CGIAR G-12 - IBPGR - Documents Vol. 1

AGPE: IBPGR/74/6
July 1974

G-12 - Document
w/Ltr 9/14/79.

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

First Meeting

Rome, Italy, 5-7 June 1974

DRAFT REPORT

IBPGR SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome 1974

AGPE: IBPGR/74/6
July 1974

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

FIRST MEETING

Rome, Italy, 5-7 June 1974

DRAFT REPORT

1. The first meeting of the International Board for Plant Genetic Resources (IBPGR) was held at the headquarters of FAO in Rome on 5-7 June 1974. Mr. R.H. Demuth, Chairman of the Subcommittee on Genetic Resources of the Consultative Group on International Agricultural Research (CGIAR), was in the Chair, pending election of the Board's Chairman.

2. The meeting was attended by all members of the Board. The Secretariat was provided by FAO. A list of participants is attached (Appendix I).

3. A statement of welcome was presented by Dr. O.E. Fischnich, Assistant Director-General of the Agriculture Department of FAO.

4. Mr. Demuth presented an introductory statement on the origins of CGIAR and IBPGR, and the relationships of the Board to CGIAR and its Technical Advisory Committee (TAC), a summary of which is attached (Appendix II). He thereupon relinquished the chair to Dr. de Bakker, Chairman of the Planning Committee of the Board.

5. Dr. de Bakker welcomed Board members and expressed satisfaction that all had accepted membership. He reported the following activities of the Planning Committee: consultations with the Director-General of FAO on the election of a chairman; approving the draft of a Letter of Agreement between donor members of the CGIAR and FAO under which contributions to support the Board's activities would be administered by FAO as a Trust Fund for the Board; and arranging the first meeting of the Board.

Election of Chairman and Vice-Chairman of the Board

6. Dr. de Bakker informed the Board that he had conveyed to the Director-General of FAO the recommendation in paragraph 21 of the Report of the second meeting of the Subcommittee on Genetic Resources that Mr. Demuth be elected Chairman of the Board, and that the Director-General had endorsed this recommendation. Mr. Demuth was thereupon unanimously elected as Chairman of the Board and resumed the chair. Dr. de Bakker was unanimously elected Vice-Chairman.

Adoption of the Agenda

7. The Provisional Agenda was amended by the addition of two items, "Budget of the Board and Representation at International Centres Week" and "Relationship with UNEP", and as so amended was adopted (Appendix III).

Constitution of the Board

8. The Board agreed that the Secretariat should prepare a consolidated document incorporating (i) the terms of reference of the Board as established by the Subcommittee on Genetic Resources, and (ii) basic rules and procedures established either by that Subcommittee or by decision of the Board itself. In this connection, it was decided that nine members of the Board will constitute a quorum; that English will be the working language but that at present interpretation at Board meetings will be provided in English, French and Russian; and that five members of the Board plus the ex officio FAO member will constitute the Executive Committee of the Board which will act for the Board in the interim between Board meetings.

9. It was further decided that the Board will meet at least once a year, at FAO headquarters in Rome unless otherwise agreed by the Board. Dr. Brezhnev invited the Board to hold a future meeting at the N.I. Vavilov All-Union Scientific Research Institute of Plant Industry in Leningrad. Dr. Sastrapradja proposed that a future meeting should be held in a developing country, for example, in southeast Asia.

Membership Term of Individual Board Members

10. The membership term was determined by lot as follows: to serve until 31 December 1975: Messrs. Bouvarel, Brezhnev, Bunting

and Majisu; to serve until 31 December 1976: Messrs. Creech, Kugler, Roberts and Taysi; to serve until 31 December 1977: Messrs. de Bakker, Fischbeck, Joshi and Kåhre and Mrs. Sastrapradja.

Relationship of the Board to FAO and its Panels of Experts on Plant Exploration and Introduction, and on Forest Gene Resources

11. Dr. Albani summarized the FAO Regular Programme functions of the Crop Ecology and Genetic Resources Unit of the Plant Production and Protection Division and the role of the Secretariat to the Board which is located in this Unit. He also advised the Board of the functions of the two Panels of Experts which had been established to advise FAO in the planning and coordination of the Organization's efforts in the exploration, conservation, evaluation, documentation and utilization of plant genetic resources; the preparation of short-term and medium-term action programmes in the field of plant genetic resources work; and the exchange of plant material and genetic information between member countries. He suggested that the Board might consider the panels as "consultative" bodies which could be requested to study specific problems or proposals for action.

Channels for Proposals to the Board

12. The Board decided that it would receive proposals from the CGIAR and TAC, any international or regional research centre

within the international network, and any public international agency within the UN system, including FAO. Proposals to the Board from private groups or companies will be considered only if made through and endorsed by FAO or the proposer's government. Such proposals will not be accepted unless any benefits derived from them are freely available to all interested parties. Proposals will be submitted through the Secretariat, which will present them to the Board with its analysis.

Financial Arrangements

13. The Chairman referred to the proposed Letter of Agreement between donor members of the CGIAR and FAO for the establishment of a Trust Fund and thanked the Director-General of FAO for agreeing that FAO would administer this Trust Fund in 1974 without charge.

14. Concerning the Rockefeller Foundation's contribution to the Trust Fund, Dr. Albani explained the need to apply to the U.S. Treasury Department for tax-exempt status for the Board. The Board authorized the Secretariat to initiate action in filing an application for tax-exempt status. The Board also formally approved the action taken by Dr. Creech in signing a copy of the letter to him from the Rockefeller Foundation, dated 26 March 1974, whereby he provided the Rockefeller Foundation with certain assurances on

behalf of the Board which enabled the Foundation to make a grant of $15,000 towards the cost of the first meeting of the Board.

Programme of the Board

15. As a background for discussion of the Board's programme, Dr. Bunting presented a paper co-authored by Erna Bennett and Mr. Sykes of FAO's Crop Ecology and Genetic Resources Unit and by Dr. Bunting, entitled "Plant Genetic Resources: A Historical Survey" (Appendix IV).

16. A Working Party (Dr. Bunting, Chairman; and Drs. Creech, de Bakker, Joshi and Pichel) was designated to formulate preliminary proposals for a programme of action which might be undertaken by the Board in 1975 and later years. After considerable discussion of the proposals so formulated, the Board agreed to undertake or endorse the programme and pre-programming activities described in the following paragraphs of this report.

17. Information Storage and Retrieval System. The Board approved and strongly supported the development, by a team under FAO auspices, of a Communication, Information and Documentation System (CIDS) for the storage and retrieval of information on genetic resources. The Board agreed that it would provide or recommend financial support for the continuation and expansion of this work in 1975.

18. Regional Centres. The Board heard reports on plans for the initial establishment or development of three regional genetic resource centres to which the Beltsville meeting had recommended priority attention:

(a) Izmir: With respect to this centre, the Board adopted the following statement:

> "The Board was informed of the Swedish Government's intention as an emergency action to continue its support for the genetic resources work of the Agricultural Research and Introduction Centre at Izmir, which is designed as a regional effort for six countries 1/ in the Near East and Mediterranean area. In principle Sweden is ready to make funds available to CGIAR for this kind of activity, but would like to leave it to the Board to recommend the detailed use of such funds. While the Board has had no opportunity to consider the programmes of the centre in detail, it notes the priority given to the genetic resources work of this centre by the Beltsville group, the FAO Panel of Experts and TAC, and recognizes that the objectives of the centre are consistent with those of the Board. The Board intends to examine the Izmir programme

---

1/ Afghanistan, Iran, Iraq, Pakistan, Syria and Turkey

in depth in the near future, but in the meantime, it would welcome action by the Swedish Government in providing continuing finance for Izmir."

The Board requested Professor Bunting, Dr. Kåhre and Mr. Pichel to review the situation at Izmir in September 1974 and report to the next Board meeting.

(b) Ethiopia: Dr. Fischbeck reported on the plans for a centre in Ethiopia to be financed bilaterally by the Federal Republic of Germany. The Board welcomed this report and asked Dr. Fischbeck to convey to the German authorities the suggestion that scientific representation from the Board might appropriately be included on the Ethopian centre's managing board. The Board also felt that consideration should be given to affiliating related activities in other East African countries with the work to be conducted in Ethiopia. In order to develop these relationships, the Board recommended that Dr. Majisu be invited to attend the meetings of the managing board of the Ethiopian centre and to report to the Board on the regional implications of this centre.

(c) Turrialba: Dr. Fischbeck reported on the progress being made in negotiating the establishment of a regional centre for Central America at Turrialba, which would also be financed bilaterally by the Federal Republic of Germany. The Board

expressed general support for this enterprise, but indicated some concern that the Turrialba centre might be trying to deal with too many crops in too short a period of time, and that this might result in some duplication of genetic resources work being undertaken or planned elsewhere in the region. The Board requested Drs. Roberts, Kugler and Creech to visit Turrialba, as a committee of the Board, to convey this message and to prepare a report for the Board on the Turrialba programme for consideration at the Board's next meeting.

19. Bari. The Board noted the potential importance of the Germplasm Laboratory at Bari for genetic resources work in the Mediterranean. It requested its Secretary, Mr. Pichel, to discuss with the Bari Centre the possibility of obtaining that institute's cooperation in coordinating further genetic resource explorations in the west and central Mediterranean regions.

20. Asian Regional Centres. Regional programmes were proposed for South Asia by the Indian Agricultural Research Institute and for South-East Asia by the National Biological Institute at Bogor in Indonesia. Dr. de Bakker agreed to organize and lead a fact-finding mission to visit these regions, to examine the proposals in depth in consultation with Dr. Joshi and Dr. Sastraprajda, and to prepare a report thereon for early consideration by the Board.

21. Specific Crops. With regard to specific crops, the Board took the following actions:

(a) Wheat: The Board noted that, although wheat is one of the major cereals for human consumption, there is need for an inventory of present collections, for increased exchanges of material and information and for identification of gaps in present collections. Accordingly, the Board decided that it would be desirable that a symposium on wheat be held in 1975 to further these objectives and to formulate a plan of action. The Board accepted the invitation of Dr. Brezhnev to have the Vavilov Institute host this symposium in Leningrad, possibly in June.

(b) Groundnuts: The Board was informed by Dr. Roberts that the Rockefeller Foundation was discussing with the University of Florida the possibility of organizing a symposium at that university in 1975 on the germ plasm of groundnuts, with the participation of experts from the principal groundnut areas of the world. The Board welcomed this initiative and requested Dr. Roberts to keep it informed of developments.

(c) Rice: The Board noted that the situation with respect to rice was reasonably satisfactory in view of the emphasis put on genetic resources work by IRRI. Professor Bunting and Dr. Joshi were requested to visit IRRI and report to the Board on whether

further work was necessary to fill gaps in collections and on what, if any, action might be needed by the Board in connection with either coordination or financing.

22. Emergency Collections. The Board took note that the United Nations Environment Programme had made available to FAO a substantial fund for emergency genetic collections. The Board endorsed a programme proposed by FAO for such an emergency collection in Tunisia and Algeria. The Board also proposed to FAO that it organize a similar emergency collection in the Sahelian Zone, with emphasis on sorghum and millets, and forage grasses, but not neglecting other crops.

23. Japan and China. The Board took note that Dr. Creech intended to visit Japan and the People's Republic of China. He was requested to contact the important genetic resources centres in these countries and to report to the Board on possible means for obtaining their participation and cooperation in the international work which the Board is charged with developing.

24. Training. The Board considered a training proposal received from the University of Birmingham, U.K. Although this proposal received some support, the Board decided not to provide the requested financing at the present time. In part, this decision reflected the view that funds mobilized within the CGIAR framework were not intended to be used to finance capital expenditures

in a developed country. In part, it reflected the view that, before any programme of training was endorsed by the Board, the Board needed better estimates than are presently available of the requirements for trained manpower in the proposed international network, and a careful analysis of how and where those requirements might best be met. The Board requested Dr. Kåhre, with the help of Professor Bunting and of the Secretariat, to examine this whole subject in some depth, not only in relation to the Birmingham proposal but also in relation to other means of meeting training requirements, and to report back to the Board at its next meeting.

25. Requests to the Secretariat. The Board requested the Secretariat to initiate action or conduct studies on the following items:

(a) To estimate the training requirements at different levels, to compile an inventory of existing training facilities in genetic resources at universities and institutes, and to make the information available to Dr. Kåhre and Professor Bunting in connection with their study of training (see paragraph 24 above).

(b) To compile, in consultation with AGRIS, as complete a bibliography as might be available on genetic resources material.

(c) To advise the Board on the desirability of a central library and how it might best be assembled.

(d) To initiate preparation of an inventory of the major world collections of the most important food crops and of the existing coordinating committees or organizations for these various crops, and for forestry species; and to prepare a general inventory of existing collections of food legumes.

(e) To obtain information on the rules and conventions of plant breeders' rights and to assess, for the Board, how they may affect the activities of the Board.

26. The Board noted the following items which would be discussed in the future: forestry proposals; quarantine requirements; collection and evaluation of forage legumes in Latin America.

Relationship with the United Nations Environment Programme (UNEP)

27. The representative of UNEP, Professor Olembo, reported on the activities which UNEP is undertaking in the genetic resources field. The Board welcomed the speed and generosity with which UNEP had provided FAO with $203,000 over a two-year period for emergency collection of threatened genetic resources material and for training activities. The Board instructed the Secretariat to undertake discussions with UNEP with a view to developing appropriate relationships between that body and the Board. To this end, the Board decided to invite UNEP to be represented as an observer at future meetings of the Board.

Representation at International Centres Week

28. The Chairman and Secretary were designated by the Board as its representatives at International Centres Week in Washington in July to present the programme of the Board. It was agreed that it was not possible, by Centres Week, to present a detailed budget for the Board for 1975.

Budget

29. The Board requested the Secretariat to prepare detailed estimates of the cost of the various programme and pre-programming activities approved by the Board and, on the basis of those estimates, to prepare a budget for 1975, not exceeding $1 million, for consideration by the Executive Committee. The Board authorized the Executive Committee to submit the budget, as approved by it, to the CGIAR for consideration at its meeting in November 1974. The Board expressed the hope that the CGIAR would approve its programme and budget for 1975 subject to subsequent, rather than the normal prior, review by TAC of the priority and technical merits of proposed programme activities.

30. The Board envisaged that the Secretariat may need to be strengthened in 1975 to implement the Board's programme and asked that it present appropriate proposals to the Executive Committee.

31. The Board authorized the Executive Committee to make commitments out of the central fund in support of programmes and in the execution of policies approved by the Board, up to $25,000 for any single activity.

Dates and Places of Next Meetings

32. The Executive Committee will meet on 23-25 September 1974 in Rome.

33. The second meeting of the Board will take place from 15 to 17 January 1975 in Rome.

APPENDIX I

LIST OF PARTICIPANTS

Chairman:

Mr. R.H. Demuth
Surrey, Karasik & Morse
1156 15th Street, N.W.
Washington, D.C. 20005
U.S.A.

Members:

Dr. F. Albani
Director
Plant Production and Protection Division
FAO, Rome, Italy

Mr. P. Bouvarel
Inspector General of Agricultural Research
INRA
Champenoux 54270
Einville, France

Acad. D.D. Brezhnev
Director
N.I. Vavilov All-Union Scientific Research Institute of Plant Industry
44 Herzen Street
Leningrad, U.S.S.R.

Dr.J.L. Creech
Director
U.S. National Arboretum
Washington, D.C. 20002
U.S.A.

Dr. G. de Bakker (Vice-Chairman)
General Director
Agricultural Research
Ministry of Agriculture and Fisheries
le van den Boschstr. 4
The Hague, Netherlands

Prof. Dr. G. Fischbeck
Institut für Pflanzenbau und Pflanzenzüchtung
8050 Freising-Weihenstephan
Federal Republic of Germany

Dr. A.B. Joshi
Director
Indian Agricultural Research Institute
New Delhi 12, India

Professor I. Nilsre
Director
Swedish State Seed Testing Institute
S-17173 Solna, Sweden

Dr. W.F. Kugler
C.P. 351
99.100 Passo Fundo
Rio Grande do Sul, Brazil

Dr. B.N. Majisu
Director
East Africal Agriculture and Forestry Research Organization (EAAFRO)
P.O. Box 30148
Nairobi, Kenya

Dr. L.M. Roberts
Associate Director
Agricultural Sciences Program
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020, U.S.A.

APPENDIX I
(Continued)

Members (Continued):

Dr. Setijati Sastrapradja
Director
National Biological Institute
P.O. Box 110
Bogor, Indonesia

Professor V. Tayşi
Department of Agroecology and General Plant Breeding
Ege University
Izmir, Turkey

Secretary:
Mr. R.J. Pichel
Chief, Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO, Rome, Italy

Assistant Secretary:
Mr. J.T. Sykes
Agricultural Officer
Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO, Rome, Italy

Observers:

UNEP
Professor R.J. Olembo
United Nations Environment Programme
P.O. Box 30552
Nairobi Kenya

FAO
Dr. O.E. Fischnich
Assistant Director-General
Agriculture Department

Mr. R.L. Willan
Chief, Afforestation Section
Forest Management Branch
Forest Resources Division

TAC Secretariat
Mr. B.N. Webster
Assistant Secretary
Technical Advisory Committee
FAO, Rome, Italy

Dr. D.J. Rogers
Senior Genetic Resources Documentation Officer
Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division

APPENDIX II

ORIGINS OF THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH, AND THE INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

R. H. DEMUTH

The creation of this International Board for Plant Genetic Resources (IBPGR) is the most recent accomplishment and this Board is the newest member of the family of a unique institution known as the Consultative Group on International Agricultural Research (CGIAR). All members elected to this Board have accepted membership indicating the importance that is attached, by them and the Consultative Group, to the work of the Board.

Origins of the Consultative Group on International Agricultural Research (CGIAR)

First, an explanation should be given of why CGIAR was formed, how it is composed and the way it operates. Why it was formed is quite simple. Beginning in the 1960's, great efforts were put into modernizing agricultural techniques. Under the leadership of the Ford and Rockefeller Foundations, a strategy was developed to contribute to this end; a critical mass of scientific talent was assembled in a few places in the developing countries to launch a multi-disciplinary attack sharply focussed on the most urgent technological problems facing agricultural production in the Third World. The means devised to implement this strategy was the international agricultural research and training center, for example IRRI and CIMMYT. By 1970, $9-million a year was being invested in these centers.

There was a need to expand these centers and to create new ones, and a corresponding need to broaden their base of support. The amount of money required was beyond the financial capacity of the Foundations, and the mobilization of funds from numerous donor governments seemed to them not an appropriate function for private agencies. Accordingly, the International Bank for Reconstruction and Development (IBRD), FAO and UNDP co-sponsored the creation of CGIAR to mobilize such broadened support. Essentially it seeks agreement among its members on what international agricultural research programs should be considered as having priority, on the extent of the funds to be provided each year, and on how the burden of financing might be shared among the donor governments and agencies. The Consultative Group is composed of 13 donor governments; 7 international and regional development assistance agencies (FAO, IBRD, UNDP, 3 regional banks, and EEC); 4 private and public foundations and 10 developing countries, 2 from each of the five major developing regions of the world. In its mixed composition of public and private organizations, of donor and recipient countries, and of regional and international agencies, the Consultative Group is a unique institution.

CGIAR is a consultative organization as the name implies. It has no funds of its own, nor any authority to make decisions binding on its members. Yet, despite these limitations, and despite the size and diversity of its membership, the Group has thus far succeeded in reaching very general agreement on the issues with which it has grappled. Perhaps the best indication of this is that funding for the international centers rose from $9-million for 1971 to $15-million for 1972, $24-million for 1973 and $32-million for 1974. For 1975, it is estimated that requirements will be well over $40-million.

The family of centers supported by members of CGIAR numbers eight. In addition to IRRI, CIMMYT, CIAT and IITA which were in existence when CGIAR was created, the family now includes the International Potato Center (CIP), the International Center for Research in the Semi-Arid Tropics (ICRISAT), the International Laboratory for Research in Animal Diseases (ILRAD), and the International Livestock Center for Africa (ILCA). This Board today becomes the ninth member of the family. Other initiatives are in process: for a Near East Institute and a possible Fertilizer Institute.

The Consultative Group is assisted in its work by a Technical Advisory Committee, known by its acronym as TAC, composed of six scientists from developed countries and six from the developing countries under the chairmanship of Sir John Crawford of Australia. TAC considers the technical merits and priority of all proposals put forward for financing and advises the group on the principal research gaps which it believes need to be filled. The CGIAR Secretariat is supplied by the World Bank; the TAC Secretariat is supplied by FAO, with costs shared by FAO, IBRD and UNDP.

Origins of the International Board for Plant Genetic Resources

Concern was expressed by TAC at the erosion of the world pool of germplasm represented by primitive cultivars and wild or weed species. TAC convened an Ad Hoc Working Party of leading scientists to prepare "an action programme for the collection, evaluation and conservation of genetic resources for future use". This Working Party met at Beltsville under the chairmanship of Sir Otto Frankel in March, 1972. Prof. Brezhnev, Dr. Creech and Prof. Taysi were among the scientists who attended the Beltsville meeting.

The Beltsville Group proposed the creation, over a period of five years, of a network of genetic resources centers organized as follows:

(1) A Coordinating Committee, with a Central Staff as its executive arm, to provide overall guidance and coordination for the effort;

(2) Nine regional genetic resources centers, each to have a gene bank and each to be in charge of a regional network of collaborating national centers, which would be concerned chiefly with exploration, short-term conservation and the rejuvenation of the genetic stocks stored in the regional center;

(3) A series of Crop-Specific Centers - consisting, for the most part, of the international agricultural research institutes sponsored by CGIAR, such as IRRI for rice, ICRISAT for millet and sorghum, CIMMYT for wheat and corn, and CIP for potatoes.

The general lines of the Beltsville report were endorsed both by the Technical Advisory Committee and by the Consultative Group, but some revisions were made and the proposal raised a number of organizational questions which had to be sorted out before final approval was given. The major revisions were three:

(i) TAC felt that the establishment of nine regional centers over a five-year period was too ambitious and recommended that this be reduced to three in the first instance, with the need for the others to be reviewed in the light of experience;

(ii) TAC also added a provision for information exchange and data storage and retrieval which had been omitted from the Beltsville proposal; and

(iii) A provision was included that an annual report on the genetic resources programme should be sent to TAC and to the Consultative Group.

The organizational issues were somewhat more complicated. In the first place, a number of members of CGIAR, who are also major contributors to FAO, felt that the coordinating functions outlined in the Beltsville report were so closely related to FAO's basic responsibilities that FAO should be charged with providing the central coordinating staff and that the costs of this staff should be financed out of FAO's regular budget. CGIAR asked the Director-General of FAO to make provision for this in his budget and the Director-General, after careful consideration, and despite very substantial financial constraints under which the Organization was then operating, agreed to do so. As a result, there is included in the FAO regular budget for the 1974/75 biennium an item of $350,000 for the coordinating staff. In effect, this permits the addition of three professional officers - two seniors and one more junior - to the Crop Ecology and Genetic Resources Unit of the Plant Production and Protection Division. Moreover, the Director-General decided that the work program of the Unit should be reoriented to enable it to undertake the coordinating functions proposed by the Beltsville meeting.

The other set of organizational issues revolved around the question whether the Board or Committee charged with overall supervision of the genetic resources program should be an integral part of FAO reporting to the FAO governing bodies, or should be an independent entity within the Consultative Group framework but with very close links to FAO.

The Consultative Group established a Subcommittee on Genetic Resources, which I was asked to chair, to resolve these issues. After considerable discussion in the Subcommittee and between the Subcommittee and the Director-General and his representatives, there was general agreement on the approach which you will find spelled out in the report of the first meeting of the Subcommittee which took place last October.

The principal elements of this approach are the following: first, this Board was created as an independent entity, reporting to CGIAR through TAC and receiving its funds as part of the CGIAR effort; but, second, the headquarters of the Board were sited at FAO headquarters here in Rome; it was agreed that the FAO Secretariat would provide the Secretariat of the Board, and FAO was given a permanent seat on the Board, although, at the request of the Director-General, the FAO member participates without vote.

The final element of the agreement was that a central fund be created to finance the expenses of the Board, additional secretariat assistance from FAO if needed, and such program activities as the Board might decide could better be financed through such a fund than through bilateral or UNDP financing. A minimum target of $300,000 was set for the central fund for this first year. It is to be administered by FAO as a trust fund without charge, at least for the first year, but disposition of the fund is entirely under the control of this Board.

Donors to the central fund, for the present, are to be Germany, the Netherlands, Sweden and the U.K., the total amount subscribed by them being $225,000. In addition, the Rockefeller Foundation has indicated its

willingness to provide up to $100,000 to support the activities of the Board, but under the provisions of US law applicable to the Foundation, it cannot make a contribution to the central fund unless and until this Board is declared to be a tax-exempt body for purposes of US law.

The initial membership of the Board was selected by the Consultative Group through its Subcommittee on Genetic Resources, at a second meeting of the Subcommittee held in February. I think I can state on behalf of the Subcommittee that, when we had completed our task of selecting this group from about a hundred nominations which had been submitted to us, we felt that, if all of you agreed to serve as you have, we would have established a Board of outstanding talent and with a very good balance of scientific skills and of geographic background. When vacancies occur on the Board, it will be up to CGIAR to fill those vacancies, but it will act only after receiving the recommendations of the Board.

Several other decisions were made by the Subcommittee which are of concern to you. First, although the normal term of membership on the Board is three years, the terms of the initial Board members are to be staggered. Four of you selected by lot will serve until 31 December 1975; four of you will be selected by lot to serve until 31 December 1976; and the term of the remaining members will run until 31 December 1977. Members are eligible for re-election after their term has expired, but they can only serve for two consecutive terms.

Finally, the Subcommittee asked three members of this Board who were also members of the Subcommittee: Dr. de Bakker, Professor Bunting and Dr. Roberts, to serve as a Planning Committee to make arrangements for this first meeting. Dr. de Bakker has served as chairman of that Planning

Committee and I would like to express to him and his associates, as well as to the Secretariat, my thanks, and I am sure the thanks of the members of the Board, for the considerable efforts they devoted to making the arrangements for this meeting.

In conclusion, some explanation should be given of the functions of this Board. Basically, your task, as the Subcommittee viewed it, is to come up with recommendations, covering a period of years, for the establishment and operation of a coordinated network of genetic resources activities. The objectives of this network are set out in some detail in the Terms of Reference for this Board contained in the report of the first meeting of the Subcommittee. The programs recommended by this Board to meet those objectives, although they will have no binding force, are expected, because of the weight of authority of the members of the Board, to influence and guide national institutes engaged in genetic resources work, the international centers in this aspect of their work, the regional centers which the Beltsville Group recommended be created, FAO, and the donor countries in the allocation of their development assistance funds. So far as FAO and the donor governments are concerned, they have indicated their desire for the guidance of this Board and their intention, so far as practicable, to orient their own assistance activities to support the programs recommended by this Board.

Let me make it clear - because there has been some confusion about this - that while the Board is to recommend overall policies and develop long-range programs, and to estimate the annual financial requirements of those programs it is <u>not</u> basically an agency to provide finance itself for those programs. That is a matter for the host governments, for the

the donor members of the Consultative Group and for other sources of finance. The Board, to be sure, has a central fund at its disposal, to finance its own expenses, including consultants, to enable the Board to augment the Secretariat provided by FAO, if that should prove necessary, and to finance some urgent genetic resources activities, falling within the Board's overall program, which for one reason or another may be more suitable for support from the central fund than from UNDP, bilateral aid programs or other sources. But the major part of the financing of the proposed network will be the responsibility of the host countries, and of the donor members of the Consultative Group, not of this Board.

AGENDA

1. Address of welcome by Dr. O.E. Fischnich, Assistant Director-General, Agriculture Department of FAO

2. Introductory statement by the Chairman of the CGIAR Subcommittee on Genetic Resources on:

   2.1 The origins, development and structure of CGIAR

   2.2 The development of the International Board for Plant Genetic Resources, and its relationship to CGIAR and TAC

3. Report by the Chairman of the Planning Committee of the Subcommittee on Genetic Resources

4. Election of Chairman and Vice-Chairman of the Board

5. Adoption of the Agenda

6. Constitution of the Board:

   6.1 The terms of reference and quorum of the Board; working languages; the periodicity and place of its meetings

   6.2 Membership terms of individual Board members

   6.3 Relationship of the Board to FAO and its Panels of Experts on Plant Exploration and Introduction, and Forest Gene Resources

7. Financial arrangements:

   7.1 Funding operations: bilateral contributions and donor contributions to the Board's Central Fund under FAO Trust Fund agreement (Letter of Agreement)

   7.2 Status of Board under US tax laws

8. Programme of the Board:

   8.1 Medium-term programme and discussion of objectives

   8.2 Statements by individual Board members

   8.3 Relationship with UNEP

9. Proposals submitted to the Secretariat of the Board

10. Budget of the Board and representation at International Centers Week

11. Election of the Executive Committee

12. Date and place of next meeting

13. Any other business

APPENDIX IV

AGPE:IBPGR/74/3

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

First Meeting

Rome, Italy, 5-7 June 1974

PLANT GENETIC RESOURCES: A HISTORICAL SURVEY

by

Erna Bennett and Trevor Sykes
(Crop Ecology and Genetic Resources Unit,
FAO, Rome)

and

Hugh Bunting
(University of Reading)

The first meeting of the International Board for Plant Genetic Resources opens a new phase in the history of the relations between mankind and the plants on which we depend for survival and progress. This review is intended to sketch this history and to show how the purposes for which the Board has been established are related to the achievements of the past and the tasks that lie ahead.

The domestication of plants and genetic diversity

Agriculture first appears in the archaeological record, in two widely-separated regions of the earth, about ten thousand years ago. At that time, in South-west Asia men began to supplement hunting and gathering by deliberately cultivating plant species (including wheat, barley, Vicia species, flax/linseed, chickpea) which had previously been gathered. At roughly the same time, in Central America, Phaseolus beans, maize, amaranth and squashes began to be cultivated.

In the new ecological conditions of domestication, heritable diversity began to increase in the cultivated populations. More prolific forms, better adapted to harvesting, and more able than others to succeed in the new conditions, were consciously or unconsciously selected, and variants that would not have survived in wild populations were preserved. In outbreeding taxa, the cultivated forms crossed more or less freely among themselves and with their wild relatives, many of which may well have been weeds in and around the fields, so that the pool of variation was maintained or increased. In different locations, local environmental diversity became reflected in different patterns of heritable diversity in the populations. All this gave rise to an enormous pool of genetic variation, the extent of which is still far from fully known, even in crops like maize and wheat which have been intensively studied.

These features are seen, not only in the archaeological material, but to this day in the crops of traditional cultivators in many less-developed regions of the earth.

Migration of farmers and their crops

Though agriculture soon led, where perennial water supplies were available, to more or less permanent settlement, many early farmers were at least seasonally nomadic, as many are today in north-east Africa and Central Asia. As their numbers increased, supported by increasingly assured supplies of food, agriculture spread widely, during several thousands of years, in both the Old and New Worlds. Trade and navigation further increased the spread. So the early crops of south-west Asia radiated to the Mediterranean basin, to Central and Western Europe, to Central Asia and to China, to Arabia and Ethiopia, and down the Tigris and Euphrates to India and Ceylon, and so to South-east Asia.

Along these routes they may well have come into the hands of people who had already begun to cultivate crops, and certainly many new species were domesticated in these regions. The new domesticates, in their turn, were carried to new regions. So for example, early agriculture in Arabia and Ethiopia led to the domestication of sorghum, bulrush millet, diploid cotton, sesame, niger seed, safflower and castor, which spread not only through Africa but also (in some cases) to India, South-east Asia and the Pacific. In the same way banana/plantain, rice, taro, citrus and other East Asian crops came to Africa.

Similarly in the Americas the early cultivation complex of maize, beans and Cucurbits spread north and south, and tetraploid cotton, peanuts, potatoes, sweet potatoes, tobacco, sunflower, Capsicum peppers and many more were brought into cultivation and spread widely through the continent.

Throughout these vast botanical diasporas new climatic and soil environments, new methods of farming (of which irrigation was the most important), and new relatives, both wild and weedy, all combined to increase the stock of heritable diversity and to produce in each region a characteristic and adapted constellation of crops and crop varieties.

The ages of discovery

The ancient and largely coastwise navigation of the Indian Ocean, which (as Marco Polo describes) linked China, South-east Asia and the East Indian Archipelago, India, Ceylon, the Persian Gulf, the Red Sea, Madagascar and East Africa, was of the greatest importance in dispersing cultivated plants throughout the old World tropics and subtropics, and into the Mediterranean. The more perilous navigation of the open Pacific, on the other hand, does not seem to have carried rice to the Americas or maize to Asia - though a recent archaeological report of peanuts in China may lead us to look afresh at this question.

In a later age, the voyages of Columbus and those who came after him (in search not only of precious metals, gems and silk but also of spices), led to an extremely rapid dispersal of cultivated plants - of Old World crops to the Americas, and particularly of American crops to Asia and to Europe (by the Spanish), and to Africa and India (by the Portuguese). Within 70 years several species had encircled the earth. By the middle of the seventeenth century many of the crops of the Old and New World had become the common property of mankind.

The first flowerings of science in the eighteenth century included the great voyages of discovery and research in which the study and collection of wild and cultivated plants was a constant objective. The classic botanical gardens of the tropics were established, and many species were brought to them to be "acclimatised" for use/or for scientific study. Even slavery played a part. Bligh brought breadfruit from the Pacific to the West Indies to feed African slaves (though with little practical success); and cassava, and the methods of preparing it, were moved from Brazil to West Africa.

The nineteenth century saw great advances on many fronts. The search for crops and varieties for agricultural development became more specific. Thus considerable numbers of local forms of sorghum from Africa and soya from the Far East were introduced into the United States, and in time two major new crops were thus added to American agriculture. Similarly the development of California was served by introductions of vines, olives, citrus, dates and figs. Wallich, after failing to introduce tea from China to India, found it growing wild in Assam and so helped to produce the modern tea industries of India, Ceylon and East Africa. Wickham collected Hevea seeds on the upper Amazon, and through the foresight of Ridley, the Malayan rubber industry was developed from the six trees which were established as a result in the botanic gardens at Singapore.

Though in these ways some crops were carried as far as half a world away from their ancestral homes and wild relatives, they appear, even in inbreeding taxa like soya, to have carried with them sufficient diversity and variability to permit very considerable further evolution, both spontaneous and by deliberate breeding. Thus Africa became an important secondary centre of evolution for the peanut, an almost completely self-fertilised crop whose wild relatives are exclusively South American.

Cytology, genetics and evolution; the rise of plant breeding and agronomy

The intellectual foundations for the next stages of advance were also laid in the nineteenth century in the first generalisations of plant cytology, reproductive biology, genetics and evolution. Supported by these disciplines, plant breeding developed from an art into a science.

Other nineteenth century advances, particularly in soil science, plant nutrition, plant physiology, plant pathology and entomology, have helped, through modern agronomy, to provide greatly improved agricultural environments for improved varieties to exploit.

On these foundations, plant breeding has achieved spectacular successes in the 20th century. Hybrid maize may be the best-known example, but virtually every crop of Western and Northern Europe and of North America can tell a comparable story.

Vavilov: studies of the diversity and evolution of crops in the 20th Century

In the twenties and thirties of our own century, N.I. Vavilov proposed the first great generalisations about the geographical distribution of genetic diversity in cultivated plants. In the course of numerous collecting expeditions within the USSR, in Afghanistan and other mountainous regions to the south and east, in Central and South America, and in Ethiopia, he and his collaborators assembled very large collections of crop varieties. They were intended primarily to help plant breeding and agricultural development in the Soviet Union, but they also provided a broad basis for progress in the study of crop evolution, of which Vavilov's ideas about centres of origin and primary and secondary centres of diversity were a part.

In the past 30 years, other researches have led to adjustments to Vavilov's original bold generalisations. Advances in knowledge of man's cultural history (of which the history of his crops is an essential part) have provided independent scales of reference in time and space against which Vavilov's ideas can be checked. At the same time, taxonomic, genetical, cytogenetical and ecological studies have provided internal evidence of relationships and descent. They have also made it easier to use primitive forms and wild relatives of crop plants in practical breeding programmes.

Since Vavilov's time, many other important explorations have added to our knowledge of variation and descent in crop plants. In the USSR, vast collections (about 40,000 accessions of wheat alone) are now distributed among a dozen centres in different ecological regions. The Rockefeller Foundation, cooperating with U.S. National Science Foundation, the U.S. Department of Agriculture, and local scientists, collected maize varieties throughout Latin America in the "fifties" and "sixties"; the material is maintained in two great collections in Colombia and Mexico. The expeditions of Gregory and Krapovickas have transformed our conception of the genus Arachis, in respect both of cultivated forms and of wild species, of which between 70 and 100 are now known. Some of these carry important types of resistance to pests and diseases. The Cotton Research Corporation completed its first studies of the taxonomy and evolution of Gossypium in 1947, and some important developments in breeding, particularly for resistance to bacterial blight and to jassids, have been based on them. The improvement of sugar cane, Saccharum officinarum, has depended very largely on wild forms and on the traditional cultivated species of China and India. Australian and British wheat breeders have found important sources of disease resistance in collections from Afghanistan and Ethiopia respectively. Japanese and Indian Scientists have assembled thousands of varieties of rice, and the Japanese have collected primitive wheats in many parts of the world. The large American collections of soya have now been brought together at Illinois, where duplicates of a large part of the world sorghum collection are also held. In Australia and in the United States, as in the USSR, national plant introduction services maintain and study large collections of species and varieties, and increase them by exploration.

So far, most of the benefits arising from this work have flowed to the more developed countries, which were first able to develop the scientific and organisational capabilities necessary to realise them. During the past 30 years, however,

important progress has been made in the developing countries also. Each of the International Agricultural Research Institutes concerned with crops holds, and extends by exploration, collection and exchange, a world-wide variety collection for every crop for which it is responsible. CIMMYT is the primary centre within the system for wheat, maize and Triticale; IRRI for rice; CIAT for Phaseolus beans and cassava (manioc); CIP for potatoes and other tuber-bearing Solanum species; IITA for tropical soya, cowpea, sweet potato and yams; and ICRISAT for sorghum, millet, chickpea and pigeon pea. These permanent and well-recorded collections are associated with the soya and sorghum collections in Illinois, and the Andean maize collection in Colombia. Most of them contain not only unimproved indigenous forms, but also their wild and weedy relatives. The improved rice varieties of IRRI, from IR8 to IR24 and beyond, owe their "plant type" to a native variety from Taiwan, and the Mexican and Indian wheats descend in part from the Norin varieties brought from Japan to the Pacific coast of the United States 50 years ago. Certain Mexican native forms of maize have proved to be of particular value in hybrid breeding programmes for many tropical and subtropical regions. Ecuadorian and Peruvian varieties helped to eliminate the threat of maize rust in East Africa 20 years ago.

Germplasm collections of economically important taxa, around the world, must contain at least some hundreds of thousands of accessions. Exchange amongst them is on a considerable scale, and many of the original provenances have as a result become obscure or have even been lost. Many of the entries are certainly duplicates. There is a continuing risk of loss through disease or accident; and of confusion if accession numbers are inadvertently interchanged at harvest or in storage. Internationally accepted systems of description and identification exist for very few taxa, and for even fewer do we have reliable and descriptive world-wide lists of holdings. For all these reasons, the value to mankind of these collections, large as they are, is consequently distinctly smaller than it might be. It will be an urgent task of the Board to help to correct these weaknesses.

Agricultural development and genetic erosion in the twentieth century

This is the great century of agricultural development. In Europe and North America, improved varieties, mechanisation of field operations and new production and protection systems using fertilisers, herbicides and other crop protection chemicals, and often irrigation, have greatly increased yields. Where a ton of grain per hectare was once regarded as satisfactory, two or three tons may now be commonplace and four and even five tons not unusual. Though changing costs of petroleum and energy may well lead to some adjustments of method, the world's needs for food and agricultural raw materials of all sorts will not allow us to relax the continuing search for more productive plant varieties and farming systems.

Since the early days of FAO and of the Rockefeller Foundation's Mexican Programme, more than 30 years ago, agriculture has begun to move in many other parts of the world also - not so fast as we would wish, and with many false starts and not a few humiliating failures, but nevertheless it moves. Technically, far more productive farm systems can be developed in tropical , subtropical and Mediterranean regions, as many individual farmers in such regions have proved.

A central component in all these innovations, in developed and less-developed countries alike, is the widely-adapted uniform "high yielding" variety, spreading rapidly along new roads, and accompanied by new practices (including weed control), and increasingly by at least some degree of mechanisation, for which uniformity is desirable and often essential. The older diverse varieties and land races are sown no more; many of the weedy relatives with which they maintained genetic interchange have been swept away. 40 years ago, 80% of the wheat area of Greece was sown to genetically variable native races. Today 95% of it is sown with new, uniform varieties. A similar though perhaps less complete transformation is reported from Turkey. (Indeed it may well be that some of the centres of diversity owe at least part of their genetical interest, not so much to special ecological and evolutionary features thousands of years ago, as to the remote and inaccessible situations which have separated (some would say protected) them from agricultural development in modern times).

Disasters which lead to crop failures may also extinguish genetic diversity. In Afghanistan in 1970-1 drought, crop failure and famine made it necessary to import many thousands of tons of seed of advanced varieties, since nothing else was to be had. As a result, in areas where the crops were extremely diverse only five years ago, none of the native races of wheat are now to be found.

When such changes occur in the countryside, the further evolution of the crops they affect becomes confined to plant breeding centres. In many breeding stations, however, diversity tends to be limited, and breeding programmes are based largely on older, successful varieties. The more advanced a production variety is, the more tedious and costly it is to recover its special qualities by back-crossing after a cross with an unimproved form from which the breeder wishes to transfer some special attribute. So breeders tend to seek such attributes in forms as closely related to the production varieties as possible. Moreover, since it is both difficult and costly to maintain large living plant collections adequately, not a few plant breeding centres have felt compelled to limit their holdings and to jettison material not essential to their foreseeable practical objectives. As a breeding programme advances, unimproved material which was useful in the earlier stages is all too often neglected and lost and so has to be collected once more when it is wanted again. These pressures may be particularly strong in the commercially-oriented organisations, public or private, which are so important in crop improvement in many countries.

So, as agriculture advances, heritable diversity, which may be important or even essential for further progress, tends to be lost both in the field and at the breeding centre. It is to this paradoxical trend that the emotive term "genetic erosion" has been applied. Regional and international action is evidently required to counteract it. The Crop Ecology and Genetic Resources Unit, advised by the Panels of Experts on genetic resources in agriculture and in forestry was set up in FAO to act internationally. Under its guidance the first regional centre for exploration, collection, conservation, evaluation and documentation was established at Menemen, Izmir, Turkey, in 1966. A comparable centre has since been established at Bari, Italy, which is well-placed to serve the Mediterranean basin. The centre at Gatersleben, based on the distinguished and long-continued work of German scientists on the evolution of cultivated plants, maintains important global collections.

The International Board for Plant Genetic Resources provides for the first time an international means of initiating further action in particular countries and regions and, for particular taxa, of articulating these new endeavours with those which are already established, and of ensuring that the materials collected are useful to, and are used by plant breeders to improve the world's crops and by research workers to advance knowledge of crop evolution. In these ways, it is assuming, on behalf of mankind, a central world-wide responsibility for the further evolution of the cultivated plants on which our species depends. This is the historic task to which we have now to address ourselves.

6R. TAC Repat. - Extract.

106. With regard to the appointment of a project director, the Committee was in agreement that authority for immediate direction must be tested in a single person of high scientific ability and that this should be reflected in the resolution. The mechanism, by which such an appointment might be made, should be subject to the decision of the Steering Committee. There was a concensus that the appointment of the project Director should be made by WARDA on the nomination of the Steering Committee, and that the Director should be ex-officio a member of the Committee.

107. The Chairman requested the drafting group to re-formulate the Resolution taking into consideration the points on which agreement had been reached. The amended Resolution is attached hereto as Annex IV.

Conservation of World Genetic Resources (Agenda Item 6)

108. The Chairman asked the Secretary to open the discussion on this subject. Mr. Oram explained that the document they were considering (IAR/73/16) had been prepared in order to clarify doubts expressed at their previous meeting in respect of three main points. These were, first the contribution which FAO was prepared to make to the operation of the network from its regular programme resources. Secondly, the role of the genetic resources centres. Thirdly, the part to be played by the International Research Centres in the global network.

109. As far as FAO was concerned, the Director-General had decided to make available the sum of 350,000 dollars over the 1974/75 biennium to reinforce the efforts of the existing crop ecology and genetic resources unit in FAO. This was additional to the present staff costs of the unit, and would make it possible by enlarging the staff for FAO to take on executive functions related to the central coordination of the network, as envisaged in the Beltsville Report. This would include assistance to regional and other centres in the planning and execution of their programmes, the supervision of the central fund for conservation, exploration, documentation and training, and coordinating functions for information and seed exchange, as well as training. He felt that the Committee would agree that the Director-General's decision to allocate these substantial additional resources was an important step forward in meeting the wishes of the TAC and the CG.

110. The need for the Genetic Resources Centres was stressed by the Beltsville meeting and had since been re-emphasized by the FAO panel of experts, in March 1973, which defined three priority areas for action in plant exploration collection. It had also suggested an order of priority for support to ten centres in the regions of main genetic diversity, more or less corresponding to those proposed at Beltsville. Now TAC in its previous discussions, while endorsing the concept of these centres had recommended a cautious policy in their establishment with no more than three priority centres being set up in the first three years, followed by a review of their operations before expanding their number. The recommendations of the panel of experts concerning these priorities tallied closely with those proposed by the TAC, and the budget proposed envisaged support to three regional centres at Izmir in Turkey, Debra Zeit in Ethiopia, and IICA, Turrialba; plus IRRI for specific work on rice, during the first three years of operation. According to the recommendations of the expert panel, IITA would be the next regional centre qualifying for priority support.

111. This led naturally to the role of the International Centres. Following the November Consultative Group meeting, he had written to all the centres with a list of question and had received very helpful replies. These indicated that while the Centres were willing to participate in the operations of the network, their stage of readiness to do so and the scope of commitments they were prepared or geographically able to make varied quite considerably.

112. IRRI and CIMMYT, operating on a global scale for rice and maize respectively, had the most advanced programmes, as perhaps might be expected from the oldest established institutes, although IRRI would require some additional financial support, to enable it to take on the full global responsibility for rice work. The possibilities for the future cooperation of the other centres in the network were discussed on page 6 and had sought advice of Sir Otto Frankel, Chairman of the Expert Panel, in reviewing their replies to his letter. Only ICRISAT was not approached because it did not have a director then, but he imagined that in due time Dr. Cummings would also be willing to cooperate.

113. It was clear that while the International Centres had an important, and for some crops an indispensable task to undertake, there would be major gaps in the network both geographically and in terms of crop coverage if no complementary regional centres existed. The latter also had a significant role to play in assisting in collection work, organizing training, and in seed and information exchange for the developing countries in their regions.

114. In addition, more than one centre may be required to handle vegetatively propagated crops, such as cassava, and also to provide the insurance of replicate storage. The availability of and cooperation from international centres did not, therefore, in his opinion, eliminate the need for the proposed regional centres, nor vice-versa - they were both essential to the network. The success of the whole operation would depend on mutual cooperation and sharing of work and responsibilities between the International Research Centres, the independent regional genetic resources centres, and national centres in both developed and developing countries.

115. The strong support likely at the national level was indicated from the replies received from a number of countries indicated in the footnote to page 3, as well as from interest expressed to him personally by several European countries. The establishment of linkages between donor agencies and research institutes in the developed countries, and regional centres or institutes in developing countries, either directly or through the CG, clearly offered interesting possibilities.

. This related to his final point, which was how the external coordination, supervision and technical advice to the network as a whole, could best be assured. The paper before TAC proposed that this should be a task for the FAO panel of experts of which Sir Otto Frankel was the Chairman. But while in many ways eminently suited to performing a coordinating function, the panel was a technical rather than an administrative body and was not representative in any way of the Consultative Group. According to his information at least one interested donor country might propose at the CG that some more broadly representative committee might be established and the TAC might like to examine this possibility in advance of the CG's discussions. One possible approach might be to establish a coordinating or advisory committee (more or less the equivalent of a governing body of an International Centre), which would inter alia advise in the use of funds coming from the CG; with appropriate donor and perhaps developing country representation on a rotating basis; and then to use the panel of experts as an independent body of technical consultants to both the coordinating committee and to the central unit in FAO. It would not, however, for obvious reasons, control the use of funds allocated from FAO's regular programme to the support of the central unit. Hopefully, such a mechanism would help to link assistance coming through the CG with bi-lateral assistance.

117. Thanking Mr. Oram, the Chairman indicated that he intended to ask a number of questions so that members would be in no doubt as to what was now being proposed.

118. It was true that the TAC and the Consultative Group were concerned to discover why FAO was now attaching such importance to this work and why it had therefore not been given higher priority in FAO's own programme. He had felt sympathy with Mr. Jackson's predicament over this at the Consultative Group meeting, and he felt that FAO's agreeing to meet the costs of the Central coordinating unit was a matter to be greeted with considerable satisfaction.

119. Another doubt in the minds of the Consultative Group which perhaps did not emerge too clearly from the paper they were now considering, was whether to proceed even with three Regional Genetic Resources Centres. He believed that the Secretary was right in inferring that this doubt was based in part on feeling that the International Research Centres could do the w' 'e job, and in exploring with their Directors exactly what they were able and prepared to d

120. His main worry lay with para. 10, which stated that the present paper did not depart substantially from the conceptional structure proposed at the Beltsville meeting and previously discussed by the TAC. On the contrary he felt that they were now being asked to endorse a proposal which had been modified in several respects. In particular he was referring to the form of governance, (apart from the advisory role of the Panel of Experts); and to the budget, which seemed to be considerably larger. This might in part be due to inflation, but he would like clarification on these points, and to know whether the project really was the same as that TAC had originally endorsed. Mr. Oram informed the Committee that in essence the project did not differ substantially from the original. It still proposed FAO operating the central coordinating staff. It still proposed three regional genetic centres; although it added IRRI as an additional centre for rice. However he believed that this to be an economical addition which was in line with the priorities suggested by the expert panel. It spelt out in more detail the role of the International Centre. This was not possible before because the Beltsville meeting did not have representation from all the Centres, but it did not fundamentally alter what the international centres would do in the network. T

121. There was a rather different suggestion for the coordinating committee, because the Panel of Experts existed, and the most convenient machinery for this purpose. He had only raised the alternative of a CG Committee because he had had that advance notice from potential donors would probably raise this question at the CG, and he thought that TAC perhaps ought to consider its position in advance.

122. He had just checked the budget, against the original one, and it was roughly ,000 dollars higher. Part of this was inflation, part of it was the addition of IRRI to the network (which came to 85,000 dollars), so in fact he did not think it was enormously different. The network of genetic centres was originally 9 - TAC had cut it to 3, and he had maintained this figure, plus IRRI. The actual priorities suggested for the first three Centres and the first three years of operation were essentially the same as originally recommended by TAC. It had been agreed by TAC that provision would be made for review, and if necessary for the establishment of audit and centres after three years.

123. Members asked why, even if the overall total for three years was not so very much higher, the sum budgeted for the first year of operations appeared to be 770,000 dollars, instead of the considerably smaller amount in the original proposal. Mr. Oram explained that this was due mainly to a difference in the phasing of the support to regional and national activities, including exploration, meetings, and training, which now would start in the first year on a larger scale than in the original proposal. The reason for the difference was that it was now felt that following the additional time since the proposal was first formulated, and the work put in by the panel of experts, these activities could get off to a faster start.

124. There was also, in the present proposal, a regional centre coming into operation in the first year. This had been strongly urged by the panel of experts because of the critical situation in the Near East and the fact that the already existing Ismir centre would need immediate support when the UNDP support phases out in January. This added another 120,000 plus the cost for the IRRI work, to what was shown in the first year in the earlier proposal.

125. Dr. Hopper recalled that the Committee had said 1 million dollars was too much in the first year and he was concerned about the rather large sum now budgeted, even though he eed that exploration and training were important to the programme as a whole. He queried how long the activities would need to be continued at the levels and he was also concerned about the phasing in of the other centres, and at what level of cost. This could become a

very large bill indeed, and in going through the proposal he did not find an adequate discussion of what the future looked like. For example, at what point should training phase out - how much training was needed? Could training not be centred at one place, rather than at several different places? In other words, there were items in the present programme which he did not recall discussing extensively at their last meeting and which he found inconsistent with the statement that this was what they had basically approved then. He was not quibbling at the need for it; he thought it was a good addition, but he believed they should spend a little more time on discussing how these activities to be supported from the proposed Central fund might be handled; for example whether the training budget needed to go from 80,000 in the first year to 120,000 in the third year, and what was going to happen thereafter to that particular element of the programme.

126. Dr. Bommer asked for clarification concerning the FAO contribution. On page three, this was shown as 350,000 dollars but Appendix II, indicated 170, 180, 200,000 dollars in successive years to a total of 55,000 dollars.

127. Mr. Oram stated that the figure of 350,000 dollars shown on page three was for the next biennium (1974/75). The figures shown in Appendix II were FAO's contributions to the Central Unit from the Regular Programme over three years, the annual increases being mainly to cover inflation.

128. Prof. Bommer informed members that the German Government was interested in participating in this programme, even before final conclusions were reached by the CG. They had around 2.6 million dollars available to finance appropriate Regional Centres and had had discussions with the Turkish authorities during the FAO panel meeting at Izmir. While progress in these negotiations was disappointing, discussions with Ethiopia were well advanced, and he had just received a telex that Ethiopia had asked the German Government for funds to establish the centre there. In addition they hoped to contribute even in 1973 a third Centre, if the arrangements could be made in time.

129. Dr. Swaminathan referred to the need to utilize all available resources in developing the world genetic resources network. Obviously the proposal could not spell out everything in detail, but he felt that it should include provision for long-term storage through the establishment of linkages with existing centres with such facilities such as Fort Colling and Bari. He hoped that suitable arrangements could be worked out, since this would obviate the need for investing additonal money in long-term storage.

130. He also drew the attention of members to the needs of Monsoon Asia; an area for which special cold storage facilities had to be provided because of the high temperature and humidity. Considerable progress had been made in collecting native species from this area and he believed that a strong base had been established for further progress provided adequate storage for preservation of the seed was available. While he agreed with the TAC's decision to establish only three centres in the initial three years, he urged that other priority regions be phased into the programme as soon as possible thereafter.

131. Finally he emphasized the importance of the fund for assisting countries to undertake their own exploration and collection so as to preserve their genetic heritage for use by posterity of all nations. For this reason, he believed that item 2 of the Budget was crucial to the success of the whole programme and he hoped that this could be put into operation as soon as possible - the primitive cultivers were fast disappearing in many regions of the world. A great deal would therefore depend on the effective organization and coordination of this effort, in selecting the priority areas, setting up the exploration teams, and entrusting the collections to appropriate institutions for maintenance. He hoped that this would be borne in mind when establishing the constitution and membership of the governing body.

132. Mr. Oram replied that the paper did in fact point out that Bogor, would be considered as the main regional centre for South East Asia, and this was listed on page 8 as the next priority after Tropical West Africa (IITA). He believed that this was certainly a gap in the network which would have to be filled rather quickly. If the programme was approved by the CG and was operating successfully after three years, then TAC would be able to restate the case for additional centres, and Bogor and IITA would be the next two to come in.

133. As far as the governance was concerned, one of the main objectives of having an independent governing body, whether this was the Panel of Experts or some other body, was to ensure that the global fund for exploration, conservation and training was properly administered and that the use of the funds was well coordinated. A main reason for the budget in the first year of operation of the new programme being larger than in the original proposal was so that the work to be undertaken under item 2 could be advanced, as Dr. Swaminathan had urged. Dr. Sauger asked why IRRI needed 30,000 dollars extra per year to contribute to its world rice collection when the other institutes apparently did not feel the same need, even though some of them saw their responsibilities for germplasm collection being of a broadly similar nature. Was this because this collection was not within the normal framework of IRRI's programme?

134. Mr. Oram thanked Dr. Sauger for raising this point, which he had perhaps not explained adequately. In fact, this money was to enable IRRI to enlarge its staff slightly to take on the global function in developing rice collection and encouraging exploration, as well as enlarging its storage facilities slightly. The other institutes had not in fact asked for any money for such purposes at the moment, but he knew from conversations that IITA would require more money later, for example, for food legumes. CIMMYT had already got a grant of 250,000 dollars from the Rockefeller Foundation to assist with their work and they had stated that this might not be adequate for wheat, although it would be sufficient for maize.

135. CIAT and CIP were perhaps not far enough forward to be able to decide whether they wanted more money or not at this stage, and this was also true of ICRISAT. Professor Bommer suggested that rather than seeking separate funds for such functions the International Centres should be thinking of raising their normal budgets to do this job, and that this should be regarded by the Consultative Group as a fair contribution to the operations of the genetic resources network. The Chairman agreed with this viewpoint and noted that he would draw it to the attention of the Consultative Group.

136. Recalling that IICA, Turrialba was proposed in the report as the genetic resources centre for Tropical America, Dr. Elgueta informed the Committee that they had already made good progress in a number of crops; for example quite sizeable collections had been established of Cacao and Coffee, and new cold storage facilities had recently been constructed.

137. The Chairman said that from the discussion so far he was now reasonably assured that the proposal was essentially the one TAC had sponsored before; and he felt that the budgetary differences were reasonable and were matters he could explain to the Consultative Group.

138. However, one matter on which he had not yet received a satisfactory answer concerned the government of the whole operation in a way which would ensure freedom of management from routine budgetory interference and red tape. He would like further clarification from the Secretary on this point.

139. The Secretary told the Committee that he did not believe it would be in the interests of any Director-General to be difficult about the use of the FAO money for the operations of the Central Unit, since although it would have to be supported from FAO's regular programme funds as the only way of ensuring continuity, the bulk of the rest of the funds for the genetic resources network would have to come from extra-budgetary resources, hopefully through the Consultative Group. Replying to a question from Dr. El-Tobgy, he agreed that the FAO Conference had not yet approved the additional regular programme money, but it had been through the programme and finance committees and the Council without objections and he would be extremely surprised if the Conferences were to reject it.

140. The Beltsville group had made a proposal for a coordinating committee and this was in effect what was suggested here in the present paper. However, whether this coordinating committee was the FAO Panel of Experts or whether it was some independent body, presumably established by the CG, was something on which he felt unable to go further at this point. In any case its object would be essentially to act as a supervisory or advisory body for the use of the extra-budgetary money coming to FAO via the Consultative Group, whether for genetic resources centres or for the central fund for exploration, collection information and training shown as item 2 in the Budget. He hoped that it might be possible to establish some arrangement such as a Trust Fund, whereby these funds could be used with the minimum of bureaucratic hindrance, as was the case with the TAC fund.

141. Dr. Pagot pointed out that there already existed within FAO at least one, and probably two procedures of the same nature; for example the emergency programme for protection against epizootic diseases - there was a special fund which was administered by FAO but could be disbursed only to the extent where a group of specially appointed experts gave their agreement. He saw no reason why some similar arrangement could not be worked out for the expenditure of extra-budgetary funds coming to FAO for the genetic resources programme.

142. Dr. Pereira suggested that since FAO administering the main scheme and there was a great deal of exploration and travelling involved, in which FAO's logistic machinery for getting people moving and contacts all over the world would be very valuable indeed - they should be careful that not to complicate matters any more by imposing some additional machinery. While he agreed that FAO's organization was complex, any further complications might even slow matters up.

143. The Chairman felt that perhaps his concern had not been understood; - he was quite happy about all the overall proposals and their financing, but he was still uncertain about the extent to which the new proposals differed from the original coordinating committee endorsed by TAC. He did not think the document was sufficiently clear on this, but if he could say to the CG that the original recommendations of TAC had been protected in these proposals; that he was satisfied concerning the budget changes, but that there was a need for some suitable coordinating committee to guide the programme, preferably making full use of the FAO machinery for the administration of the money; then he believed that this would be all that it was necessary to say. Nevertheless he felt sure that he would be asked if it was Sir Otto Frankel's Panel of Experts or some other committee that would undertake the coordinating function, and he might well say that he considered this is a matter for the CG and FAO to work out.

144. Dr. Pereira agreed that this would be a very fair solution because he suspected that there would be a proposal from the CG. In fact, on page 10, in para. 51, there was a specific proposal that the FAO panel of experts should act in the coordinating role; in the original proposal, TAC had also suggested a coordinating committee which would be a management board of 9 members, 6 from the proposed regional genetic resources centres and three independent scientists. In fact, the FAO Panel of Experts did consist of independent scientists and one or two of these would probably be connected with the regional centres anyway. The supporting technical staff to the coordinating centre would still be the FAO genetic resources unit, so in essence it was not a very different proposal from the one TAC had endorsed earlier.

145. He asked for more information on the nature of the FAO Panel of Experts, were members nominated by countries or as selected specialists in the subject? Dr. Bommer, (a member of the Panel), confirmed that it was the latter. Dr. Hopper asked that some of the donors might be alerted to the fact that this was a mechanism that would probably extend in the future to other centres, and that the mechanism as established should be capable of providing the necessary government overview should particular bi-lateral programmes wish to support some of the additional centres listed in the proposal for the future, but at an earlier date. He was referring particularly to Dr. Swaminathan's comment with regard to Asia where he believed that there might be some initiative taken outside the immediate boundaries of this particular proposal on a bi-lateral basis. This sort of action might be encouraged.

146. In conclusion the Chairman asked for members agreement to his informing the Consultative Group that in reply to its request after receiving the earlier recommendations from TAC on this subject, FAO had adjusted its budget to absorb the management costs of the central unit of the proposed genetic resources network. FAO had not made any significant change in the other recommendations made by TAC, although it had revised the budget upwards : reasons which he would explain. It proposed to use a special Panel of Experts, chosen for their expertise in this field to assist it in managing the programme; but he could quite fairly say that in this and in other matters the proposals as revised did not depart from the intentions of TAC when it made its previous report. The Consultative Group would have to decide whether to accept these proposals, or whether to suggest any further changes; for example in administrative procedures if they wished for any additional assurances of freedom from ordinary FAO budgetary constraints on use of funds.

147. He hoped that they would support the revised report, and that the network would provide a means of collaboration between the genetic resources centres and other institutions in developing countries, and those in the developed countries with interest and competence in this field, such as CSIRO of Australia. This he believed to be basic to the success of the whole operation.

Bruce -

This seems to be the collection of documents that Dick Demuth brought back from the grass meeting in Rome. Will you make appropriate disposition of them, please?

Hugh

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Via delle Terme di Caracalla, 00100 Rome, Italy
Cables: FOODAGRI ROME - Telex: 61181 FOODAGRI
Telephone: 5797

TO: Members of the Consultative Group
Members of the Sub-committee on Genetic Resources
Members of the Technical Advisory Committee

FROM: B.N. Webster, Secretary
Sub-committee on Genetic Resources

The Consultative Group Sub-committee on Genetic Resources met at FAO Headquarters in Rome on 1-2 October, 1973. The draft report, cleared by the Rapporteur and the Chairman of the Sub-committee now circulated for your review and comments prior to formal consideration by the Group at its meetings on 1-2 November 1973.

Comments received prior to the meeting will be taken into account in presentation of the report.

In order to ensure consideration of your comments prior to the Group meeting, you are kindly requested to forward these to the Executive Secretary of the Group, Mr. Harold Graves, at the IBRD, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A. not later than 29 October 1973, rather than to the address above.

Your collaboration will be greatly appreciated.

Enclosures

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SUB-COMMITTEE ON GENETIC RESOURCES

FIRST MEETING

1-2 October, 1973

Rome, Italy

DRAFT REPORT

1. The First Meeting of the Sub-committee on Genetic Resources of the Consultative Group on International Agricultural Research (CGIAR) was held at the Headquarters of FAO in Rome on 1-2 October 1973. Mr. R. H. Demuth, Chairman of the Consultative Group, was in the Chair. Mr. J. F. Yriart, Assistant Director-General, Development Department, FAO, welcomed participants on behalf of the Director-General of FAO.

2. The meeting was attended by representatives of 10 governments, international agencies and private foundation, and by a representative of the Technical Advisory Committee (TAC) to the CGIAR, who also represented his government. Seven observers and resource personnel also attended. The Secretariat was provided by the secretariat of the TAC. The list of participants is attached as Annex I.

3. A list of documents provided to the Sub-committee is attached hereto as Annex II.

4. The Agenda as adopted is attached hereto as Annex III.

5. The Chairman requested Dr. G. de Bakker (Netherlands) to act as Rapporteur with the assistance of the Secretary.

Discussion of the programme and administrative questions. (Agenda Item 2 and 3)

6. The Sub-committee endorsed in principle the establishment of a coordinated network of genetic resource activities and discussed in detail the administrative questions inherent in the establishment of a coordinated programme. It came to the conclusion that an International Board for Plant Genetic Resources should be created and specifically proposed the following Terms of Reference, Mode of Operation and Membership for such a Board.

7. " International Board for Plant Genetic Resources

a) Terms of Reference

The International Board for Plant Genetic Resources shall, under the authority of the Consultative Group on International Agricultural Research, have responsibility for recommending policies and developing programmes in close collaboration with and with the help and advice of FAO, to meet the objectives set out below:

i) To identify general and specific needs for exploration, collection, evaluation and conservation of plant genetic resources with particular reference to species of major economic importance and their wild and cultivated relatives, to determine priorities among them, and to ensure to the fullest possible extent that the materials conserved are made available for plant breeding and other scientific activities as required;

ii) To establish standards, methods and procedures for exploration and evaluation and to determine minimum standards for conservation and renewal of stocks of both seeds and vegetative material;

iii) To arrange for replicated storage of seed and vegetative stocks;

iv) To promote technical meetings;

v) To promote training activities at all levels;

vi) To develop a world-wide network of institutions, organizations and programmes able and willing to contribute to the above objectives;

vii) To promote the articulation of ongoing programmes so as to avoid unnecessary duplication and to fill in gaps;

viii) To strengthen the programmes of existing institutions and to encourage the establishment of new organizations, institutions and programmes to the above ends, where necessary, particularly in areas of major genetic diversity;

ix) To promote the dissemination of information and material among centres and institutions, and to encourage, within existing resources and possibilities, the establishment of inventories of collections;

x) To make appropriate recommendations with respect to computerized information storage and retrieval systems, taking into account their suitability for an effective international genetic resources network, and their compatibility with existing systems already in operation at some regional and national centres;

xi) To estimate the annual financial requirements of those parts of genetic resources programmes not already adequately covered.

b) Mode of Operation

i) The Board will be expected to draw as fully as possible for technical advice on the knowledge and experience of scientists in relevant disciplines throughout the world in developing as well as developed countries. In particular the Board will be expected to ask FAO to provide the guidance of its Panels of Experts on Plant Exploration and Introduction and on Forest Gene Resources.

ii) The Board shall recommend financing for appropriate institutions and organizations, national, regional and international, including FAO, for the furtherance of its priority programmes and projects. It shall have at its disposal a central fund, contributed by the members of the Consultative Group on International Agricultural Research, both to meet its own budgetary expenses and to help carry out programmes which it has recommended, and shall make appropriate arrangements with an international organization, e.g. FAO, for the administrative of such a fund.

iii) In response to a suggestion from the CGIAR that a substantial role should be played by FAO in any global genetic resources programme, the Director-General of FAO has proposed that FAO's capability in this field should be strengthened. Given appropriate approvals, this will enable FAO to provide the secretariat and other central services to the Board, and, if necessary, the Board may arrange that additional resources be provided to FAO for that purpose from the special fund referred to in para. 2 above.

iv) The Headquarters and the Secretariat of the Board will be located at FAO headquarters in Rome.

c) Membership

i) The Board will consist of 14 members.

ii) 13 members of the Board will be elected by the Consultative Group, directly or through its Genetic Resources Sub-committee. Members will serve for a three year term, to be arranged on a staggered basis.

iii) FAO will appoint one ex-officio, non-voting member to the Board.

iv) No less than 4 members of the Board will be nationals of developing countries, and not less than 6 will be scientists.

v) Elected members will serve in their personal capacities irrespective of their professional or official affiliations.

vi) The Chairman of the Board will be elected by the member of the Board in consultation with the Director-General of FAO. He may be one of the 14 members of the Board, or from outside, and his term of office will be for three years."

8. . . Following consideration of the above proposals the Sub-Committee was informed that, subject to the approval of FAO's Governing Bodies, it would be possible for the Organization to fulfill its anticipated role in a coordinated programme organized along the lines proposed by the Sub-committee.

Financing of the project. (Agenda Item 4)

(a) Creation of the proposed central fund and specification of activities to be financed by such fund.

9. The creation of a central fund to finance centralized operations is recommended by the Sub-Committee as included in the suggested "Mode of Operation" above. This fund, to be at the disposal of the Board, would be utilized for financing activities in the exploration, conservation, training, documentation and information services, additional secretariat assistance from FAO and for general programme support as outlined in the Budget (Item 2) of the Research Proposal.

10. The Sub-committee recommended that contributions to the central fund should be sought, with a minimum target of $ 300,000 on the basis of indications given, it was felt that $ 500,000 might be forthcoming, (possibly at the level of $ 100,000 per donor) from the Federal Republic of Germany, Netherlands, Sweden and the Rockefeller Foundation; the possibility of a contribution from the U.K. was also indicated. Any surplus should be carried over to 1975. Contributions to the central fund might be considered in future years from Canada and the U.S.A. (in addition to any bi-lateral support) whereas UNDP was more prepared to support specific programmes at national and regional centres than operations at the centre.

11. The question of an agency which could be asked to handle the funds on behalf of the Board was discussed and it was felt that, if FAO had the authority and machinery to do so, this would prove most satisfactory. Alternatively the IBRD might be approached to undertake this task as it had done during the early days of establishment of other centres.

(b) Other financial requirements.

12. Concern was expressed about funds at present available for the development of new Regional Centres and the continued servicing of existing centres. The timetable of operations approved by the TAC and recommended to the CGIAR, envisaged finances being available to commence some specified operations in 1974 and additional specified operations in 1975. Funds were now earmarked by various donors for more projects than the TAC had contemplated for 1974. It was agreed that the Board should have maximum freedom of action and that therefore financial support to any of the centres should not be specified or quantified by the CGIAR at this time. This should not however deter potential donors from continuing negotiations on a bi-lateral basis, to avoid the possibility of earmarked funds being lost. This was the more desirable because, in the light of the historical record, all operations for which funds were earmarked were likely to be considered of high priority by the Board when it was constituted.

(c) Other matters.

13. The Sub-committee considered the appointment of an executing agency for conducting the necessary further steps to be taken in the constitution of an International Board. These would include, subject to CGIAR approval of the Sub-committee's recommendations, the consideration and screening of a large number of candidates based on nominations to be called for from national and international and non-governmental agencies and organizations.

14. Following discussion it was agreed that the Netherlands and the United Kingdom (subject to the approval of their respective governments) would undertake this responsibility jointly, in consultation and with the assistance of the Rockefeller Foundation and FAO. Confirmation of acceptance of this responsibility would be communicated to the Consultative Group before its 1-2 November meeting.

APPENDIX I

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SUB-COMMITTEE ON GENETIC RESOURCES

Rome, 1-2 October 1973

LIST OF PARTICIPANTS

Members:

Chairman: Mr. R. H. Demuth
Chairman, Consultative Group on International Agricultural Research
c/o IBRD. Washington

CANADA

Mr. Ian B. Robertson
Director
United Nations Programmes Division
Canadian International Development Agency
122 Bank Street
Ottawa, K1A 0G4, Canada

FAO

Mr. J. F. Yriart
Assistant Director-General
Development Department
FAO
Via delle Terme di Caracalla
Rome 0100, Italy

NETHERLANDS

Dr. G. de Bakker
General Director, Agricultural Research
Ministry of Agriculture
The Hague
Netherlands (Rapporteur)

ROCKEFELLER FOUNDATION

Dr. L. M. Roberts
Associate Director
Agricultural Sciences
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

SWEDEN

Prof. Lennart Kåhre
The Swedish Central Seed Testing Institute
S-17173 Solna
Sweden

TAC

Prof. Dr. Dieter Bommer
Director
Crops and Seed Research Institute
Agricultural Research Center
Braunschweig-Völkenrode
Federal Republic of Germany
(Also representing the Federal Republic of Germany)

UNITED KINGDOM

Prof. A. H. Bunting
Professor of Agricultural Development Overseas
The University of Reading
Berkshire, U.K.

UNDP

Mr. William T. Mashler
Director, Division for Global and Inter-regional Projects
United Nations Development Programme
866 United Nations Plaza
New York, N.Y. 10017

UNITED STATES OF AMERICA

Dr. Guy Baird
Associate Director (Research)
Office of Agriculture
Technical Assistance Bureau
Agency for International Development
State Department
Washington, D.C.

Secretary: Mr. B. N. Webster
Assistant Secretary, TAC
Research Development Centre
Development Department
FAO

Observers

FAO

Dr. R. A. Peterson
Acting for the Director
Plant Production and Protection Division
FAO

Dr. J. León
Chief
Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO

Mr. J. P. Dobbert
Senior Legal Officer
Office of the Legal Counsel
FAO

ROCKEFELLER FOUNDATION

Dr. R. J. Johnson
Consultant
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

SWEDEN

Mr. Erik Cornell
Permanent Representative of Sweden to FAO
Royal Swedish Embassy
Rome

UNDP

Dr. W. R. Fertick
Senior Technical Advisor
Technical Advisory Division
UNDP
866 United Nations Plaza
New York, N.Y. 10017

APPENDIX II

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SUB-COMMITTEE ON GENETIC RESOURCES

Rome, 1-2 October 1973

List of Documents

1. PAB:IAR/72/11. "The Collection, Evaluation and Conservation of Plant Genetic Resources". Report of TAC ad hoc Working Group held in Beltsville, USA 20-25 March 1972. Rome, April 1972.

2. PAB:IAR/72/15. "A proposal for the Collection, Evaluation and Conservation of Plant Genetic Resources". Rome, July 1972.

3. DDDR:IAR/73/16 (RESTRICTED). "A revised proposal for the Collection, Evaluation and Conservation of Plant Genetic Resources". Rome, May 1973.

4. DDDR:IAR/73/30 (RESTRICTED). "Establishment of a Committee on Crop Genetic Resources: Proposed Consitutional Framework and Draft Statutes". Rome, September 1973.

5. "The Collection, Preservation and Evaluation of the World's Plant Genetic Resources". Lewis M. Roberts - Rockefeller Foundation - New York, September 1973.

APPENDIX III

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SUB-COMMITTEE ON GENETIC RESOURCES

Rome, 1-2 October 1973

AGENDA

1. Adoption of agenda
2. Any further discussion desired by the Sub-committee of program of revised genetic resources project
3. Discussion of administrative questions;
   (a) scientific guidance
   (b) management control; and
   (c) FAO staff support.
4. Financing of project:
   (a) creation of proposed central fund and specification of activities to be financed by such fund; and
   (b) other financial requirements (e.g. regional centres).
5. Report to Consultative Group.

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

GENETIC RESOURCES SUBCOMMITTEE

MEETING OF OCTOBER 1-2 IN ROME, ITALY

Provisional Agenda

1. Adoption of agenda
2. Any further discussion desired by the Subcommittee of program of revised genetic resources project
3. Discussion of administrative questions;
   (a) scientific guidance
   (b) management control; and
   (c) FAO staff support.
4. Financing of project:
   (a) creation of proposed central fund and specification of activities to be financed by such fund; and
   (b) other financial requirements (e. g. regional centres).
5. Report to Consultative Group.

August 21, 1973

1ST WORKING GROUP

2ND DRAFT

2 October 1973

SUB-COMMITTEE ON GENETIC RESOURCES OF THE CGIAR

International Board for Plant Genetic Resources

Draft Terms of Reference

Preamble

The International Board for Plant Genetic Resources shall, under the authority of the Consultative Group on International Agricultural Research, have responsibility for recommending policies and developing programmes in close collaboration with and with the help and advice of FAO, to meet the objectives set out below:-

1. To identify general and specific needs for exploration, collection, evaluation and conservation of plant genetic resources with particular reference to species of major economic importance and their wild and cultivated relatives, to determine priorities among them, and to ensure to the fullest possible extent that the materials conserved are made available for plant breeding and other scientific activities as required;

2. To establish standards, methods and procedures for exploration and evaluation and to determine minimum standards for conservation and renewal of stocks of ~~both~~ seeds and vegetative material;

3. To arrange for replicated storage of seed and vegetative stocks;

4. To promote technical meetings;

5. To promote training activities at all levels;

6. To develop a world-wide network of institutions, organizations and programmes able and willing to contribute to the above objectives;

7. To promote the articulation of ongoing programmes so as to avoid unneccesary duplication and to fill in gaps;

8. To strengthen the programmes of existing institutions and to encourage the establishment of new organizations, institutions and programmes to the above ends, where necessary, particularly in areas of major genetic diversity;

9. To promote the dissemination of information and materials among centres and institutions, and to encourage, within existing resources and possibilities, the establishment of inventories of collections;

10. To make appropriate recommendations with respect to computerized information storage and retrieval systems, taking into account their suitability for an effective international genetic resources network, and their compatibility with existing systems already in operation at some regional and national centres;

11. To estimate the annual financial requirements of those parts of genetic resources programmes not already adequately covered and to which the Board has given priority, and to make appropriate recommendations to the Consultative Group on International Agricultural Research (CGIAR).

and of its Panel of Experts on Forest Gene Resources

Mode of Operation

1. The Board will be expected to draw as fully as possible for technical advice on the knowledge and experience of scientists in relevant disciplines throughout the world in developing as well as more developed countries. In particular the Board will be expected to ask FAO to provide the guidance of its Panel of Experts on Plant Exploration and Introduction.

2. The Board shall recommend financing for appropriate institutions and organizations, national, regional and international, including FAO, for the furtherance of its priority programmes and projects. It shall have at its disposal a special fund, contributed by the members of the Consultative Group on International Agricultural Research, both to meet its own budgetary expenses and to help carry out programmes which it has recommended, and shall make appropriate arrangements with an international organization, e.g. FAO, for the administration of such a fund.

3. In response to a suggestion from the CGIAR that a substantial role should be played by FAO in any global genetic resources programme, the Director-General of FAO has proposed that FAO's capability in this field should be strengthened. Given appropriate approvals, this will enable FAO to provide the secretariat and other central services to the Board, and, if necessary, the Board may arrange that additional resources be provided to FAO for that purpose from the special fund referred to in para. 2 above.

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

Sub-committee on Genetic Resources

Rome, 1-2 October 1973

LIST OF PARTICIPANTS

Members:

Chairman: Mr. R. Demuth
Chairman, Consultative Group on International Agricultural Research
c/o IBRD. Washington

CANADA

Dr. Ian B. Robertson
Director
United Nations Programme Division
Canadian International Development Agency
122 Bank Street
Ottawa, K1A 064, Canada

FAO

Mr. J. F. Yriart
Assistant Director-General
Development Department
FAO
Via delle Terme di Caracalla
Rome 0100, Italy

NETHERLANDS

Dr. G. de Bakker
Director, Agriculture Research
Ministry of Agriculture
The Hague
Netherlands

ROCKEFELLER FOUNDATION

Dr. L. M. Roberts
Associate Director
Agricultural Sciences
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

SWEDEN

Prof. Lennart Kåhre
The Swedish Central Seed Testing Institute

TAC

Prof. Dieter Bommer
Head, Institute for Plant Cultivation and Seed Research
Agricultural Research Center
Braunschweig-Völkenrode
Federal Republic of Germany
(Also representing the Federal Republic of Germany)

UNITED KINGDOM

Prof. A. H. Bunting
Professor of Agricultural Development Overseas
The University of Reading
Berkshire, U.K.

UNDP

Mr. William T. Mashler
Director, Division for Global and Inter-regional Projects
United Nations Development Programme
866 United Nations Plaza
New York, N.Y. 10017

UNITED STATES OF AMERICA

Dr. Guy Baird
Associate Director (Research)
Office of Agriculture
Technical Assistance Bureau
Agency for International Development
State Department
Washington, D.C.

Observers

FAO

Dr. R. A. Peterson
Acting for the Director
Plant Production and Protection Division
FAO

Dr. J. León
Chief
Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO

Mr. J. Trevor Sykes
Crop Ecology and Genetic Resources Unit
Plant Production and Protection Division
FAO

Mr. J. P. Dobbert
Senior Legal Officer
Office of the Legal Counsel
FAO

ROCKEFELLER FOUNDATION

Dr. R. J. Johnson
Consultant
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

SWEDEN

Mr. Erik Cornell
Permanent Representative of Sweden to FAO
Royal Swedish Embassy
Rome

Secretary: Mr. B. N. Webster
Assistant Secretary, TAC
Research Development Centre
Development Department
FAO

Mr Demuth

MEMBERS OF GENETIC RESOURCES SUBCOMMITTEE

FAO

Mr. J. F. Yriart
Assistant Director-General
Development Department
FAO
Via delle Terme di Caracalla
Rome 0100, Italy

GERMANY

Dr. Werner Treitz
Federal Ministry for Economic Cooperation
Friedrich Ebertstrasse, 114
Bonn
Federal Republic of Germany

NETHERLANDS

Dr. G. de Bakker
Director, Agriculture
Research
Ministry of Agriculture
The Hague
Netherlands

ROCKEFELLER FOUNDATION

Dr. John A. Pino
Director for Agricultural Sciences
The Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

SWITZERLAND

Dr. Rolf Wilhelm
Director of Projects
Swiss Technical Cooperation of the
Federal Political Department
Berne, Switzerland

CHAIRMAN

Mr. Richard H. Demuth

SWEDEN

Mr. Arnold Willen
Head of Section
Department of Development Cooperation
Royal Ministry for Foreign Affairs
Box 16121
S-103 23 Stockholm 16, Sweden

UNITED KINGDOM

Mr. W. A. C. Mathieson
Deputy Secretary
Overseas Development Administration
Eland House, Stag Place
London, SW1E 5DH, England

UNITED STATES

Mr. Omer Kelley
Director, Office of Agriculture
Bureau for Technical Assistance
Agency for International Development
Washington, D. C.
U.S.A.

UNDP

Mr. William T. Mashler
Director, Division for Global and Inter-
regional Projects
United Nations Development Programme
866 United Nations Plaza
New York, N.Y. 10017

TAC

Professor Dieter Bommer
Head, Institute for Plant Cultivation
and Seed Research
Agricultural Research Center
Braunschweig-Völkenrode
Federal Republic of Germany

SECRETARY

Mr. Peter A. Oram

THE INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

13 members of the board will be elected by the Consultative Group, directly or through its Genetic Resources Subcommittee. Members will serve for a three year term, to be arranged on a staggered basis.

No less than 4 members of the board will be nationals of developing countries, and not less than 6 will be scientists.

FAO will appoint one ex-officio, non-voting member to the board.

The Chairman of the Board will be elected by the members of the board ~~after~~ in consultation with the Director General of FAO. He may be one of the 14 members of the board or from outside and his term of office will be for three years.

Elected
Members will serve in their personal capacities irrespective of their professional or official affiliations.

The headquarters and the secretariat of the board will be at FAO in Rome.

THE COLLECTION, PRESERVATION AND EVALUATION OF THE WORLD'S PLANT GENETIC RESOURCES

Lewis M. Roberts
September 17, 1973

The importance and urgency of collecting, preserving, and evaluating the world's germplasm of each important crop plant and its wild relatives is now being increasingly recognized. This growing concern is a fairly recent phenomenon and derives principally from the need to insure that crop breeding programs around the world have ready access to as much genetic diversity as possible for their current and future varietal improvement efforts. Many wild relatives and primitive varieties of the relatively few plant species on which man largely depends for his food are in real danger of becoming irretrievably lost as new, improved varieties are released for use over vast areas of the globe. Also, in many instances this loss is a consequence of overgrazing and other pressures on land use resulting from the rapid growth of population.

The concern for this problem is not limited to plant species but applies to animal species as well, both domesticated and wild, and to microorganisms. The following comments will focus entirely, however, on the problem of the collection, preservation and evaluation of the genetic resources of the principal food crops on which man depends so largely for his total sustenance. This is done with no intention of denigrating the importance of conserving and making better use of the germplasm of animal species, tree crops, fiber crops, forage grasses and legumes, and microorganisms, etc. These are also important to man's welfare and they

do, of course, deserve attention. In terms of priority of importance, however, the relatively few crops that supply man with most of his food merit special attention.

It is estimated that about 60% of man's food supply is provided directly by cereal grains. The three major ones -- wheat, rice, and corn -- together supply around 50% of man's total caloric intake at present. These three crops, along with sorghums and millets, which are increasing in importance, will undoubtedly continue to be the main sources of human food supplies for many years.

It has been pointed out that man has used about 3000 species for food, or approximately 1% of all plant species that have been identified. We have cultivated about 150 of them extensively enough so they have entered into world trade. Nevertheless, only about 12 to 15 of these species feed the majority of the world's people. These, in addition to wheat, rice, corn, and sorghums, include sugar cane and sugar beets, potatoes, sweet potatoes, and cassava, common beans and soybeans, coconuts, bananas, and peanuts.

The task of assembling the genetic resources of a single important food crop such as rice, wheat, or corn is a very complex undertaking that is quite costly in time and money. But the collection of the germplasm of any crop is simple and inexpensive in comparison to the chore of keeping the seedstocks viable (which means growing them periodically to renew them and having good storage conditions to preserve them); describing them; evaluating each accession in the collection under a diverse set of environmental conditions for desirable genetic traits such as resistance to major diseases and insects, tolerance to adverse

growing conditions (cold, heat, drought, poor soil, etc.); and sending seed samples to plant breeders around the world who want and need the germplasm collection for their programs. Preservation, evaluation, and supplying of seedstocks are never-ending processes and require good organization and management plus substantial amounts of financial support for effective results. A very sharp focus of a global genetic resources program will be required in order to keep it from becoming so broad and unwieldy that it cannot be adequately financed or managed to assure its success.

While there is no doubt that there is a growing concern about the need to collect and preserve the world's germplasm, it would be a mistake to overestimate the breadth and depth of that concern and the amount of additional financial support that is likely to be available for this purpose during the next few years. It is heartening, of course, that within the new U. N. Environment Program (UNEP), created last year at the Conference on Human Environment at Stockholm, considerable attention will be paid to the collection and conservation of plant and animal germplasm. The amount that the UNEP will be able to allocate for this purpose is a matter of speculation at this point, but it appears that the total is hardly likely to exceed $2,000,000 annually during the next five-year period, with perhaps half of this to be used for food crops and the balance to be distributed over tree crops, fiber crops, forage crops, microorganisms, pests, etc.

The fact that TAC has concerned itself with this problem for the past two years is also heartening. TAC studies during this period have led to the development of a proposal that was re-presented (it was first presented in 1972) to the CG at the International Centers Week in

Washington last month. This calls for the provision of CG members of $2.0 million over the period of the first three years for use in collecting and preserving plant genetic resources with recommended emphasis on food crops but not limited to these crops. Under the proposal, FAO would furnish an additional $175,000 annually for 1974 and 1975 for the provision of "core" staff services from FAO Rome headquarters to the international germplasm network.

THE ROCKEFELLER FOUNDATION'S ROLE -- PAST AND PRESENT -- IN GERMPLASM COLLECTION, PRESERVATION AND UTILIZATION

The Foundation's involvement in preserving and using germplasm of the important food-crop plants is of long duration, dating back to the beginning of the cooperative agricultural program in Mexico in 1943. One of the first steps taken in that program was to collect systematically the indigenous corns -- first in Mexico and then in all the Latin American countries. The U. S. National Research Council and the countries of the region have collaborated with the Foundation in this work, and approximately 15,000 corn collections have been assembled in germplasm banks in Mexico, Colombia, Peru, Brazil and at Fort Collins, Colorado.

The Foundation has also furthered the assembling of the world's wheat germplasm by collaborating with the U. S. Department of Agriculture, which is the leader in the western world in collecting and preserving this important crop.

Since its creation 13 years ago by the Rockefeller and Ford Foundations, The International Rice Research Institute (IRRI) has collected

more than 15,000 cultivated rice varieties and breeding stocks, and another 1600 or so varieties of genetic tester, wild species, and cultivated African rice. It plans to complete its collections from several regions where important genetic differences may still be found in local rice varieties.

Through the efforts of the Indian Government and the Foundation during the past 15 years, a good start has been made in assembling sorghum and millet germplasm collections. The Foundation has provided most of the support and leadership for this cooperative effort.

Because The Rockefeller Foundation, during the past 25 years, has played such a leading role in bringing together the world's germplasm of corn, wheat, rice, sorghum, and millets, the officers of the Foundation decided in 1969 that it would be wise to undertake a thorough review of the status of the collections and to determine the amount of additional work needed (a) to bring them to a reasonable level of completeness and (b) to assure that they would not subsequently be lost for lack of proper care. They invited a small group of the world's leaders in germplasm collection and preservation to a workshop meeting in New York in November 1969. Four subcommittees were organized -- on corn, wheat, rice, and sorghum and millets -- which in September 1971 presented their reports at the second meeting in New York. Gaps in the present collections of the five crops were defined as precisely as possible, and plans to fill them were presented. A report of this meeting, including reports of the subcommittees is attached. Some of the principal decisions taken at that meeting follow.

Although extensive collections of all five crops exist, there are serious gaps; expeditions should be organized without delay to obtain samples of domesticated and wild strains from regions not appropriately represented in existing germplasm banks. It is the collection phase that is urgent: the international agricultural research institutes have safe facilities for continued storage as well as for international evaluation and exchange.

Because CIMMYT is the international institute concerned with wheat and corn, it should assume responsibility for coordinating efforts to complete the collections of these two crops. CIMMYT has since stated its willingness to accept this responsibility.

Similarly, IRRI should assume responsibility for completing the work on rice germplasm. It is willing to do so. Several Asian countries have already collaborated in this work, and USAID has provided support for field work in certain countries where it has PL 480 funds available.

Basic collections of sorghum and millets have been assembled through the joint efforts of the Indian Council of Agricultural Research and the Rockefeller Foundation's Indian Agricultural Program. The new International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has accepted the leadership role on a global scale to assemble the world's germplasm of sorghum and millets, and also of chick peas (Cicer arietinum) and pigeon peas (Cajanus cajan). ICRISAT's staffing pattern provides for two germplasm specialists -- one to head the work on sorghum-millets and the other to look after the two food legume crops.

Following up on the reports and recommendations of the four sub-committees presented at the September 1971 meeting in the RF offices in

New York, the Trustees of the Foundation approved an appropriation in April 1972 for allocation by the officers. Allocations are made on the basis of approved work plans and budgets to institutions -- including CIMMYT, IRRI, ICRISAT, the Plant Introduction Service of the U. S. Department of Agriculture, and others -- that will work to complete the collections of germplasm of corn, wheat, rice, sorghum and millets.

THE TAC PROPOSAL[1] TO THE CG FOR THE COLLECTION, EVALUATION AND CONSERVATION OF PLANT GENETIC RESOURCES

The fundamental philosophy and basic objectives of the proposal seem soundly conceived. These are exemplified in paragraphs 11 and 12 (page 3) of the original version, to wit:

"11. In our recommendations for this programme we have envisaged a network of cooperating centers in both developing and developed countries making use of institutions already in existence. Some of these are adequately staffed and equipped already, but others require strengthening for this purpose. We have tried to indicate the role of the various units within this network, and to show how its creation and coordination would achieve complementarity and economy of effort.

"12. The objectives of the proposed network are:

1. To salvage disappearing and threatened germplasm as rapidly as possible.

2. To collect genetic resources on a systematic basis for future plant breeding programmes or for direct use.

---

[1] Includes the original proposal dated April 1972 that was presented to the CG in November 1972, and the revised version dated May 1973 that was presented at International Centers Week in Washington, July 25-August 3, 1973.

3. To distribute material from the collections to plant breeders and other scientists.

4. To conserve on a permanent basis as much genetic material as is practicable.

5. To provide for rejuvenation of stocks as needed.

6. To provide information about material held in centers and its characteristics.

7. To assist in training of personnel.

8. To stimulate a worldwide awareness of the problem."

It is not the purpose of this paper to present a critique of all of the detailed recommendations of the TAC proposal with respect to such things as number and suggested designation by geographical location and character (national versus regional; crop specific versus multiple crop centers) of the principal centers in the network, the order of priority for their development, etc. Some of these seem sound while others would seem to call for further thought and discussion before final acceptance. Rather, the comments to follow will be almost entirely directed to basic general recommendations in the TAC proposal that treat the organizational structure of the international network.

The Proposed Structure of the Network

A Coordinating Committee

The TAC proposal recommends (page 9, par. 32 in original) that the activities of the network be coordinated by a committee consisting of six scientists representative of the network, and three independent scientists designated by the TAC, but not necessarily members of TAC.

The functions of the coordinating committee are outlined in paragraph 33. These will not be dealt with in this paper because in the main

they seem to be sound, and they were undoubtedly presented on the basis that they are subject to modifications and refinements that might be indicated.

A Central Staff

The original TAC proposal (p. 9, par. 34) recommends that "a central staff be created that would be the executive agent in implementing the policy of the coordinating committee. It should consist of a small core of three scientists with broad experience in fields relevant to genetic resources. They should, in total, provide leadership in the areas of exploration, conservation, information, and documentation, one of them being designated as leader." It recommends that the Central Staff be located at FAO headquarters in Rome.

The relations of the Central Staff with the Crop Ecology and Genetic Resources Unit of FAO were suggested in the original TAC proposal in paragraphs 36, 37 and 38 on page 10 as follows:

"36. The FAO Unit has responsibilities for meeting the needs of its member countries (in particular the developing countries), in the conservation, exploration and use of crop genetic resources. However, the scope of these responsibilities is far in excess of the resources available, or likely to be available to it because of the increasing demands generated by the needs indicated in the introductory section."

"37. The proposed central staff has been planned with a view to complement and cooperate with the existing staff of the Unit, particularly with respect to exploration, conservation and publications. It will rely on the Unit for the central distribution of seed and other stocks. The size of the central staff for the Coordinating Committee has been determined accordingly."

"38. The FAO Unit has been assisted by an international advisory panel of experts. This panel has repeatedly stressed the inadequacy of resources to enable the Unit to fulfill its mandate effectively, and this was one of the main reasons for submitting a proposal to TAC for independent support to complement its activities. We believe the organization we proposed would assure more effective participation of non-governmental institutions and other international agencies (e.g. foundations, IBP, universities, etc.)."

The recommended Association of the Network with FAO was described in paragraphs 39, 40 and 41 of the original TAC proposal as follows:

"39. Recognizing the need for associating the proposed network with an appropriate international organization to provide the essential administrative support, we recommend that FAO be invited to assume this responsibility. It is proposed that a trust fund be set up for this purpose. Its articles should safeguard the technical and administrative autonomy of the Co-ordinating Committee and Central Staff compatible with the requirements of the Organization."

"40. To ensure good liaison between the network and the Crop Ecology and Genetic Resources Unit, we recommend that the head of the Unit be an additional (non-voting) member of the Co-ordinating Committee."

"41. FAO is expected to present nominations for appointment to the Central Staff to the Co-ordinating Committee."

The Revised Proposal

While the statement is made in paragraph 10, page 12 of the revised proposal that: "There is no intention of departing in essence from the

conceptual structure proposed by the Beltsville meeting and modified by the TAC...," it would seem that paragraph 11, page 2 and paragraphs 50, 51 and 52 under Coordination on page 10 do represent substantive changes in the original concept in reference to structure, management, and coordination of the network.

These paragraphs state as follows:

"11. It is clear that activities on a world-wide scale in such diverse fields as the establishment of base collections for long-term seed conservation, widespread exploration activities, and the establishment and support of genetic resources centres spread over three continents, will require considerable expert guidance and coordination. It has been generally accepted, i.e. by the Beltsville meeting, by TAC and the Consultative Group, and recently by the FAO Technical Conference on Crop Genetic Resources (March 1973), that this is a role FAO should assume."

"50. The central unit in FAO will have a highly demanding task in attempting to coordinate the expanding activities of the network outlined above, even if the field programmes are phased on the basis of the priorities now proposed, with only three genetic resources centres operating, plus IRRI and IITA."

"51. In this work, it must have the guidance of an expert body with functions as close as possible to those projected for the governing body recommended in the original Beltsville proposal submitted to the TAC. The obvious body to give such guidance is the FAO Panel of Experts, composed of prominent scientists in the field of genetic resources, with wide geographical experience, including the regions of genetic diversity. It is available for continuing consultancy and has declared its readiness to play such a guiding

role. In pursuing this aim, it has appointed a Chairman for three years (Sir Otto Frankel of Australia) who will keep in continuing touch both with the FAO genetic resources unit and with Panel Members."

"52. The new FAO appropriation will enable the Panel to fulfill this role by meeting more frequently than at present, and to permit the establishment of a small Standing Committee of the Panel which could meet ad hoc according to special need."

From these it would appear that the FAO Panel of Experts would be substituted for the independent coordinating committee recommended in the original proposal. It would also seem that the small central staff of three experts recommended to be established in the original proposal to serve as the executive agent for the coordinating committee would be added to the present staff of the Crop Ecology and Genetic Resources Units of FAO to become an integral part of it. If this interpretation is correct, this is quite a different concept from that set forth in paragraphs 37 and 38 on page 10 of the original proposal. This raises the question as to whether the revised version recommends that expanded germplasm activities be accomplished through an increase of the staff and budget of the Genetic Resources Unit of FAO which would virtually have total responsibility for managing the entire program with advisory guidance from FAO's Panel of Experts. If the answer is affirmative, then the statement in paragraph 38 of the original proposal that "We believe the organization we propose would assure more effective participation of non-governmental institutions and other international agencies (e.g., foundations, IBP, universities, etc.)" perhaps loses its validity.

RECOMMENDATIONS

It would seem that a mechanism to direct and manage the new expanded international germplasm network should be sought with the following general characteristics:

(1) An autonomous International Genetic Resource Board should be created to direct the network. This should be a truly international group with representatives from FAO, the international centers, and UNEP, together with other outstanding scientists and individuals of great stature, vision and concern for adequate food production.

(2) The Board should be assured of a high degree of autonomy in its actions which may make it desirable to give it its own legal status as an international, non-profit organization, which would be eligible to receive and administer grant funds.

(3) The Board could arrange for FAO to provide the secretariat and the logistical services for the small core staff of germplasm specialists. Also, it might contract with FAO to conduct a substantial amount of the work. It could also arrange for the participation of personnel of other institutions as needed, and would coordinate the work among institutions.

(4) It should have the responsibility of determining the needs for germplasm work crop by crop, species by species, on a priority basis, and of determining what should be done, in what way, where samples are to be maintained, and who is to participate in and have responsibility for the various phases of the work. The Board could commission studies by authorities on the particular genus or species under review, and on locations where germplasm collections, general or limited, should be preserved, and how they should be financed. It could also commission explorations.

(5) The Board should be financed on a year-to-year basis as needed to enable it to conduct its planned programs. It should be subject to external program review at appropriate intervals.

DDDR:IAR/73/30 (Restricted

September 1973

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

SUB-COMMITTEE ON GENETIC RESOURCES

Rome, 1-2 October 1973

Establishment of a Committee on Crop Genetic Resources: Proposed Constitutional Framework and Draft Statutes

Food and Agriculture Organization of the United Nations

Rome, 1973

I. Background

During the last two years FAO, the TAC and the Consultative Group have been discussing the implementation of a programme on conservation, exploration, documentation and training in crop genetic resources. The programme was outlined at a special meeting of experts held in Beltsville, USA, in March 1972 (Doc.DDDR:IAR/72/11). In November 1972 the Consultative Group asked FAO to accept responsibility for the coordination of this work and the Director General is proposing to the 17th Session of the Conference the provision of the necessary funds (estimated at US$291,000 for 1974-75) for such coordination, under the Regular Programme.

At its 6th meeting in July/August 1973, the Technical Advisory Committee decided to recommend to the Consultative Group the financing of the proposal described in document DDDR:IAR/73/16 Restricted.

At the same time it called the attention of the Group to the existence of FAO's Panel of Experts on Plant Exploration and Introduction as a source of scientific and technical advice but suggested that the Group might wish to consider the establishment of an additional body which could be fitted into the FAO framework to meet the understandable wish of potential donor organizations to be associated with the development of the programme.

The Consultative Group, at its last session in August 1973, decided to establish a Sub-Committee to determine, inter alia, the possibility of establishing a body representing among others the different donors, to consider the planning and execution of the activities envisaged in the global genetic resources proposal approved by the TAC.

FAO undertook to examine the possibility of, and the legal considerations inherent in, the establishment of such a body and to prepare a proposal for the consideration of the Sub-Committee. It was understood from the outset that any body proposed must be of such a nature as to permit adequate representation by donor governments and organizations and yet be compatible with the constitutional framework of FAO.

The proposal which follows has the approval of the Director General, who has agreed to submit it to the Programme Committee for subsequent transmission to the FAO Council. As the Programme Committee is currently meeting it would be appreciated if the views of the Consultative Group Sub-Committee could be made known as speedily as possible in order that they may be conveyed to the Programme Committee.

II. Proposed Constitutional Framework and Draft Statutes

Under the FAO Constitution, bodies (i.e. established organs with recurrent meetings) of a worldwide scope devoted to specific tasks relating to the Organization's general field of competence may be set up in one of the ways set out in the attached table, which differ both as regards the designation, composition and task incumbent on the body and the authority that may establish it.

A body of the type listed in the table under No. 1, being open to all FAO Member Nations, would not seem to be adapted to the purposes of the proposed Committee on Crop Genetic Resources. Similarly, a body of the type listed under No. 4 requiring the adoption of a convention or agreement by a two-thirds majority of the FAO Conference would appear not suited to the purposes envisaged, in particular because of the cumbersome and lengthy procedure for this establishment and the lack of flexibility for future adjustment.

As regards the choice between the remaining two alternatives, i.e. a Committee of selected Member Nations and a Committee of Experts appointed in a personal capacity, it would appear from the deliberations of the Consultative Group at its meeting in Washington in August 1973, that the intention is to establish a committee representing in particular countries making major contributions to international development in the field of crop genetic resources, whereas the strictly scientific and technical advisory functions are to be left to another body consisting of experts. Consequently a Committee of Selected Member Nations set up under Article VI.2 of the FAO Constitution would seem to meet best the requirements of the proposal.

Meetings of such body would be open, in addition to the Selected Member Nations, also to the representatives of participating inter-governmental organizations, e.g. IBRD (and regional Banks), UNDP, and UNEP, although only participating governments would formally have the status of "members". The practice of bodies of the kind envisaged shows, however, that it is not customary to decide matters through votations and therefore the distinction between "members" on the one hand and "observers" on the other, although inevitable under the relevant provision of the FAO Basic Texts, appears of little practical consequence. If so provided in the Statutes of the Committee, invitations to participate in the deliberations of the Committee can also be extended, in consultation with the Member Government concerned, to national bodies concerned with nutrition, food and agriculture, and more specifically with international work in the field of crop genetic resources.

The selection of the Governments and other participants in the Committee could be exercised either by the FAO Council or by the Director General acting upon authority granted to him by the Council and in accordance with whatever criteria may be laid down in the Statutes of the Committee in order to ensure a balanced representation of those who have a major interest in the field to which the Committee's work would be devoted. Membership of the Committee could thus include major donors to multilateral projects in the field of crop genetic resources as well as a representation of developing countries. The Committee could advise the Director General on the use of extra-budgetary resources made available to the Organization in the form of trust funds for work in this field, subject, however, to such specific provisions on the purposes of the contribution as may have been agreed between a particular donor and FAO.

In order to set up a body under Article VI.2 of the Constitution it would be possible, pursuant to Article VI.3, for the Director General to obtain from the FAO Council the general authority to do so and to draw up and promulgate Statutes which would lay down the terms of reference, reporting procedures and other details customarily included in the Statutes of such bodies. However, the prevalent practice of the last years is to submit to the FAO Council, together with the proposal for the establishment of the body, a draft for its Statutes. Such a draft is accordingly attached hereto.

D R A F T

STATUTES FOR THE FAO COMMITTEE ON CROP GENETIC RESOURCES

Article 1

Participation in the Committee

1. The Committee shall consist of not less than (10) and not more than (20) FAO Member Nations selected by the Director General having regard to their interest in, or contribution to, international activities in the field of crop genetic resources. Members shall be appointed for a term of three years, but may be reappointed (subject to reappointment).

2. States which, while not Member Nations of FAO, are Members of the United Nations may, upon their request to the Director General of FAO, be invited to participate in an observer capacity at sessions of the Committee, in accordance with the principles established by the FAO Conference.

3. International Organizations having a major interest in or contributing to the activities under purview of the Committee shall be invited to participate in the work of the Committee in accordance with the Principles established by the FAO Conference and Council.

4. The Director General, in consultation with the Member Nations concerned, may similarly invite national bodies contributing to the activities concerned.

private as well as public?

Article II

Terms of Reference of the Committee

1. The terms of reference of the Committee shall be:
   a) to review the activities contemplated or undertaken by FAO, or with FAO participation in the field of crop genetic resources and to make recommendations on the formulation of policies, programmes and projects in this field and on the provision of funds required for their implementation;
   b) to advise on the use of funds allocated to programmes or projects in this field from the Organization's Regular Programme or made available through contributions from extra-budgetary sources, subject, however, to any decisions on the Organization's governing bodies regarding its Regular Programme and to such specific provisions on the purposes of the contribution as may have been agreed between a particular donor and FAO;
   c) to be apprised of the operation of such programmes and projects and to advise the Director General in this respect;
   d) to contribute to worldwide coordination of efforts in the field of crop genetic resources with a view to avoiding gaps and duplication.

2. In discharging its functions, the Committee shall take into consideration any findings and recommendations on scientific and technical aspects which may have been formulated by the Panel of Experts on Plant Exploration and Introduction or any other panels dealing with crop genetic resources.

Article III

Organization

1. The Committee shall hold at least one session every two years. Sessions shall be convened and their agenda shall be drawn up by the Director General in consultation with the Chairman.

2. Each Member of the Committee shall have one vote. Representatives of members and observers may be accompanied by alternates, experts and advisers.

3. The Director General shall designate an officer who shall serve as Secretary to the Committee and, in particular, make arrangements for providing the documentation for the Committee and prepare its reports.

Article IV

Reports and Recommendations

The Committee shall report and submit recommendations to the Director General and, through him, to the governing bodies of FAO. Copies of these reports, including any conclusions and recommendations, shall be forwarded, as soon as they become available, to all members and observers having participated in the deliberations of the Committee and to other interested Member Nations, international organizations, and to the Consultative Group on International Agricultural Research.

Article V

Expenses

1. Expenses incurred by representatives of members and their alternates, experts and advisers as well as expenses of observers in connection with their attendance at sessions of the Committee, shall be borne by their respective governments and organizations, except as may be otherwise decided by the Committee, with the approval of the Director General.

2. The Director General shall make the necessary secretariat services and facilities available to the Committee and its subsidiary bodies.

Article VI

Subsidiary Bodies

The Committee may establish such subsidiary bodies as it deems necessary for the accomplishment of its task, subject to the availability of funds as determined by the Director General.

Article VII

Rules of Procedure

The Committee may adopt and amend its own rules of procedure, which shall come into force upon approval by the Director General, subject to confirmation by the FAO Council. Unless otherwise determined by any such Rules of Procedure, the quorum voting arrangements, proceedings at meetings and other procedural questions shall be governed by the provisions of the General Rules of the Organization.

Table

Designation	Constitutional basis	Mode of Establishment	Composition	Task
(1) Commissions [variant: joint commissions in conjunction with other inter-governmental Organizations]	VI.1	Conference or Council resolution determining also the terms of reference and reporting procedures [for Joint Commissions also analogous acts of the other Organizations]	Open to all Member Nations [in the event of Joint Commissions also to Members of other Organizations]	To advise on formulation and implementation of policy and to coordinate the implementation of policy
(2) Committees (or Working Parties)	VI.2	Conference or Council (as above) or Director General acting on the authority of the Conference or Council	Selected Member Nations designated by the Conference, Council or Director General	To study and report on matters pertaining to the purpose of the Organization
(3) Committees (or Working Parties) of Experts	VI.2	same	Individuals appointed by the Conference, Council or Director General in their personal capacity because of their special competence in technical matters	same
(4) Commissions or Committees	XIV	Convention approved by two-thirds majority of the Conference and adherence by Member Nations (open under certain conditions also to Non-Member States)	All Member Nations parties to the Convention	As laid down in the Convention

DDDR:IAR/73/16 (RESTRICTED)
May 1973

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

Sixth Meeting, Washington, D.C., 25 July - 3 August 1973

A REVISED PROPOSAL FOR THE COLLECTION, EVALUATION AND CONSERVATION OF PLANT GENETIC RESOURCES

(Agenda Item 3)

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ROME 1973

WS/D9397

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
TECHNICAL ADVISORY COMMITTEE

Agenda Item 3.

A REVISED PROPOSAL FOR THE COLLECTION, EVALUATION AND CONSERVATION OF PLANT GENETIC RESOURCES

A. Background to the Proposal

1. Following a recommendation from the Technical Advisory Committee that international support was urgently needed for action to collect, evaluate and preserve for future utilization the world's dwindling reserves of crop genetic resources, the Consultative Group examined a proposal for an international network of crop genetic resources centres at its meeting in November 1972.

2. This proposal was based on one prepared by an expert working group convened by the TAC at Beltsville, USA in March 1972 which provided for an expert coordinating and management committee, a small technical coordinating unit to be attached to FAO, Rome, under a Trust Fund, a central fund to support plant exploration and collection work by any approved institution, and nine regional genetic resources centres to be located at strategic points in the main centres of crop diversity, all of which are in the "developing" regions of the world. While some of the proposed regional centres were to be established at the existing International Research Centres, e.g. IRRI, IPC, others would be newly created and attached to universities or research institutes in selected developing countries, e.g. Ethiopia.

3. The TAC considered the Beltsville proposal and while endorsing its general lines, felt that it was too ambitious in recommending the establishment of nine regional centres over a five year period. It recommended that these be reduced to three, with a provision for review of the need for further centres in the light of their operations. It also made provision for information exchange, data storage and retrieval which was omitted in the Beltsville proposal. The budget was amended accordingly and in this form the proposal was sent to the Consultative Group.

4. Members of the Group, although supporting the need for action in this field, expressed two main reservations concerning the proposal. These concerned the funding of the central unit and the role of the International Research Centres in the world network.

5. While endorsing the concept of a coordinating committee and a central unit located at FAO Headquarters to guide the operations of the network and the disbursement of funds, it felt that core technical staff and supporting services of the central unit should be funded out of FAO's regular budget and not by the Consultative Group. The

Director-General of FAO was requested to examine this possibility as a pre-requisite for the Group's further consideration of support for the other operations of the proposed network.

6. In respect of the latter, there was a wish to examine in more detail the extent of the contribution which the International Centres were making or could make, if given additional resources. The Chairman of the TAC was requested to explore this with the Centres' Directors and to report to the Consultative Group at an appropriate time both on this question and on FAO's response to the request concerning the central unit.

7. Following the request from the Consultative Group, the Director-General of FAO has examined the possibility of adjusting his Regular Programme Budget to accommodate an enlarged genetic resources unit in FAO which is able to take on the coordinating function proposed by the Beltsville Group. In parallel, the Secretary of the TAC has contacted the Directors of all the International Centres concerning their wishes and ability to participate in the network.

8. In preparing this revised report and budget for consideration by TAC and the Consultative Group, setting out amended proposals for the whole network in the light of the decision of the Director-General of FAO and the replies from the International Centres, one other subsequent event has been taken into account.

9. This is the meeting held at FAO in March 1973 of the FAO Panel of Experts on Plant Exploration and Introduction. The Panel emphasized the need for coordination of plant exploration, exchange of information and training related to genetic resources, and endorsed the concept of an international network of genetic resources centres based on regional centres in areas of great crop diversity and on the International Research Institutes. It also endorsed the selection of locations and institutions proposed in the Beltsville report, but it reconsidered the priorities on the basis of most recent information on the urgency of crop collection. Three areas of highest priority were named, i.e. the Near East, Ethiopia, and Tropical America in that order and specific plans were made for these areas. This adds a positive dimension to the Beltsville proposal.

B. The Revised Proposal

10. There is no intention of departing in essence from the conceptual structure proposed by the Beltsville meeting and modified by the TAC, as outlined in paragraphs 2 and 3 above. The object of this revised proposal is rather to indicate, for the information of TAC and the Consultative Group:

i) what FAO is prepared to do in respect of coordinating the operations of the network;

ii) the nature of the network, the role of the International Centres, and the gaps remaining to be filled;

iii) the priorities proposed for action;

iv) the estimated costs of the whole operation, specifying unfunded items for which support is sought from the Consultative Group.

i) The Role of FAO

11. It is clear that activities on a world-wide scale in such diverse fields as the establishment of base collections for long-term seed conservation, widespread exploration activities, and the establishment and support of genetic resources centres spread over three Continents, will require considerable expert guidance and coordination. It has been generally accepted, i.e. by the Beltsville meeting, by TAC and the Consultative Group, and recently by the FAO Technical Conference on Crop Genetic Resources (March 1973), that this is a role FAO should assume.

12. The Director-General of FAO has, therefore, decided that the resources of the existing Crop Ecology and Genetic Resources Unit of the Plant Production and Protection Division will be greatly strengthened and its work programme largely re-oriented, to enable it to undertake the coordinating functions proposed by the Beltsville meeting.

13. This unit, which at present has three professional officers, will accordingly be reinforced by three more professional officers, two of them at the senior level. The new staff will include one officer responsible for work in plant exploration and conservation (working in cooperation with the existing professional officer in charge of exploration); one for documentation and information services; and one for seed exchange and distribution working with an existing professional staff member. The staff will assist regional and other centres in the planning and execution of joint programmes and will supervise the use of funds allocated for their implementation.

14. The budget for the 1974/75 biennium directly related to the provision of "core" staff services to the international network will be:

	$ US
Staff (professional and secretarial)	201,000
Documentation and information services[1/]	38,000
Consultant services (exploration, documentation)	86,000
Travel	25,000
	350,000

1/ Includes FAO computer capacity for information storage and retrieval to service the international network.

ii) The Global Network for Plant Exploration and Conservation

The Nature of the Network

15. The Beltsville report recommends a global network of strategically placed Centres in the major regions of crop genetic diversity, and of international institutes capable and prepared to play a role with respect to particular crops in which they have primarily the expertise, and also the facilities required for genetic resources work. In addition, it is envisaged that other institutions, both in developed and developing countries, would form part of the world network, and a number have already indicated their wish to be involved[1/]. Additional institutions, especially in developing countries where the genetic diversity of crops is found, would also be willing to participate, but require some financial support for these activities.

16. The need for urgent action to create such a collaborative network has been stressed by the recent meetings of the FAO Panel of Experts and the Technical Conference on Crop Genetic Resources held in March 1973, as well as by the Stockholm Conference on the Environment.

1/ Positive replies, some of them very encouraging in response to an approach from FAO at the request of its Expert Panel, have been received from: INTA (Argentina), CIAT (Colombia), IICA (Costa Rica), Völkenrode (Germany), Bunsu (Ghana), Bari (Italy), IITA (Nigeria), CIP (Peru), IRRI (Philippines), Academy of Sciences (Poland), Svalof (Sweden), Izmir (Turkey), USDA (USA), Vavilov Institute (USSR). Replies are awaited from CSIRO (Australia), ICAR (India), Gatersleben (Democratic Republic of Germany), Hiratsuka (Japan).

The Functions of the Genetic Resources Centres

17. To increase production in the developing countries, it is necessary to replace primitive cultivars and land races with higher yielding, more resistant, nutritious or adaptable varieties. The materials displaced should be preserved, but most of the developing countries cannot afford to maintain such collections. These materials could be consolidated and kept either as regional or as world collections, in genetic centres well equipped for permanent conservation and rejuvenation. The role of these centres is not only as gene banks for the storage of genetic materials, but also as sources of germplasm for breeding programmes within the region and elsewhere. The arrangement for the distribution and evaluation of these materials is an essential task of the proposed network. It will also be necessary to establish cooperative agreements within the network for the establishment of duplicate collections to insure against possible losses. In any exploration work supported by the proposed programme, a set of the materials collected would be offered to the country in which the exploration has been carried on.

18. Genetic resources centres as defined by the FAO Panel at its 1973 session can comprise either or both of the following components:

i) "base collections" (previously termed "conservation centres") for long-term conservation;

ii) "active collections" (previously termed "working collections") for:

(a) medium term storage;
(b) regeneration;
(c) multiplication and distribution;
(d) evaluation;
(e) documentation.

These two components are necessary for the continued maintenance of germplasm collections and, if not in the same institution, collaborative links are essential.

19. The establishment of genetic resources centres in the main regions of diversity is pivotal to the whole programme and their functions, as defined in the Beltsville report, would include some or all of the following, i.e.:

1. Exploration and collection of material, and collaboration with national centres;

2. Identification and preliminary evaluation of materials;

3. Initial planting of introduced material according to the quarantine laws of the country in which the centre is located;

4. Exchange and distribution of seed and vegetative stocks, including, where appropriate, the introduction of breeding lines and advance cultivars;

5. Maintenance and storage of seed and vegetative stocks for medium or long-term preservation;

6. Documentation and exchange of information with other centres in the network in an internationally accepted form. Some centres will be able to take advantage of existing local facilities for computerized information storage and retrieval;

7. Organization of genetic stock rejuvenation by national centres wherever possible, or otherwise by regional centre;

8. Organization of training programmes for personnel in collaboration with national or international training schemes;

9. Identification of "genetic reserve areas" in consultation with national centres and the international coordinating body.

The genetic centres would thus have a direct relevance to crop improvement and diversification, as well as safeguarding the storage of materials at more than one centre, both for security and to facilitate interchange of germplasm.

20. The developed countries also have a major role to play, not only in the global effort of exploration, but in particular in collaborating with the proposed regional centres in the evaluation and conservation of newly collected materials, as well as in the training of staff and the exchange of information on genetic resources. Considerable research is still needed on certain aspects such as reproduction techniques for vegetatively propagated crops, as well as in evaluation and storage methods. Association between institutes in developed and developing countries in these activities might attract support from members of the Consultative Group in whose countries the former were located.

The Role of the International Research Centres in the Global Network

21. At the Beltsville meeting, it was envisaged that the International Centres could play a key role in the proposed global network, not only as genetic resources centres of a "global" nature for a specific crop (e.g. IRRI with rice) or on a regional basis (IITA for humid tropical Africa), but also in related activities such as training.

22. However, while all the International Centres have expressed their willingness to cooperate in the activities of the network, it is clear from discussions and correspondence that some are better equipped than others to play a major role. This is partly due to their geographical location, partly to more ephemeral matters such as their stage of maturity and the availability of staff with the specific skills required for the operation of a genetic resources centre as opposed to a research centre. The nature of their present effort and possible future contribution to the network, based on replies to a circular letter from the TAC Secretariat, is shown in tabular form in Appendix 1.

23. Their replies show that certain of the International Research Centres already perform very adequately as genetic resources centres for some specific food crops. At present, these include IRRI, operating on a world-wide scale for rice and CIMMYT for maize. Both Centres have well-planned programmes for these crops, conducted with a high degree of expertise, including conservation, exploration, distribution and documentation, and involving the coordination of work elsewhere in a collaborative effort. IPC also has a soundly conceived programme and is beginning to play a similar role for potatoes and for certain other tuber crops originating in the Andes.

24. The programmes of CIAT, IITA, as well as that of CIMMYT in respect of wheat are less advanced, and the role of AVRDC for vegetables remains somewhat uncertain. ICRISAT was not approached, as no Director had been appointed when the other Institutes were contacted; but it is assumed that as its programme develops, this Institute will be prepared to take a major responsibility as a genetic resources centre for sorghum, pearl millet, and appropriate food legumes.

25. CIAT could play an important part in stimulating collaborative effort on cassava collection, but because this crop is vegetatively propagated and involves risks of virus infection, collections will have to be maintained at several locations. In the case of beans (Phaseolus species, especially vulgaris) it may be less well situated as a centre than Turrialba.

26. IITA has expressed its willingness to perform a world-wide role in respect of cowpea, yams and sweet potato, and is well located to do so in the case of the first but not for sweet potato which is of Latin-American origin or for the Asiatic yams, both of which may involve difficult transportation problems. It could, nevertheless, act as a regional centre for "expatriate" crops of ancient introduction to Africa such as cassava, rice, or maize, and in this respect would fill an important geographical gap in the network. However, the Institute as yet has no specialized expertise or experience in this field, nor a fully worked out and costed plan. Its programme will, therefore, have to be built up carefully over time.

27. CIMMYT is prepared to play a catalytic role in the assembly of germplasm of wheat and possibly of other small grains such as barley and rye, in support of other national, regional, or international agencies concerned with this very major endeavor. However, it is not ideally situated in relation to the centres of origin of these crops, and the Panel of Experts has recommended that priority be given in this task to the genetic resources centre already operating in Izmir, and to a new one to be established in Ethiopia. CIMMYT does not plan to initiate a major wheat or small grain germplasm bank of its own, but only to continue its own relatively small working collection for its breeding programme.

28. Despite some understandable reticence about open-ended commitments to the future, most centres do not feel that additional financial resources would be needed in the short term to enable them to take on the tasks indicated above. Only IRRI has specifically requested additional funds for expanding activities related to rice germplasm collection, including training, amounting to $185,000 over a five-year period. This sum which includes $40,000 capital costs for long-term seed storage facilities, is in line with their indicative figure to the Beltsville meeting.

29. CIMMYT has been assisted by a generous gift of $250,000 from the Rockefeller Foundation for its wheat and maize germplasm work, but while this will be adequate for its maize collection, the Centre believes that it will be insufficient for its catalytic role in wheat and small grains collection. However, CIMMYT states that the ultimate size and nature of the task envisaged have yet to be defined and that a detailed plan of operations must await the recruitment of a suitable scientist.

30. The contribution which the International Research Centres can make to the network may therefore be summarized as follows:

i) all are anxious to participate in the network, but not all are yet suitably equipped or staffed to do so;

ii) even when fully geared up to participate their active role will be limited by their terms of reference and geographical location to certain important food crops;

iii) both for technical reasons and to ensure the safety of the germplasm one or more additional collections will need to be maintained elsewhere for these specific crops.

The Gaps in the Network

31. Over and above anything that the International Centres in their "global" or regional activities and the genetic centres already established in developed countries can do, there is still a wide field to cover, as many important food crops are either very

poorly represented in these collections or are completely absent. Among these are wheat, barley and rye; several of the grain legumes; practically all vegetables and fruits; certain roots and tubers; oil crops, sugars, and many food crops of limited distribution but of considerable present or potential value.

32. Beyond this lies the question of germplasm collections for all other agricultural crops - some of which such as cotton have multiple uses, and most of which, especially the beverages and other fibres, contribute significantly to foreign exchange earnings, income and employment from agriculture in the developing countries.

33. Finally, there are the pasture and fodder species on which rest the main hope of increasing the productivity of ruminant livestock in many developing countries. The transformation of agriculture in Australia, as a result of plant introduction and evaluation, is convincing evidence of the value of such work, and its benefits are now flowing back to the developing countries, through inter alia the research programmes of the International Centres.

34. It is thus no denigration of the work of those centres to say that whatever they are doing or could do in the work of germplasm collection would not in itself be adequate to meet future needs. A wide spectrum of highly important crop species would remain neglected unless complementary action was taken with international support to reinforce the global network.

35. This is the main purpose of the request for extra money from the Consultative Group to establish and run additional strategically placed genetic resources centres and to provide what might most aptly be described as extra-budgetary "outreach" funds for disbursement by the Coordinating Unit in FAO to support other appropriate cooperating national or international institutions, exploration, and training. The International Centres would have access to the general funds for exploration and collection for their own breeding work in respect of crops for which they were not specially funded to act as main genetic resources centres.

iii) Priorities for Action

Institutional Priorities

36. The FAO Panel of Experts endorsed the selection of locations and institutions requiring financial support as genetic resources centres in the regions of genetic diversity as proposed in the Beltsville report, but it has reconsidered the priorities on the basis on urgency of crop collection. "Urgency" is determined to a large extent on the actual or expected erosion of genetic resources, but also on the need for making available fresh genetic material for immediate use.

37. The priorities recommended for support to these institutions are shown below, in descending order of importance:

1. Near East and Mediterranean: Agricultural Research and Introduction Centre, Izmir;

2. Ethiopia: College of Agriculture, Haile Selassie University; Institute of Agricultural Research;

3. Tropical America: Interamerican Institute of Agricultural Science (IICA), Turrialba;

4. Rice: International Rice Research Institute (IRRI), Manila, Philippines;

5. Tropical West Africa: International Institute of Tropical Agriculture (IITA), in cooperation with other institutes and centres such as IFCC, IRAT, IRHO, Moor Plantation, ORSTOM, etc.;

6. South-East Asia: Botanic Gardens of Indonesia, Bogor;

7. India: Indian Agricultural Research Institute (IARI), New Delhi;

8. Andean Highlands: La Molina, Peru;

9. Subtropical South America, Instituto Agronomico, Campinas;

10. Mexican Highlands: Chapingo.

38. While no priority has been indicated for the People's Republic of China, it is encourageing to note that China has now rejoined FAO. China is a historic centre of crop diversity and has had long continuity of crop production. It is reported that the Chinese maintain a germplasm reservoir of some 200,000 accessions of 50 or more crops. There would be decided benefit in establishing cooperation in germplasm exchange, which would benefit developed and developing countries alike. Seed exchange has already started with FAO and China can be expected to contribute new components to the existing germplasm base of rice, soybean, barley, wheat, oats, maize, numerous vegetables and fruits. In turn, China would gain greatly by access to the existing world collections.

Plant Exploration

39. Among the institutions listed above the Panel of Experts has recommended that, for the immediate future, highest priority be assigned to three main target areas: the Near East/Mediterranean, Ethiopia, and Tropical America, respectively. For these target areas it has made the following proposals:

Target No. 1: Near East & Mediterranean

40. Information available indicates that the most endangered major crop is wheat in the Near East and Mediterranean regions. The case of wheat is critical, but others require urgent attention. These are barley, oats, rye, grain legumes, melons, vegetables and their wild relatives. Large quantities of uncollected germplasm valuable to man are threatened by rapidly expanding agricultural development and a massive salvaging effort is required involving a comprehensive plan of exploration covering the Mediterranean mainland and islands, North Africa, Turkey and the Eastern Mediterranean, Iraq, Iran, Pakistan, Afghanistan and Nepal.

41. A number of Near East and Mediterranean countries have expressed their desire to collaborate in this effort, and there are two established genetic resources centres within the overall area at Bari in Italy and Izmir in Turkey. The latter, however, is in urgent need of strengthening, as indicated in the Beltsville report. There is also an actively cooperating network of agricultural research workers including both scientists from the countries of the region and from agencies such as FAO, CIMMYT, Ford and Rockefeller Foundations and USAID.

42. It has therefore been decided that FAO, in its coordinating role will convene a meeting at Izmir as soon as possible to prepare a detailed plan of action to be launched in 1974/5. This would identify the areas to be collected in order of priority, consider arrangements for the storage of the material collected and for documentation and logistic support for the explorations, and develop a budget for the 1974/5 campaign.

Target No. 2: Ethiopia

43. Ethiopia is given second priority because it is still rich in genetic resources of a number of important crops and genetic erosion is accelerating. Wheat is the most immediately endangered crop and should be given a priority equivalent to Target No. 1. Other crops requiring urgent attention are barley, coffee, grain legumes, vegetables, sorghum and millets.

44. The more easily accessible material has, to a considerable extent, already been assembled. Attention must now be directed to the remote and less accessible regions and these are indicated in greater detail in the Panel's report. This will require careful planning, cooperation and participation by Ethiopian personnel and outside specialists. A genetic resources centre should be established as recommended in the Beltsville report, and funds provided for a storage facility as a first step.

Target No. 3: Tropical America

45. Third priority should be given to tropical crops. The number of species is large and genetic erosion threatens many of them. It is very difficult to set priorities, but the situation is urgent in many cases. The Panel has recommended that attention should first be directed towards Tropical America, but it has also suggested priority crops for other tropical areas. These are:

Tropical America: Field beans, cassava; potato; sweet potato; peanuts; capsicum; tomato; cucurbits; forage legumes; cacao; pineapple; papaya and avocado, etc.

Southeast Asia: Rice; sugarcane; tropical tree fruits; aroid tubers, etc.

Tropical Africa: Rice; cowpea; yams; sorghum; millets; forage grasses; coffee, etc.

46. It will be apparent from this list that support to IRRI's proposals for rice would contribute significantly to this priority target, and that the development of an active genetic resources centre at IITA would add a further dimension both in respect of rice in collaboration with IRRI, IRAT and the WARDA countries, and for the other important African crops listed. Gaps would still exist in Africa for coffee; and in S.E. Asia for sugarcane, tree crops and the aroids (to be filled eventually by Bogor); but an important and economical addition to the range of coverage would have been achieved.

Other Action for Which Financial Support is Required

47. The Beltsville report places a great deal of emphasis on financial support from the Consultative Group for three other categories of action:

1. National institutions within regions of genetic diversity requiring support mainly in conservation but not included in the list of Centres given above (page 7 of the report).

2. Plant exploration conducted within the overall plan by any appropriately qualified institution or individual. In supporting such work, every attempt would be made to involve local personnel and to provide in-field training in order to strengthen indigenous expertise.

3. Training in the area of genetic resources at the level of a university degree or diploma or other specialist training, or at the level of short practical field courses in priority

regions of genetic diversity in association with established Centres (page 12 of the report). It is proposed, inter alia, to fund at least five fellowships per year at the University of Birmingham, the only institution where specialized courses may be taken at the MSC level.

48. The FAO Panel strongly endorsed the emphasis given to these three important requirements, which are considered essential to developing national capabilities for future work in the field of genetic resources; especially as they are not likely to attract financial support from bilateral sources. It is envisaged that they would be funded largely from the proposed central fund for exploration, information and training referred to on Page 13 of the Beltsville report.

49. Special attention would also be paid to the development of methodology and coordination in documentation especially in the adoption of standard forms for storage and retrieval of information. This is of common interest to all centres, to those already established in the developed countries and to the centres planned for the regions of genetic diversity.

Coordination

50. The central unit in FAO will have a highly demanding task in attempting to coordinate the expanding activities of the network outlined above, even if the field programmes are phased on the basis of the priorities now proposed, with only three genetic resources centres operating, plus IRRI and IITA.

51. In this work, it must have the guidance of an expert body with functions as close as possible to those projected for the governing body recommended in the original Beltsville proposal submitted to the TAC. The obvious body to give such guidance is the FAO Panel of Experts, composed of prominent scientists in the field of genetic resources, with wide geographical experience, including the regions of genetic diversity. It is available for continuing consultancy and has declared its readiness to play such a guiding role. In pursuing this aim, it has appointed a Chairman for three years (Sir Otto Frankel of Australia) who will keep in continuing touch both with the FAO genetic resources unit and with Panel members.

52. The new FAO appropriation will enable the Panel to fulfill this role by meeting more frequently than at present, and to permit the establishment of a small Standing Committee of the Panel which could meet ad hoc according to special need.

iv) The Costs of the Proposal

53. As requested by the TAC, a budget has been prepared, phased over the three-year period 1974/76, with the following main objectives:

i) the strengthening of the central coordinating machinery based on the FAO Genetic Resources and Crop Ecology Unit and the FAO Panel of Experts;

ii) the initiation of the network of genetic resources centres through the implementation of the three priority exploration targets outlined above; the establishment or strengthening of three centres, in Turkey (Izmir), Ethiopia (Haile Selassie University) and Costa Rica (IICA, Turrialba), and additional support to IRRI's programme on rice;

iii) the development of training, documentation, and public information programmes along the lines recommended in the Beltsville report and endorsed by the FAO Panel of Experts and the Technical Conference on Crop Genetic Resources held in Rome in March 1973.

54. The costs and phasing of these requirements are shown in Appendix II.

THE ROLE OF THE INTERNATIONAL RESEARCH CENTRES IN A GLOBAL NETWORK OF GENETIC RESOURCES CENTRES

APPENDIX I

QUESTION		CENTRE	C.I.M.M.Y.T.	I.R.R.I.	C.I.A.T.	I.I.T.A.	C.I.P.
Q.1	Scope of existing programmes relative to the collection and maintenance of germplasm:	Crops	Maize - Wheat - Rye - Barley -	Rice. O. sativa & glaberrima (+ wild species)	Cassava - Phaseolus - Maize - Rice	Primary: Cowpea - Yam - Sweet potato Secondary: Maize - Rice - Soyabean - pigeon pea-cassava	Potato - Solanum tuberosum and other tuberous Solanum spp.
		Collection	Yes. Yes in respect of working materials. Use made of USDA collections	Yes. 19,700 accessions	Yes major; Yes; No; No only current requirements	Yes for all primary crops on limited bases. For secondary crops as required by breeders	Yes
		Evaluation	Yes. Yes, working collections & breeders materials	Yes For 36 major characteristics Coordinates international testing	Yes; Yes; Utilize ICA & IRRI materials	Yes of "primary" materials	Yes
		Exchange and distribution of germplasm	Yes. Yes, to collaborating countries	Yes 100 different countries	Yes; Yes; No; No	Yes, subject to quarantine limitations, but expect to become main source of "primary" crop materials	Yes
		Cooperating countries, exploration or collection	47 countries. Use U.S.A. and other collections	Over ten countries, mainly in the Far East, but materials also obtained from U.S.A. and Africa	6 countries in Latin America; Yes mainly Latin America; No; No	Mainly West Africa to date, but have valuable cowpea collections from CIAT and other sources	Andean region and all major global sources
		Annual expenditure	In excess of $ 250,000	$ 100,000 per annum estimated	$ 50-75,000	Integrated in core budget at present	25% of total budget
Q.2	Use of current collections and information thereon	Own breeding programmes?	Working collections of wheat and other small grains restricted to breeders programmes and CIMMYT outposted staff	Utilized in own breeding programmes and made freely available, mainly to experiment stations in developing countries. Information disseminated through IRRI publications, scientific press and IRC newsletter.	Primarily for own programmes except for cassava	For secondary crops (maize, rice, soya pigeon pea, cassava) own breeding programmes and regionally available	Not exclusively for own programmes. Freely available to all potential users, information exchange expected. Hope to link existing potato germplasm banks into a network
		Freely available?	Maize materials fully available		Cassava material available, planning to set up information and dissemination programme	For primary crops(cowpea, yam, sweet potato) hope to establish and make available world germplasm collection	
Q.3	Prepared to collaborate in global network?	Global responsibility?	Yes, for maize	Yes	Yes, for cassava, but additional sites in other regions advisable	Yes, for cowpea, yam, sweet potato	Yes, for potato
		Regional responsibility?	For regional working (breeders) collection	Yes	Yes, for Phaseolus spp. Would also collaborate for maize and rice	Yes, for maize, rice, soya bean, pigeon pea	Yes, for other tuber crops also
Q.4	Participation in germplasm collection?	Prepared to participate?	Yes, especially for maize	Yes	Yes, especially cassava	Yes, especially cowpea and yam	Yes
		To make available?	Yes	Yes	Yes	Yes	Yes
Q.5	Siting of centre	Appropriate for plant collection?	Ideally situated for maize	Yes, for Asian materials. Will collaborate with IITA (Africa) and CIAT (Latin America)	Yes, ideally sited for cassava, very near centre of origin. Also very close to that of Phaseolus	Well sited for cowpea and yam	Ideally sited
		Difficulties?	Not ideally sited for wheat, but could maintain regional role. Closely associated with N.East centres of diversity through outposted staff	Not foreseen	Not foreseen, except for restrictions on virus infected cassava	Restrictive phytosanitary regulations currently militate against adequate collection: Anticipated will be overcome	Not foreseen
Q.6	Expert staff availability	Available now?	Yes, for maize	Yes, adequate	Part time expert services available	Not at present. Preliminary collections of cowpea made with assistance from University of Ibadan	Yes. World authority available
		Future plans?	Seeking staff member for wheat and other small grains	To continue as at present	Above expert probably available for future work	One or two full time staff members would need to be added or seconded from University	Actively engaged in training programmes for personnel from secondary potato centres
Q.7	Data collection and participation in information network	Data bank now?	Yes, for maize. Computer system includes about 65% of 12,000 accessions, remainder being entered. Not envisaged for small grains	Yes, computerized data on 8628 accessions	Not as yet. Cassava data bank is envisaged. Additional support needed	Developing computerised data bank for cowpea, yam, sweet potato and secondary crops such as pigeon pea	Yes. Currently in final stages of determining best means to computerize
		Prepared collaborate in network?	Yes	Yes. IBM data available are freely transferable	Yes. Subject to availability of additional support	Yes, when data more complete	Yes
Q.8	Additional resources required	Budget available?	Yes, and funds available ($ 250,000) to complete maize collections and initiate wheat and small grains work	Yes. $ 184,800 required for 5 year programme	No. Efforts can be intensified within limits of present core budget	$ 377,800 over 5 years for the systematic collection of legumes and tubers. Proposed as a special project in 1973 budget presentation	Yes. Additional costs would be minor unless other crops added
		To be prepared?	Additional funds needed for wheat and small grains programme. Budget could be prepared	-	Will prepare a budget, if required, to cover additional responsibilities		If required for additional crops

APPENDIX II

ESTIMATED BUDGET

DETAILS

	1st Year (1974)	2nd Year (1975)	3rd Year (1976)	3 Year Cumulative
1. Coordinating services provided by FAO	170,000	180,000	200,000	550,000
2. Support to regional and national activities				
Conservation (mainly support to national institutions: storage, evaluation, etc.)	100,000	150,000	150,000	400,000
Exploration	120,000	150,000	150,000	420,000
Meetings	20,000	20,000	30,000	70,000
Documentation, publications	80,000	90,000	100,000	270,000
Training	80,000	90,000	120,000	290,000
	400,000	500,000	550,000	1,450,000
3. Regional Centres and IRRI				
Recurrent expenses, regional centres	120,000(1)	320,000(2)	330,000(3)	770,000
Staff 52,000				
Materials & Supplies 7,000				
Operational Costs 20,000				
Regional Activities 16,000				
Non recurrent expenses	90,000	180,000	40,000	310,000
Total	210,000	500,000	370,000	1,080,000
GRAND TOTAL	780,000	1,180,000	1,120,000	3,080,000
Support required from Consultative Group	610,000	1,000,000	920,000	2,530,000

(1) One centre (Izmir) $95,000; IRRI $25,000

(2) One established, two new centres (Ethiopia, Turrialba), IRRI $30,000

(3) Three established centres, IRRI $30,000 + $40,000 capital expenditure

DDDR:IAR/73/14 RESTRICTED
March 1973

DRAFT

THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

R. HD
see p. 23-504
& 43-genus.

REPORT OF

THE FIFTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE

TAC SECRETARIAT

FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS

Rome 1973

WS/D9039

I N D E X

FIFTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE OF THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

30 January - 2 February 1973

Rome, Italy

SUMMARY RECORD

ATTENTION IS DRAWN TO THE CHAIRMAN'S SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS, PAGES 44-48, PARAS. 273-301

1. The Fifth Meeting of the Technical Advisory Committee of the Consultative Group on International Agricultural Research was held from 30 January to 2 February 1973 at FAO Headquarters in Rome, Italy. Sir John Crawford was in the Chair.

2. The meeting was attended by twelve Members and 20 Observers and 12 other participants in specific discussions. Dr. George Harrar was unable to attend. A list of participants in the Meeting is attached as Annex 1.

3. The Chairman, on opening the Meeting, reminded Members that one of the primary purposes of the Meeting was the discussion of priorities in International Agricultural Research. The Agenda had therefore been arranged to permit full discussion of this most important topic. He then introduced Mr. Roy I. Jackson, Deputy Director-General of FAO.

Opening Statement by the Deputy Director-General of FAO

4. Mr. Jackson welcomed the Members and Observers to the Meeting on behalf of the Director-General of FAO. Referring to the reputation already built by the TAC for its application to an extremely heavy work load, Mr. Jackson emphasized his belief that the Committee would face its greatest challenge in the current Meeting, in its attempt to define priorities for future work. Several of the more outstanding needs had been already covered by existing international centres, but remaining priorities were much less clearly defined.

5. Differences in regional needs could well lead to conflicts of interest thus requiring an essentially pragmatic approach to judgement on definitive priorities within broad general guidelines. Flexibility would be imperative to cope with necessary shifts in priorities over time, even to the extent of phasing out of established support if necessary.

6. Re-affirming the support of FAO to the aims of the Consultative Group, including the examination of research problems through its links with the TAC and active support to selected projects within its resources, Mr. Jackson informed the Meeting that means of supporting the Coordinating Centre for the proposed Genetic Resources Network were being closely examined. It might also prove possible for the Organization to participate in work on international socio-economic research problems and in other technical fields such as aquaculture.

7. FAO had a major responsibility towards its Member Countries in the building up of their own research capabilities. This could be regarded as a two-way process - firstly by conveying to TAC and the Consultative Group information derived from its field network on the needs of Member Countries beyond their own resources and which might merit international support - and secondly by providing a link between developing Member Countries and other

countries and agencies supporting research bilaterally or multilaterally. Apart from its importance as a component of FAO's Regular Programme, this type of direct assistance could be of importance to Consultative Group activities through improving the capacity of member countries to absorb the results of international research and assisting in the solution of problems outside the mandate of the Consultative Group.

8. To facilitate its work in the "bridging operation" outlined above, FAO had recently taken steps to strengthen its own resources in the research field through the creation of a Research Development Centre, which included the TAC Secretariat, and the establishment of research officers in certain Regional Offices. It was hoped that during the next biennium these efforts would result in the evolution of adequate linkages between the developing countries and potential aid agencies, and that these would, inter alia, complement the work of the Consultative Group by assisting the successful transfer of new techniques to farmers.

Adoption of the Agenda (Agenda Item 1)

9. The revised Provisional Agenda was adopted, subject to further revision which might prove to be desirable during the course of the Meeting. The Agenda, as followed, is attached hereto as Annex II and the List of Documents as Annex III.

Adoption of the Report of the Fourth Meeting of the TAC (Agenda Item 2)

10. The Draft Report of the Fourth Meeting, which had been circulated to Members, was adopted on a proposal from the Chair.

Priorities for International Agricultural Research (Agenda Item 3)

Chairman's introductory statement

11. The Chairman referred to his own revised notes on the question of priorities, to a paper just circulated prepared by Dr. Pagot, and to other useful notes from members already distributed by the Secretariat. Members should feel free to elaborate on their written comments and to indicate their general thinking on this whole subject so that a sense of the direction in which their minds were moving would emerge. He did not, however, expect the Committee to be able, in the course of this meeting, to complete a polished draft of their position. What he was hoping for was an ample discussion from which, with the help of the Secretariat, he would be able to prepare a consolidated position paper, hopefully for clearance at the July meeting.

12. In preparing his paper (which he regretted had been delayed due to illness), he had not expected to be able to define hard and fast regional or commodity priorities, but rather to erect a framework within which the TAC could judge these matters. In doing this he had attempted to give appropriate weight to the apparent urgency of problems, and to indicate a possible order of magnitude of financial requirements over time. These had been based on needs of existing centres, the proposals the TAC were studying, the possible types of institution which might evolve, etc., and broadly confirmed his approximation to the July meeting of the Consultative Group that they should not be surprised if proposals calling for funds of an order of $70-80 million by the end of the decade were supported by TAC. This figure was indicative and did not imply a judgement favouring any particular proposal; it did, however, give an idea of the significance of the possible financial constraint and the need for care by TAC in vetting proposals.

13. He had also drawn attention to the possible background thinking of the founders of the Consultative Group in setting the Terms of Reference for the TAC. While there was clearly a need for flexibility in their interpretation there was also no doubt that the inspiration for the establishment of the Consultative Group system was on the one hand a sense of great urgency about the food needs of the developing world, and on the other a conviction that agricultural research of the type already underway in certain of the established centres was

vital to the development of improved technology to meet those needs. He also wished to stress that the work of any centre, established or new, must be effectively linked with the needs of developing countries in order to get its results translated rapidly into expanded agricultural productivity.

14. In broad terms no one had ever had real difficulty in agreeing that food supply should be accorded first priority, but many things could contribute to the improvement of food supply and the question was where to begin. There had been some tendency to rest content with assuring an adequate calorie supply; in his opinion this was too limited an approach, attention should also be focused on the quality of the diet, which was why he felt the TAC had been right in stressing the importance of legumes and other components of the protein supply.

15. Consideration of proteins, vitamins, etc. raised the issue of what was meant by food, and whether the TAC should give consideration to food processing as well as to research related directly to production. So far this had not arisen, but it was a question they might have to grapple with in the future.

16. Nor were the Committee barred from recommending research in relation to the industrial agricultural crops such as jute, cotton, and the oilseeds. However, while specific proposals in respect of such crops would be given due consideration he felt that very powerful arguments would have to be evinced if they were to be given preference in the allocation of funds for international research, over some other urgent requirement in the food category.

17. One other important factor conditioning the early thinking of the founders on priorities was the pressure of population on available resources. This, of course, was a relative matter which did not imply that interest must be confined largely to India, Pakistan, etc.; there was no continent free of such pressures, and even countries which might be able to finance food imports from other resources such as oil might have problems of employment which could not be solved rationally without the development of agriculture.

18. There was a need for pragmatism in assessing priorities as between regions. It would be impracticable to deny the benefit of international research investment to any major region of developing countries meeting acceptable criteria and the TAC was likely to define and support a top priority for a given region even though not sure that it ranked above the third or fourth need of another region in which population pressure on food supply was more desperately apparent.

19. Flexibility was also required in relation to institutional approaches. He had been impressed from the start by the work of IRRI and CIMMYT and in many respects still regarded this kind of set-up as the basic model. Nevertheless, taking into account financial and other constraints, and the difficulties TAC was encountering in applying this type of model to research on such matters as water management, he felt that they must be ready to innovate in their future recommendations for approaches to tackling research problems, as there may be other forms of activity which TAC could properly sponsor. Thus in some fields TAC was not yet sure that the need was for one centre or whether it should develop more effective results by seminars and workshops in the spirit of its terms of reference. Certainly small central groups formed to develop such workshops were likely, in his view, to be an effective device in socio-economic research and this might well be true also of other activities such as aquaculture.

20. Finally, he had indicated some of his ideas concerning socio-economic research. There were some special problems in this field of research and he remained sceptical about the feasibility of covering these adequately with any single research centre, or possibly even on a regional basis. This, however, was a personal opinion and he hoped that the Committee would feel free to thrash this question out, along with the other matters he had raised without feeling that they had to propose specific resolutions at this stage.

Discussion

21. It was decided to separate the discussion of research on socio-economic problems from consideration of technical priorities, both because of the special nature of those problems and to enable the comments of economists from FAO and the international research institutes to be taken into account. (This discussion is reported in paras. 47 - 105).

22. Members were not daunted by the financial magnitudes indicated by the Chairman. These were considered a realistic order of progression for international support to research activities of the strength required to generate significant advances in agricultural productivity, having regard to the overall parameters of aid commitments to agricultural development, the foreseeable needs of existing international centres, inflationary pressures, and new proposals in the pipeline. There was wide agreement that rather than starting by seeking guidance from the Consultative Group as to a possible financial ceiling, the TAC should present its views to the Group as to the probable level of support required towards the end of the decade, based on sound evaluation and well prepared proposals. It would then be the task of the donors to decide how far they could go in extending financial backing to the programmes recommended by the TAC., after the most careful revision of its estimates.

23. In its consideration of broad fields of priority the Committee was unanimous that first place should continue to be given to food production, with cereals and legumes receiving highest priority. Despite the considerable measure of success achieved in developing high yielding varieties of wheat and rice it was felt that the current food situation, particularly in Asia, gave no gounds for complacency. While there was no single cause, it was obvious that basic staple cereals were still extremely vulnerable to climatic hazards and to pests and diseases. There were inherent risks in having large contiguous areas of widely adaptable varieties with a narrow genetic base, and attention needed to be focused in international research not only on improving yield but on reducing avoidable sources of instability in production. This implied taking full advantage of any new advances in weather control or prediction, better surveillance and forecasting of pest and disease outbreaks, more research to increase understanding of pest and disease problems and their control, and study of measures which might mitigate risks of total crop failure due to severe problems of weather - described by one member as "life-saving research".

24. In addition to emphasizing the dangers of any lowering of sights on support being given to research on cereals and legumes in existing international programmes Members drew attention to specific gaps in work on food crops which merited additional effort. These included barley among the cereals, lentils and field beans (Vicia faba) amongst grain legumes, and certain starchy foods especially yams and plantains - the latter being virtually outside any major research programmes.

25. Improvement of the quality of the diet, with particular reference to protein, was rated of high importance. Several Members felt that raising the content of protein and/or limiting amino-acids in the cereals deserved special attention, since these crops already supplied the bulk of the protein in most developing countries. While there were also important problems of amino-acid balance and digestibility of food legumes, the critical factors for study in many of these species were felt to be those related to their extremely low yields.

26. Next to cereals and legumes, the improvement of ruminant livestock - especially cattle and buffaloes, was accorded priority. In many cases this could make an important contribution to human nutrition without competing directly with land required for crops; in others dual purpose cattle or sheep and goats could be integrated into the economy of small farms to increase income and employment. Pigs and poultry, however, were felt to be adequately covered by knowledge derived from research mainly in developed countries, the successful application of which mainly required advice, sound management, and appropriate investment.

27. Some Members referred to the need for closer integration of research on animals and their nutrition. In some cases livestock had to be slaughtered at low weights and/or low prices for lack of fodder; there was also widespread evidence of imbalances between feed grain prices and those of livestock which made better feeding of livestock uneconomical. Research effort on rangelands, tropical pastures and fodders needed to be stepped up, and the fact that a crop yielded valuable by-products for animal feeding, e.g. cotton, oilseeds, and sugar crops could be a reason for allocating it high priority for research support. It was felt that the question of animal nutrition might merit more detailed consideration by a later TAC meeting, possibly following on the recommendations of a special working group.

28. Aquaculture was also felt to have an important potential for improving human nutrition in the developing countries, although Members did not feel sufficiently well informed on this to give it as high a rating as ruminant livestock. They hoped that the forthcoming working group being sponsored by TAC would enable more a definitive judgement to be made on its priority.

29. Fruits and vegetables were felt to be of lower priority for the immediate future, although it was recognized that their importance in the diet varied considerably between regions and that consideration of soundly worked out proposals for particular areas should not be excluded. It was pointed out that the food habits of the population were an important determinant of regional needs; these habits were conditioned both by ecology and by human physiology. Nutritional research could offer valuable guidelines in assessing the validity of proposals for work on specific food items and might in some cases merit support from TAC.

30. The Committee agreed on a pragmatic approach to "non-food and industrial crops" pending an "overview" of the needs, potential benefits, and economic justification of undertaking additional research on the various crops competing for support within this group of commodities, and where any research would be most valuable - in production, end-use or both. Although not inclined to give crops such as cotton or oilseeds, priority over cereals and legumes, several Members stressed the importance of their contribution to the economy of many developing countries in terms of foreign exchange, human food, and by-products for livestock. Reference was made to serious dietary deficits in edible oils, a problem not always appreciated in developed countries, whose people often suffered from diseases due to excess consumption, especially of animal fats. In this sense generic descriptions such as non-food or industrial crops were felt to be misleading.

31. On the other hand, most speakers were doubtful whether the Committee should advise the Consultative Group to support research on crops of direct economic importance to only a few countries, especially where these had no food-uses, e.g. jute, where it might be difficult to reverse adverse trends in end-use, e.g. sisal, or where weaknesses in essential infrastructure or inelastic demand made a significant impact from research unlikely. In some cases research on alternatives to such crops might be more valuable than backing a lost cause. This did not mean that the TAC was unsympathetic to such needs, which it recognized might be of critical importance to some countries, e.g. jute to Bangladesh. However, Members felt that there might be other mechanisms which could be invoked in such cases. This led to the suggestion that a two-tier approach might be adopted in making recommendations to the Consultative Group. Rather than turning down proposals which on first sight appeared to be of narrow geographical application, it might evaluate their merits and potential importance, and either recommend them for general Consultative Group support if a "second reading" justified this, or alternatively as being technically sound, second level projects for some other form of international or bilateral assistance. In some cases (e.g. conservation of genetic resources), there might be room for a combination of the two approaches.

32. There was considerable support for this viewpoint, since it was felt that the financial horizons suggested by the Chairman for priority commodities would not accommodate many more major research programmes, and that sources of complementary financing of second priority research activities would be needed to ensure the balanced promotion of development and to reconcile filling the most significant world gaps with meeting the needs of backward areas or disadvantaged agricultural raw materials. Unbiased advice on such matters from a body like TAC would also be of great value to governments and donors.

33. Forestry, while not rated as of immediate priority inter se, was considered to have an important bearing on questions of balanced land use, diversification of production, shifting cultivation, environmental degradation, soil conservation, and water control. Concern was expressed that short-term pressures to increase agricultural output and foreign exchange earnings would lead to the sacrifice of the resource base for sustained production. This merited further study by TAC, possibly with the help of a working group to highlight critical problems and areas.

34. The Chairman pointed out that so far the orientation of the discussion had been very much in terms of specific crops or livestock and he sensed that in relation to most issues the Committee wished to express its research priorities in this way. Nevertheless it had before it proposals for water management, pesticides, etc. involving very different questions and approaches, and he wondered how commodity-oriented research and work on these other factors, which were of undoubted importance, might be reconciled. In most cases he suspected that they would be found to form an integral part of a production package woven around a given commodity, research on which was implicit in assigning a priority to research on that commodity, and which might also involve studies on socio-economic constraints to the adoption of the "package" or evaluation of its implications for employment, credit policy, marketing, etc. He would appreciate Members' comments on this matter.

35. While it was recognized that certain problems transcended individual commodities or their specific factor-mix, such as diversification, integrated land-use planning, water management for a multiple crop rotation, etc., and that these might require multi-disciplinary systems research; there was a wide measure of agreement that much research on water use, soil management, pest control, etc. was only meaningful in relation to a specific production objective.

36. This did not mean that Members were satisfied that there was always an adequate disciplinary balance in production-oriented work. It was pointed out, for example, that the Rice Institute had entomology, pathology and soils units but not a water management section nor an overall programme on water management which integrated various units working in some aspects of water management. Similarly, there were widely recognized problems of management of tropical soils concerning which it was important to ensure that there was adequate coverage in the research programmes of the appropriate international institutes. Storage was another field for research in relation to specific commodities which some Members believed needed greater emphasis.

37. Several speakers felt that while it was TAC's responsibility to indicate the first order of priorities, a number of options existed as to the emphasis and balance of disciplines required in research programmes related to those priorities. The best method of attacking a problem varied from area to area as did the bottlenecks; it was the duty of the institutes to identify these and to structure their programmes to tackle them effectively. This had to be left largely to the judgement of their Directors and staff.

38. The Chairman emphasized that the fact that TAC might judge it most meaningful to express its priorities in terms of commodities did not rule out its recommending support for research on critical production factors. Research could not normally be concentrated on only one facet of a specific commodity. But, as Members had pointed out, a different approach might be required compared to that for genetic research, where materials developed at a central institute could have a wide impact. Research on water management, for example, might be quite location-specific, and it would probably be beyond the scope even of international institutes to undertake work in large areas of several countries. They could, however, with the help of a national system, demonstrate the value of an approach. Outreach programmes, workshops and seminars could thus play an important role in developing research on such problems, and might sometimes be more effective than a central institution.

39. Several Members stressed the value of better information on research and its results. This was necessary for TAC and the Consultative Group, which had frequently called for more information on ongoing research in order to guide its decisions, and to ensure that best use was made of existing facilities in international support for new research. It could help to indicate promising new fields for research by providing an inventory of knowledge not always available in books. It was also essential to bridge communication gaps between institutes in different countries, which were often exacerbated by linguistic differences, and to enable them to apply the scientific principles developed by international institutes more effectively to national conditions. There was a very strong need to reassess how information channels worked, and how information could be made more widely available on a selective basis, through the development of a communications network

to maximize the use of research results. The TAC had not really had time to do this, and it was suggested that the Committee should give it further thought, including inter alia, more detailed consideration of the CARIS and AGRIS operations.

40. The need for flexibility and innovation was generally accepted in future institutional approaches to research, but it was recognized that the alternatives to international centres so far explored (regional cooperative networks, workshops, etc.) had been relatively unpromising.

41. It was felt nevertheless that regional cooperative programmes with national participation and involvement could both help build up national capacities and generate greater political and economic support from countries by making best use of existing facilities. It was agreed that such programmes deserved further study by TAC to determine their applicability and the conditions required to achieve success, possibly starting with the WARDA proposal. They might in some cases involve participation of international centres or be complementary to them.

42. There was considerable concern that national research was receiving insufficient attention compared to support going to international centres, and Dr. Sauger emphasized that this might prove to be the weak link in the chain by which the results of the work of those centres was transferred to farmers and translated into development. In addition there were numerous agricultural research problems of national or local importance not being covered by the work of any international centre. Both to tackle these and to achieve creative research of their own, developing countries needed to build up their own capabilities rather than relying on results fed to them from outside centres which would merely accelerate the brain-drain.

43. While strengthening national research would largely have to be done with assistance from bilateral and international agencies rather than through the Consultative Group, some Members believed that it might require a positive effort to enlist and coordinate support from appropriate centres of strength in developing countries in a more systematic way. These might work with the international centres, with regional programmes, or in direct cooperation with stations in individual developing countries, thus forming a true international network with free communication in respect of research carried out around the world. The TAC should consider exploring how this might be followed up.

44. The Chairman pointed out that there were organizational problems implicit in getting people to work together. The TAC had already called together people working on genetic resources, on legumes, and would do so on aquaculture; it might also pay them to do the same on tropical pastures. He felt that in the fairly near future they should discuss how TAC saw its role in such matters, and whether it wished to assume executive responsibilities for this kind of activity. So far, with certain strains, they had done quite well; he felt they were better off when organizing their own missions, but in the long-term this would require a bigger budget.

45. Dr. Hopper sought clarification concerning the role of the TAC in assessing the programmes and budgets of the international centres. So far, because of pressure of work, they had tended to take these as given and had avoided discussing the internal balances within the budgets and the nature of the costs. Now he had heard that the World Bank were appointing a team to look at the budgets, whereas he felt that this was an integral part of the research assessment task of the TAC.

46. The Chairman indicated that it was the Consultative Group that had requested the budget reviews, which in any case he felt the TAC was not equipped to undertake. He had always insisted that all that TAC could be reasonably expected to do was to express judgements, that a proposed research programme was a proper one within its general priorities. To do any more had executive implications and would require a larger budget and secretariat. On the other hand, it was very important for the Committee to decide how it could improve its knowledge of the Institute's programmes; it had been agreed that to retain their independence

TAC Members would not be on external review panels whose reports would be available to them anyway, but this should in no way restrict their freedom to become better acquainted with the work of the Centres through informal visits. However, he realized that some aspects of how best the Committee could evaluate their overall programmes as well as just new proposals might require further debate, and he would attempt to provide for this at a future meeting.

Priorities and Approaches to Socio-Economic Research (Agenda Item 3)

Introductory statements

47. The Chairman noted that economists from three of the international centres (CIAT, CIMMYT, and IRRI) and from FAO would be presenting their views on this subject prior to open discussion. He welcomed their presence and regretted that Mr. Headley of IITA had been unable to attend. Dr. Barker of IRRI was asked to give the first introduction.

48. Dr. Barker (IRRI) explained that their programme had three major thrusts: first, the constraints on the introduction of improved rice technology; secondly, water management - which had been identified as one of the major constraints; and third, questions related to rice mechanization and employment.

49. In trying to identify constraints they were attempting in particular to look at whether they were up against environmental or management problems by working at the farm level in several Asian countries in cooperation with local institutions. The results showed an enormous gap between experiment station results and farm experience as well as great variability between different areas in their progress in the adoption of new technology.

50. In the case of water management a long-term continuing inter-disciplinary approach was required involving economic studies, but also social and technical elements including engineering and hydrology. A main problem lay in convincing IRRI's own management of the need to maintain such a coordinated effort in water management.

51. Together with their engineers the economic staff were looking at the implications for labour displacement, income, etc. of some new work IRRI was pioneering in the development of small tractors which could be made locally in several countries of the region vis-à-vis the current practice of importing four-wheel tractors. They were interested not only in what happened at the farm level, but also what the effects were on the rural community and even further up the line.

52. Along with these three thrusts IRRI had been trying to develop a microlevel network of people interested in research at the farm levels, the objective of which was to let IRRI know what was happening in the farmers' fields in the various parts of Asia, and from this experience to get some insight to feed back to policy makers in those countries. Work was going on with the help of an IDRC grant in 12 locations in seven countries of Asia. A seminar had shown that there was a felt need for such work, but on the other hand that policy makers had no clear ideas as to what guidance they expected from it.

53. Finally, he felt that their results showed the need for a better understanding of the agro-climatic environment for which they were trying to do research. This again was not purely an economic issue, but it was important to know initially the specific characteristics of of the environment, how many people lived there, etc. before you could begin to define the priority, the nature of the problem, the possible social and economic consequences of developing a given technology there, etc. The imprecision surrounding the definition of "upland" rice in Asia was a good example.

54. Dr. Winkelman (CIMMYT) explained that their programme was only sixteen months old and its main feature was a set of adoption studies. These were oriented to four questions: (i) to what extent had various classes of farmers adopted the new technology; (ii) what is the relative profitability of new compared to traditional technology; (iii) what was the

nature of the infrastructure and services as the new technology was being introduced; and (iv) to what extent programmes aimed at small farmers accelerated the adoption of new technology. Four studies were being carried out on wheat and four on maize with the help of national collaborators; first reports were expected in the summer and final reports around the turn of the year.

55. Looking to the future they were hoping to concentrate on developing work along the interface between agronomy and economics, to identify the interaction between agro-climatic and economic factors influencing farmers' acceptance of recommendations. They would be examining the relevance of the recommendations in their timing and their relation to farmers' goals.

56. They would also be working on organizing formats which national economists could use in generating, analysing, and presenting information to policy makers, hopefully improving the latter's awareness of circumstances at the farm level, leading to more efficacious agricultural policies. Tightening the links between farmers, agronomists, and policy makers (including helping CIMMYT's policy makers to orient their research to farmers' needs) was one of their main objectives, and training and the adoption studies were important tools in this work.

57. Mr. Pinstrup-Andersen (CIAT) indicated that the objectives of their agricultural economics programme were mainly to improve the quality and quantity of information available for the decision-making process in agricultural research (with initial emphasis on helping to orient the research management of CIAT and its collaborators) and in public policy.

58. The work was divided into five interlinked groups. The first of these was concerned with analysing the factors limiting yields and productivity of the commodities on which CIMMYT was working, involving description of the predominant production systems of the lowland tropics, identification of the bottlenecks in production and marketing, and estimation of the costs of reducing these bottlenecks. The second main line of work was a study of the factors limiting adoption of the new technology; thirdly, and closely related to this, was cooperation with the biological scientists on evaluating the experimental research from the conomic point of view right from the design of the experiment to the evaluation of the results and their suitability to adoption by the farmer. Fourthly, they were concerned with certain aspects of the demand for the commodities included in the CIAT programme, especially with consumer acceptance, e.g. for high lysine corn, and the possibilities of developing untraditional uses for traditional foods such as cassava. Finally, they were concerned with the possible socio-economic implications of new technologies and technical alternatives on employment and income distribution both within the farm sector and for the economy as a whole. A main aim here was to try and get ahead of the problem, to see whether the consequences were in line with social goals, and if not, what public policies were needed to align them more closely to those desires.

59. Looking ahead he did not foresee major shifts in the emphasis of this relatively new programme for some time to come, but they were proposing to introduce a further component of studying the processes of agricultural production on the small farm, not so much in terms of individual commodities but in relation to the factors conditioning farmers' decision-making. Their programme on agricultural systems was also being expanded. He hoped that as their methodology and information base on Colombia improved, CIAT would be able to collaborate with national agencies in other countries of the humid tropics of Latin America to develop a more formal kind of network of cooperative agro-economic research. This might involve channeling some funds to support research being carried out by national institutions; it should, however, lead to an improvement in the quality of the research being carried out, to greater capacity of researchers to undertake relevant problem-solving research, and also to the promotion of multi-disciplinary research where this seemed to offer the best approach.

60. Dr. Hardin referred briefly to the work going on at IITA, a major aspect of which involved the development of superior systems of farming to bush fallow. To better understand the problems involved, their staff had surveyed 100 farms in three villages in depth with economists and social scientists cooperating closely with the production specialists. A number of interesting lessons were already emerging from these studies as to what needed to be done and how best to do it.

61. The necessity for a practical micro-economic research component was brought home every time an international institute collaborated with a national programme in an outreach endeavour, where questions had to be answered as to what kind of national policies were required if a new technology was to succeed. This was an essential element of the two-way flow of information from farm level economic research emphasized already by every speaker so far, which illuminated policy decisions on such matters as input supply, price supports, storage and the capacity of governments to carry such decisions through in a manner credible to the farmers.

62. Dr. Ojala, on behalf of FAO, emphasized that their paper was not a list of ongoing work by the Organization, but rather an attempt to look at the general problem of socio-economic research related to agriculture. In order to keep the subject within bounds they had chosen the limited approach of trying to identify the problems and approaches which seemed of interest to a body such as the TAC/Consultative Group involved in the management of a large international research activity. In so doing they had stressed the important interaction between socio-economic and other types of agricultural research, involving on the one hand the analysis of constraints to adoption of research results, and on the other the role of socio-economic research in orienting on-going and future programmes of international agricultural research.

63. FAO had noted the increasing weight being given to socio-economic problems by governments and development agencies, and it was clearly no longer enough to adopt a simple output-increasing approach to agricultural research. This had important implications for the Consultative Group which reflected the development policies of governments.

64. He felt that a distinction needed to be drawn between fact finding and policy analysis, although FAO was involved in both and in helping governments to improve the instruments of policy. Research was a starting point for this, and the Director-General had recently strengthened the structure of FAO both in respect of research and of policy analysis and assistance to governments in the formulation of policies.

65. A first task of socio-economic farm research was to identify the constraints to the adoption of the results of scientific research; here he felt that it was generally necessary to study the whole farm situation, not just a single enterprise. The farm was the framework within which the farmer made his decisions. Other constraints stemmed from deficiencies in infrastructure and services, which often limited the ability of the farmer - especially the smaller ones - to acquire the correct package of modern inputs. This could be aggravated by social inequities in the rural structure which enabled larger farmers to pre-empt the supply of goods and services. Religious and customary practices, including consumer tastes, could be obstacles to the transference of technology or the technology might produce undesirable side-effects.

66. All these factors needed to be identified and taken into account in orienting future research programmes towards development goals and objectives, but it was also necessary to identify the relevance of particular crops and farm systems in the local and national economy as a means of providing criteria for decisions as to research priorities. This was a second important service arising from socio-economic research. A further much needed service was to provide the widest possible access to relevant results of research of both of the kinds mentioned above.

67. Finally, there was the feed-in of the results of such research into the formulation of public policy where the measures to counter the effects of constraints, to stimulate the adoption of improved farming practices, and to prevent the emergence of second-generation problems, had to be decided on.

68. FAO had given a great deal of thought to the best approaches to such problems, where a number of factors had to be borne in mind. The first was location-specificity, especially in dealing with constraints, which had led to the approaches to farming system research related to specific ecological zones already described by the representatives of international centres. There was a great advantage in that work at this level could help directly to orient the technical research of these centres and to speed the adoption of their results.

69. Another problem was how to promote research of the kind desired by governments and national institutions, and then to provide opportunities for dissemination and access to the results. This would help to identify gaps, to develop improved methodologies, and to determine training and financial requirements to support more work of the type needed.

70. FAO was inclined to think that there was a need for some kind of international service that would help to make the most of research undertaken at the national and regional level, and their paper had indicated some of its possible functions. Such a service would not itself undertake research, but should have funds to promote research by other bodies aligned to priorities identified by international research management bodies and not yet adequately covered, as well as to work on methodology. It could also do valuable work at the national level to help governments improve their policy instruments and to exchange information on governments on workable instruments. Such a centre could benefit from close association with a body like FAO which had an intergovernmental structure, and could offer guidance on national policies; it could also obtain a great deal of valuable material from FAO's own work in the socio-economic field. However, he did not believe that it should be part of FAO, since as an independent body it would be better placed to give advice to FAO and other international and national agencies as to how their efforts could be better oriented and coordinated.

71. In addition, FAO was hoping to interest its Member Governments in the idea of an international development centre which would be part of FAO, and which would be concerned not only with economic research but also in policy analysis and formulation, methodology and training related to the development process. It was hoped to establish a close association between the work of such a centre and universities in developed and developing countries, and this would obviously be relevant and useful to the purposes of TAC and the Consultative Group.

Discussion

Note: This summarises the TAC's discussion of socio-economic research both before and after the introductory papers outlined above, and is therefore not in strict chronological order.

72. Dr. Hopper noted that the Committee had a great deal of literature before it. This was an area to which he had also given much thought and he would like to touch on some of the main issues he believed the TAC should consider.

73. Judging by the papers he believed that the institutes were now doing valuable work at the micro-economic level; IRRI in particular had a long-standing programme and was developing the first real production functions in relation to water and its impact on rice yields, as well as work on multiple cropping, experimental design, etc. The other international institutes were also beginning to develop this kind of competency and the TAC should press them to undertake more such research so as to obtain a better idea of the economics of the crops they were working with.

74. In his opinion, however, the public policy issues arising logically from the micro-economic work, for example its implications for fertilizer supply and other support to increasing production, water management, irrigation development, and investment policy, etc. were being less well handled. The Indian Agricultural Research Institute was just beginning to work on such matters and also IRRI, e.g. in relation to drainage and multiple cropping in the Philippines; he also recommended Members to study a report by the Chairman to the World Bank with regard to Indian agriculture. This area of micro-economics and its translation into policy was one to which the Committee must give considerable emphasis, since the research they were recommending would often alter the structural nature of agriculture, and the only clues as to what that structure might be had to come from the research plot. More farm surveys, etc. were not a sufficient answer, since if the research was successful they were rapidly out-dated.

75. There was a third level of macro-economic studies which he was not sure the Committee ought to be greatly concerned with. This involved broad estimates of commodity movements, world trade policy, perhaps price policies. While some people felt that there was still a dearth of material in this field, he believed that many of its aspects were being well covered by FAO, which had a good commodities section, as well as by UNCTAD and others. It was not the TAC's responsibility to try and cover such work, although it should draw the attention of the organizations concerned to any urgent gaps and encourage them to cooperate in response to need.

76. Turning from economic to social studies he emphasized that all development implied change, and the surest way to avoid social problems was to avoid development. Once development started a chain of events was set in motion, and the so-called "second generation" and subsequent problems were simply part of this process. This did not mean that social questions were unimportant, many of the obstacles to increasing livestock production in Africa were to be found in the framework of human society, and there was a substantial volume of anthropological studies which provided a good understanding of the traditional livestock systems. Research aimed to change structural patterns and while the anthropological literature could offer useful guidelines as to the factors conditioning decision-making by the farmer, he doubted whether the human sciences had yet reached the stage where they could provide clues as to how to engineer society, and perhaps this was a good thing! He therefore believed that some caution was necessary in giving a very high priority to social studies per se.

77. A number of other questions had been raised related to credit, farm size, economic aspects of land use planning, etc. on which he also had reservations as far as the involvement of international research was concerned. He reiterated that their main focus should be on the components of decision-making as they affected the farmers and their implications for public policy. In this respect he drew the Committee's attention to a project in which IIRC were involved with IRRI and other international and national centres in cooperating in the study of the impact of the new rices on farming according according to an agreed work programme. Although not costly, this was a truly international network which might serve as a model of the type he believed necessary for successful collaboration in a field of research which had delicate implications for national sovereignty and policy.

78. The Chairman thanked Dr. Hopper for his clear statement of the problems, and emphasized the importance of definition of the subject before the Committee could have a meaningful discussion of organizational approaches. They needed to reach agreement amongst themselves as to what matters were closely linked to their work, and those that lay beyond their domain. For example, credit was important to the expansion of production, but decision-making rested with governments as part of public policy, and international institutes could not be expected to come up with credit packages. Social objectives, such as full employment, prevention of urban drift, etc. were also of great importance, giving rise to questions of rural development in which research played a part. However, he did not consider that anyone should expect TAC to become an authority on regional development - international agencies and national governments had far more experience of such matters than could be expected from any group of scientists. For these reasons he had shown some hesitancy in defining the scope of TAC's approach to socio-economic research in his paper on priorities, but he drew the Committee's attention to the importance which the Consultative Group attached to this subject. He hoped that the observers present would not hesitate to indicate more specifically their views or those of their agencies.

79. Discussion centred mainly on three issues: the value of the work of the existing international research institutes; the translation of the results of micro-level farm research into public policy and the role of the international institutes in this; and whether there was a need for some other form of institution to undertake research in the socio-economic field which was not being adequately covered at the moment.

80. In respect of the first issue, there was general agreement that the international institutes were doing useful work along lines which the TAC supported. The adequacy of the resources being allocated to their socio-economic programme would be carefully studied in the light of their overall budgets at the July Centres Week meeting. Members welcomed the

close cooperation between economists and other scientists now developing at the institutes, since research in human sciences was regarded not as an end in itself but as part of team-work oriented to development.

81. Dr. Pinstrup-Andersen of CIAT suggested that there were at least four lines of socio-economic analysis which could provide valuable guidance to their scientific colleagues, as well as helping in the allocation of resources to research, a field in which progress in the public sector was rather limited. These were: first, systematic feedback from the farm to describe what was actually going on in the fields; second, estimation of the importance of the various factors limiting production; third, assessment of the cost of solving such problems; and finally identification of the possible socio-economic consequences of successful new technology, e.g. a breakthrough in raising yields in irrigated areas reducing the price of a commodity, with unfavourable effects on incomes in rainfed areas where the new technology could not be applied successfully.

82. In reply to questions concerning the extent to which they could assist scientists in designing their programmes and experiments, the economists of the institutes felt that a great deal still depended on personal relationships. There were understandable sensitivities among scientists who had devoted their lives to what they believed to be the desirable goal of increasing food production in respect of the numerous criticisms by socio-economists of the allegedly harmful social repercussions of the Green Revolution. Even so collaboration between disciplines at the international institutes was superior to that at many universities in developed countries. It was felt that the economists could offer guidance both in respect of programme management, e.g. what commodity should be given priority, and concerning project management - what orientation a given specialist's work should have and how his projects might best be designed. While any suggestion of dictation by the economists would be fatal, considerable progress was being made by the supply of relevant information of the type indicated by Dr. Andersen and by the development of informal working relations with their scientific colleagues.

83. Members saw the work of the socio-economists at the institutes as having particular value in defining the parameters of a problem in collaboration with other scientists (e.g. with agro-climatologists in identifying the importance of upland rice), in providing guidance as to whether a new technology was likely to be capable of adoption by farmers, and in helping in the programme development and allocation of resources to research at their institutes. All such information would also be of great assistance to the TAC.

84. Most speakers doubted, however, whether the results of the micro-level research programmes per se of the institutes could have widespread application because of their location specificity and the impossibility of providing tailor-made solutions to the wide range of situations existing in countries covered in the institutes' terms of reference. Doubts were also expressed as to whether the institutes could play as effective a role in influencing public policy as they could in micro-level research, since their rather narrow focus, although a source of strength in approaching problems at the farm level, limited their scope for offering guidance on broader issues. It was pointed out that so far micro-level research had not had a great impact on policy formulation: in India, for example, decision-makers had been influenced much more by pressures from farmers once a successful technology had been evolved by the scientists than by the results of socio-economic studies. Nevertheless, many nations would need help in assessing total input and institutional (e.g. credit) needs if the new technologies were to be encouraged.

85. Concern was expressed by several Members at the disparity which appeared to exist between the rather considerable resources now being channelled to the analytical case study type of socio-economic research being undertaken by the institutes, valuable though this was, and the weakness of national systems which were being expected to undertake complex studies on such broad policy issues as optimum size of farm, employment and other problems consequent on the choice of various technological alternatives, investment strategies for agriculture, etc. Attention was also drawn to the need for information on which to assess the results of large-scale development projects, the acceptance of new techniques being introduced, the reasons for success or failure, and the economic impact of such investments. This was a much broader field of socio-economic research than the rather narrowly specific

work being undertaken by the international institutes, but although the latter were strongly equipped to study individual components of the agricultural structure in a local environment, they could not be expected to provide the integrated approach at the national level which was really required for the solution of broad policy issues.

86. There was a strong feeling that this dilemma could only be resolved by channeling more resources to helping the developing countries to build up their own capacity to undertake socio-economic research both at the farm and the policy level.

87. In this process the international institutes could play an important role through the development of generalised methodology (e.g. for the study of production functions) and the construction of flexible models (e.g. on farming systems) capable of wide adaptation by national institutes; in the training of national workers (including scientists and planners) to use and understand the socio-economic technology and to enable them to cooperate in multi-disciplinary research; and in the assembly and analysis of information and the dissemination of the results of socio-economic research.

88. The latter should not be confined to exchanges between socio-economic researchers, but should facilitate both the two-way communication between social and other scientists necessary to the correct orientation of research policy, and the feed-in of results of field studies to national planners essential to decision-making in public policy. This would provide the link between research, development and investment, which was often missing, but the studies on which information for national planning had to be based must in most cases be undertaken within the national environment where the direct influence of international institutes would generally be marginal.

89. The Chairman noted that the Committee generally shared Dr. Hopper's concern that there was a weak link between field level socio-economic research and the translation of its results into public policy. He asked whether the economists from the institutes would like to elaborate on how they saw this being improved. Was a continuing dialogue developing between researchers and policy-makers, or was it still largely an ad hoc process?

90. Representatives of the institutes emphasized that the first requirement was to establish the credibility of their programmes through the results of their research, and through the development of methodologies which were transferable. This took time, but the task of building up the necessary network of contacts with researchers and policy makers outside their home country took even longer. Nevertheless, while they clearly could not be the only source of information to policy makers, they believed that the institutes could play a useful part in providing facts, and perhaps even more in helping countries to build an apparatus of their own which would generate the right sort of information on which to base policy decisions. Dr. Barker gave examples of how their work could also provide guidance on investment policies and choices to international agencies such as the World Bank if adequate channels of communication could be established.

91. However, while the need for developing a better mechanism for interchange and communication of micro-level research findings up the line was clearly felt, there was still considerable uncertainty as to how this could best be achieved. In this connection, Mr. Gucovsky indicated that this was a problem now being studied by OECD and it would be useful for the TAC and the institutes to open a dialogue with them.

92. Mr. Evans raised the question of whether the TAC and the Consultative Group should concern itself with any additional mechanism for strengthening socio-economic research oriented to the national policy level. While he recognized the excellent progress being made in micro-level research by the institutes, he shared other speakers' doubts as to whether their focus was broad enough to provide sufficient guidance for decision-making in agricultural policy and perhaps something more was needed. So far this had received very little attention in this meeting, although the possibility of establishing some international or regional centre to develop research and training in the policy field had been debated elsewhere. He was still uncertain as to whether much would be gained by such an approach, since in any case

a good deal of work of this nature was going on at national institutes and universities as well as in international agencies, although in a somewhat uncoordinated manner. Nevertheless, he felt sure that the Consultative Group would wish to have the TAC's opinion on this issue.

93. Professor Bommer felt that since much would depend on the ability to strengthen national establishments attention should be directed to training, the development of broadly applicable principles, and coordination of all the many institutions trying to cooperate in various fields of socio-economic research. The collation, analysis, and dissemination of information on such research on a broader basis than could be expected of the international institutes could play an important role in this process; it would also help to identify the major gaps, some of which might be tackled at the national level by sub-contracting to appropriately reinforced national or regional bodies, others at the macro-level by asking international agencies to step up their efforts. There might be a case for establishing some centralized coordinating mechanism to undertake such activities, perhaps along the lines suggested in the Mosher report, or possibly it would be enough to bring together existing institutions in an improved network arrangement.

94. While most Members agreed with the need to strengthen training, coordination, and information, the majority of Members doubted the usefulness of a central socio-economic research institute. It was pointed out that a number of such approaches at the regional level had had little success, and that even the existing international institutes, working in a fairly restricted field, experienced increasing difficulties in exercising an effective influence the further they extended their efforts outside their host country.

95. In summing up the discussion, the Chairman noted that only two speakers had referred seriously to a single centralized socio-economic research organization, and he shared the scepticism of those who doubted the feasibility of such an approach. Conversely there had been general support for the strengthening of socio-economic work, whether at international, regional or national institutes, which would help to build up a picture of the type of problems likely to be generated by any new technology developed as a result of research. What he found lacking was any clear idea of how policy makers could be given the opportunity to take advantage of this kind of work. An interesting and challenging example had been given by IRRI of how they might be able to improve the efficiency of World Bank lending, which showed the need for better dialogue even at the international level. But at the national level perhaps even greater difficulties existed, and although it was unfair to expect effective influencing of policy makers to come solely from the researchers, there was an urgent need to build a better bridge between the makers of new technology and those who not only had to provide the inputs and services if they wanted results, but also had to bear the brunt of any problems which might emerge, for example in respect of employment.

96. It was, of course, nonsense to say that no one was thinking about these policy issues; as he saw it the problem for TAC was whether there was any role that international action could play in improving the effectiveness of communications on research to the people who had to take decisions. One sphere in which drastic strengthening might be called for was the training of nationals in the capacity to interpret research and its policy implications.

97. He saw no simple solution to what might well prove to be a complex of requirements; but it was up to the TAC at least to try and disentangle the complexity to the point of making some practical suggestions which would lead to the more effective use of investment in research.

98. Dr. Hopper agreed that this was a large and complex area, charged with feeling and emotion, and not one in which it would be easy to define or establish priorities. Referring to the proposal by Dr. Bernstein of U.S.AID to hold a seminar on socio-economic research in Washington in conjunction with the July Centres Week meeting, he wondered whether the wisest course might not be for TAC to wait a little longer before making any definitive proposals. This would give its Members a chance to reflect on the present discussion, the Chairman's summary, and the U.S.AID sponsored meeting. He would represent TAC at the one day preliminary meeting arranged by Dr. Bernstein later in February, and would provide the Committee with a brief report on this.

99. He had been very impressed with the presentation of work going on at the Centres, and at the coming July meeting TAC would have to give careful consideration to the support being given to socio-economic studies within their overall programmes and budgets. However, he believed that the Committee was being asked by the donors to consider a broader base of economic investigations than was presently being conducted by the international institutes, involving organizational questions and whether the TAC felt they should recommend that the Consultative Group moved on to such a broader base. He would like more time to reflect on this, to weigh up the opportunities, and to have the benefits of the comments of the proposed seminar before reaching a conclusion. The matter might therefore be postponed for final decision to the January 1974 TAC meeting.

100. While agreeing with the sense of this proposal, which was in tune with the comments of several Members who argued against hasty decisions, the Chairman felt that the donors placed such weight on the socio-economic problems of agricultural development that there would be considerable disappointment if he did not give some account of TAC's position at the November Consultative Group. He felt that they could emphasize the high place being given to socio-economic research in their thinking, and the value they placed on the work of the international institutes in this field. On the other hand, he believed it would be entirely reasonable to state that they still needed further time to consider what wider work needed to be supported and how best to approach it. However, it was quite possible that they would have insufficient time at the July meeting to react to the conclusions of the seminar, and it might be necessary, if their budget permitted, to hold a third TAC meeting in 1973, prior to the November Consultative Group.

101. Dr. Sauger stressed the need to develop a more complete picture of the socio-economic research going on at the national level, to supplement the adequate view which they now had of the work of the international institutes. He suggested that the proposed seminar might offer an opportunity for bringing enough people together to provide this overview, which he considered essential to TAC's position on further support which might be required to such work.

102. The Chairman considered this to be a valuable suggestion, but pointed out that the July seminar was being organized on the initiative of U.S.AID and not of TAC. There would be a meeting on 13 February, to which Dr. Hopper had referred, to discuss its composition and content. While it did not preclude the possibility of TAC getting a selected group of people together to help it evolve its thinking, this would prevent them reaching a decision in 1973. As an aid to their further study of the issues involved, he advised Members to read as much as possible, especially the report produced by Dr. Mosher for a Bellagio Group meeting, and the minutes of that meeting. He did not wish to be misunderstood; he was not trying to force conclusions before the November Consultative Group on all aspects of the subject, but rather to convince the donors that their concern with the problems involved was genuine.

103. Dr. Hopper was alarmed at a generalised approach to reviewing the vast field of socio-economic studies and stressed the need to narrow down what TAC wanted. He believed that the first exercise following the seminar should be to decide where the sphere for action lay, and what general areas needed to be concentrated on. Only then should they begin the study of ongoing work.

104. In concurring with this view, the Chairman emphasized that the volume and diversity of socio-economic research could be overwhelming unless a systematic approach was followed, with each level being examined to see what was needed and what was manageable. For example, he felt that in respect of commodity and price forecasting collaboration between agencies such as FAO and IBRD was now producing documents in which confidence could be placed, and he did not believe that TAC or the international institutes should concern themselves with this. By such means, the range of choice could be reduced to something they could discuss meaningfully.

105. He therefore recommended that the Committee should follow Dr. Hopper's suggestion. He would ask the Secretariat to provide a particularly detailed report of the present meeting, a further discussion would be held in July assisted by the seminar, and they would take it from there for further analysis. He hoped that at the July meeting Members would be prepared to be positive about the socio-economic work of the international centres, which were closely related to their agronomic research. However, he agreed with Dr. Pagot that they needed a broader view of work going on elsewhere before the TAC could make more general recommendations for support of such work.

West African Rice Development Association (WARDA) (Agenda Item 4)

106. At the request of the Chairman, the Secretary introduced the revised research proposals of WARDA. He recalled that the Committee, at its last meeting, had recommended that the research programme of WARDA should be reviewed with the WARDA secretariat on behalf of the Committee, by the Directors, or their representatives, of IRAT, IRRI and IITA. The objectives of such a review were to identify the priorities within the rather extensive programme originally submitted to the TAC, and to establish clear linkages with the ongoing work of the international centres. This review had been undertaken and the revised proposals which had been circulated to Members reflected the recommendations of the meeting.

107. Low priority had been assigned to projects on agro-meteorology, mechanization and water control, and topics not considered as research such as coordination, training and seed multiplication had been eliminated. The remaining four projects, in order of priority, were the Coordinated Trials, costing $2,136,000 over five years; varietal improvement costing $948,750; Soil Fertility and Management, costing $464,970 and Plant Protection, costing $995,970, all over four years. Total funds now being requested amounted to $4,545,690, instead of over $10,000,000 as originally requested.

108. The high priority Coordinated Trials Project would be based on standardized comparative trials of the best local and introduced varieties, and various combinations of other inputs, at a number of stations in the WARDA network. Varietal materials and technical backstopping would be supplied by the international institutes which would also participate in annual programming and review meetings. Detailed operational aspects were to be finalized during seminars to be held in the near future and it was expected that firm proposals would be available to the next meeting of the Committee.

109. The Varietal Improvement Project was aimed at developing new varieties for the specific conditions of West Africa and work would be confined to 3 of the principal stations in the WARDA network: Mopti for floating rice, Rokupr for mangrove swamp rice (in collaboration with IITA and the FAO/UNDP project) and Bouaké for rainfed rice (in collaboration with IITA and IRAT specialists).

110. Soil Fertility and Soil Management problems would be studied at Rokupr, with an emphasis on soil salinity and toxicity problems. Close backstopping would be given by IITA and IRRI, and established IRRI varieties would be utilized in the studies.

111. Finally, the Plant Protection Project would be established in three parts. Weed control studies would be undertaken at Mopti, pest control at Rokupr, (both in collaboration with IITA and IRAT) and disease control work would be undertaken at IITA in association with the regular programme of IITA.

112. It had been accepted in principle that financial management of the overall programme could be undertaken either by a financial Controller or a management committee consisting of representatives of WARDA, IITA, IRAT and IRRI, which would supervise the allocation of funds over a certain minimal amount. The terms of reference of the management committee had not yet been agreed upon and WARDA had suggested that details could be negotiated between WARDA and the Consultative Group or individual donors.

Discussion

113. In opening the discussion, the Chairman stated that the recommendations made previously by the Committee had been taken very seriously and considerable progress had been made towards meeting those recommendations. He therefore felt that the Committee should give careful consideration to the potential of the network type of operation which WARDA was trying to create, with the backstopping of the already established and experienced institutes.

114. The need for caution in reaching conclusions with respect to the framework within which such a network could be supported was expressed by Dr. Swaminathan. Whilst the TAC had agreed on the need for enhanced rice research in West Africa, it should bear in mind that the WARDA operation, if supported, could become a model for future activities of a regional nature which might be presented to the TAC/CG for support. Whilst the operation could be viewed as one of expanding the outreach activities of IRRI and IITA, in reality it went further than that in providing for assistance at the national level which appeared to be aimed, in part, at increasing the capacity of national organizations to participate in a regional programme. Several Members viewed with some disquiet the possibility of the TAC receiving requests for assistance to regional organizations well beyond its capacities unless very great care was exercised in the establishment of precedents.

115. It became clear during the course of discussion that the Committee was still not satisfied that it had adequate information on which to base a firm recommendation to the Consultative Group with respect to WARDA; and the Secretariat was requested to do all it could to ensure that this further information which was expected following the forthcoming seminars of WARDA, was made available in time for the July TAC meeting.

116. The Chairman, whilst agreeing that a decision on assistance to WARDA must be postponed until the next meeting of the Committee, sought the further reactions of Members to the proposals submitted. Discussion then centred on the nature of the proposed WARDA network and its specific relationship to the outreach activities of IITA and IRRI. It was felt that these institutes now fully supported the revised proposals from WARDA, having indicated during the review meeting the extent of their proposed cooperation. Two alternative viewpoints were, however, apparent in the Committee. Some Members believed that the Committee should regard the WARDA programme as mainly, if not exclusively, a vehicle for outreach activities of the institutes already in receipt of support from the Consultative Group. Others felt that the Committee should continue to view the programme as presenting an opportunity for giving support to a regional organization providing a framework for the coordination of all rice research in the region, in which IRAT, IITA and IRRI, would play an important catalytic and coordinating role which would help to ensure that the technical and scientific background for support was sound.

117. Dr. Pagot suggested that the association of the international centres' work with WARDA might be considered rather in the category of "Special Projects" than "Outreach". In either case, accepted methods of financing were available, and the Committee would need to recommend to the Consultative Group the extent to which it felt Group financing, or bilateral financing, was appropriate. Members should, he believed, receive the record of the meeting between WARDA and the international centres in order to assist them in reaching a final decision. He felt that the TAC should not attempt to suggest a hierarchy within the final associative network and hoped that the further discussions of the Committee on other proposed networks might help to elucidate a workable structure for such operations.

118. The Chairman reminded Members that the Committee had already decided that whatever the final nature of the WARDA programme might be, it was not debarred from recommending support for any reasonable research activity within the bounds of the resources of the Consultative Group. It had taken the initiative to bring together the international institutes and WARDA and the final form of the WARDA project might prove to be a compound of their several activities. In summing up he gave an assurance that the question would be further discussed at the next meeting of the Committee, when it was expected that additional information would be available, in the form of detailed research projects, and proposals for their operation and management.

Water Use and Management (Agenda Item 5)

119. Dr. Hopper reviewed the steps which led to the offer by IIRC to arrange for a study of current practice in farm water use and management with special reference to the humid areas of Asia. This problem had been the subject of at least three previous missions since 1968. The first of these had recommended the establishment of an Asian institute for irrigated agriculture, the second had recommended an international institute for water management, whilst the third, also mounted by the IIRC, had recommended a travelling seminar, to be conducted by a selected team visiting major water use and management projects with a view to selecting a few of these for strengthening on a "pilot project" basis, to be followed by a task force investigation of basic research requirements for soil/crop/water relationships and the reasons for and consequences of, mismanagement of water resources. The problem had been discussed at previous meetings of the Committee, and, in view of the reservations expressed by Members and others who had reviewed the proposals, the IIRC had agreed to mount a further consultant mission to undertake a survey of existing projects in the field and to indicate what additional research lines might profitably be followed. This mission had been undertaken by Dr. Dean Peterson, whose report had been made available to Members.

120. Dr. Hopper indicated that a voluminous literature review, which formed an integral and important part of the report had not been circulated but could be made available to Members on request.

121. Dr. Peterson, in presenting his report, stressed that the literature review would provide a very wide overview of existing technological information, much of it site-specific but nevertheless giving indications of transferability. In his opinion it gave support to the position (taken earlier by some Members of the Committee) that much of the required technology was already known and that the basic problem was one of implementation of known technology at the farm level. Although there were many common features in the monsoonal lands of Asia the translation of technology from area to area faced major constraints at two levels - at the farm level, in its immediate ecological and cultural environment, and at the national level where such questions as land tenure, rights of way, large scale land levelling, etc. raised problems which could only be tackled by government. Thus, national policy could have a very great influence on the possibilities for change, but unfortunately, all too often, basic consideration of the problems involved at the national level in getting water to (or off) the farm was overlooked in national planning.

122. During the study it had become more and more apparent that, although many countries of Asia had a very high percentage of their land under controlled irrigation, an improvement of the water control base, throughout the region, was essential for the economically effective use of other inputs to support further production increases. This was particularly noticeable in respect of increases in yields of upland crops, such as legumes, dependent on the availability of water in the dry season.

123. Following a review of existing research programmes, pilot farm schemes, seminars, etc., Dr. Peterson had concluded that although the pilot scheme approach was the most promising means of dealing with "on-site" problems, its very nature made necessary a parallel approach at the national level. The general record of pilot schemes was not good and this could be traced to the lack of necessary national and regional level linkages. This need had been recognized to some extent in India with the expansion of an earlier pilot project programme into a comprehensive area programme covering one of the larger canal projects.

124. Recognition of this need for an expanded overall approach to the problem had led Dr. Peterson to a belief that an opportunity existed for a substantial research effort in adapting known technologies more imaginatively to developing country conditions in order to avoid further disappointing results from the extremely large investments being made in water supply and flood control developments in the Asian region.

125. He therefore proposed that a centre be established to undertake the development and adaptation of technology, the study of the economics of the problem, both at national and farm level, and the development of policies and institutions up to the national level and even impinging on the international level. He foresaw the possibility of such a centre utilizing modern methods of systems analysis and model building in its work on a total systems study of farm water delivery and management. Other important roles foreseen for the centre were in the fields of education and training, selective information processing and retrieval, and on-site assistance to ongoing projects. He had considered a strategy for the development of the centre which would include the early involvement of national policy level personnel in order to ensure subsequent feed-back and continued identification of national interests with those of the centre. It was proposed that leadership of the centre should be broadly based on engineering and economics with supporting technical personnel in soils and agronomy. National, regional and international level linkages had been identified and a suggestion had been made for much of the technological research to be conducted at existing national and regional centres.

126. In closing, Dr. Peterson emphasized the importance he attached to the educational role of the centre through seminars, working groups and training programmes, which he felt would go a long way towards ameliorating the marked lack of dialogue between civil engineers, irrigation engineers and agronomists.

Discussion

127. Whilst several Membres expressed great appreciation of the value of the literature survey conducted by Dr. Peterson and also recognized clearly the value of both educational activities and a centralized information and documentation service, there was a consensus of doubt that existing research gaps were of sufficient importance to warrant the creation of a new centre. The discussion centred around the nature of the tasks which it was proposed to assign to the centre and the extent to which these could be considered as research activities within the purview of the Committee.

128. The training and on-site advisory roles were considered by Dr. Pereira and others to be the most important functions envisaged for the proposed centre, although not research functions. They were, rather, the outcome of a process of adaptation of known technology to site-specific situations. Similarly the outstanding need for sound technical advice to those countries currently establishing new water control systems, or updating already established systems, pointed up the need for the institutionalization of adaptive and advisory services, but at the national rather than the international level.

129. Dr. Swaminathan fully supported the findings of Dr. Peterson in respect of the work which required to be done although he held strong reservations about how such work should best be organized. Giving examples from the Indian experience he recognized three major groups of problems in respect of water use. Firstly, those problems related to the fragmentation of land holdings and the consequent difficulties concerning land levelling, canal construction, cooperative management, etc. Secondly, a set of problems deriving from the past neglect of work on the qualitative aspects of water use, undoubtedly aggravated by the lack of essential contacts between engineers and agronomists already pointed out by Dr. Peterson. Concern had hitherto been mainly with the quantitative aspects of water supply rather than its scientific utilization at the right place and the right time. Closer contact between the engineering and other disciplines was clearly of the greatest importance. The third problem area, that of salinization, was largely confined to new irrigation works and derived in part from the lack of early and adequate inter-disciplinary contact referred to. Better crop planning in the early stages of implementation of irrigation schemes could have avoided many of the salinity problems currently encountered. Referring to problems of scale in the application of irrigation technology, Dr. Swaminathan recalled the often expressed criticism of existing water use technologies as being more favourable to larger land holdings. This was called into question in a recent publication by the Irrigation Commission of India which concluded that given good water management a scale neutral technology could be achieved. He believed firmly that one international centre could not make a worthwhile impact

in the face of such a multiplicity of often site-specific problems and would prefer to see a network of cooperating national centres established, based on centres similar to the water technology centre recently founded in India. He firmly supported the proposal for much earlier and closer contact between all disciplines concerned in the planning of water use and management programmes.

130. Several Members sought clarification of the nature of the research to be conducted at the proposed centre, believing that most of the research still required, particularly that concerned with crop/soil/water relations could best be conducted in a network and not by one centre. To this extent the proposed utilization of existing centres was fully supported. The question was then raised by Dr. Yamada as to whether, if the centre were merely to act as an information and data source, that work could not be adequately performed by other existing organizations such as, for example, FAO or the International Commission on Irrigation and Drainage.

131. It was explained by Dr. Peterson, supported by Dr. Horning of FAO, that the work proposed for the centre was essentially of an applied nature, similar to that already conducted by FAO in Regional Applied Research projects in the Near East and Far East regions, although of course on a larger scale than these. The fundamental role of these projects was the collection and dissemination of information on basic research relevant to the needs of the region, and the giving of timely advice to member countries of the region on the applied aspects of water use and management. The parallel seminars and training courses were considered essential parts of the projects.

132. Mr. Evans (IBRD) drew attention to an apparent lack of conviction in the report that the type of applied research proposed for the centre would have a "pay-off". He also pointed out an apparent equivocation in that elsewhere in the report it was proposed that the centre should concentrate on a basic systems study. He felt that the TAC should address itself to the question of whether a centre should be set up to conduct research which might be unlikely to have an important "pay-off". Such a centre might, certainly, be in a better position than any individual project or national centre to attract and hold the best brains, which would be essential to ensure that new information would be produced, but he felt it was not clear as to whether such new information would be forthcoming.

133. Replying to comments made, Dr.Peterson re-emphasized his belief that a high priority problem such as water use and management merited a high priority approach, and in his opinion this necessitated a high prestige centre able to bring the best people together to work on the problem. He believed that such a centre would have a pay-off but was unable to suggest how its results could be measured.

134. Dr. Hopper noted the difficulties felt by the Committee in reaching a clear-cut solution and referred to the excellent work being conducted by IRRI in the field of water management. The IRRI programmes had been aimed at precisely the problems suggested for the programme of the proposed centre and were very relevant to the issues before the Committee. Dr. Barker of IRRI informed the Committee that the work at IRRI had come face to face with one of the major problems involved in water management - the bridging of the communication gap between research and practice and the feeding of results into national and international programmes. It had proved extremely difficult at IRRI seminars to achieve a satisfactory dialogue between the various disciplines involved in the problem. The Chairman expressed the frustration felt by the Committee in trying to reach a decision as to whether the question at issue was one of research or of application of knowledge. The high priority of the problem of water management was clearly acknowledged and the Committee should not feel any inhibitions with respect to research/non-research if useful recommendations could be made.

135. Dr. Hopper recommended that the Committee take formal note of the report of Dr. Peterson. He further recommended that the Secretariat should contact the existing international institutes in order to ascertain their activities in the field of water management and their views in respect of what they might undertake in water management research as a contribution to a possible international network. A concise account of

water management activities at IRRI was already available; IITA had a small water management programme; CIMMYT had an extensive irrigation programme of its own; and ICRISAT would certainly be undertaking work on water management for rainfed areas. Dr. Hopper suggested, therefore, that the institutes be asked to indicate the extent of their existing programmes, the possibilities of establishing expanded programmes in the future, even to the extent of creating new divisions, and based on their views of what might be required, to supply tentative costings. As an extension to this enquiry the institutes might also be requested to examine the activities in water management of national and regional centres in their areas which might form part of any ultimate research network. He felt that examination of the institutes' replies would indicate clearly whether the problems related to water management which were of an applied nature could logically form part of the international centres programmes in the future.

136. There was general agreement with the proposal made by Dr. Hopper, and in summing up the Chairman expressed the decision of the Committee to invite the five existing international centres to prepare an account of their current work in water management in the applied sense and to give an indication of their views as to what further work needed to be undertaken and the extent to which their programmes might be expanded.

Food Legumes (Agenda Item 6)

The Chairman invited Dr. O. Kelley (U.S.AID) to describe the proposal for an International Soybean Resource Base to be established at the University of Illinois.

137. Dr. Kelley referred to the undertaking given to the TAC by U.S.AID to examine further the possibilities of expanding the international cooperative programme on soybean being conducted at the University of Illinois into an international centre akin to the existing international institutes. The rationale of this proposal was based on the fact that, together with the adjacent USDA Northern Regional Soybean Laboratory, the existing strength in soybean research in Illinois formed the largest concentration of such work in the world. It had become apparent, however, that a tropical base was also required and consequently the University of Puerto Rico had been involved in the preparation of the proposal tabled. University regulations precluded operation in exactly the same manner as the existing international institutes and difficulties had been experienced in incorporating provisions that would ensure the necessary involvement of worldwide expertise. Provision had been made, however, for an International Advisory Board consisting of noted scientists (not representatives of possible donors as indicated in the text of the proposal), and Dr. Kelley felt that such a body could fulfil a role analogous to that of the governing bodies of the other institutes, albeit of a more restricted nature.

138. The proposal called essentially for the establishment of an International Soybean Resources base at the University of Illinois which would utilize the existing competence and facilities of the Universities of Illinois and Puerto Rico and the USDA laboratories, in work on the improvement of soyabean in the tropics. Additional components would be required to establish relay centres (e.g. the existing international centres), outreach programmes at the national level, and training activities.

139. Whilst no definite commitments had been made Dr. Kelley believed that core support would be carefully considered by potential donors such as the Ford and Rockefeller Foundations, with whom the proposal had been discussed. He saw the feasibility of relay research, outreach and training activities being financed as appropriate by the Consultative Group or bilateral sources.

140. In response to questions from Members regarding the exact nature of the proposed research base, Dr. Kelley explained that the intention was to establish a base from which soyabean research workers could obtain all the inputs necessary for widening the scope of their work. This would include germplasm, documentation and information, the provision of land and facilities, basic funding for the scientists working at the centre but not funding for the outreach and relay work or for the support of students.

141. Dr. Pereira foresaw difficulties for the proposed centre if it remained attached to the University and questioned the possibility of establishing a more traditional international institute to work closely with the University in view of the advantages of the site. It was pointed out, however, that the existing soyabean centre was an integral part of the University and the proposal had been prepared by the University. The sponsors had hesitated to suggest that international support be given to a U.S. university, and consequently sought support only for strengthening of the relay and outreach programmes of what would otherwise remain an essentially bilateral project.

142. In summing up the Chairman proposed that full discussion be delayed until the final proposal had been examined in detail and foresaw that further steps could be taken at the next (July 1973) meeting of the Committee.

(ii) On behalf of the TAC Legumes Sub-Committee, Dr. Hopper presented a revised resolution for consideration by the Committee, the full text of which is attached hereto as Annex IV.

143. The resolution, aimed at giving effect to the suggestions contained in the Report of the Sub-Committee had the unanimous support of that Sub-Committee. The Report had already been adopted at the Fourth Meeting of the TAC (para. 1 of the resolution); the remaining paragraphs of the resolution could be summarized as follows:

2(a) The Secretariat to prepare:

i) A general review of research programmes under way (updating of the Roberts' report).

ii) An outline survey of the state of knowledge regarding the physiological and other factors contributing to low yields of legumes.

iii) Suggestions, based on the review and survey, to guide the Committee regarding the need for further basic research on legume species.

(b) The Secretariat to provide the Committee with a periodic brief reviewing the main publications (including those of the PAG) on protein needs, and on cereal and legume research programmes under way or contemplated, to meet those needs.

3. Recognizing the concern of the TAC with respect to coordination of present research on grain legumes and on the protein content of cereals and legumes, aware of the existing proposals for intensified work and anticipating new proposals for research into grain protein sources for human consumption, the Committee should appoint a standing Sub-Committee on Grain Protein with the following terms of reference:

(a) to consider and review all major ongoing and proposed work on grain protein sources and to recommend effective action for coordination of the work;

(b) to consider and recommend meaningful action to the Committee in respect of new proposals for grain protein research;

(c) to consider, upon instructions from the Committee, action that should be taken to ensure that the required research is being mounted into the improvement of grain protein sources of major importance to human diets.

Dr. Hopper stated that the Sub-Committee had foreseen a probable necessity for the appointment of a high calibre scientist to assist the Secretariat with the tasks outlined in para. 2(a), as even though a probe in depth into the physiological problems was not contemplated, several months full time study could be envisaged.

144. The Standing Sub-Committee on Grain Protein, proposed in para. 3, would be able to undertake, on behalf of the Committee, the "watching brief" proposed in the report of the Grain Legumes Sub-Committee. A considerable proportion of the protein intake in low-income areas derived from cereals and for this reason the terms of reference of the Sub-Committee had been framed to encompass protein from all grain sources. It was not considered apposite at this time to introduce other major protein sources such as meat or fish, nor exotic sources such as single cell proteins, and these would remain beyond the scope of the Sub-Committee.

145. The Chairman, in opening discussion requested that the resolution be considered in two parts as covered by para. 2 relating to the preparation of basic data and para. 3 concerning the establishment of a continuing machinery.

146. Referring to the requests to the Secretariat, the Secretary, Mr. Oram, sought clarification of the time horizon envisaged for the review and outline survey requested in para. 2(a). The Chairman indicated that the task would not be expected to be completed by the next meeting and in view of the probable need to hire additional assistance he would expect to have to seek additional support after an appropriate examination of the budget.

147. In respect of the periodic brief to be prepared following a review of current literature and ongoing or proposed research, the Secretary undertook to discuss an appropriate methodology with the PAC Secretariat inter alia, and to report back on feasibility to the next meeting.

148. The Chairman welcomed the proposal to establish a standing Sub-Committee which would act as a screening mechanism on behalf of the Committee as well as giving guidance to the Committee on ongoing work and its implications.

149. On the proposal of the Chairman the resolution was adopted with the understanding that an additional budget might need to be provided for work envisaged in para. 2(a) and that the Secretary would report on the feasibility of the proposals in para. 2(b).

150. The Standing Sub-Committee on Grain Protein was constituted with Dr. Bommer as Convener, and Drs. El-Tobgy, Swaminathan and Yamada as members. It was agreed that Dr. El-Tobgy should represent the Sub-Committee at the forthcoming CIAT Seminar on Grain Legumes in Latin America.

Research on Animal Production and Health in Africa (Agenda Item 7)

151. The Chairman reminded the Committee of its earlier recommendations to the Consultative Group that two parallel international efforts should be developed in the animal production and health field in Africa. The first was in respect of ILRAD, on which negotiations were now proceeding, and the second led to the establishment of the Task Force headed by Professor Tribe. The report of the Task Force had been circulated to members and the Chairman warmly thanked Prof. Tribe and the members of the Mission[1/] for what he considered to be an excellent report. He invited Prof. Tribe to introduce the report.

152. Prof. Tribe stated that his intention was not to summarise the report but to highlight certain points which might assist the TAC discussion. The central theme of the report, emphasis on the priority need for a multi-disciplinary approach to systems of livestock production, took one step further a concept which had been gradually developed

1/ Dr. B. Nestel, Dr. D.J. Pratt and Dr. M. Thomé

in a succession of previous reports and in earlier work of the members of the Task Force. The Task Force had not however begun its work with pre-conceived ideas and had revised and developed its views gradually following its discussions with over 400 authorities in 20 countries during a six month period. The final report reflected essentially the unanimous recommendations of the members.

153. Referring to the two broad strategies available for cattle development in Africa, firstly the ranching type, which brought all necessary inputs into underpopulated areas but the scope of which was necessarily limited, and secondly the improvement of existing pastoral systems, Prof. Tribe indicated that the recommended international centre was planned to service the second development strategy. Progress was likely to be slower by this approach but would affect a vast area, millions of livestock and most importantly could improve the welfare of the increasing human population. The research programme of the centre should therefore concentrate on the study of existing systems of production in order to facilitate identification of those practices within a given system which might be susceptible or resistant to change. Recognizing the desirability but also the difficulty of attempting to define "a multi-disciplinary approach to a system of animal production", Prof. Tribe gave as an illustrative example, the situation of a feed-lot system (or sub-system) within a broader, predominantly rangeland system. The feed-lot represented a comparatively simple closed system with precisely defined parameters and sufficiently subject to control to lend itself to mathematically expressed model building and sophisticated programming techniques. Analysis of such a system could produce answers to management problems which integrated both biological and economic inputs and outputs. However, when such a system is considered in the light of the need to first obtain stock (usually from arid rangelands) and subsequently to market it, a whole new range of biological and socio-economic variables is opened up. Varying limiting factors would apply to different groups of pastoralists and thus it seemed essential to study existing pastoral systems in relations to their ecological, social and economic environments. Such studies could not result in a high degree of precision in view of the empiricism of the approach but nevertheless identifiable research problems would result.

154. Prof. Tribe underlined how misleading it could be to consider specific research projects when thinking in terms of systems. More than adequate lists of well defined research topics existed and these were, as topics, eminently valid. The scientific approach, planning and interpretation would however be multi-disciplinary and development oriented under the systems approach. He gave as an example the simple problem of calf parasitism and mortality, pointing out the totally different approaches necessary to this problem in an up to date ranching system and a nomadic pastoral system. Whereas in the former well worked out drenching programmes could probably effect adequate control, in the latter a study in depth of the management system, including social anthropological considerations, by an inter-disciplinary team would be essential. Only by study of a problem in the context of a specific system can there be any likelihood of a lasting solution. Given the dependance of African systems of livestock production on innumerable local conditions of ecology, sociology and economics the question could be raised as to whether a single centre could make a contribution of more than local significance.

155. The main justification for such a centre he felt, was the need for more multi-disciplinary research directly related to the improvement of present systems of production. Although a chain of research centres existed, some strongly supported, others less so, the aim of many of these centres had been the accumulation of biological knowledge too rarely related to processes of development. Similarly sociologists and anthropologists had devoted themselves to studies of traditions rather than the problems of communities in a situation of economic and technological change. The problem of the Task Force had been to decide how best to improve support and complement existing efforts.

156. It had been agreed at the outset "that the ultimate success of a centre would depend on its influence through national and regional institutions rather than through its own activities." It must have adequate status and identity, but its role should be

complementary, cooperative and catalytic, rather than competitive.

157. It could thus be described as a "decentralized centre", assisting national and regional centres through scientific leadership, policy guidance, training and project support in clearly identified critical areas. It must clearly first establish its ability to fulfil such a role and to this end would clearly need adequate headquarters capacity in research, documentation and training roles. Various means of achieving this desirable situation were considered, from the establishment of a number of sub-regional centres with only a central administrative office, to the channeling of all support into existing stations. Finally, the establishment of a centre with a strong headquarters and network of cooperative research programmes on national stations, was envisaged. The headquarters, or "nerve centre" would provide leadership and support for national efforts, and outposted staff for the cooperative research projects which could form part of the systems research programme. Prof. Tribe emphasized that the Task Force had not foreseen the international centre as sub-contracting projects to national centres nor acting as a channel for finance between donors and recipient countries. He again emphasised the prime importance of national programmes and the need for complementary assistance at the national level in addition to any international assistance to the centre.

158. Having recommended the establishment of a centre, the Task Force had also given consideration to its siting. It had finally recommended Addis Ababa although stressing that no "ideal" site existed. In respect of time phasing of the establishment of the centre the Task Force felt that the key to speedy implementation would be the rate at which suitable staff could be found. The staff would need to include men with African experience, with a "systems approach" orientation, representing a wide range of disciplines and accustomed to inter-disciplinary work and, to the extent possible, should be bi-lingual in English and French. Such people were rare and great care would be needed in selection.

159. The Task Force had estimated that if it were decided to establish the centre the first 3-4 years would be occupied by building, recruitment, and launching of programmes. However, if recruitment could be speeded up the schedule could be revised.

160. Prof. Tribe closed by reminding members of the important difference between animal and plant research, consequent upon the slow growth and mobility of animals, and the resulting need for caution in adopting plant research policies to animal research.

161. He expressed the firm personal conviction of the team members in the conclusions and recommendations expressed in the Report and hoped that it indicated an adequate sense of confidence and urgency.

Discussion

162. The Committee was unanimous in congratulating Prof. Tribe and the Task Force on the preparation of an outstanding report. It wholeheartedly applauded the imaginative approach made to the problems of African livestock production which was reflected in the proposals made in the report. These called for a multi-disciplinary, systems oriented programme of research, which would make full use of existing research institutions and installations through the establishment of a cooperative research network, coordinated and backstopped by a strong centre.

163. Welcoming this approach, as an innovation in the field of internationally supported agricultural research, many members felt convinced that it constituted the only possible approach which held out any promise for the successful implementation of change through improved technology.

164. All members who commented were particularly gratified with the proposals made for the close involvement of national research institutions in the work of the proposed centre. Most members believed that such involvement was essential to ensure

effective implementation of any results of research whilst some felt that only through the involvement of national institutions could a truly and effectively international type of research be established.

165. Notwithstanding the general and spontaneous early consensus in favour of the recommendations of the Task Force, several members sought further clarification from Prof. Tribe on specific issues such as data and statistics collection, and most wished to discuss such issues as the research programmes and research role of the centre itself, its siting, and above all the proposed phasing which was generally felt to be over protracted before full operations got under way. A number of suggestions were also made for specific research issues to be included in the overall programme.

166. Believing that the proposals of the report were fundamentally sound and that matters of detail should best be left to the staff and governing body of the centre, if established, Dr. Hopper proposed that the Committee regard the report as a "policy document" rather than a detailed blueprint for action, and examine other issues as supplementary or incidental to the main policy line. He particularly stressed the importance of the role proposed in the centre for forward-looking social anthropologists.

167. In summing up the first part of the debate the Chairman warmly welcomed the wide acceptance which had been accorded to Prof. Tribe's report, and recognized that several of the members' earlier questions on the report had been answered during Prof. Tribe's introduction. He therefore agreed with a proposal that this introduction should be transcribed and issued as an Annex to the Report. He too had particularly welcomed the inter-disciplinary approach to problem solving, and agreed with some members that clarification of some of the problems to be solved would be helpful, particularly of those on which work could be conducted during the early developmental phase (Phase I) of the centre. No member had happily accepted the impression given that three years work would be conducted at the centre before real research was started, and he requested Prof. Tribe to resolve any ambiguities. The Chairman recognized some members' insistence on having a more detailed research programme on certain components of the systems, agreeing that single technical factors could often be responsible for very wide changes; nevertheless he felt that Prof. Tribe had given due recognition to this and had also stressed the fact that there were few single factors applicable equally, to all African livestock systems; he therefore felt that the final programme could best be prepared following the review of priorities by the initial staff of the centre, and urged the early appointment of key personnel. The Chairman believed that the Committee should make a definitive statement with respect to a relationship between the proposed centre and ILRAD, and should also attempt to justify any proposals made to the Consultative Group in respect of specific siting for the centre. He sought the views of Prof. Tribe in respect of the possible reaction of African scientists and governments to the proposals of the report and asked him to deal with the various requests and questions of members which had been raised in discussion.

168. The representative of the UNDP shared the concern of the Chairman and other members for some clarification of what research might be undertaken during the early stages of formation (Phase I), particularly in order to shorten the apparent three year wait. On the whole he welcomed the report and applauded the cooperative national network.

169. Dr. Pereira recalled his earlier support for the report and reiterated his conviction that no attempt to set up expensive study facilities should be made until after the preliminary review of problems had indicated the type of facility required. This, he was sure, would take the full three years foreseen in the report.

170. This view was supported by the delegate of France, who stressed the need for a thorough survey of the different production environments and a concise documentation before any work should be undertaken. He believed it was now time to inform the concerned African states of the proposals in the report, and to obtain their views before further work was undertaken.

171. This latter proposal was fully supported by the Chairman of the Livestock Sub-Committee of the Consultative Group, Mr. Evans. He indicated that subject to the approval of his Sub-Committee, the report, with attachments comprising the presentation to and the views of, the TAC, could be given wide circulation at a fairly early date. It was in very great demand already including from quarters outside Africa.

172. In replying to members' and observers' questions and requests for clarification, Prof. Tribe indicated at the outset that the Task Force had recognized the sheer impossibility of giving answers to all the innumerable questions which were raised during the mission.

173. The members of the Task Force were in full agreement with the TAC on most of the issues raised. They had fully recognized the importance of the integration of crop and livestock research and accepted Dr. Sauger's point that many traditional crop production areas might form excellent take-off points for new, integrated livestock ventures.

174. With regard to documentation and statistics it might be possible to avoid further confusion by a categorical statement that it was not intended for the centre to become a statistical collecting agency. However, in view of the lack of reliable statistics it might well, in its own interests, have to use its influence to ensure that those who were responsible for statistics provided appropriate and accurate ones. The documentation role of the centre would certainly have to be organized in such a way as to avoid overlap and duplication with others, and it would seem logical to tie this in with FAO's current activities under the CARIS and AGRIS programmes.

175. In reply to the Chairman's request for information on the reaction of African Governments, Prof. Tribe indicated that although it had clearly not been possible for the Task Force to convey its final conclusions to any government, as these had been formulated only during and after the visits, their reception had been everywhere most sympathetic. A great deal of interest had been aroused by the mission, both among individual scientists and governments, and the amount of trouble taken over the mission, if indicative of future cooperation, would hold out good promise for the general future of the proposal.

176. Explaining that the lack of emphasis in the report on a central or core research programme was the result of assuming this to be taken for granted, and not a deliberate exclusion of central research, Prof. Tribe underlined that the whole thrust and importance of the centre would be its research activities. These activities would, if successful, establish a reputation for the centre, which most members had considered essential if it was to be effective in its leadership role. The other cooperative and outreach activities must be viewed in relation to the centre's core programme with which some of the cooperative activities would be associated. With regard to the consultancy work proposed for the senior staff, which some members had applauded and others questioned, clearly it should not be allowed to detract from the research at the centre; on the other hand the specialized consultancy work of the staff of the already established centres had proved to be a very valuable output of these centres and the Task Force had believed that such a role was also essential for the staff of the proposed livestock centre.

177. Prof. Tribe regretted the confusion which had resulted from the terminology used in describing the suggested 'phases' of development of the proposed international centre. The planned development was clearly outlined in the report and showed, as several speakers had confirmed, that the probable time required to open the centre would be 30-36 months. This did not mean however that certain of the operations indicated could not be speeded up or even conducted in parallel. Nevertheless recognizing the current difficulties in obtaining research staff of high calibre, of negotiating and conducting building contracts etc., he believed the Task Force time estimates to be reasonably optimistic. He would certainly expect research activities to be started as soon as possible and it was never contemplated by the Task Force that a three year delay would ensue before any research was got under way!

178. He greatly appreciated the intervention of Dr. Hopper and the introduction of the concept of the report as a "policy document". It had become clear to the Task Force that the director and staff of the new centre must have a major hand in the preparation of their research programmes and should not be presented with too clear-cut a programme in advance. Furthermore the views of the proposed scientific advisory committee (or panel of specialists) should carry considerable weight in programme preparation.

179. During this build-up period research work could be initiated, or continued, at existing centres in Africa, to a considerable extent on a "non-cost" basis as explained earlier by Dr. Pagot. Thus the director of the centre would have a nucleus of research under way whilst full details of research, training, information, outreach and cooperative programmes were still under discussion. Prof. Tribe emphasized the importance of "tailoring" the research programmes carefully to the context of the various ecological zones of Africa, and in particular, of avoiding over sophistication in apparatus etc. The Director would need to travel extensively in the region and, to the extent possible, to seek offers to cooperate in the centre's programmes rather than attempt to impose upon existing national and regional centres.

180. The Task Force had had similar difficulties to the TAC in attempting to resolve the question of siting of the centre. Although Ethiopia was generally regarded as the most appropriate country, Addis Ababa itself was very atypical, perhaps too much so for the establishment of expensive field facilities. Thus the Task Force had considered the possibility of a minimal sized Headquarters (say 10 Ha.) in Addis Ababa, with a larger field station more appropriately sited, e.g. in Debre Zeit where some concentration of veterinary and livestock training facilities already existed. There had been a divergence of opinion on the Task Force, however, some members feeling that even Debre Zeit was too atypical of the rest of the African region to be used.

181. The Chairman thanked Prof. Tribe and reminded members that they would have a further opportunity for discussion of the report in closed session after some reflection. On resumption of the debate the Chairman, commenting on the very favourable reception given to the Report of the Task Force, sought the views of the members on the desirability of the Committee formulating a resolution of accord in respect of the Report. As he still had one or two reservations he felt this might be best carried out in two parts - a note of general accord, followed by discussion and minuting of certain matters of principle.

182. Some members were in agreement with this proposal, believing that the TAC should leave detailed discussion to the forthcoming meeting of the Consultative Group African Livestock Sub-Committee. Others however felt that the Committee had a duty and the right to make any comments which might seem relevant to members. The Chairman upheld this right and indicated his own disquietude at the rather rapid build up of the budget in respect of staffing and the late appointment of the Governing Body. He suggested a greater degree of flexibility in budget planning and a much earlier appointment of the Director and Governing Body. He also believed that the Committee should discuss further the siting problem. Agreeing with the proposal from the Chair, Dr. Swaminathan drew attention to the extremely rapid action which had followed the Consultative Group's decision on the creation of ICRISAT and believed the "ICRISAT model",could be followed closely and to advantage, should it be decided to establish the proposed centre in Africa.

183. Dr. Hopper, whilst supporting the Chairman's proposal in principle, felt it would be advantageous to explore a few of the implications of the overall report before he could agree to general acceptance with specific reservations. Viewing change in traditional agriculture as resulting from the conjunction of three feasibilities, the technical, the economic and the organizational feasibility leading to adoption of a new technology, he believed the Task Force report indicated a fair degree of technical feasibility for upgrading African livestock. There were also indications that the prospects of development of a market economy were good and a reasonably developed network

of research centres existed, although not yet organized as a functional network.

184. It was indicated however that there were improved technologies that were not being applied, that there was need for coordination of existing stations and that there were peculiar human/livestock systems subject to a considerable degree of variation. Dr. Hopper indicated that if the objectives of the proposed centre were to act as a technical coordinator, to point up technical gaps; to elucidate variations in the human/livestock system and identify suitable points for technical innovation, then he would support it wholeheartedly. Similarly, he saw the proposed centre applying itself to the development of livestock policy in Africa, including market research, quality constraints, slaughter points, livestock and meat movements etc.

185. If this were all inherent in the proposals, although more explicit in the verbal presentation of Prof. Tribe than in the report, then he would join the majority subject to an assurance from colleagues with African experience that this is what was needed and what could have a worthwhile payoff. This assurance was forthcoming, both from Dr. Muriithi and Dr. Pagot. The latter confirmed that, in reality, the big gap in livestock research was not one of technology, but of appropriate investment - hence the great importance attaching to the proposed socio-economic studies at the centre.

186. Both Drs. Bommer and Pereira welcomed the intervention of Dr. Hopper which clarified a misunderstanding which had probably arisen partly as a result of some donor representative's insistence on more clearly defined research programmes. This type of observation had tended to obscure the basic "systems approach" of the report by repeated insistence on the more traditional project approach.

187. The Chairman summed up the discussion and made the following observations which he hoped could be taken into consideration by Drs. Pagot and Hopper who would be attending the forthcoming meeting of the Consultative Group African Livestock Sub-Committee.

188. i) Firstly it was clear that the TAC supported the systems approach to African Livestock Research and believed that the establishment of a centre, at first separate from ILRAD, with cooperative national and regional programmes, would be the best means of achieving a significant break through. Concentration on a "systems approach" should not however obscure the need for more traditional research in disciplinary fields although these should be integrated into the whole to the fullest extent possible. A start should be made to "mobilize" some of the technology now available and an initial role of the centre should be to conduct a careful documentation survey.

189. ii) The programmes of the centre should be aimed essentially at the integration of biological, economic and social research activities, taking due note of the need to establish clear economic feasibility for any new or changed technology proposed as a result of the study of existing systems.

190. iii) An important and innovative approach of the centre, would be the cooperative research programmes conducted with existing national government stations.

191. iv) The establishment of detailed research programmes should await the preliminary review of ongoing work, and be decided, with the appropriate supporting budget levels, by the Director and scientific committee of the centre.

192. v) Such a policy made imperative the early appointment of a Director, sympathetic to the "systems approach", a management body and a local scientific advisory committee.

193. vi) Staffing and financial levels would gradually be evolved during the phase of programme development.

194. vii) The Committee had been unable to make any commitment with respect to the siting of the centre and suggested that a final decision might be taken by the Director, when

appointed, in consultation with the Consultative Group Sub-Committee and/or any agency appointed as executive authority to carry these proposals further.

195. viii) The Committee had recommended that its representative to the Consultative Group African Livestock Sub-Committee, Dr. Pagot, be given a mandate to present the views of the Committee and to urge the early designation of an Executive Agency.

THE STATEMENT MADE BY DR. PAGOT TO THE SUB-COMMITTEE IS ATTACHED HERETO AS ANNEX V.

Report of the TAC Sub-Committee mission to examine the Research Needs for Protein Production in Tropical America (Agenda Item 8)

196. The Chairman expressed his regret that Dr. Marcano, the Chairman of the Sub-Committee had been taken ill and on behalf of the Committee wished him a speedy recovery. He requested Dr. Bommer to present the summary report of the Sub-Committee.

197. Dr. Bommer recapitulated the Terms of Reference of the Sub-Committee and summarized the activities of the Mission. With respect to the ecological definition of the very vast area involved, he indicated that the Sub-Committee had decided, after review of various classifications, to adopt the broadest possible definition of Tropical America, as utilized earlier by Roberts and Hardin, as those areas lying between the 23°N and S parellels at elevations up to 1,000m. This would exclude the Cordillera of the Andes and the Brazilian massif but would include the vast areas of the llanos and the Brazilian grasslands, the Amazon and Orinoco basins and the low lying coastal lands. In view of the short time available to the mission only four countries had been visited, Brazil, Columbia, Venezuela and Costa Rica, but the mission had had opportunities for discussions with representatives of other countries and of regional and sub-regional programmes and had visited CIAT and IICA.

198.a) Turning to the two major commodities to be reviewed by the mission, Dr. Bommer confirmed that beans were regarded as one of the principal sources of cheap protein throughout the region and had consequently been allocated a high priority in the research programmes of the countries visited. Important national programmes were in progress in Brazil, Columbia and Venezuela; CIAT had initiated a well planned bean improvement programme and was planning a regional seminar whilst an interesting cooperative programme was being conducted by IICA in Central America utilizing, inter alia, the work of the Turrialba Centre. The main priorities in field bean research were the need for new high-yielding varieties and varieties with greater pest and disease resistance; the improvement of quality, particularly the protein content; adequate zoning of the crop, and work on the socio-economic problems of the small farmer which limited the adoption of new practices. On the basis of its findings, borne out by the expressed interest of many individuals contacted, the mission had concluded that an adequate base existed for the organization of a regional cooperative programme in field beans based on existing national, regional and international centres. Such a programme should have as its main objective the achievement of greater efficiency in the work presently being conducted and planned, much of which was duplicated through lack of adequate contact between the widely separated workers many of whom were, individually, highly experienced.

199. The Sub-Committee had, therefore, recommended that the TAC should appoint a working group of 2-3 persons to prepare a definitive project for a cooperative programme following the forthcoming CIAT seminar on legumes at which the question of a regional cooperative network would be discussed in some detail. It was felt strongly that provision should be made for attendance at this seminar on behalf of the TAC, by one of the members of the working group.

200.b) A very high priority had been given to beef cattle research in the areas visited. The popularity of beef was based on the need for high quality protein production coupled with the existence of vast tracts of land capable of meeting that demand, given adequate economic management practices. An additional stimulus was given by the high foreign exchange earning potential of exportable surpluses. Ongoing work had also indicated the possibilities of intensive cattle raising in the lower lying high rainfall areas utilising various by-products, e.g. of the sugar industry. Dairy cattle were also considered important in those areas and a need was found for the coordination of existing efforts in breeding, feeding and management.

201. The principal constraint restricting expanded beef production in the area under review was undoubtedly the lack of feed of adequate quantity and quality, particularly

during the dry season. A noticeable swing in research priorities from breeding to feeding was apparent throughout the area. Major problems being tackled were: the use of supplementary feeds in the dry season, the improvement and maintenance of forage yields and quality through better management coupled with the introduction of exotic grasses and legumes and the correction of mineral deficiencies. Disease problems were not considered to be as serious as in some other regions although a need was found for improved diagnostic services.

202. Ongoing research in the area lacked coordination and although IICA conducted quite effective cooperative research programmes in the Andean and Central American zones and CIAT was developing valuable contacts throughout the region, the Sub-Committee believed a need existed for strengthening of the cooperative effort in the region through a single regional programme. The objectives, similar to that of the suggested legume programme, would be to avoid unnecessary duplication and repetition and to achieve better application of existing knowledge.

203. To this end the Sub-Committee had recommended the establishment of a working group to organize a regional beef cattle seminar with the object of stimulating regional coordination. Subsequently a cooperative programme involving both CIAT and IICA might be developed either with international or bi-lateral funding. Additional aspects of the work of the Sub-Committee mission which merited attention were the following:

204. i) Cassava. In view of the importance of this commodity throughout the region the Sub-Committee had called attention to the need for enhanced research on such problems as the production of varieties with favourable fertilizer response, with high yield potential under conditions of poor fertility, and with increased protein content. Further work was also required on cassava as a stock feed and as an industrial crop for starch and flour production. To this end, the Sub-Committee emphasized the importance of recommending continued support to the cassava research and outreach programmes of CIAT.

205. ii) The Turrialba Centre (CTEI). Although unable to recommend specific support to the livestock and legume programmes for Central America proposed by CTEI and which had led to the establishment of the Sub-Committee mission, the Sub-Committee had felt nevertheless that the future of the station should be assured. It had therefore proposed that the Centre should have a major role in any regional programmes on legume or livestock research which might be established and should participate as a major regional centre in any future global network of genetic resources centres, with a specific responsibility for training programmes. The Sub-Committee also believed that CTEI should be considered as a possible site for tropical commodity work which may be planned at an international level in the future, including work on fruits and forestry.

206. iii) CIAT. The Sub-Committee welcomed the expansion of the legume programme of CIAT to a major regional effort and fully endorsed the leadership taken. The Sub-Committee had not been able to decide whether CIAT had yet achieved the minimal critical mass of research effort required in such a regional programme and pointed out a possible future need to strengthen the field bean programme of CIAT.

207. With respect to the beef cattle programme, however, the Sub-Committee was convinced that a regional network under the leadership of CIAT was not only desirable but feasible.

208. iv) North-East Brazil. The Sub-Committee believed that the current reorganization of agricultural research in Brazil should be completed before any specific action could be recommended to the TAC in respect of this area. Various international and bi-lateral organizations were already active and outreach activities of ICRISAT and IITA could be considered in the future when these institutes had developed the necessary capacity.

Discussion

209. In opening the discussion Dr. Pereira expressed some disquiet both at the rather extensive executive role for the TAC implied in the recommendations of the Sub-Committee and at the suggestion that the Committee establish working groups to undertake the organization of regional activities which, he felt, could best be handled by CIAT, the existing international centre in the region. Whilst supporting the basic objectives of the recommendations, he urged that the Committee give detailed attention to the mode of action to be employed in promulgating them.

210. It was pointed out by the Chairman that an important issue had been raised as to how far the Committee could go in acting as a coordinator or stimulator of action - a role which was clearly over and above its terms of reference, aimed at giving sound advice to the Consultative Group. Nevertheless precedent had been created for an approach being made to the Consultative Group for additional funds to permit greater investigation of problems in depth, and further dialogue was probably necessary to work out an agreed framework for action.

211. On behalf of the Sub-Committee Dr. Bommer pointed out that the summary report had expressed very clearly the conviction of the members that CIAT would have a major role to play in the organization of research networks both for legumes and beef. However, the Sub-Committee had been reluctant to suggest outright that the leadership be assigned to CIAT ab initio, in view of the fact that other regional organizations already existed and that not all national organizations had yet established close relations with CIAT. The mission had seen the need for a very careful examination of the views of the possible participants in such a network and felt that many of these views would be expressed at the forthcoming CIAT seminar. For this reason the Sub-Committee had suggested that TAC be represented at the seminar and that further consideration of possible mechanisms for a research network take into full account the conclusions reached at the Seminar.

212. The Committee in general supported the proposals made in the summary report but welcomed the opportunity for further discussion after the receipt of the full report. Particular emphasis was laid by several speakers on a trend, becoming apparent during the meeting, towards the recommendation of cooperative network activities rather than the more traditional "centre of excellence" type of activity. The importance of the participation of national research organizations and centres in internationally sponsored activities was stressed as facilitating a much needed complementarity of effort as well as permitting closer contact with field problems at the national level on the part of the international centres' personnel. There was general agreement that the organizational problems inherent in this type of approach should not constitute an insurmountable difficulty and that in any case they would be of secondary importance within the framework of the overall approach suggested.

213. Speaking on behalf of the UNDP Dr. Gucovsky expressed the hope that the full report, when available, would present an analysis of the factors which would help to establish the priorities for research in the region and that it would not be limited to a description of current research activities or those meriting future attention.

214. Dr. Hardin (Ford Foundation), referred to the relatively modest legume programme of CIAT, which is currently aimed at a two to three year time horizon pending further discussions on the possible establishment of a global network, and hoped that the TAC would advise the Board of Directors of CIAT of its reactions in respect of the Sub-Committee's proposals regarding legume work in tropical America.

215. Recognizing the major role that would have to be played by CIAT in any cooperative work on legumes or beef in the region, and agreeing fully with the need for coordination, as proposed by the Sub-Committee, Dr. Hopper felt that it was nevertheless

premature for the Committee to form a working group prior to the forthcoming CIAT Seminar. He felt that a more rational course of action would perhaps be to request CIAT to continue the work on which it had taken a lead by organizing the seminar, and to inform the TAC in due course on the problems of coordination of field bean research in the region.

216. Similarly, in respect of beef cattle research he believed that the Committee should approach CIAT to ascertain the views of the Director and staff with regard to the possibility of CIAT holding the beef research seminar proposed by the Sub-Committee to examine the coordination of work and diffusion of results in the region. Further, he felt that CIAT, possibly in conjunction with other institutions in the region, might also be approached by the Committee for its views on the possibility of establishing cooperative programmes to stimulate regional activities following such a seminar. In brief, he felt that the Committee should hinge its efforts towards the establishment of cooperative programmes in the region quite firmly onto the CIAT development, and should ensure that sufficient resources were available to permit CIAT to handle such programmes.

217. General agreement was expressed with the proposal made by Dr. Hopper and in summing up the discussion the Chairman asked Dr. Bommer, as Convenor of the Standing Sub-Committee on Grain Protein to suggest a member of that Sub-Committee to attend the forthcoming CIAT Seminar on legumes. Dr. El Tobgy was subsequently appointed. The Chairman also requested the Sub-Committee to discuss further the nature of the problem which the TAC would ask CIAT to handle and to guide the Secretariat in its approach to CIAT. He felt that a similar approach to CIAT would need to be made in respect of the possibility of holding a beef seminar, although this was probably not of such immediate urgency. Further discussion, on the full report, would take place at the next meeting.

Pest Control and Pesticide Residues (Agenda Item 9)

218. The Chairman invited Dr. Gucovsky (UNDP) to introduce this subject on which the UNDP had prepared a background paper. Referring to the numerous project proposals which had been received by UNDP on this subject and the summary of UNDP views on these proposals in the background paper, Dr. Gucovsky indicated that the UNDP attached great importance to the views of the Committee on whether gaps existed in research work on pesticide production and residues or integrated pest control in an overall relationship to the environment, which might be subject to an international research approach. Further he sought the views of the Committee on the place to be taken by an identifiable activity in pest control research within the general priorities which might be established for international research. He drew attention to the need for careful consideration of the relationship of any such work to, and its coordination with, similar activities which might be undertaken within the framework of the UN Secretariat for the Environment.

219. In putting forward the FAO point of view Dr. Whittemore (FAO) stressed that FAO supported the technical necessity of studies and training in particular isotope tracer techniques for the elucidation of certain specific residue problems and believed that the objectives of the proposal submitted would serve in part to implement some of the recommendations of the Environment Conference. Such techniques were also of tremendous utility as a tool in the study of wider problems of the fate of pesticides and further joint proposals of IAEA, FAO and WHO would be formulated in the near future. FAO's vital concern was to give scientifically based advice to its member countries on the risks and benefits of pesticide usage, bearing in mind that residue problems were primarily a function of time, place and amount. Thus, the need for local, national level activity was paramount and the Organization continued to seek support for pesticide laboratories in all major user developing countries. Broader environmental issues were currently under examination but it was felt that first priority should be given to residues in food and animal feeding stuffs.

220. Over ten years experience in providing advice on safe levels of pesticide

residues, based on data from governments and industry in which tracer work had played a part, had shown clearly that there were still many gaps in scientific investigation into the subject, associated particularly with pesticide use in tropical and sub-tropical areas by relatively untrained personnel. The joint FAO/WHO expert panel on pesticide residues had repeatedly urged FAO to explore the possibilities for internationally supported work and this had lead to the FAO proposal for an agricultural pesticide coordination centre. Certain lacunae in data could be expected to be filled by ongoing work at developed country institutions and in the pesticide industry, but there still remained the problem of the site - crop - climate - and practice - specific data which required much more detailed investigation. A careful selection of the most promising lines of work was clearly required and the joint expert panel might be called upon to give overall guidance on this problem.

221. Referring to the UNDP background paper and the questions before the TAC, Dr. Whittemore specified certain problems which, in his opinion, could lend themselves to an international approach. These included inter alia the nature, magnitude and significance of residues of new pesticides which might sooner or later have to be introduced; their persistance, toxic hazards to unskilled operators, resistance to them of pests and their environmental effects. To approach these problems at the international level would require a pesticide residue research coordination centre with funds and resources to sponsor and accelerate research at appropriate institutions in a network. Such a proposal could be formulated, if required, by FAO in collaboration with IAEA and WHO.

222. The Chairman then introduced Prof. Ray Smith who briefly reviewed his background paper. Describing it as a status report on crop protection generally, but with specific reference to the developing countries, Prof. Smith emphasised the increasing problems in crop protection brought about by the technological changes of the agricultural revolution, and outlined the ecological reasons for those increasing problems. Whilst control of crop losses formed one of the most obvious means of increasing food production, concern for the environment, both the quality of the environment and the crop/pest ecological aspects of the environment, necessitated an ecological approach to the problem. Such an approach involved consideration of all aspects of the problem, from natural mortality through cultural control and biological control to chemical control. Most authorities believed that chemical control was, and would continue to be, indispensable, but not necessarily alone - rather as a component of a system variously labelled "pest management" or "integrated pest control".

223. In addition to the problems of chemical control detailed by previous speakers, Prof. Smith drew attention to the problems associated with selective pesticides and the development of new pesticides. In the main these related to production costs which made the development of new pesticides, especially selective materials, uneconomical and therefore unattractive to the chemical industry. A different set of problems was now being created by the use of "free" materials - those no longer protected by patent and in which commercial companies took no further interest. Despite the fact that many were old materials, it was often found that relevant background data were lacking.

224. A wide variety of new techniques such as the use of hormones and pheromones, the release of sterile males and other genetic control measures, also contributed to effective control but none could be regarded as panaceas - they simply added to the control "armoury". Of rather more promise were some of the newer microbiological control techniques utilising viruses, fungi and bacteria host-specific to certain pests. Unfortunately this very specificity made these highly selective materials unattractive commercially. Nevertheless despite the existence of other problems as well, including human safety and patent difficulties, great hopes existed for this type of material.

225. Before turning to his recommendations, Prof. Smith emphasized the need for the gradual evolution of integrated control programmes through the step by step introduction of new techniques, rather than by the imposition of a fully formed system.

This clearly pointed out the need for continuing development of methodologies through the wide testing of research results.

226. In an attempt to find a mechanism to link the efforts of developed and developing countries' institutions with those of existing regional and international centres, Prof. Smith proposed the establishment of a network of cooperative multi-country research projects. This network could be considered as forming a set of linkages secondary to those of the already established international centres, but going beyond the existing concept of "programme collaboration" in that participants' personnel would be involved, from the start, in problem identification and project planning, implementation and review. Such a scheme would permit the most effective utilization of each participating countries' limited resources and ensure the appropriate application of new technologies emanating from the international centres and other sources.

227. Two basic necessities for the successful implementation of cooperative multi-country projects would be a source of international funding and a management centre, which might be established in an existing international or regional centre, or even in a developed country institution.

228. Additional features of the proposal would be the forging of supplementary links between individual participants (possibly on a donor/recipient basis) in the network, the recognition of common problems and a focus on those of high priority and most importantly the establishment of a technical forum, or committee, composed of active workers from the participating countries.

229. Dr. Winteringham (FAO/IAEA) endorsed the statements made by Dr. Whittemore and assured the Committee of the continued collaboration of IAEA through the FAO/IAEA joint division. He emphasized the wide participation of experienced scientists in the proposals made to UNDP for residue studies, which, although based on isotope techniques, were thus assured of the fullest available range of methodologies. The proposals sought to extend to the developing countries the available techniques, including isotope application, for the study of residue problems. For this reason a training element was essential and this could not be divorced from the proposals.

Discussion

230. The Chairman, in thanking the speakers, drew attention to the emerging complexity of the problem and the very wide field which the Committee would need to survey from the point of view of possible international assistance.

231. Early in discussion several members sought clarification of the precise nature of the questions placed before the TAC. A very broad field had been reviewed in the background papers presented and it appeared that the Committee was required, in the first instance, to formulate some general guidelines. Justification was also sought for the view that pesticide residue research was of a high priority for the developing countries. Whilst of undoubted importance to developed countries field experience indicated that the principal concern of many devoloping countries was to ensure that pesticides were used at all.

232. The Chairman referred back to the UNDP background paper which he had interpreted virtually as a request to explore the whole field. This was patently not possible so he proposed to ask the Committee to try to formulate an attitude to the problem on the basis of the review of ongoing work and proposals which had been presented.

233. This suggestion was supported by the UNDP representative who affirmed that UNDP was not seeking the views of the Committee on the relative merits or demerits of any of the projects proposed, but on the more general question of what were the gaps in pesticide residues research in relation to management of the environment, and which if any, of those gaps might be subject to Consultative Group support and in what form. Other issues of

interest to the Consultative Group might also appear during discussion.

234. Supporting the contention that pesticide residues were, at present, of high priority for the more developed countries with a high-input agriculture, one member recognized nevertheless that they would become of increasing importance to the developing countries as inputs rose. A large resource base was however available and there was encouraging cooperation and coordination at the international level. It was not therefore easy to see a role which the TAC could adopt. This view was supported by other speakers who believed that highest priority should be given to local adaptive research and the establishment of training programmes in integrated pest control, the safe use of pesticides and the methodology of residue analysis. The most likely advantage of any multi-national project would, it was felt, be the periodic exchange of ideas at seminars.

235. It became apparent that there were two rather distinct questions before the Committee. On the one hand was the very specific question of pesticide residues, and on the other the much broader question of integrated pest control in developing countries. It was obvious that the multi-disciplinary work of the international centres must include pest control components and the Committee agreed that unconditional support should be given to the introduction of such components into sectoral studies on a crop by crop basis. With regard to pesticide residues research, however, in which national policies were involved, developing countries would need to take their own decisions on whether further local research was required, or whether the information from pesticide producers, developed countries or international sources was adequate. In the event that the United Nations system felt an urgent need to establish an international body, some members believed that this should be the concern of WHO, FAO and the UN Environment Secretariat rather than the TAC/CG.

236. This view was generally supported, one speaker pointing out that the ultimate success of any programme for the control of residues would rest on compulsion, under international law, and could therefore be a proper topic for United Nations intervention.

237. Referring to the need to separate regulatory work from research on pesticide residues, several members felt that the latter type of work, in view of the volume currently going on, could not be given high priority for international support and could with advantage be undertaken by an existing centre such as the FAO/IAEA Joint Division. The proposal for improved coordination of research work on integrated pest control was however strongly supported, but there was some feeling that this coordination should be undertaken by FAO as part of its regular activities.

238. One speaker referred to the great responsibility of the manufacturing industries in respect of harmful residues and suggested the possibility of trying to establish closer contacts between crop protection specialists and the large group of scientists in the manufacturing industries. Given the present international status of many of the large companies it should not prove difficult he felt to expand international testing prior to the issue of new products.

239. In refuting the suggestion that residues research was not of importance to the developing countries Dr. Whittemore gave several examples of export products of developing countries found to contain residues above the permitted limits of importing countries. This clearly supported the need for local expertise and facilities to cope with the problem. Both he and Prof. Smith instanced the very high mortality rate in some developing countries through the use of inappropriate pesticides, for which less toxic substitutes existed but on which further research was needed. Both saw a role for international coordination of the type of research needed, and believed that an additional effort, over and above those of the present international and bi-lateral agencies in the field, was urgently required.

240. Dr. Yamada recalled to the notice of the Committee the extremely important role played by plant breeders in the production of pest and disease resistant varieties.

These, he felt, formed the front line of integrated pest control or pest management studies, closely followed by the application of revised agronomic practices to attack diseases and pests at the weak points indicated by ecological studies, and only as a last resort by chemical means of control. He therefore also agreed with earlier speakers that assistance to better coordination of integrated pest control studies should have a much higher priority than the relatively circumscribed problem of pesticide residues.

241. The point made by Dr. Yamada on the importance of breeding and agronomic work, aimed at improving resistance to pests and diseases, was taken up by Dr. Hopper. Referring to the impossibility of international financing for the chemical development work which industry was now unable to afford he sought some clarification from the invited speakers on what exactly could be done internationally. There were elements of breeding and agronomic work, aimed at resistance, in the programmes of most of the centres currently being supported. Furthermore the recent developments in biological control, outlined earlier, held considerable promise of success. He therefore saw the need to look for a balance between the type of work currently being supported and other work of a non crop-specific nature which the Committee might be called upon to consider. Such a balance would be essential for the Committee if it were to extract from the whole complex of integrated pest control, associated with environmental protection, a single clear function for it to perform.

242. Prof. Smith, in replying to Dr. Hopper's question, regretted his inability to give a clear answer. He agreed wholeheartedly with the need for continual consideration of balance, particularly when discussing the more broadened (or corrupted) concept of what constituted biological, vis à vis chemical, control. He felt that despite the many specious claims of numerous biological control enthusiasts, in respect of once and for all panaceas, a combination of different forms of partial control would be required for many years. The balance in individual cases could differ and each situation would have to be judged on prevailing circumstances. With regard to a role for the TAC/CG he felt that existing international agencies were not in a position to undertake the task of overall coordination and that this would have to depend on additional international support being forthcoming.

243. It was clear that the Committee recognized the very great importance of pest control as a production factor. Several speakers however stressed the importance of the current research work being conducted on total production systems and showed some reluctance to consider an individual and limited approach to single components. This was particularly emphasised by Dr. Sauger who reiterated his earlier caution on the dangers of the Committee being inundated with project proposals dealing with individual production factors.

244. In summing up the first part of the discussion the Chairman underlined the acceptance by the Committee of the sheer necessity for increased coordinated work on crop protection measures. It had not been made clear in discussion, however, how the Committee could differentiate between the existing research pattern and gaps in the research, and the many other important factors involved such as education and training, administrative and regulatory problems.

245. The Committee would clearly need to re-examine the topic in greater depth, in pursuit of its primary task of identifying research gaps and indicating the need for additional programmes or strengthening of existing ones. This study might also lead to a 'by-product', establishing some primacy for additional work to be done in such fields as training or regulatory programmes, which could also be brought to the notice of the Consultative Group and other appropriate agencies.

246. As he felt that the Committee was not yet in a position to make a definitive statement on the subject he sought members' views on the procedures to be followed in respect of its further examination.

247. Dr. Swaminathan recommended that the international centres be approached for their views on what further work needed to be done in the field of crop protection research with special reference to the crops for which they had responsibility. This approach was supported by Dr. Hopper with the proviso that the centres be asked simply to indicate the problems for which they felt they had no adequate means of control. Referring to the overall question of priorities he believed that any further consideration of the pesticide residues research problem would lead to an unjustifiable dissipation of resources. On the wider question of integrated pest control research, whilst recognizing the possible need for strengthening of work at the international centres and elsewhere, he would assign a second level of priority to this work. Even if a special thrust were felt to be necessary he thought this should not be financed through the Consultative Group, unless the maximum level of support were previously given to the recognized priorities of centres already established, or in development. These views were shared by other members who, whilst not able to see a clear role for the TAC/CG were nevertheless reluctant to shelve the question without further study of additional information which might be requested from FAO and the FAO/IAEA joint division.

248. Dr. Pereira, on the other hand, considered that the question of integrated pest control was so specific to local crop ecology, that no single centre or single effort could be expected to make a marked contribution to the problem, and he did not share the opinion of the UNDP that this aspect of the problem would be satisfactorily covered by ICIPE. With respect to residues, the Committee was alerted to the fact that this constituted a major research study but one which it was not in a position to undertake. The problem should, he felt, continue to be pursued by the international agencies.

249. In summing up what had proved to be a long and confused debate, the Chairman emphasised firstly its inconclusive nature. Nevertheless there had been a marked indication of scepticism about the need or scope for international research on pesticide residues. With regard to the broader question of integrated pest control research, there was a clear feeling that this research would be naturally associated with the primary commodity research centres but on the basis of information currently available and on a first debate, the Committee had been unable to identify gaps which might call for a special internationally supported thrust.

TAC Mission to the Near East and North Africa (Agenda Item 10)

250. The Secretary reported that the team and the itinerary for the Near East and North Africa Mission had been finalized and approved by the Chairman. A soil salinity and drainage expert had been added to the team which was now composed as follows:

251. Prof. Dunstan Skillbeck (U.K.), Team Leader, Research Organization and Management; Prof. Charles Bower (U.S.A.), Soil Salinity and Drainage; Dr. G.J. Koopman (Netherlands), Irrigation, Water Use and Management; Dr. E.D. Carter (Australia), Animal production and integration with crops; Prof. G. Barbero (Italy), Agricultural Economics; Dr. I. Abu Sharr (FAO), Agronomist, and for North Africa only, Mr. G. van Poorten (France), Agronomist. The mission will be joined in Cairo by Dr. A. Hafiz, wheat and barley specialist, from the FAO Near East Regional Office, who would accompany them as "staff officer" at Professor Skillbeck's request.

252. After briefing in Rome the Mission would visit Egypt, Iran, Lebanon, Iraq, Syria, Tunisia and Algeria.

253. In answer to members' queries it was confirmed that all possible sources of assistance had been utilized in the planning of the mission, including FAO and UNDP Country Representatives, and that all interested parties had been informed of the origins and terms of reference of the mission.

254. Dr. Hopper specifically requested that the mission should pay close attention to the new ALAD programmes in the Near East and was informed that the mission would be requested, during briefing, to take cognizance of all possible linkage programmes in the region including those of ALAD, CIMMYT, IRAT etc.

255. The Committee congratulated the Secretary on the thorough preparations made for the Mission.

Aquaculture (Agenda Item 11)

256. The Secretary informed the Committee that the final Terms of Reference and List of Participants, as distributed to members, had been arrived at after considerable discussion with countries and organizations interested in the seminar and after very careful screening of proposed participants. In answer to a query he indicated that changes in the original list had been made principally to ensure a wide range of disciplines and as wide a representation as possible of regions of high potential for aquaculture, in which the selected participants might be expected to have considerable influence. It was now hoped that the seminar would be held in Italy but the exact site was not yet decided; Bellagio was a possibility with Rome as a second probable.

257. The Chairman drew members' attention to the very wide interest, including that of commercial groups, which had been aroused by the proposed seminar. It had been made plain that the basic purpose of the seminar was to examine the long term potential of aquaculture as a source of protein food supply rather than as a means of fostering commercial fisheries for developed country markets.

258. Referring to the wide interest aroused by the seminar Dr. Hopper sought the views of the TAC regarding the attendance of observers. There had been a considerable re-awakening of interest in aquaculture during the last five years and the seminar would provide an excellent opportunity for an exchange of views between an even wider range of interests than that covered by the participants.

259. A different point of view was held by Dr. Sauger who, supported by Dr. Pillay (FAO), recalled the earlier proposal of the Committee to limit attendance to as small a working group as possible in order to provide the best possible opportunity for the preparation of a worthwhile basic document for consideration by the TAC.

260. It was finally agreed that the seminar should be opened to observers but that steps should be taken to ensure that the selected observers were technical personnel and that representation would be limited to one observer from each member of the Consultative Group. The Secretary informed the Committee that should the meeting be held at Bellagio no more than five observers could be allowed because of the small size of the meeting room.

261. In summing up the Chairman confirmed the agreement reached on representation and reminded the Secretariat that the seminar was not being requested to provide a report with precise research proposals and estimates, but rather a broad overview of the state of aquaculture research and an indication of possible gaps and future needs on which the TAC might wish to take further action.

Date and place of the Sixth Meeting (Agenda Item 12)

262. The Chairman indicated that the next meeting would be held at the IBRD headquarters in Washington in conjunction with the International Centres Week to be held from 30 July - 30 August. It was agreed that the dates of the Meeting should be arranged in such a way as to permit the attendance of TAC representatives at a USAID

sponsored seminar on Socio-economic research, provisionally scheduled for Monday and Tuesday 6-7 August, and to permit adequate discussion with the Centre's Directors.

263. The Secretary of the Consultative Group indicated that discussion with the Centre's Directors could be arranged on Wednesday, 1 August, leaving TAC members free to attend Centres Week discussions on 30-31 July and 2-3 August.

264. Dr. Hopper believed that there existed a possibility of the USAID Seminar being held on Monday and Tuesday 23-24 July - in the week preceding Centres Week.

265. The Chairman therefore indicated the following possibilities for the TAC session, depending on the dates of USAID seminar the findings of which it was agreed, would be of considerable value in finalising the TAC discussion on socio-economic research.

i. Seminar dates: 23-24 July

TAC to meet: 25-26-27 July
1 August with Centres Directors
4 and/or 6 August to complete business.

ii. Seminar dates: 6-7 August

TAC to meet: 26-27 July
1 August with Centres Directors
6-7 August (with representatives at seminar)
8 August to complete business.

266. Dr. Hopper undertook to convey to the Chairman the final dates agreed upon for the USAID seminar following a forthcoming planning meeting.

267. Members would be informed of the agreed dates of the TAC Meeting as soon as possible.

Any other Business (Agenda Item 13)

i) Genetic Resources

268. The Chairman outlined briefly the reaction of the Consultative Group to the recommendation of the Committee for the establishment of an international network of plant genetic resources centre. Whilst there had appeared to be a general consensus of opinion in favour of additional work on the collection and conservation of genetic resources and no overt opposition had been expressed, the Group members had not committed themselves to full support of the proposal. Questions had been raised with regard to the extent of the participation of the existing international centres in the proposed network, and of FAO in the Coordinating Centre. It had been agreed to ask FAO to consider what role it might play in support of the Coordinating Centre and, in collaboration with the TAC, to identify the main gaps currently existing in global genetic resources work. FAO had since indicated that it had accepted in principle to support the Coordinating Centre under its Regular Programme and ways and means were now under consideration. He hoped that this would stimulate additional donor support.

269. The Secretary added that FAO's action had been welcomed by some of the major donors both in FAO's Council Meeting and in subsequent correspondence. He informed members that, after consultations with Dr. Creech and Sir Otto Frankel he had approached the existing international centres to ascertain what they were prepared, and technically equipped, to undertake in the fields of collection, conservation, storage and evaluation of genetic materials of the major commodities on which they worked. All had replied and

a background paper would be prepared for the next meeting setting out what FAO was prepared to undertake in respect of the Coordinating Centre, what the existing international centres would undertake and what gaps remained which were not covered by other national and regional programmes.

270. The Committee took note that a major donor was currently considering the bi-lateral financing of three major regional genetic resources centres.

271. In closing the discussion the Chairman affirmed that the subject would be placed on the Agenda of the next meeting.

ii) Submission of proposals to the TAC

272. In reply to a question from Dr. Pagot requesting clarification of the procedures to be adopted in submission of proposals to the Committee, the Chairman outlined the procedures currently being followed. There was firstly an understanding that the Committee itself could initiate discussion on any subject within its terms of reference. Secondly, the Consultative Group or any of the three co-sponsors could refer proposals to the Committee for comment and advice, and thirdly proposals from other sources could be presented through any of the co-sponsors. Since this understanding had been reached the Consultative Group had developed quite considerably and a proposal from an individual member had now been presented, and accepted, for discussion at the next meeting. He believed it was now opportune to request the Consultative Group to give formal guidance on the question of submission of proposals for study, and he asked the Secretary of the Group to take up the matter appropriately. He emphasized that the Committee was currently working to full capacity at each meeting and would not welcome any system which would permit the uncontrolled submission of a large number of proposals at any one time.

Chairman's Summing-Up (Agenda Item 14)

273. The Chairman pointed out that as this was the first of two meetings to be held before the next meeting of the Consultative Group, his statement would be somewhat informal and some of the conclusions would be tentative pending further examination by the Committee in July.

274. He would begin with the question of priorities which had been the main purpose of the present meeting and on which he felt they had had a very useful discussion. The next step would be for a position paper to be drafted for clearance at their July meeting; until it had been cleared there and presented formally to the Consultative Group no one would have authority to quote TAC on priorities.

275. On this understanding he would indicate some of the issues of priority they had been debating and the trend of the discussion on what was a very complex subject.

276. In the first place there was a definite priority for food on grounds of human need, of population pressure on resources, and of the fragile base on which the food supplies of much of the world still rested. Recent events in Asia showed this only too clearly. Moreover, the food sector in many countries represented a major part of total agricultural production, and agriculture had a key economic role to play both in terms of direct employment and in providing the market for other industries designed to improve the quality of living for the mass of people.

277. Within the food sector they were concerned both with quantity and quality (with particular reference to protein aspects), and their decisions so far indicated clearly the priority consideration being given to cereals, food legumes, and ruminant livestock. However, a number of other commodities entered the food field, for example, oilseeds (both annual and perennial), sugar, fruits, vegetables, and aquaculture, even pastures and fodders as related to meat production, which they had not yet fully considered. This was not to be

interpreted as due to lack of interest but rather to pressure of work in dealing with what had been generally accepted by Members as the highest category of food priorities which he had mentioned earlier.

278. In some cases, for example aquaculture, their approach was to find out the current state of research as a pre-condition for deciding whether to advise the Consultative Group whether a significant further investment in research would make a contribution to the food needs of the mass of people.

279. In respect of the so-called "non-food" crops, the Committee had so far not initiated any research proposals. He recognized, however, that certain of these - such as cotton - had a food and feed significance, and the TAC would not refuse consideration to such commodities if it felt that a first class research programme was being proposed with obvious economic significance to a number of countries. It would certainly examine and offer advice if such proposals were referred to it, but would want to reserve the right to express doubts that they should be supported at the expense of research on major food commodities.

280. It was necessary to emphasize the financial constraint because this was a main reason for the rigorous screening of priorities, but he was not at this stage willing to make any precise estimates about finance, his earlier estimate of $75-80 million did not include inflation, and he did not wish to be held down to this pending more detailed study.

281. They had tried to state their broad priorities in terms of categories of commodities, but the end point of research on a commodity was the development of a package of technology, and research had to be conducted with a clear recognition of the critical factors associated with this technology. For this reason the Committee had attached high importance to study of these factors of production which it recognized as an integral part of a balanced research programme; but as they were variables whose weight differed according to circumstances they had not attempted to grade things like water management, fertilizer, pesticides, etc. in order of importance.

282. Consideration of the relationships between the technical components of the package led inevitably to problems of socio-economic research, since when results emerged from a research station they should not merely be in terms of the theoretical yield of a variety but must take into account the constraints on the feasibility of achieving the experimental potential under practical conditions. This was why the TAC was placing growing emphasis on systems work on the need to put research into a practical setting, and on means of communicating its results to those responsible for the decisions on public policy which would make them readily unseable by farmers.

283. This did not mean that CIMMYT or IRRI should be held responsible for the entire range of public policy decisions or for what governments did with new technology. Nor, on the other hand, could research institutes hand down wisdom like the tablets from Mount Sinai and expect the rest to follow. Their results were often restricted in their immediate application, and might have to be adapted to far away situations revealing new problems and needs.

284. There was thus a crucial two-way linkage to be created between the field and the research institute, and between national and international or regional research programmes. Each had a vital role to play, and although the Consultative Group was not directly designed to deal with national research systems, the overall aim should be to creat a worldwide network of research activity from which the full dividends would not be obtained unless there was an effective involvement of national effort both at the research and the policy level. This implied strengthening of national systems. TAC had already drawn attention to the need for cooperative arrangements between an international centre and national systems in its discussion of the African livestock proposal and in relation to extending the ICRISAT network to Africa and possibly to North-East Brazil. It would continue to stress the need for developing national systems wherever this seemed appropriate, even though its own financial proposals would mostly be related to strengthening work at the international or regional levels.

285. In respect of socio-economic research, they were only just beginning to get to grips with the problem. It was clear that there had to be close integration of technical and economic researchers in studying not only the technological package, but its implications, and in relating the identified constraints to action for their resolution in the field of public policy.

286. However, he could not pretend that TAC were ready to advise on how best to achieve a closer relationship between micro-level socio-economic research and policy formulation. Workshops and seminars with policy-makers brought in could help, but this was by no means the whole solution.

287. At the next level of macro-economics there was a number of international bodies working on such matters as the study of world production and trade trends, or sector analysis, and he was sceptical of expecting the research institutes to undertake this type of work. Nor, on the other hand, was he convinced of the case for an international centre in this area.

288. Indeed, a great deal more thought needed to be given to how to strengthen most aspects of socio-economic research in the developing countries, and although TAC recognized the importance of the entire area, it had - like most people - only just begun to formulate its ideas in relation to this field of research. He did not wish to prejudge its further conclusions, on which it might receive further guidance from the socio-economic seminar being held in Washington in conjunction with Centres Week, and would now pass briefly to other matters.

289. On the genetic resources proposals they had been a little disappointed by its reception by the Consultative Group, but the Secretary had reported considerable progress by FAO and others since then. It was evident that the Consultative Group were encouraged by this, and he hoped that the TAC would be able to make a more definitive statement at its July meeting, based on a further report to be prepared by the Secretariat.

290. On aquaculture they had agreed to hold the seminar, probably in June. The next matter was the African livestock proposal. The report was described accurately in the course of the general debate as a policy document, and this explained the nature of the TAC's recommendation. Professor Tribe had given a very helpful exposition in his introduction of the report: this, together with his answers to questions, would be made available to the Consultative Group and should be read as an important supplement to his team's report.

291. There were really two inter-related strands in the recommendations of the mission, involving, on the one hand, a multi-disciplinary systems approach to research; and, on the other, an understanding of the policies and related investment requirements needed to bring about change. The first strand was the strengthening and coordinating of research now taking place in Africa, reinforced by research appropriate to the central institute. There would be a study of the systems now in operation and what was required to reconstruct those into more viable and rewarding systems. In the course of that study, technical gaps would be identified and themselves become a subject of research. Research programmes would thus arise from, and be very much an integral part of, the overall systems approach, rather than a series of isolated and unrelated thrusts. The second strand is involved recognition and close study of the great significance of the human-cattle relationship, where there were many significant factors which themselves when recognized would call (for example) for investment in infrastructure.

292. The TAC strongly commended action in this field and along the lines proposed, and believed that it was a first essential to select a director sympathetic to the approach so strongly emphasized in the report. In parallel, early action should be taken to appoint a governing board which also understood the need for a fresh and broader approach to research in this area. On the question of siting, the TAC had not offered a detailed recommendation; some Members who knew Africa felt that the report had made a fair judgment on this, but it could bear further examination if deemed necessary by the Consultative Group.

293. On the question of relations with ILRAD, there was a strong consensus that the two institutes be allowed to develop initially as separate enterprises, although Members saw an advantage in some common denominators in membership of their governing boards, with a view to an ultimate merger of their operations. The TAC wanted a link, but did not think the risk should be taken in the early stages of either part being submerged by the other, because they were quite different approaches to different problems.

294. On the question of the extent of financial support and staffing for the proposed new institute, he was emphatic that the TAC did not wish to be committed to a judgment. This would evolve in collaboration with the board after the Director and initial staff had been appointed; and the Committee hoped that staff recruitment would advance faster than had been predicted in the report, although perhaps not to the full complement of 28.

295. Referring to the Mission to Latin America, he noted that its full report would not be available until late March, and all TAC had done so far was to take two decisions. One was that a Member would attend the CIAT seminar on bean research, and that CIAT would be invited to work on the problem of developing a network on this crop for the region. This modified an original proposal for TAC to establish a working group; a similar approach was to be followed for cattle production, for which it was hoped CIAT would organize a seminar later in the year from which further action would stem.

296. On water management the TAC had felt that the Peterson report was a useful document, but that they were not ready to take up its recommendations without further consideration of ongoing work in this field. Accordingly it had been decided to correspond with the international institutes inviting an indication from them of their current work in water management, and what further applied research they might be prepared to attempt, given additional funds. This was the first formal step; TAC would expect further guidance in respect of the requirements of semi-arid areas from its Near East Mission.

297. Concerning pesticides, which appeared to him a very complex and confused field, their debate had been inconclusive. There had been strong scepticism about the scope for an international centre for work on pesticide residues; and a feeling (in some respects parallel to that on the water management question) - that research on more general questions of control of pests in crops should be largely associated with the programmes of institutes working on those crops. As yet there were no clear feelings on whether gaps existed calling for uniquely directed international research, and the subject would remain on their agenda.

298. On the July agenda there would be proposals for research on tropical fruits, a forestry centre, and the development of a notion that the United States should become more formally the centre of a soya bean research network reaching out to the developing world. The WARDA proposal would also remain for discussion, and he assured the observer from Nigeria that they would do their utmost to reach a firm conclusion on this matter then. They had already made some progress, but were awaiting further details on the revised proposals before making a final judgment.

299. In conclusion, he reminded Members and observers that their commitment to the Consultative Group arose from their final report after the July meeting. For this reason he had not attempted to reach hard and fast conclusions on certain new or difficult issues; but he believed that the Committee's positive recommendation in relation to the African Livestock proposal represented an important step forward.

300. In reply to a question from Dr. Pagot concerning the machinery for formal submission of projects to the TAC, the Chairman said that as he understood it the original agreement was that TAC itself could initiate a proposal related to any subject within its terms of reference. Projects could also be submitted by one of the three Co-Sponsors, or through the Co-Sponsors from other agencies after scrutiny as to their technical soundness although this did not necessarily imply the blessing of the Co-Sponsor on the proposal.

301. Since that ruling there had been a considerable development of the Consultative Group itself; for example he had consented to have on the July agenda a matter referred to TAC from the French Government. He stressed that at every meeting they were at the limit of their capacity to deal with subjects so would not welcome a system which would mean that they could have 40 or 50 items per meeting. This would require quite a different institution. However, he believed it was important to have some understanding of the procedure that the Consultative Group would wish to follow, and this is a matter he would take up again with the Co-Sponsors.

ANNEX 1

FIFTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE ON INTERNATIONAL AGRICULTURAL RESEARCH

30 January - 2 February

Rome, Italy

LIST OF PARTICIPANTS

MEMBERS

Sir John Crawford (CHAIRMAN)
32 Melbourne Avenue
Deakin
Canberra, A.C.T. 2600
Australia

Cable Address: NATUNIV, Canberra
Telephone: 492510, 478649

Prof. D. Bommer
Institutsdirektor
Institut für Planzenbau und Saatgutforschung
Forschungsantalt für Landwirtschaft
33 Braunschweig-Völkenrode
Bundesalle 50
Federal Republic of Germany

Cable Address: Landforschung
Braunschweig-Völkenrode
Telephone: 596307

Ing. Manuel Elgueta
Director
Centro Trópical de Enseñanza e Investigación
Instituto Interamericano de Ciencias
Agrícolas de la OEA (IICA)
Turrialba, Costa Rica

Cable Address: IICA, Turrialba
Telephone:

Dr. Hassan Ali El-Tobgy
Regional Agricultural Adviser
The Ford Foundation
P.O. Box 2379
Beirut, Lebanon

Cable Address: FORDLEB
Telephone: 274346

Dr. M.S. Swaminathan
Director General and Secretary to the
Government of India
Indian Council of Agricultural Research
Krishi Bhawan
Dr. Rajendra Prasad Road
New Delhi 1, India

Cable Address: AGRISEC, New Delhi
Telephone: 382629

Dr. H.C. Pereira
Chief Scientist
Ministry of Agriculture and Fisheries
Whitehall Place
London SW1A. 2HH.
United Kingdom

Cable Address:
Telephone:

Dr. W.D. Hopper
President
International Development Research Centre
P.O. Box 8500
Ottawa, Canada KIG 3H9

Cable Address: RECENTRE, Ottawa
Telephone: 998-4131

Dr. Luis Marcano
Presidente
Fundacion Servicio para el Agricultor
Edificio la Estancia, Oficina 360
Urbanizacion Chuao
Apartado 2224, Caracas

Cable Address:
Telephone:

Dr. I.E. Muriithi
Director of Veterinary Services
Veterinary Research Laboratories
P.O. Kabete, Kenya

Cable Address: VETLAB, Kabete, Kenya
Telephone: Port Smith 231

Dr. J. Pagot
Directeur Général
Institut d'Elevage et de Médicine
Vétérinaire des Pays Tropicaux
10, Rue Pierre Curie
94 Maisons Alfort (Val-de-Marne)
France

Cable Address: TROPELVA, Maisons-Alfort
Telephone: 3688873

Dr. L. Sauger
Directeur
Centre de Recherches Agronomiques
Bambey, Sénégal

Cable Address: NORAGRO, Bambey
Telephone: 843-50

Dr. Noboru Yamada
Director
Tropical Agriculture Research Centre
2-2-1, Nishigahara
Kita-Ku
Tokyo, Japan

Cable Address: METROPICAL, Tokyo
Telephone: 03-915-6157

OBSERVERS

Belgium

Dr. C. Populer, Représentant de l'Administration de la Coopération au Développement Place du Champ de Mars 5, B-1050 Bruxelles, Belgique.

Consultative Group on International Agricultural Research

Mr. H. Graves, Executive Secretary, Consultative Group on International Agricultural Research, International Bank for Reconstruction and Development, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

Food and Agriculture Organization of the United Nations

Mr. R.I. Jackson, Deputy Director-General, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome, Italy.

Ford Foundation

Dr. Lowell S. Hardin, Program Officer for Agriculture, Office of the Vice-President, The Ford Foundation, 320 East 43rd Street, New York, N.Y. 10017, U.S.A.

France

Dr. M. Lacrouts, Inspecteur Général de l'Elevage et des Industries Animales, Ministère de l'Agriculture et de Développement Rurale, 1.ter Avenue de Lowendal, Paris 7eme, France.

International Bank for Reconstruction and Development

Mr. L.J.C. Evans, Director, Agricultural Department, Central Projects Staff, International Bank for Reconstruction and Development, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A.

Netherlands

Dr. Ir. A.S. Tuinman, Minister Plenipotentiary, Permanent Mission of the Kingdom of the Netherlands to FAO, Via Australia 2, 00144 Rome, Italy.
Dr. Ir. G. de Bakker, General Director of Agricultural Research, Ministry of Agriculture and Fisheries, le v.d. Boschstraat 4, The Hague, Netherlands.

Rockefeller Foundation

Dr. J. Pino, Director, Agricultural Sciences, The Rockefeller Foundation, 111 West 50th Street, New York, N.Y. 10020, U.S.A.

Sweden

Mr. Erik Cornell, First Secretary, The Royal Swedish Embassy, Piazza Rio de Janeiro, 3 00161 Rome, Italy.

United Kingdom

Dr. R. Melville, Chief, Natural Resources Adviser, Overseas Development Administration, Foreign and Commonwealth Office, Eland House, Stag Place, London S.W.1., United Kingdom.

United Nations Development Programme

Dr. M. Gucovsky, Senior Technical Adviser, Technical Advisory Division, United Nations Development Programme, United Nations Plaza 866, New York, N.Y. 10017, U.S.A.

United States

Dr. Omer J. Kelley, Director, Office of Agriculture and Fisheries, Bureau for Technical Assistance, United States Agency for International Development, 21st and C Street N.W., Washington, D.C. 29523, U.S.A.
Dr. Guy B. Baird, Office of Agriculture, Bureau of Technical Assistance, United States Agency for International Development, 21st and C Street N.W., Washington, D.C. 20523, U.S.A.
Mr. J. Cooper, United States Agency for International Development, 21st and C Street N.W. Washington, D.C. 20523, U.S.A.

Representing Africa - Nigeria

Mr. B.O.E. Ammon, Secretary, Agricultural Research Council of Nigeria, Moor Plantation, P.M.B. 5382, Ibadan, Nigeria.

Representing Asia and the Far East - Thailand

Mr. Pairaj Laowhapan, Agricultural Attaché and Permanent Representative of Thailand to FAO, Royal Thai Embassy, Via Nomentana 132, 00162 Rome, Italy.
Alternate: Mr. Prasan Saranyawatin, Third Secretary and Alternate Permanent Representative of Thailand to FAO, Royal Thai Embassy, Via Nomentana 132, 00162 Rome, Italy.

Representing the Near East - Pakistan

Mr. M.I.K. Khalil, TQA., CSP, Agricultural Counsellor, Embassy of Pakistan, Lungotevere delle Armi 22, 00195 Rome, Italy.

Representing Latin America - Brazil

Mr. Sergio F.G. Bath, Permanent Representative of Brazil to FAO, Embassy of the Federative Republic of Brazil, Piazza Navona 14, 00186 Rome, Italy.

OTHERS PRESENT

(For specific Agenda Items)

Dr. D. Winkelmann
C.I.M.M.Y.T.
Londres 40
México 6, D.F.
Apdo. Postal 6-641
México

Dr. Randolph Barker
Agricultural Economist
The International Rice Research Institute
P.O. Box 1300, M.C.C.
Makati, Philippines, D-708

Dr. Dean F. Peterson
Dean
Utah State University
Logan
Utah 84321
U.S.A.

Dr. E.M. Ojala
Assistant Director-General
Economic and Social Policy Department
FAO

Mr. J.P. Huyser,
Director
Investment Centre
FAO

Mr. H.M. Horning
Senior Officer
Water Resources and Development Service
Land and Water Development Division
FAO

Dr. P. Pinstrup-Andersen
Leader, Program of Agricultural Economics
Centro Internacional de Agricultura Tropical
Apartado Aereo 67-13
Cali
Colombia

Professor Ray F. Smith
Chairman
Department of Entomology and Parasitology
137 Giannini Hall
Berkeley
California 94720
U.S.A.

Professor D.E. Tribe
Professor of Animal Nutrition
School of Agriculture
University of Melbourne
Parkville, N.2
Victoria
Australia

Mr. D. Pratt
Overseas Development Administration
Foreign and Commonwealth Office
Eland House
Stag Place
London, S.W.1.
United Kingdom

Dr. B. Nestel
Associate Director
Agriculture, Food and Nutrition Sciences
265 Arts Building
University of Guelph
Guelph, Ont.,
Canada

Dr. T.V.R. Pillay
Chief
Fish Culture Section
Fisheries Department
FAO

Mr. J. Rendel
Chief
Animal Production and Health Service
Animal Production and Health Division
FAO

Dr. F.W. Whittemore
Senior Officer
Pesticides and Post-Harvest Control Group
Plant Production and Protection Division
FAO

Dr. F.P.W. Winteringham
Senior Officer
Pesticide Residues and Pollution
Joint FAO/IAEA Division of Atomic Energy
in Food and Agriculture
Vienna

Dr. R.F.E. Devred
Agricultural Research Officer
Research Development Centre
Development Department
FAO

SECRETARIAT

Mr. P.A. Oram
Secretary, TAC
Director, Research Development Centre
FAO

Mr. B.N. Webster
Assistant Secretary, TAC
Research Development Centre
FAO

ANNEX II

FIFTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE

30 January - 2 February

Rome, Italy

REVISED AGENDA

CLOSED SESSION

Item 1. Adoption of the Agenda
Item 2. Adoption of the Report of the Fourth Meeting
Item 3. Priorities for International Agricultural Research, including socio-economic research

Item 4. WARDA - Report on meeting in Monrovia and revised research proposals

OPEN SESSION

Item 3. (cont.) Priorities and approaches to socio-economic research
Item 5. Water use and management

CLOSED SESSION

Item 6. Food legumes:
(i) Report by Dr. Kelley (USAID) on proposal for an International Soybean Resource Base
(ii) Discussion of draft resolution of TAC Sub-committee

Item 3. (concluded) Conclusions and formulation of recommendations on priorities

OPEN SESSION

Item 7. Research on Animal Production and Health in Africa: discussion of report and recommendations of Tribe Mission
Item 8. Report of TAC Sub-committee Mission to examine the Research Needs for Protein Production in Tropical America
Item 9. Pest Control and Pesticide Residues

CLOSED SESSION

Item 10. TAC Mission to the Near East and North Africa: finalization of arrangements
Item 11. Aquaculture: discussion of arrangements for proposed Expert Working Panel
Item 12. Date and place of the Sixth Meeting
Item 13. Any other business. Genetic Resources - Progress Report

OPEN SESSION

Item 14. Chairman's Summing-up

ANNEX III

FIFTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE

30 January - 2 February 1973

Rome, Italy

LIST OF DOCUMENTS

Revised Agenda		Languages
Item 1		
1.	**DDDR:IAR/73/1**	
	Provisional Agenda.	E
	Ordre du jour provisoire.	F
	Programa provisional.	S
Item 2		
2.	**DDDR:IAR/72/18**	
	Draft Report of the Fourth Meeting of the TAC.	E
	Projet, rapport de la quatriéme réunion du CCT.	F
	Proyecto de informe de la cuarta reunión del CAT.	S
Item 3		
3.	**DDDR:IAR/73/5**	
	Socio-economic research. International Centres.	E
4.	**DDDR:IAR/73/6**	
	Socio-economic aspects of International Agricultural research. FAO Contribution.	E
5.	**DDDR:IAR/73/8 (Restricted, members only)**	
	Proposal for an international tropical forestry research institute.	E
	Project d'institut international de recherche sur les forêts tropicales.	F
	Propuesta de creación de un instituto internacional de investigación forestal tropical.	S
6.	A proposal for the establishment of the International Tropical Fruits Centre in Thailand. (Restricted, members only)	E

		Languages
Item 3 (continued)		
7.	DDDR:IAR/73/10	
	Research on Tropical Fruits - South East Asia. Note by FAO	E
	Recherche sur les fruits tropicaux - Asie du Sud-Est. Note de la FAO	F
	Investigiciones sobre frutas tropicales - Sudeste asiatico. Nota de la FAO	S
8.	DDDR:IAR/73/13 (Restricted)	
	Notes for discussion in TAC on Priorities in International Agricultural Research. Sir John Crawford	E
	Notes pour l'examen par le CCT des priorités en matière de recherche agricole internationale. Sir John Crawford	F
	Notas que han de someterse a debate en el CAT sobre prioridades en la investigación agricola internacional. Sir John Crawford	S
9.	Notice about priorities in international agricultural research. J.R. Pagot	E
Item 4		
10.	Research proposals of the West Africa Rice Development Association (WARDA) (Restricted, members only)	E
11.	WARDA: Note to the TAC concerning meeting of representatives of IRRI - IRAT - IITA - WARDA and FAO. Monrovia, 4-6 December 1972 (Restricted, members only)	E
Item 5		
12.	DDDR:IAR/73/12	
	Water Use and Management	E
13.	IRRI Water Management (Extract from Annual Report) (Restricted, members only)	E
14.	IRRI. The Research and Training programme in Water Management, Agricultural economics Department (Restricted, members only)	E
Item 6		
15.	DDDR:IAR/73/2 (Restricted, members only)	
	Report, and Resolution proposed by the Grain Legumes Sub-committee of the Technical Advisory Committee	E
	Rapport, et resolution proposé par le sous-comité des legumineuses vivriéres du comité consultatif technique	F
	Informe, y Resolucion propuesto per el subcomite sobre leguminosas di grano, del comité asesor tecnico	S

		Languages
Item 6 (continued)		
16.	Resolution proposed by the Grain Legumes Sub-committee of the Technical Advisory Committee (Revised) (Restricted, members only)	E
17.	International Soybean Resource Base - A proposal. USAID. (Restricted, members only)	E
Item 7		
18.	Animal Production and Research in Tropical Africa. Report of the Task Force.	E
	Production animale et recherche zootechniques en afrique tropicale. Rapport du groupe d'etude.	F
Item 8		
19.	DDDR:IAR/73/9	
	Report to the Technical Advisory Committee of the Sub-Committee appointed to review agricultural research in Tropical America (Summary)	E
	Rapport presenté au comité consultatif technique par le sous-comité chargé d'examiner la recherche agricole en amerique tropicale (Resumé)	F
	Informe al comite asesor tecnico del sub-comité creado para examinar la investigación agricola en america tropical (Resúmen)	S
20.	DDDR:IAR/73/9 Corr. 1 Corrigendum to document DDDR:IAR/73/9	E
Item 9		
21	DDDR:IAR/73/7	
	Pesticide Residues Research. UNDP.	E
	Recherche sur Les Residus De Pesticides	F
22.	FAO. Pesticide Residues Research - Comments - and suggestions on UNDP Background Paper.	E
23.	DDDR:IAR/73/11	
	Problems of Pest Control in Developing Countries in Relation to Management of the Environment	E
Item 10		
24.	DDDR:IAR/73/3 (Restricted, members only)	
	Terms of Reference, Research Review Mission: North Africa and Near East.	E
	Mandat de la mission chargée d'etudier la situation et les besoins de la recherche en afrique du nord et au proche-orient	F

		Languages
Item 10 (continued)		
	Mandato de la mision de estudio de la investigación en africa del norte y el cercano oriente	S
Item 11		
25.	DDDR:IAR/73/4 Draft Terms of Reference of proposed Technical Advisory Committee Working Group on Aquaculture	E
	Projet de mandat du groupe de travail de l'aquiculture du comité consultatif technique, que l'on envisage de creer	F
	Proyecto de mandato del propuesto grupo de trabajo sobre acuicultura del comite asesor technico	S

ANNEX IV

RESOLUTION PROPOSED BY THE GRAIN LEGUMES SUB-COMMITTEE OF THE TECHNICAL ADVISORY COMMITTEE

Moved that:

1. The Committee adopt the report of the Sub-Committee on Grain Legumes. 1/

2. To give effect to the suggestions of the Grain Legume Sub-Committee, the Committee:

   (a) instruct its Secretariat to prepare for its early consideration:

      (i) a general review of the main research programmes now under way by up-dating the survey by Roberts presented to the first meeting of TAC;

      (ii) an outline survey of the present state of knowledge of the basic physiological aspects of grain legumes that potentially contribute to the seeming low yield characteristics of grain legumes; and

      (iii) suggestions, framed from the survey and research review, that would give initial guidance to the Committee's deliberations of whether further action should be taken to encourage additional basic research on legume yield.

   (b) instruct its Secretariat to provide the Committee with a periodic brief that reviews the main publications on protein needs, including those of the UN Protein Advisory Group, and on the cereal and legumes research programmes under way or publicly contemplated or recommended to meet these needs.

3. In view of the Sub-Committee's concern to establish a mechanism to coordinate properly the present research work on the improvement of individual grain legume crops and the protein content of cereals being mounted at various international and regional research centres, and recognizing that the Committee has before it several proposals for additional or intensified improvement work on specified grain legumes that must also be assessed on both their individual merits and in the light of present on-going research with which each must ultimately be coordinated; and being aware that in the future the Committee will likely wish to examine new proposals for research into grain protein sources important to human consumption that have been neglected or given too little attention in the conduct of international agricultural research, the Committee appoint a standing Sub-Committee of the TAC on Grain Protein with these terms of reference:

   (a) to consider, in consultation with the Chairman and the Secretary, work on each grain protein source now being undertaken at international and major regional research institutions and to review research work envisioned in grain protein improvement proposals now before the Committee, and to recommend to the Committee the action likely to be most effective in gaining meaningful coordination among research centres working on the same crops, that is, a coordination pattern that strives to eliminate unnecessary or wasteful duplication in seperate research efforts;

./.

1/ Adopted at the Fourth Meeting.

ANNEX IV Cont'd

(b) to consider and periodically recommend to the Committee the action it judges the best response to any new proposals for grain protein research that may come before the Committee;

(c) to consider, upon instruction from the Committee, action that should be taken to ensure that the required research into the improvement of grain protein sources of major importance to human diets is being mounted.

ANNEX V

CONCLUSIONS OF TAC ON AGENDA ITEM 7 PRESENTED BY DR. J. PAGOT:

INTERNATIONAL CENTRE FOR LIVESTOCK PRODUCTION IN TROPICAL AFRICA

The TAC, having reviewed the Report of the Task Force headed by Professor D.E. Tribe and with Drs. B. Nestel, D.J. Pratt, and M. Thomé as members, offered its congratulations to the authors.

It noted that the approach to the problems suggested for study by the Task Force represents an innovation in international research because:

1. The research is focussed primarily on systems of animal production aimed at determining the constraints handicapping development of animal production in order, from this vantage point, to frame appropriate research programmes to overcome those constraints.

2. The operational basis will comprise, first of all, a network for cooperation with existing national centres for the implementation of joint programmes of work, with or without international financing.

Regarding purely technical research, with reference to which the report notes that many findings in Africa still remain to be disseminated, this will therefore be confined to those fields in which an examination of production systems will have indicated gaps.

Accordingly, the purposes of the International Centre for the Development of Animal Production in Tropical Africa, the establishment of which is advocated, were conceived within the spirit of the respective terms of reference of the Consultative Group and the TAC, viz:

CG "(i) on the basis of a review of existing national, regional and international research activities, to examine the needs of developing countries for special effort in agricultural research at the international and regional levels in critical subject sectors unlikely otherwise to be adequately covered by existing research facilities.

(ii) to attempt to ensure maximum complementarity of international and regional efforts with national efforts.

TAC (i) to advise the Consultative Group on the main gaps and priorities in agricultural research.

(v) ... encourage the creation of an international network of research institutions and ethe effective exchange of information among them."

The TAC therefore warmly supported the proposals of the Task Force. However, after a careful perusal of the report, it felt that Professor Tribe's introductory statement to the TAC should be considered as an integral part of the report itself, and deemed it advisable that certain comments or criticisms formulated by its members be communicated to the Consultative Group.

Thus, in the following text, the general conclusions of the Task Force are presented as revised in the light of the views of the TAC. Opinions on specific points follow.

1. The current level of animal production[1/] in Africa is definitely below the continent's potential. Efforts to improve this situation are urgently needed for various reasons: economic growth, the nutrition and welfare of its population, its balance of trade status, and the conservation of grassland resources which are now on the downgrade.

2. The principal obstacle to the development of animal production is not mere lack of technical know-how. A considerable amount of knowledge has been accumulated over several decades of work at numerous research centres. Moreover, the existing centres, whether national or regional, could make available most of the facilities required for future research.

3. Although the findings of previous research have not been sufficiently widely diffused and current research work is handicapped by lack of funds and experienced staff, the disappointing achievements in tropical Africa as regards growth of animal production are due primarily to the failure to integrate the biological, economic and sociological components of research and development programmes. Technology is definitely far ahead of development, because stockmen lack the means to apply technical know-how and are particularly short of investment funds.

4. Most essential, is a more thorough study of animal production systems in tropical Africa with a view to full utilization of already available knowledge and to establishing an order of priority for future research. Such a study should embrace biology, economics and social anthropology in all aspects relating to animal production. This production systems approach will make possible research on mixed farming -combined crop and animal production, which are all too often considered independently of one another.

5. The authorities of several African countries are now attempting to approach the problem of development of animal production from the multi-disciplinary angle, and several promising programmes of work have come to our notice. The pace of progress is slow, however, for lack of appropriate information and of a sufficient number of multi-disciplinary scientific teams.

6. The TAC endorses the establishment of an International Centre for the Development of Animal Production in Tropical Africa insofar as this centre will have a limited and very precise purpose and especially because its research programmes will constitute a departure from conventional ones.

7. This purpose will consist essentially in determining ways and means for enhancing the efficiency of the main animal production systems in tropical Africa and in assisting governments and responsible authorities to attain new productivity thresholds.

8. In order to achieve this purpose, the centre will have to analyse selectively all available information, assemble data furnished by new research and participate directly or indirectly in a broadened programme of multi-disciplinary research aimed at integration of the various disciplines. Special attention will be paid to the analysis of current programmes for development of animal production.

9. It is recommended that the centre undertake first and foremost the following tasks:

(i) Review, collate and disseminate in both English and French all appropriate data concerning animal production in tropical Africa; the TAC suggests that the international centre adopt in this field the methodologies utilized by FAO's specialised information services in order to facilitate the collation and dissemination of such information.

(ii) Recruit a multi-disciplinary research team to investigate existing animal production systems.

(iii) Devise and develop new or improved animal production systems and establish new research priorities.

1/ In this report, the expression "animal production" is taken in the broadest sense, as defined in paragraph 2 of the Terms of Reference, page 5 of the report.

(iv) Support and complete (where necessary) existing national and regional research stations and cooperate with them in developing a well coordinated research programme that takes into account urgent needs in the field of development of animal production.

(v) Take all those measures that will enable it to launch specific research programmes that might appropriately be entrusted to an international centre. Such programmes must be strictly justified and special attention should be paid to ensure that they are of an international character and that the schedule for their execution is adhered to.

(vi) Arrange or assist in the organization of seminars, technical meetings and training courses for staff or workers concerned with problems of stock raising (whether in research, extension work, planning or production) primarily with a view to enhancing the competence of staff in the region in devising multi-disciplinary, integrated research and development systems; and

(vii) furnish national, regional or international authorities with basic statistics, data and consultant services in the various branches of animal production in which the centre will be actively working, the TAC stipulating that in the field of statistics the centre will undertake rather to improve methodology than to collect data itself and that, as regards consultant activities, these should not be the sole or full time occupation of the centre's research workers.

10. This approach to the problem, which has the merit of supporting whatever work is already underway while setting up machinery for appropriate coordination, is preferable to other possibilities which could include reorganizing all work at one single central station or using all supplementary resources available to support existing national research stations.

The TAC, considering the suggested phasing of activities in the report, would like to see the following procedures accelerated, although it understands clearly the reasoning behind the suggestions given.

Phase One:
- Launching of investment;
- Initiation of research on production systems;
- Outlining of a cooperative programme with national or regional centres.

Phase Two:
- Cooperative research with national or regional centres;
- Eventual technical research at the centre and at existing national and regional centres.

11. The TAC, after examining the suggestions of the Task Force regarding the location of the centre, found nothing unfavourable against any of the sites proposed.

On examining the ecological advantages of the several suggested locations, it appeared that both Addis Ababa and Yaoundé were favourable, the proposal to select Addis Ababa being motivated by its cultural advantages and its proximity to international agencies already concerned with economic problems.

12. Regarding liaison with ILRAD, the TAC noted that these two centres have very different objectives and suggested that, at least initially, they should be developed separately. The TAC did not, however, discount the possibility of a later fusion into a single body, although of the opinion that if this were done from the outset it might unnecessarily complicate the development of investment work.

13. Regarding the appointment of the Director-General, the TAC recommended that the individual selected should be already convinced of the value of the production systems approach as a means of making worthwhile progress.

In respect of the Governing Body, its composition should also take into account the new orientation of research on animal production.

The TAC hoped that the members of the Governing Body and of the Scientific Committee would be appointed quickly.

14. The TAC did not feel it necessary to enter into the details of the research programme, but left this matter to the Scientific Committee and Governing Body which would be better able to judge the worth of the proposals of the future director and his staff before submitting them to sponsors and their advisers.

It suggested nevertheless that specialists in the human sciences should be able to effect the change over from an attitude of "observation", conventional in this sphere, to one of perspective projection that will enable them to attempt to forecast the trends of the man/livestock complex in the light of new technology, infrastructures, investments, etc. The idea was voiced that the human sciences, in particular sociology, could perhaps gain by following the road traced by "stockmen".

As regards specific research programmes, although the following suggestions were put forward, they are not considered to be in any way mandatory as the TAC felt that in this respect, the committees of the centre will be more competent to give advice.

(i) Use of the energy resources of rough herbage that livestock find unpalatable;

(ii) Manufacture of livestock feeds;

(iii) Study of natural forages and pasture.

Research should cover all existing and possible production systems, not nomadism alone, and it should not be static but rather dynamic.

15. On reviewing the suggested financial development plan, the TAC felt it was unable to accept the suggestions as anything but indicative, because with full knowledge of the situation the nature of the investments to be made will depend on the programmes, which will in turn have to be framed on the basis of the findings of preliminary research.

The TAC recognized that the estimates are somewhat optimistic, although still reasonable. It hoped that the procedures envisaged will be speeded up, although some of its members considered that the suggested schedule and deadlines are not unrealistic.

16. The TAC recommended that the Consultative Group should designate an Executive Agency as soon as possible (the Ford Foundation was designated for ICRISAT), and that the IBRD open a credit line in order to get things started, as has been done for other international bodies and institutions.

17. On concluding its review of the report of Professor Tribe's Task Force, the TAC felt that the document gave "a clear expression of a policy for the orientation of research in the field of animal production" and that, in view of its importance, this report and its annex, which consisted of Professor Tribe's introductory address, should be published and distributed together with a request seeking the opinions of African Governments, in order to facilitate the preparation of an outline on future cooperation between the international centre and national centres.

18. The TAC also hoped that the observations and comments on the report by members of the Consultative Group and the TAC would be transmitted for the information of the members of the Governing Body and Scientific Committee of the new centre to be created.

PAB: IAR/72/15
July 1972

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

Fourth Meeting, Washington, 2-4 August 1972

A PROPOSAL FOR THE ESTABLISHMENT OF AN INTERNATIONAL NETWORK OF PLANT GENETIC RESOURCES CENTRES

(Item 15)
16

TAC SECRETARIAT
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ROME 1972

WS/D0429

PROPOSAL FOR THE ESTABLISHMENT OF AN INTERNATIONAL NETWORK OF PLANT GENETIC RESOURCES CENTRES

ANTECEDENTS

1. The losses of crop genetic materials, mainly due to the replacement of primitive cultivars by advanced varieties, and the means to counter further losses, have already been discussed in the last two meetings of TAC. This matter is of world-wide interest, as shown by its inclusion in the agenda of the Stockholm Conference on the human environment.

2. As a result of a resolution at the last TAC meeting, a group of specialists met in Beltsville, Maryland, 20-25 March 1972, to prepare a plan for the establishment, at an international level, of a coordinated programme to organize the collection, conservation and utilization of crop genetic resources. The report of this meeting is attached as an appendix.

NATURE OF THE PROBLEM

3. The sources of varieties of crop plants are not distributed equally all over the world, but concentrated, due to biological and/or historical factors, in limited regions called "centres of crop diversity", or of "crop variability". All of them are situated in the developing countries. In several of them the richness in primitive types is fast disappearing, as new and superior man-made cultivars replace the old varieties. However, it is to these old varieties that the breeders in all countries have to turn to obtain the factors of resistance, quality and other characteristics for the further improvement of the current cultivars. Thus, the conservation of the primitive types of crop plants and the related wild species is an international task which requires (1) the exploration of these resources in the field; (2) their conservation on a long-range basis, and (3) their evaluation and utilization in crop improvement programmes.

ORGANIZATION OF A WORLD NETWORK OF GENETIC CENTRES

4. The plan here proposed is based on the conclusions of the Beltsville meeting. It aims to establish a world network of genetic resources centres, involving:

(a) centres already existing in the developed countries;

(b) international centres working in specific crops, e.g. CIMMYT, CIAT, IITA, IRRI, IPC, ICRISAT;

(c) new 'regional' centres which it is proposed to establish in the areas of crop diversity;

(d) a coordinating centre.

5. The coordinating centre will consist of a coordinating committee, or management board of nine members - six from the regional centres and three independent scientists; with supporting technical staff, consisting of three scientists - one in conservation, one in exploration, and one in documentation, plus administrative and secretarial staff. The main functions of the coordinating centre will be to:

(a) promote the cooperation of all interested institutions in a world-wide network of genetic resources;

(b) plan and supervise the activities of the new centres to be established, and the distribution of funds for their regional work in exploration, conservation, training and other activities;

(c) promote and assist in technical meetings;

(d) arrange for the maintenance of replicate storage of seeds and vegetative stocks;

(e) establish an information system with standard procedures in documentation, recording, storage and retrieval.

The central staff will be the executing agents of the Coordinating Committee and will be located at the FAO Headquarters in Rome, attached to the Crop Ecology and Genetic Resources Unit of the Plant Production and Protection Division under a Trust Fund with specific provision to ensure maximum flexibility for its activities. The Coordinating Centre will be responsible for the distribution of the funds for the world network of genetic centres, in exploration, conservation, documentation, training, publications and meetings. The appropriations will be established by the Coordinating Committee every year.

6. Each regional centre will provide the focus of a regional network consisting of cooperating national centres. The regional centre will have the necessary scientific and supporting staff and maintain a gene bank. The Beltsville meeting recommended the setup of ten regional centres in the following regions: China, South East Asia, South Asia, Near East, Ethiopia, Tropical Africa, Meso-america, Tropical America, Andes and Sub-tropical South America. These centres are not regarded simply as depositories of seeds or living collections, but as active agents in the interchange, evaluation, distribution and eventual utilization in plant breeding programmes of genetic resources, as well as in the promotion of research in fields allied to these activities. Their main functions will be to:

(a) explore, collect and maintain the genetic materials of the region, in cooperation with the national centres;

(b) introduce and evaluate new materials and exchange them with other centres;

(c) maintain a documentation system following a standardised internationally accepted form laid down by the Coordinating Centre.

These centres will be established in agreement with the governments of the selected countries under arrangements designed to guarantee complete freedom for the collection of materials and their exchange according to specified quarantine regulations, as well as for exploration and rejuvenation of genetic materials. It is planned that the centres be located at research or teaching institutes, where scientific personnel and facilities (library, herbarium, laboratory) are available, thus keeping capital costs to the minimum and ensuring technical competence in their operations.

7. It is recognized that in addition to cooperating centres in developed countries, an important part of the world network of genetic centres would be the international institutes dealing with specific crops, e.g. CIMMYT,

IRRI, both of which were represented at the Beltsville meeting. The International Potato Centre and Asian Vegetable Centre, in their proposals to TAC, have also placed strong emphasis on the collection, conservation, and utilization of genetic resources as an integral part of their work. Such centres have an important responsibility for the exploration, conservation, evaluation and rejuvenation of the specific crops in which they work, but cannot entirely substitute for regional centres since in certain respects they lie outside the main centres of genetic diversity, e.g. CIMMYT for wheat. A close liaison would nevertheless be maintained between the institutes and the regional centres in the planning and execution of the four activities mentioned above. They could participate, inter alia, in exploration and conservation work, and in providing replicate storage for collections of their specific crops. However, no budgetary provisions were established, as these centres receive special support for such activities.

PHASING FOR PROPOSED ACTION

8. First year (1973): Establishment of a trust fund in FAO to start the Coordinating Centre. For this purpose it is suggested that TAC or the Consultative Group appoint the Coordinating Committee who will consult with FAO in the recruitment of staff and other administrative matters. Plans for the development of the network and related activities, e.g. information systems, would start this first year, with the recruitment of personnel, selection of countries and institutes. For this purpose travel funds are included in the proposed budget.

9. Second year (1974): Establishment of three regional centres, following either the priorities set up in the Beltsville report or according to the facilities offered by countries. For each centre, in the first year, an appropriation is included in the budget for the purchase of equipment, vehicles and other materials. No major building projects are foreseen. These non-recurrent funds are estimated according to the Beltsville report.

10. Third year (1975): Establishment of three more regional centres.

11. Fourth year (1976): Establishment of three additional regional centres to complete the world network.

PROPOSED BUDGET (US$)*

First year (1973)				
1.	Coordinating centre			
1.1	Staff (supplies, servicing costs etc.)	175,000		
1.2	Coordinating Committee (travel, meetings)	25,000		
1.3	Fund for exploration, training and documentation	133,000**	333,000	333,000
Second year (1974)				
1.	Coordinating centre			
1.1	Staff, etc.	180,000		
1.2	Coordinating Committee	25,000		
1.3	Fund for exploration, etc.	253,000**	458,000	
2.	Three regional centres			
2.1	Recurrent (staff)	150,000		
2.2	Non-recurrent expenses	300,000	450,000	908,000
Third year (1975)				
1.	Coordinating centre			
1.1	Staff, etc.	160,000		
1.2	Coordinating Committee	30,000		
1.3	Fund for exploration, etc.	460,000	650,000	
2.	Regional centres			
2.1	Three centres already established			
2.1.1	Recurrent expenses	155,000		
2.1.2	Non-recurrent expenses	95,000	250,000	
2.2	Three new centres			
2.2.1	Recurrent expenses	150,000		
2.2.2	Non-recurrent expenses	300,000	450,000	1,350,000
Fourth year (1976)				
1.	Coordinating centre		655,000	
2.	Six existing centres		500,000	
3.	Three new centres		450,000	1,605,000
Fifth year on				
1.	Coordinating centre		660,000	
2.	Nine regional centres		975,000	1,635,000
	Five-year total			5,831,000

*an inflation factor of around 5% has been considered for each year
**the documentation activity as per Annex 3.

THE COLLECTION, EVALUATION AND CONSERVATION OF PLANT GENETIC RESOURCES

Report of TAC Ad Hoc Working Group held in
Beltsville, U.S.A. - 20-23 March 1972

Documentation of Genetic Resources

The need for appropriate and, as far as possible, integrated records and retrieval systems is generally recognized. It was mentioned in the Guidelines for the ad hoc Working Group (8 (a) (ii)), was recognized during the Working Group's discussions, and referred to in the Report under 33, 11, 34, 47.16 and 50.6. However, firm recommendations on organization and budgetary requirements were deferred in the expectation that a meeting of specialists on documentation of crop data, to be held at Izmir shortly after the Beltsville meeting, would resolve the long-standing difficulties and disagreements on descriptive, procedural and programming approaches. A brief reference to the omission of this important subject was to be made in a note to the Budget proposals, but was inadvertantly omitted.

At the Izmir meeting, a large measure of agreement was reached among representatives of four genetic resources centres (Izmir, Bari, Volkenrode and IRRI) and a number of specialists from U.S.A. and U.K. The four members of the ad hoc Working Group present - Bommer, Chang, Frankel and Hawkes - considered that the proposals which emerged from this meeting were likely to be widely acceptable in principle, and therefore presented a basis for active preparations at the institutional and regional level, and for international participation in assisting and guiding these efforts with a view to achieving a large measure of international compatibility and co-operation. Indeed, participation at international level had now become not only possible but essential. With the help of two of the experts mainly involved in preparing the groundwork for the proposals, Drs. C.F. Konzak and D.J. Rogers, the outline of the following notes was prepared by the four ad hoc Working Group members present:

Documentation is an integral component of every operation, from surveys and collecting to evaluation and conservation. This input and output of information is essential for the effective use of all kinds of gentic resources. The larger the volume of information, and the larger the circle of users throughout the world, the greater is the need for systematic collection and dissemination of information. Computer procedures can now cope with the large volume of data which have been accumulated and which are rapidly growing.

Documentation is essential for the operations of all collections - from specialized genetic stocks in a research institute, to collections at regional centres or world collections such as those of rice, corn, wheat or sorghum. The same principles of classification and description can be applied to computer tapes or discs and to manually operated card systems, as long as the latter are made available in machine readable form.

Major documentation centres are essential for the functioning of a global network. Examples are the data banks at Beltsville and at 5 regional centres in U.S.A., at Volkenrode, Bari, Izmir (proposed), Leningrad, Canberra, New Delhi, and at the International Rice Research Institute.

The need for documentation being generally recognized, and preparations proceeding in many places, it is considered important and urgent that guidance in planning and operations be provided at an international level, so as to secure efficiency of operations at all levels, and to lay the foundations and prepare the ground for international compatibility which is essential for the establishment of a global network of information at a later stage. For this purpose it is proposed to set up as part of the co-ordinating staff a small unit whose tasks it should be to assist in the establishment of data banks, to regulate the flow of information between them and from smaller institutions to documentation centres, and to explore the needs and generate plans, for global documentation centres which may be established in the future.

The principal member of this unit should be an operations research specialist, who should have the closest co-operation of the biologists on the staff of the co-ordinating unit. Financial provision is proposed for the appointment of short-term consultants to assist in the standardization of procedures essential for global functioning. Funds will be required for computer time for trial runs, and for extensive travel. The following budget proposals are made:

Salary	$ 25,000
Travel	$ 10,000
Secretary	$ 8,000
Consultants, assistance to data banks, computer time for trial runs, etc.	$ 40,000
	$ 83,000

This proposal should be visualized in the first instance as a two-year project, subject to review in the second year of operations.