposals formulated are to be marketed. The first two stages have now been completed. With regard to the third, more than one party will be responsible for implementing it. The project moreover, is being jointly conducted by the Economic and Social Commission for Western Asia (ESCWA) and FASRC.

3. This report discusses the reasons for selecting the subject of co-operation in scientific research in the region; how the areas of co-operation were chosen; the priority research fields; how they were defined; and the strategy followed in formulating the project proposals for co-operative research in these fields. The report ends by making a number of suggestions about the role member States can play in putting the project proposals for co-operative scientific research into operation.

4. The promotion of co-operation in the field of science and technology among Arab countries in general, and among ESCWA countries in particular, is one of the main aims of the science and technology programme of ESCWA.[1/] Indeed, the promotion of scientific and technological co-operation has been the focus of the work of the programme since it was established in the mid-1970s.

5. The promotion exercise in question began in 1985 when external funds were made available to ESCWA to support co-operation in the field of science and technology between ESCWA member States.

6. The first exercise was to hold extensive consultations with the concerned people and government officials in the region in order to establish the order of priority of the issues and subjects being considered for promotion. These consultations revealed that there was general concensus that greater importance needed to be attached to the issue of co-operation in scientific research. It was widely agreed that several Arab and ESCWA countries face a number of serious problems that have firm scientific roots which transcend national borders, and which can only be dealt with efficiently through co-operation in scientific research.

7. FASRC was one of the regional institutions that were consulted and, as will be seen, it has played an effective role in the project. FASRC already made serious efforts in this regard. In 1982, it organized a conference in

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1/ See the Economic and Social Commission for Western Asia, Draft Programme of Work and Priorities for the Biennium 1988-1989 (Baghdad, 1987). (E/ESCWA/C.1/14/8).

which a large number of Arab scientists defined subjects for scientific co-operation. An extensive list of scientific subjects covering a variety of scientific issues and problems was drawn up and identified for possible co-operation.

8. However, between 1982 and 1985, when the present work was first initiated, nothing was done to implement the research projects recommended by the FASRC conference.

9. Therefore, it was first necessary to ascertain why nothing had been done since 1982 to put these recommendations into effect and secondly, whether the Governments concerned: (a) were still interested in co-operation in scientific research; (b) willing to participate in the implementation of co-operative research; and (c) had a clear list of priorities for implementing scientific research.

10. A questionnaire to this effect was sent to five of the main scientific research centres in the region. These centres were requested to state their official policy towards co-operation in scientific research; their preferred field of research; and the type of strategy they would like to adopt for the implementation of co-operative research.

11. In addition to their position papers, the heads of the scientific research centres were also asked to indicate their readiness to participate in a week-long expert group meeting at ESCWA headquarters. The aim of this meeting was to work out any differences in approach and agree on the list of priorities for co-operative research as well as to define the role that ESCWA and FASRC would play to support the co-operation process (see annex).

12. This meeting took place in October 1985. It was attended by the heads or high-ranking officials of all five research centres (see next paragraph). Prior to attending the meeting, each of the research centres also prepared an extensive position paper along the lines mentioned earlier.

13. The research centres represented at the meeting were: Academy of Scientific Research and Technology (Egypt), the Kuwait Institute for Scientific Research (Kuwait), the Royal Scientific Society (Jordan), the Scientific Research Council (Iraq) and the Saudi Arabia National Centre for Science and Technology (Saudi Arabia). Representatives of FASRC and ESCWA were also present.

14. The meeting succeeded in defining eight priority research areas for co-operation (see below). The participants also agreed that FASRC and ESCWA should work closely together to convene a series of expert group meetings in which feasibility project proposals for each of the subjects selected would be prepared. It was also agreed that a different strategy might have to be followed when implementing each of the co-operative research projects. In addition to their role in formulating the project proposals, FASRC and ESCWA were also requested to co-operate in marketing the project proposals and to raise the funds needed for their implementation. Co-operation between the two organizations in all of these aspects has continued.[1/] FASRC was made responsible for circulating the drafts of the project proposals among member countries and soliciting comments, as well as ascertaining the extent of their

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1/ A formal letter of agreement on co-operation between the two organizations was signed on 10 June 1980.

interest in participating with the aim of enlarging the circle of co-operation. ESCWA was given the tasks of: (a) organizing and financing the expert group meetings to prepare the project proposal for each of the eight priority research areas; and (b) marketing the projects, persuading international funding organizations to support their implementation. FASRC was made responsible for contacting Arab regional funding agencies.

15. The October 1985 meeting, mentioned earlier, defined the following eight priority research areas:

(a) Utilization of solar energy for agricultural development;
(b) Desertification control;
(c) Improving wheat productivity under stress environments;
(d) Aquaculture (fish-farming);
(e) Environment (pollution);
(f) Industry (industrial corrosion);
(g) Health and nutrition (nutritional value of arabic food);
(h) Remote sensing.

As the reason for preparing the project proposals was to promote co-operation, the failure to implement the recommendations made at the FASRC conference showed that this was partly owing to the fact that a vital element was missing from the recommendations: research activities need financial and institutional support. In order to promote the former, concrete project proposals were needed to raise the funds required. The recommendations of FASRC did not specify exactly who was responsible for implementing this research, how the projects were to be implemented and where the necessary funds were to come from. The project proposals drawn up in the October 1985 meeting deal with these points.

16. The strategy for organizing the expert group meetings that formulated the project proposals in each of the above-mentioned priority areas was also conceived on the basis of co-operation. Thus, while ESCWA was responsible for organizing and financing the expert group meetings, the national research centres contributed the services of their experts in each field, while the regional research centres and some of the national centres hosted week-long meetings in each case. They provided secretariat facilities, as well as the services of their experts and researchers. The contribution of FASRC, as was mentioned earlier, was to attend the meetings and distribute the draft project proposals to the member States, solicite their comments and approach the Arab regional funds for support. These efforts are still continuing.

17. Among the regional centres, the International Centre for Agricultural Research in Dry Areas (ICARDA) and the Arab Centre for the Study of Arid Zones and Dry Lands (ACSAD) were actively involved. Among the national centres, the Academy of Scientific Research and Technology of Egypt, the Kuwait Institute for Scientific Research and the Royal Scientific Society of Jordan each hosted a meeting and provided generous institutional support. Altogether, more than 60 Arab scientists participated in the expert group meetings that formulated the projects; their scientific contribution constituted, in effect, a donation from their respective national research centres.

18. The following research project proposals were prepared:

(a) The use of solar energy for agricultural development. This includes:

(i) Crop-drying utilizing solar energy;
(ii) Plant production utilizing solar energy;
(iii) Water pumping from deep wells utilizing solar energy;
(iv) Desalination of underground water utilizing solar energy;

(b) Handbook for the climatic design of buildings in the Arab region;
(c) Research programme on integrated desertification control;
(d) Improving wheat productivity under stress environments;
(e) Aquaculture (fish-farming);
(f) Research into the control of mobile sand and protection techniques;
(g) Development of an indigenous capability in remote sensing technology through the provision of relevant education for educators.

19. The first project proposal is an umbrella project that covers four sub-projects on the utilization of solar energy in: plant production; the desalination of underground water; pumping water from deep wells; and crop-drying. As is well-known, not all Arab countries produce energy cheaply. A number of Arab countries face formidable problems in energy transportation. As a result, there is a real need to develop the use of solar energy in agricultural activities under the above-mentioned subtitles.

20. The second project is entitled "Handbook for the climatic design of buildings in the Arab region". The present increasing demand for housing in the region, including non-oil-exporting countries, has resulted in the utilization of inappropriate building materials and inefficient equipment and building designs, particularly with respect to the use of energy. At present, the utilization of energy in the building sector is extremly wasteful. Between 25-60 per cent of the total energy used in buildings goes on climatic control. If marginal conservation techniques alone were applied, this amount could be reduced by almost 50 per cent. The aim of this project is to conduct the type of scientific research needed to make building materials and the design of both commercial and private buildings in the region efficient in terms of energy consumption.

21. With regard to the project to improve the productivity of wheat, wheat is a strategic crop in the region; about 50 per cent of the annual area under cultivation is sown with wheat. Nevertheless, the region is one of the world's highest wheat importers. This is because the yield from wheat in the region is one of the lowest in the world. Most wheat production takes place under the physical stresses of drought, heat, cold and salinity. There are also biotic stresses such as disease, insects and low inputs. In addition to all these factors, crop management is poor. It was recently discovered that salinity is a growing problem in most of the areas where wheat is produced, regardless of whether they are fully or only partially irrigated. This is especially true of those areas where wheat is irrigated with brackish water. As a result, the problem of salinity has increased. Therefore, the region now needs to conduct research on soil reclamation and the development of saline-tolerant plants and wheat varieties and techniques that produce better results in a harsh environment.

22. The fourth project deals with the serious and growing problem of desertification. This problem presents a formidable challenge to the development efforts of many countries in the region. The project has multiple and closely interrelated objectives. It is based on a carefully conceived plan for group action where scientific research constitutes the core activity. The research will cover the fields of agriculture, human settlements and the environment. The project was prepared in co-operation with one of the regional centres on desertification (ACSAD) and with countries suffering from desertification. They have all pledged to make a contribution to implement this project.

23. The fifth project, entitled "Aquaculture", aims at mobilizing local technological capabilities and resources in order to make full use of fish as an important source of food in Arab countries. The project is designed to make efficient use of the facilities that already exist in the region, and to assist least developed countries like the two Yemens to make effective use of the new opportunities to increase the output of newly created fishing industries.

24. The sixth project entitled "Research into the control of mobile sand and protection techniques" deals with the problem of sand movement. The Arab region currently faces serious problems as a result of the encroachment of deserts and the movement of sand over fertile soil, human settlements and development projects. The project aims to investigate the ways and means of: protecting infrastructure established for human settlements, roads, canals and industrial and agricultural projects from the serious damage caused by sand encroachment; conserving the soil and preventing its degradation; stabilizing mobile sand and restoring vegetation cover. The project will also help to enhance current scientific and technological capabilities to deal with sand movement and desertification.

25. The seventh project is entitled "Development of indigenous capability in remote sensing technology through the provision of relevant education for educators". Remote sensing is an advanced technology with wide potential applications in the region. The extent to which the region makes use of this technology depends, inter alia, upon the scientific and technical capabilities of the people and the development and implementation of relevent research and development programmes at the regional level. The project will investigate the ways and means of designing, co-ordinating and introducing appropriate education and training programmes in remote sensing in the existing curricula of established institutions in Arab countries and, wherever possible, will harness existing local manpower resources and infrastructure. This will be carried out through the provision of relevant education and teaching techniques for educators.

26. The comments and responses obtained from member States concerning these projects have been very encouraging. There is a great desire and willingness on the part of Governments and scientists to implement these projects. For all of the projects concerned, member States have shown their willingness to participate by committing their institutions and researchers to the projects. External funds are now needed to complement these resources. The total funds needed to implement all of these projects amount to less than 17 million United States dollars. Member States should therefore make a concerted effort to persuade the regional Arab banks to support the implementation of these useful research projects.

Annex

SAMPLE QUESTIONNAIRE SENT TO THE MAIN RESEARCH CENTRES IN THE ESCWA REGION

ESCWA is planning to launch a project entitled "Scientific and technological co-operation among countries of Western Asia". For the implementation of this project, ESCWA is contacting five well-established scientific research centres in the region (see below) to inquire about their readiness to prepare a position paper on the scientific and technological research areas which in their view lend themselves to co-operative research.

The preparation of the position paper should take between three to four weeks, ESCWA is willing to pay the sum of $4,000 for the preparation of each paper.

The position paper should contain answers to the following questions:

1. Is the centre currently carrying out research in co-operation with other institutions?

2. Is the centre planning to conduct scientific and technological research in co-operation with other national, regional or international institutions?

3. Does the centre know of any scientific technological projects which would be suitable for co-operative research work (sufficient information should be given here)?

4. Does the centre know of any important scientific and technolgical research areas in the region which could only be dealt with efficiently through co-operation between a number of research centres?

5. Does the centre have any specific modality or approach for conducting co-operative research work?

6. Does the centre have a mechanism for institutionalizing co-operation?

7. Does the centre apply (or is it ready to consider the application of) reciprocity for the exchange of skills and expertise with institutions that co-operate in research work?

The position paper should also include proposals for specific research projects and a plan of action for their implementation. In the plan of action the co-operative research areas or projects should be clearly identified, and the modality and approach to be used, as well as the type of mechanism for institutionalizing the co-operation and the type of reciprocity envisaged should all be discussed.

In addition to paying for the preparation of these papers, ESCWA will also arrange an expert group meeting to discuss the position papers and plans of action submitted. Concrete suggestions and projects for co-operative research in the region will be discussed in this meeting. ESCWA will incur all the expenses of this meeting. The time and venue of the meeting will be determined by the parties concerned.

The following institutions have been contacted:

(a) Kuwait Institute for Scientific Research (Kuwait).
(b) Royal Scientific Society (Jordan).
(c) Scientific Research Council (Iraq).
(d) Academy of Scientific Research and Technology (Egypt).
(e) Saudi Arabia National Centre for Science and Technology (Saudi Arabia).

We would appreciate receiving your reply within the next two to three weeks to enable us to initiate the projects as soon as possible.