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Consultative Group on International Agricultural Research [CGIAR] - F-2 - Technical
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ANNEX V Corrigenda to Report of the Seventh Meeting

5. The Draft Report of the Seventh Meeting of the Committee was adopted, on a proposal from the Chair, subject to minor amendments as detailed in the list of Corrigenda, attached hereto as Annex V, which will accompany subsequent distributions of the Report.

EIGHTH MEETING OF THE TECHNICAL ADVISORY COMMITTEE

OF THE CONSULTATIVE GROUP ON

INTERNATIONAL AGRICULTURAL RESEARCH

24 July - 2 August, 1974

Washington, D. C., U. S. A.

SUMMARY RECORD

**ATTENTION IS DRAWN TO THE
CHAIRMAN'S SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS**

Page 87, Para. 426, et seq.

1. The Eighth Meeting of the Technical Advisory Committee of the Consultative Group on International Agricultural Research was held from 24 July to 2 August at World Bank Headquarters in Washington, D. C., U. S. A. Sir John Crawford was in the Chair.

2. The meeting was attended by thirteen members, twenty-four observers and sixteen other participants in specific discussions. A list of participants is attached hereto as Annex I.

3. The Chairman, on opening the meeting, welcomed Prof. Guy Camus as a new member of the Committee.

Adoption of the Agenda (Agenda Item 1)

4. The Revised Agenda was adopted subject to any further revision which might prove to be necessary 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 Seventh Meeting of the TAC (Agenda Item 2)

5. The Draft Report of the Seventh Meeting of the Committee was adopted, on a proposal from the Chair, subject to minor amendments as detailed in the list of Corrigenda, attached hereto as Annex V, which will accompany subsequent distribution of the Report.

Aquaculture (Agenda Item 3)

6. In introducing this item the Chairman requested Dr. Allsopp to present the report of the TAC Sub-Committee on Aquaculture and be present to answer any questions raised by members on the report. He felt reluctantly compelled to express the view that the programme proposed by the Sub-Committee was too costly and beyond the current financial capacity of the CGIAR in view of existing commitments. Rather than sacrifice the effort of the Sub-Committee however he felt that a cautious, even tentative, start had to be made and had thus asked Dr. Allsopp to try to define a proposal with a modest budget, limited to one or two top priority projects with which some impact could be made in a specific region. He felt that the previous report (cf. TAC Aquaculture Working Group, Spoleto meeting) had already indicated a research need and had described a considerable number of research problems dealing with specific fish. The Sub-Committee had therefore been charged with defining specific programmes for existing institutions. What it had really made clear however was that there was a definite dearth of qualified personnel in aquaculture and aquaculture research, and thus a great need for training in research procedures existed at all levels. He invited members of the Committee to express their views quite freely on the report.
7. Dr. Allsopp then described the highlights of the various sections of the report and explained the constraints with respect to the Sub-Committee's Terms of Reference in regard to detailed project budgets and duration. He gave some justification for the Sub-Committee's integrative approach to the problem and explained the regional network and research systems which they had outlined for the first five years in Asia, Africa and Latin America. He emphasized the need for continuous research training, both regionally and extra-regionally, and the important role that information dissemination must also play. For the administration of the programme the establishment of an International Board on Aquaculture Research (IBAR) was advocated, to serve as an independent body for stimulating and co-ordinating international aquaculture research (cf. International Board for Plant Genetic Resources). The indicative budget was explained pointing out its constraints and limitations.
8. Dr. Allsopp suggested that the programme should be initiated in the Asia and the Far East Region and the other regions involved progressively. Omissions in the report which were worthy of mention were: the possible involvement of Bangladesh in the first phase, the inputs possible through the collaboration of the People's Republic of China (the cradle of aquaculture) and possible bilateral support from other sources. Consideration was given to the role that could be played by the UNDP Global Project proposal and the Rockefeller Foundation's ICLARM proposal. In closing he emphasized that they had tried to formulate a comprehensive but realistic programme bearing in mind the obvious limitations, the human perspectives, food needs and tight money. It was hoped that donors would see fit if TAC endorsed the programme, to support various aspects of it. The Chairman invited questions from members of the Sub-Committee.
9. In reply to a request for clarification of the priority rating given by the Sub-Committee to the seven problems listed in Appendix II of the Report, it was pointed out that although these problems were integrated, and showed a clear complementarity, they had been listed in the order of priority. The first two (reproductive physiology and feeding problems) were the key problems on which hinged the effectiveness of the others. In regard to a second question as to whether aquaculture was at the level at which the isolation of two or three research problems could make an appreciable impact in regard to food production,

Dr. Allsopp felt that it would be unrewarding to make a piecemeal approach and that it was preferable to deal with the systems and problems as being completely interlinked across the board (cf. Appendix I). Clear economies could be realised by tackling the problems in this way e. g. it would never be possible to "domesticate" fish effectively (i. e. selective breeding and hybridization to give a total control of production at will), unless problems of reproductive physiology, nutritional requirements and adequate food supply were elucidated. Similarly polyculture could only be effectively accomplished when adequate numbers of all stages of the different species involved were fully available. Finally the stress conditions consistent with intensified culture systems could encourage diseases (through deficiencies, pathology or parasites) which might only emerge when the population numbers were consistently at an appropriate level. The research problems defined for the systems thus became inseparable.

10. The Chairman then referred to the comments prepared at his request by Dr. Allsopp which he wished to be issued with this Report (see Annex IV). Dr. Allsopp described them as "an inadequate and reluctantly extracted alternative in regard to the need." The provision of some \$ 300, 000 per year for the programme of carps' reproduction physiology, food and feeds of milkfish, and mullets was significant enough not to be ignored, but seemed more appropriate for small bilateral projects. In India alone for example the programme requested from IDRC had totalled \$ 1.5 million and was eventually limited to one aspect covering only \$ 350, 000.

11. Referring to the recognized lack of research personnel one member felt that this could perhaps be met in part by University institutions, citing the University of Indonesia, Bogor, as a possible source of researchers for Indonesian projects. While he fully agreed with this in principle Dr. Allsopp commented that there were frequently difficulties of liaison between universities undertaking research (much of which was irrelevant to food production exigencies) and the development imperatives of fisheries departments. He cited the case of Indian and Malaysian project requests for IDRC support, where sensitivity was evident about the suggested involvement of universities as the fisheries departments considered their research-orientation not sufficiently pragmatic. Nevertheless it was an accepted tenet in such research projects that universities should be involved and he expressed the hope that any financial assistance recommended by TAC for aquaculture might encourage a possible orientation of worldwide university research interest away from academic or esoteric subjects.

12. Dr. Pereira expressed his concern at the problems of disease inherent in the domestication of wild species as evidenced in Britain in the aquaculture experience with both marine and freshwater fishes. He felt that too incautious an approach to intensification of traditional aquaculture might result in serious disease problems. Dr. Allsopp concurred with this observation and cited the approaches recommended in problems IV and VI of the Report which could perhaps be elucidated by the stress conditions which occur in crowded or intensified culture systems. He gave as illustration the problem of parasites in Indonesia associated with a greater population concentration to achieve normal yields in a shorter season which was occasioned by the use of pesticides in rice cultivation. The residual toxicity of the pesticides created a limitation in time for rotational cultivation of fish with rice; weakened fish and crowding made them more susceptible to diseases. There the problem of Argulid parasites and the infection of juvenile fish had reached alarming proportions in some areas. This again illustrated how integrated and how inseparable the systems were in aquaculture, and underlined the need for the balanced and comprehensive research approach which the Sub-Committee's report advocated.

13. In response to a further enquiry with regard to the Rockefeller Foundation's project of ICLARM Dr. Allsopp stated that it was his understanding that the latest thinking on the proposal was for an emphasis on management of inshore fish resources rather than aquaculture research and that the centre was likely to be in Fiji rather than Hawaii. The Chairman added that he understood that the Hawaii institutes were still involved but that there had been no request by the Rockefeller Foundation for the TAC to consider this report in detail.

14. Several members enquired whether the proposal for an International Board (IBAR) to serve in a coordinating capacity was considered still valid despite the new suggestion for a reduced programme. Dr. Allsopp felt that such a Board might well serve an even more valuable role by endorsing with some authority programmes of urgent needs, by coordinating activity between regions, and by the award (at its discretion) of the proposed aquaculture research citation for work which was deemed to have produced significant research findings. The Board could thus help the movement from a cautious, tentative budgetary allocation to a programme built around priority needs for further funding.

15. On reopening discussion in closed session the Chairman voiced the general feeling of the meeting that members were now very well informed on the rather complicated inter-relationship inherent in aquaculture research programmes and the second generation problems which could result from ill considered attempts at 'domestication' of many species of fish. He stressed that his personal diffidence to the costly programme proposed by the Sub-Committee was not restricted to grounds of finance but was based equally on the probable unfeasibility of developing a global programme at the rate suggested, in the face of lack of availability of adequate trained manpower. He reminded members that a decision had already been taken by the Committee to propose a strictly limited start to international assistance in this field, and furthermore that the need for a strong concomitant training effort had been recognized. It was therefore necessary to look for bottlenecks which might be eased by the investment of a modest sum in additional research; in this respect he was prepared to accept the recommendation that carp, milkfish and mullets in Asia would be the most appropriate field and likely to offer the best chance of success. He thus sought members' agreement to recommending to the Consultative Group an initial investment in research and training, emphasising that the contribution sought could be equally well made through Consultative Group channels or bilaterally. The amount involved was, he felt, a secondary issue to that of testing the effectiveness of an additional input in stimulating research as a pilot project for subsequent and larger investment.

16. There was general agreement amongst members that a pilot action of the nature indicated in South East Asia was worthy of recommendation but doubts were expressed as to whether such action, which would be at the national level, was a valid subject for Consultative Group financing. A strong case was made for recommending bilateral financing although it was recognized that an adequate mechanism for dialogue between the Committee and bilateral donors was lacking. Similarly the need was foreseen for a mechanism to coordinate bilateral donors activities, to guide them in appropriate areas and to ensure an adequate information and training component in the projects which they were prepared to support. Many of the donors had adequate technical level backstopping of their own but, in the event that a need was expressed for project screening, the TAC should be prepared to provide this also.

17. Regarding the provision of an information service and the general need for improved communications the Committee had noted the service provided by the FAO Aquaculture Newsletter and the view had been expressed that this should be strengthened. Dr. Hopper had also indicated that the IDRC was assisting in the establishment of a series of international centres for technical communication and he felt that aquaculture would be a fitting subject for an approach of that kind. He would examine the possibilities of establishing such a centre for aquaculture at Barrackpore or in Malaysia but emphasised that such an operation would probably be of a bilateral nature also. Recognizing the strongly bilateral trend in the discussions he seriously doubted if a Consultative Group activity could be foreseen at this stage in view of the currently limited level of development of aquaculture research. The Chairman, however, whilst agreeing that the degree of success to date was limited, and that there was certainly scope for considerable bilateral activity, wished to convey a more positive position to the Consultative Group, to the effect that the Committee recognized the potential benefits of an investment in aquaculture research and believed that in the future a strong coordinated effort might be required at Group level although at present inclining to an appeal to bilateral donors.

18. Regarding a modus operandi for selecting sites, negotiating with governments and generally for channelling and coordinating a flow of resources, there was little support, in view of the presently proposed modest level of operations, for the Board proposed by the Sub-Committee. There seemed no obstacle to appropriate negotiations being handled by a Sub-Committee of the TAC at present. It might ultimately prove necessary to establish some different machinery, in which case there might be virtue in considering a Board analogous to the IBPGR or the Boards of existing Centres. It was therefore agreed that the Chairman would nominate a small number of people to undertake negotiations with governments and donors in the furtherance of the Committee's proposal should this be accepted by the Consultative Group.

CARIS (Agenda Item 4)

19. The Chairman drew the attention of members to the evaluation report on the CARIS Pilot Project, which had been undertaken by IDRC. Because they had had little time to study this he asked Dr. Hopper to convey the main thrust of the analysis to the Committee.

20. Apologizing for the late distribution of the report, Dr. Hopper explained that there had been a relatively short time for the evaluation between the completion of the project and the present meeting, as well as some unavoidable delays in preparing the report. The evaluators had found that most people were enthusiastic about the CARIS directories, there was an overwhelming agreement that the service was useful, should be carried on, and extended to a more comprehensive coverage than just West Africa. However, they had been disturbed to find that the directories had often been placed on library shelves as normal library acquisitions and sometimes they had not been seen by the scientists until the evaluation team arrived. In these instances their impressions had inevitably been based on rather hasty study, and there was therefore still some uncertainty in his mind as to how fully such a service would be utilized. Nevertheless there was no question that the scientists felt the directories to be potentially valuable to them.

21. The evaluation had been able to define certain gaps in the system more precisely. There was a need to sharpen some of the definitions, and the indexing system used by FAO in the French language version was felt to be superior to that in the English directory. Several scientists asked that there should be specialized directories, but there was no consensus on whether they should be discipline-, commodity-, or sub-sector (e.g. crop, livestock, forestry) oriented, which again highlighted the need for careful subject matter indexing. It was felt both by the evaluators and the users that the directories were very bulky and would benefit from shortening, perhaps by reducing the present detailed descriptions of the research projects to an indication of the main objectives of the research and the names and addresses of the appropriate researchers. These lessons ought to be incorporated into any extension of the project.

22. He believed that the pilot exercise had confirmed what FAO wished to demonstrate: that it was feasible at least from a processing point of view to collect research information, put it on the computer, and develop an adequately indexed printed directory, and that this was a product that was generally regarded as being useful.

23. While he felt that the FAO proposal for a "global" CARIS project now before the TAC was a fair reflection of what had come out of the evaluation process, he did not find in this proposal a sufficient examination of how best to fill the gaps in coverage which were a weakness of the pilot project. For example, his earlier question on how FAO's field staff might help in this respect was not answered. He had noted in the French evaluation report some discussion of alternative means of data collection, which concluded that most of the scientists sampled felt that the best way of doing this was by a team from the CARIS central processing unit visiting individual research stations to fill in the data on each research activity; rather than this being left largely to the person in charge of that activity, perhaps with some assistance from a travelling CARIS expert. If the main responsibility were to be on the CARIS central team, this seemed to put a rather substantial burden on FAO. This was something the Committee would have to consider rather carefully in its recommendations on the extension of the project to a worldwide activity as now proposed by FAO. He also doubted if the pilot project gave an adequate base for assessing the cost dynamics of this activity. He therefore remained skeptical about launching an enterprise costing \$ 547, 000 in 1975 and \$ 1.1 million in the next biennium, continuing at about that level subsequently. While he felt that they should now move cautiously to a worldwide CARIS coverage, he considered that the rate of expansion should be constrained pending a better view of what had happened in West Africa, a clearer definition from FAO of how they intended to staff the project, and the line to be followed in maintaining the data base.

24. He was also somewhat curious about where FAO obtained their information on the volume of data anticipated from each developing region: he would have expected roughly twice as many research projects and activities to be under way in Asia as in Africa, whereas the reverse seemed to be the case. Some re-examination of these figures seemed desirable.

25. The Chairman reminded members that their original interest in this matter was on behalf of researchers in developing countries who did not enjoy the ease of contact with their fellows which was generally available to scientists in developed countries. This was frequently made worse by quite inadequate library facilities and lack of access to scientific journals. He had been the recipient of a good deal of correspondence on this matter, for example from the Director of the ASPAC system based on Australia, and from people operating in North America. There were clearly differences of opinion among experts on the

benefits of computerization of CARIS and its directory: since while this could link it to other systems and cut its costs, it might also reduce its accessibility to people in small research centres. He had been impressed with the discussion at their last session and at the time a number of members had devoted to studying the system. He was most anxious to be fair, and to have the documentation properly studied. He sought guidance from FAO on its proposals now before them.

26. Mr. Oram informed the Committee that in preparing this proposal FAO had had the IDRC evaluation mission reports available in draft form and had done its best to take them into account. They had also corresponded with the Directors of ASPAC and the CRIS system used by the USDA on the methodology and indexing systems used in the pilot project and had received a rather favourable reaction from the CRIS group to the system adopted in the French directory, which Dr. Hopper's team had also commended.

27. The FAO proposal had two main aims: first to produce a worldwide coverage of published information on research establishments, personnel, and projects - but with the latter at a much less detailed level than in the CARIS pilot project; secondly, to store supplementary information on projects on computer tape available according to demand through a storage and retrieval system.

28. The published directories would include one covering all research establishments, broadly similar to that in the pilot project; one which would list the agricultural research scientists in developing countries and where they were working; and several volumes, probably on a regional basis, describing the research projects. The timetable envisaged the collection, processing and printing of all the essential data by late 1976; the supplementary information for computer storage would be collected over a longer period. Updating of the essential data and reprinting of regional directories of research projects would be undertaken on a rolling 3-year basis. The directories would also include a record of recently completed projects, these again would be kept up-to-date on a conveyor belt basis, but as they were dropped out of the register to be replaced by new ones, they would be stored on the computer and could be retrieved on demand.

29. He had also queried the apparent imbalance between numbers of research projects in Asia and Africa and would re-check the assessment for each region as requested by Dr. Hopper. However, to the best of his knowledge this was broadly correct, and was based on the most recent surveys available to FAO, e.g. that of the Marcano Mission to Latin America and of OECD for Africa, as well as on information available to FAO. This showed that there were a larger number of small stations in Africa than in Asia; the latter also did not include the People's Republic of China which would obviously add very greatly to the number of projects.

30. The costs of the project were shown in Annex 3 of the proposal, and were based both on the experience of the pilot project and those of other services comparable to CARIS. The largest continuing item of cost was that of the CARIS central coordinating team, the other main cost up to mid-1976 was for the establishment of the global data base, and for the publication of the first set of directories; after that it would be largely a question of data base maintenance and periodic re-printing of updated directories. At itemized cost breakdown was available if members wished to see it, but had deliberately not been included in the proposal for the sake of brevity.

31. The other important point raised by IDRC was that of the gaps in the CARIS pilot project, and he agreed that this was not adequately addressed in the new proposal. This would require further study by FAO, but he could assure the Committee that since the directories were printed and distributed a good deal of enthusiasm had been generated in West Africa, and a number of institutes and individual scientists had contributed information on their projects for inclusion in the next version of the directory. This had significantly reduced the gaps. Requests had also been received from a number of other countries, including several in Latin America, for an extension of the project to cover their region.

32. A further matter for information of the Committee was that FAO had had contacts with Australia concerning the possibility of the ASPAC (Asian and South Pacific) information system being absorbed into CARIS assuming the latter was expanded. This would give it a head start in Asia, since ASPAC was an on-going organization covering Australia, Japan, Korean Republic, Malaysia, New Zealand, Philippines, Singapore, Thailand, and the Republic of Vietnam. It differed somewhat from CARIS in publishing directories on a sub-sectoral subject matter basis (e.g. Plant Industry, Animal Industry, Forestry and Forest Products), and in including non-agricultural scientific and technical services (for example engineering consulting firms), in its region. In preparing the new CARIS proposal FAO had considered a similar approach to classifying the information, but had concluded that this might involve a good deal of duplication and overlapping which could add considerably to the cost.

33. Dr. Hopper told the TAC that he had also visited the ASPAC group which he held in high regard. Their experience suggested that a computerized processing system could be very costly, and they had therefore reverted to manual processing via a card reference system, using high school students to code the information at relatively low cost.

34. Furthermore, the students could make the necessary decisions on classifying information which the computer often could not do as well. He liked the ASPAC directories, which IDRC staff had found useful, and believed that there would be merit in asking Mr. Wolfe, the Director of ASPAC, to discuss his methodology and approach with CARIS staff. This was not only because its costs appeared to be lower, but because with rather a limited addition of information to the kind of directories which ASPAC had been putting out it appeared possible to achieve a good deal of what CARIS was trying to do in a rather more ambitious way. He agreed with Mr. Oram that there was a need for directories which gave details of the stations and the scientists but he did not feel that it was necessary to go into the depth envisaged by FAO on project information, which he believed would prove to be very expensive if CARIS attempted it. The reason he suggested looking further at the ASPAC directories as a model was because they gave the necessary information on research stations together with the main lines or areas of activity in which those stations were engaged, but without going into individual projects. Scientists wishing to know more about what was going on could pick up this information by correspondence with the station shown in the directory. To work at this level rather than at that of the individual research project or operation (which he understood as the smallest unit of research enjoying distinct funding) ought to reduce very substantially the need for frequent updating and therefore reduce the cost of the system.

35. Commenting on Dr. Hopper's remark that ASPAC was a "shoestring operation" Mr. Oram informed the Committee that while he agreed that they had done their best to keep costs to a minimum, the annual recurrent expenditure of ASPAC was around 100,000 dollars for only 10 countries. If this was compared with the budget now being proposed by FAO of some 500,000 dollars a year for the CARIS coverage of all developing countries, the discrepancy between the two systems could not be considered excessive or out of line. Although he clearly could not commit a future Director-General or the FAO Governing Body, he believed that FAO's intention was to take the project into the Regular Programme in the next or subsequent biennium since it was foreseen as an operation which would have continuing value and not as a discrete project which would be started in a given year and terminated within a relatively short period of time. What was needed now was interim extra-budgetary support to maintain the momentum of the operation and to help to get it running as a global system until such time as it could be built into the Regular Programme of FAO.

36. In replying to a question as to how he envisaged the research elements being described in any future CARIS operation Dr. Hopper took CIAT's programme as a hypothetical example. The CARIS Directory would show details of its location, the names of its principal research workers, and the areas of activity in which they were engaged. One of the latter might for example be field bean research with special reference to particular diseases and with those diseases being specified, but without going into detail on the individual units of research. Taking CIAT's Livestock Programme it would show cattle disease with special reference to blood diseases, and the three or four blood diseases that CIAT was working on would be specified.

37. Referring to Dr. Hopper's mention of the terminology used by French speaking research workers, Dr. Sauger pointed out that "research project" indicated an activity directed towards the presentation of a product which could be used for extension purposes or directly by the farmer, for instance improvement of rainfed production in such and such an area. At a lower level than this was "research operation" or "elementary action", for example the creation of a variety of rainfed rice able to resist a specific disease, fertilization techniques related to this particular variety under specified soil conditions etc. He believed that from a scientific point of view these "research operations" as well as merely the "research projects" should be stated briefly in the CARIS project so that everybody would have access to information as to where such work was being carried out. Other members argued from their experience that going down to this level of information would involve many difficulties in collecting, managing, and keeping up to date a mass of information, as well as in classifying it; since different people's opinions on what constituted a project tended to vary quite widely. While agreeing with the need for much better current research information they therefore supported the expansion of the CARIS project along the lines Dr. Hopper had suggested rather than at the level of information attempted in the pilot exercise. It was pointed out in the light of the experience of the Interamerican Institute of Agricultural Sciences that even if only a modest start could be made by listing research stations and the main crops and lines of research on which they were working considerable interest was aroused, and that out of this research workers were stimulated to seek further information. One activity which had been developed linked to recorded information of this type was a newsletter giving information in more detail about some of the on-going research activities, and gradually more detailed information got built up in this way. It was suggested that a similar stepwise approach might be followed in the CARIS project which would allow it to accumulate a greater depth of detail to be recorded on the computer over time as experience in using the system evolved but without a commitment to publishing and updating a wealth of material.

38. In addition to the need for information on current research a number of speakers also stressed the importance of providing better access to publications giving the results of completed research. One member suggested that subsidizing the cost of providing scientific journals to all stations in developing countries might be a better use of funds than supporting CARIS. While there was general agreement that it was very important to provide improved access to the whole field of published scientific information both from the developed and developing world, especially in view of the rapidly increased cost of publications for which there was often limited finance in small tropical stations, most members did not consider that this was an "either-or" alternative to CARIS. The latter was considered necessary as a means of keeping research workers all over the world au courant with on-going research concerning which publications and journals were nearly always out of date. It would enable research workers to know who their counterparts were in other countries, at what stage of progress they were in their research and how this added to or complemented what was going on in their own station or elsewhere. This would materially assist in the ultimate aim of creating suitable international networks on important research problems. I would also provide important information to the TAC and to the Consultative Group or other donors concerning national research capabilities and where and how these required strengthening.

39. There was a general feeling, however, that information on current research and past research were complementary and that an effort ought to be made to improve services related to both. It was not felt that it would be feasible to introduce into the CARIS project details on the end product of research, but there was general support for a suggestion that a link between CARIS and the AGRIS system which was being set up to provide generalized agricultural information should be established. AGRIS was now in its formative stages and there was no reason why it could not be made to assemble specific published materials on research results. These could then be fed into the CARIS descriptors to link the two systems, and within the CARIS framework a more complete record could be built up including a bibliography of material that had emerged from the main research programmes of given stations. The linkage would thus provide scientists with a much better set of bibliographic references which should greatly facilitate exchange of information among them and would indicate where they could obtain the main journals in their particular fields. It was not felt that this would be out of line with the overall course of development of the AGRIS operation which was at present concerned with computerization of the entire documentation field of agriculture into a unified agricultural information system. The next phase of AGRIS Programme would deal with the problem of documentation and would offer the possibility of providing the results of research coming out of the developing countries in documented form to any scientists who wished to obtain it.

40. In asking the Committee to formulate its recommendation to the Consultative Group on the CARIS project, the Chairman asked them to consider three main issues. These were firstly the merit of the CARIS scheme, secondly its technical feasibility and thirdly what its priorities should be relative to other proposals before TAC if there were competition for money, as seemed likely in 1975. He hoped that members had now had time to read the evaluation report, since they had frequently expressed firm views on the importance of better research information, and he considered it important for them to decide whether CARIS would provide a real service in respect of providing the improved communications on research and better opportunities for researchers in developing countries to participate in the wider scientific world which the Committee considered necessary. He had been disturbed in listening to Dr. Hopper to hear of cases where the CARIS directory was sent straight to library shelves but had been somewhat more hopeful when he learned that the

scientists had given it a general welcome once they realized what the system contained.

41. In the course of discussion on the technical feasibility of the CARIS project it had become fairly clear that most of the proposals they were reviewing were technically feasible, although sometimes only at great cost. The issue therefore seemed to have become largely one of whether, given the likely problem of financial constraint, a more modest approach could be adopted which would still provide a valuable and scientifically meaningful service. It seemed to him that there was a wide measure of agreement that an approach was technically feasible at reasonable cost which would produce (i) a directory of research stations and establishments, (ii) a directory of research scientists, and (iii) an indication of major on-going lines of work at each station; but not of individual research projects, which would produce a very sharp upswing in the cost curve. In this part of the discussion he had noted a general emphasis on the need to improve access to published information on research and particularly to abstracts, and it was in this connection that the possibility of linking CARIS with AGRIS assumed considerable importance over and above other expedients such as enabling research stations to subscribe to important publications.

42. Finally he was bound to ask the Committee to consider how CARIS ranked in importance relative to other matters they were having to consider; since while there was a clear wish on the part of donors to support existing commitments, no assumption could be made that all additional recommendations would automatically find support.

43. The Committee strongly supported the idea that there should be an up to date list produced and maintained of research stations in the developing countries and their staff, plus an indication of the main lines of research currently being undertaken at those stations. Members saw a real need for this both for reasons stated earlier in the discussion, and also because the last 5 years had seen a great deal of change in the numbers and staffing of agricultural research stations in the world and this evolution was still continuing. The Committee reiterated the importance it attached both to current information on research and to publications of scientific results, and welcomed information from Dr. Hopper that the Chairman of the AGRIS Committee working with FAO believed that AGRIS could usefully include an addition in their coding which would permit a back and forth movement between AGRIS and CARIS. This would enable information to be extracted from the AGRIS files on the documents produced by an institution and from the CARIS file on details of the location and other important information concerning the institution and the kind of programmes it was undertaking. The Chairman of AGRIS had said he would welcome a recommendation from the TAC saying that CARIS ought to be pursued and the necessary links developed with AGRIS. It was noted that a link of this kind between the two systems would assist in determining the volume and value of output from institutions and would help to overcome some of the gaps that appeared in the pilot project, where people claimed they had programmes in a certain field but where no active research was going on because of manpower or other problems.

44. The Chairman agreed to report a net agreement on the Committee's support for CARIS on the three levels of information which were considered desirable as an objective for its published output, and the desirability and benefits of achieving a link with AGRIS. He decided to stand over the question of priority until they had completed their discussion on other items and he reported on their overall conclusions to the Consultative Group.

Field Bean Research Network in Latin America (Agenda Item 5)

45. At the request of the Chairman Dr. Bommer recapitulated the position taken by the Committee at its seventh meeting after discussion of two separate proposals for the establishment of a research network on field beans in Latin America, prepared by a working party from the region and by CIAT respectively. He reminded members that the Committee had supported the decision of its Grain Protein Sub-Committee to recommend the establishment of a three-part activity consisting of: (i) a central coordinating service in CIAT which would necessitate the strengthening of CIAT's core programme in respect of germplasm and seed production work, and training and information activities; (ii) the organization of a cooperative activity to be serviced by CIAT, which should be submitted to the Consultative Group as a new activity for separate financing; and (iii) the development of special additional outreach activities to be financed in the accepted manner as Special Projects by bilateral donors. The recommendation of the Committee was to be submitted to Dr. Marcano for opinion and approval. This had since been received.

46. The Chairman asked Dr. Marcano, who had recently attended a CIAT Board meeting, to explain further to the Committee the implications of the CIAT Board Resolution No. 6, on the subject of the Cooperative Field Bean Network, copies of which had been distributed to members. Dr. Marcano explained that the Resolution was intended to convey to the TAC the satisfaction of the Board with the TAC's recommendation for a regional network on beans, with a coordinating role assigned to CIAT; to reaffirm the Board's emphasis on the priority which it assigned to the field bean research programme for which a 28% increase had been approved for 1975, and to endorse the draft proposal presented earlier to the TAC by the Director-General of CIAT which set out the possible role and functions of CIAT in a cooperative network. The Resolution also indicated the need for some little time for CIAT to prepare a full study of the proposal and expressed the wish of the Board for CIAT management to undertake adequate consultations with bean research programme leaders in the Latin American region. It was therefore foreseen that considered proposals would be included in the 1976 budget proposals of CIAT. Dr. Marcano added that, in his opinion, the time lapse of about one year should not be considered as a regrettable delay but rather as an opportunity for CIAT to prepare a programme fully orientated to the research needs of the region and taking into consideration the views of research workers of the region, some of whom would ultimately participate in the proposed Steering Committee.

47. Members expressed their satisfaction with the reaction of the Board of CIAT to the Committee's proposals and agreed that a delay in getting a well worked out programme off the ground was preferable to making too early a start on an inadequately studied proposal.

48. The Chairman and several members requested clarification as to whether the 28% budgetary increase approved by the Board for the 1975 Bean Improvement Programme had any relation to the recommendation to strengthen CIAT's core programme with respect to the cooperative network proposal. Dr. Marcano assured the Committee that this 28% increase was completely distinct from any increase which might subsequently be associated with the regional network. It represented what he considered a normal increase in a programme which was still in process of being built up and consolidated, and had in fact been foreseen previously, well before the proposal for a cooperative programme was mooted. Additional increases were foreseen as being necessary in support of the cooperative programme and it was these that the management and Board required further time to study.

49. The position of the CIAT management and Board on this proposal was later confirmed by the Director-General (q. v. below, para 112), who referred to the very enthusiastic support for the proposal in CIAT. He also confirmed that CIAT wished to examine the proposal in more detail, especially with respect to additional budgetary needs, but assured the Committee that the vital work of the bean programme would go ahead meanwhile with the resources currently available.

50. It was resolved to report to the Consultative Group that the Committee reiterated its belief in the need for a cooperative field-bean research network in Latin America, in which CIAT should play the principle service and coordinating role, and was content to await a firm request from CIAT for implementation of the proposal which would be presented with the 1976 Programme and Budget of CIAT.

Terminology (Agenda Item 6)

51. The Chairman invited the Executive Secretary of the Consultative Group, Mr. Graves, to open the discussion of this subject with a description of some of the terms used in Secretariat papers which had been made available to members.

52. Mr. Graves referred to the two CGIAR Secretariat papers, Budgeting and Accounting Procedures and the Integrative Paper. In the first a description was given of the three main words in the vocabulary of the Secretariat viz. Core Programme, Capital Programme and Special Projects. The Core Programme represented the basic mandate of a Centre as described in the approved Charter. It was thus the fundamental programme of the Centre. To elucidate some confusion that might have arisen he emphasized that a Core Programme did not necessarily have to be situated at the Centres' headquarters - there was thus no accepted geographical limit on Core operations. Several examples were given of off station Core activities, not least in importance the widespread contract research programmes of CIP.

53. In reply to members' questions Mr. Graves confirmed that a sub-division of Core, described as Restricted Core Programme was recognized, and that this was a most important distinction for many donors whose regulations permitted only specified support activities. He agreed with the Chairman that the definition was a functional one and that Core Programmes funds, whether derived in a Restricted fashion or not, related to the central mandate of the Centre.

54. Capital Expenditures and Capital Funding were quite straightforward terms although members sought clarification of the use of the term Working Capital recently introduced to some Centres' budgets. Mr. Graves explained that there was an operational difference between Capital Expenditures and Working Capital, the first relating to Fixed Capital, and the latter to a type of working reserve. A further item recently introduced was Contingency Items, which was being utilized more and more by Centres. This was well defined in the Integrative Paper.

55. The category of Special Projects contained those projects, unlike the permanent ongoing programme of the Centre, which were limited to a well defined purpose, to a definite time span and at least until latterly, to a single donor. Numerous shadings existed however between Special Projects and Restricted Core - examples were given of projects falling into both classes fairly clearly, and of others which could logically be assigned to either - e. g. the CIMMYT Triticale programme. Usually the decision rested with the Centre as to how such programmes were defined, the Centre being the authority for decision on what constituted its Core mandate.
56. The question was not so much one of type of activity but of expediency in funding. The position with regard to Outreach activities was that these were normally funded as Special Projects. However there was now considerable pressure to move many of these activities to Core.
57. Recent proposals, described in the Integrative Paper, were giving rise to a whole new vocabulary. Amongst these terms were Collaborative Research and Cooperative Research used to describe programmes in which Centres and national personnel participated jointly. These could be associated fairly easily with Core Programmes as they normally constituted part of the regular research of the Centre. An existing example of this type of work, already in a Core Programme, was the work of CIP in Mexico which involved collaboration both between CIP and CIMMYT for administrative purposes and collaboration between CIP and the national research organization in Mexico.
58. In reply to a question from the Chairman regarding the original initiatives for Outreach activities and whether this affected the type of funding, Mr. Graves indicated that programmes originating in requests from countries would normally be funded as Special Projects and not as Core. Whereas projects initiated by a Centre could fall into either Core or Special Project categories.
59. A middle group of projects, referred to by CIMMYT as regional services, was also beginning to emerge. CIP already had initiated a programme of similar services which were charged to Core Budget. These programmes were not focussed on any individual country, staff being available for movement within the region. Should a national effort be stimulated to the extent that it needed full time staff assistance then it was probable that such assistance would be conceived of for Special Project funding. Again there were many degrees of shading between projects, and between Centres approaches to those projects, and it obviously appeared desirable to work up a uniform practice for funding this type of activity in due course. The Secretariat had supported to the fullest possible extent the current move away from Special Projects if for any reason Core funding was felt to be more appropriate, and he referred particularly to the move into Core of major training programmes at most Centres.
60. The Chairman thanked Mr. Graves for his presentation, recognizing that a number of terms remained a little hazy and foreseeing the need for supplementary notes in the description of programmes. He sought elucidation, before opening discussion to members, of the attitude of the Secretariat towards direct approaches from Centres to donors for the support of particular aspects of approved programmes.
61. Mr. Graves replied that all such support activities would normally be treated as Core Projects; there were two cases in the present programmes, which the Committee would no doubt be discussing, where individual donor support had been sought in advance for

items consigned to the Core Programme. It was noted that all such activities should be brought to the notice of the Committee with adequate time for discussion in view of their implications for Core Programme, and the possibilities of Centres achieving expansion of their original mandates through a budgetary device.

62. The Chairman sought the views of Mr. Graves with regard to the use of the term "Relay Relations" which he felt had been used rather ambiguously in several discussions. He gave as an example the anticipated activities of ICRISAT in Africa and Latin America. It had been debated whether these activities should be determined by the Board of ICRISAT or should be cooperative arrangements negotiated with national Centres. It appeared now that the word "Relay" might not be most appropriate; they could under the new terminology become "Collaborative" and, if under the control of the Board of ICRISAT, could even be "Core" activities. The latter might be appropriate if they were conducted within the terms of ICRISAT's mandate.

63. Supporting the latter proposal, and expressing surprise that ICRISAT's work was proposed to be Outreach and funded as Special Projects, Mr. Graves gave the example of ILCA's Cooperative programmes which were to be funded from Core. He felt that the ICRISAT Programme should and could be moved into Core funding.

64. Questioning the continued use of the terms "Outreach" and "Relay", Dr. Bommer proposed that both should be replaced by the use of the term "Cooperative Programmes". No matter what the source of funding or the associated agency the programmes implied a cooperative effort between two or more parties. He felt that the logic of this proposal would, further, remove the rather denigratory concept of Outreach and Relay which had a connotation of inequality in the relationship. Mr. Graves tended to agree and would wish to play down the use of the word "Relay" as, even in its most commonly used form as between international centres conducting parts of each others programmes, it was not sufficiently descriptive and could better be replaced by "Cooperative".

65. It was recognized that a considerable degree of haziness would continue to exist in the use of terminology. A very much more important point, in the opinion of Dr. Pereira, was the necessity to make it absolutely clear within the network of Centres where the main scientific responsibility lay for any given programme. It was essential to establish a scientific chain of command and make this quite clear to all participants.

66. In closing the discussion the Chairman asked the Secretariats, as soon as convenient, to list the terms commonly used and define them as far as possible, pointing out the special situations and shades of definition which might arise. The basic necessity of the Committee was to see whether the terms could be used in a consistent way without losing sight of the major concern which was who was scientifically responsible for a given programme of work.

The International Centres. 1975 Programme Proposals (Agenda Item 7)

67. In opening the discussion on this item, the Chairman made reference to the extremely rapid growth of programmes, both of existing centres and new activities, within the ambit of the Consultative Group and within the Committee's concept of priorities. He reminded members that judgements about actual budgetary details were not expected of them - nevertheless there were some important points which must be kept in mind. Not least of these was the importance which the Committee attached to continuity of support being assured to directors and Boards of Trustees for approved programmes. The 1975 proposals indicated that a number of programme additions were being requested by various centres and these were required to be cleared by TAC. Subsequent support by the Consultative Group would obviously imply a continuing ability to do so.
68. Examining the components of the 1975 programme, the Chairman identified four elements; the cost of existing approved programmes with variable inflationary increases, the costs of reaching full establishment on programmes still getting under way, the cost of new programmes at the centres and, finally new activities for which the Committee might recommend financing. He believed that the Committee should press for the support of approved programmes, including inflationary increases, and make precise recommendations regarding new activities within the Centres' budgets. In making such recommendations, however, he urged that members should not be influenced by the possible need to find financing for other new activities, and that any recommendations made by the Committee should be based on the technical need and feasibility of the proposal. He expressed this caution in view of the possibility that available financing might not reach the total of the proposals submitted.
69. Referring to an excellent Integrative Paper prepared by the Consultative Group Secretariat and setting out needs and possible availability of funds, he invited Mr. Graves to comment on the financial situation with particular reference to 1975 increases.
70. Mr. Graves indicated that although preliminary calculations had indicated a possible shortfall of some \$ 6 million, recent developments promised to reduce that figure to, at the most, \$ 3 million. Even this gap might be closed if certain pending negotiations were satisfactorily concluded. Thus, although it seemed probable that existing needs could be met, there could be no assurance that any substantial support would be available for new activities.
71. The Chairman explained that he had requested certain members of the Committee to open discussion on individual centres, in the light of their special interests, and proposed that in the preliminary discussion specific topics be highlighted for subsequent discussion with the Centres' Directors. The Centres' Directors subsequently joined the Meeting and the following record reflects the discussions of the various sessions of the Committee which dealt with the International Centres and other activities sponsored by the Consultative Group.

IRRI

72. In inviting Dr. Yamada to introduce the IRRI programme proposals, the Chairman referred to a communication from the Consultative Group Secretariat regarding the

questions raised by IRRI's proposal to transfer the machinery research group from Special Project funding to 'core' funding. He commented on the short notice given to the Committee to discuss an issue which had such far-reaching implications in wider terms than of IRRI alone. He proposed therefore to take steps to ensure that this did not occur in future and that members received adequate notice of important programme changes.

73. Dr. Yamada referred to the highlights of the IRRI programme as the planned expansion in the Cropping Systems work already approved by TAC/CGIAR, the proposed transfer of the machinery research programme to 'core', the Genetic Evaluation and Utilization programme and the very considerable request for capital provision. He felt that the increases for the Cropping Systems programme (including seven senior staff) were well in line with approved development of the programme and called for little discussion. He shared the concern of the Chairman over the proposal to transfer the machinery research programme, previously funded by USAID as a Special Project, to the core programme. The transfer had been agreed by both IRRI and the sponsor and there was an indication from the sponsor that possible increased contributions to the core programme would more than cover increased core costs. The principal of the operation and the validity of machinery research as a core operation were however open to discussion. The genetic evaluation and utilization programme was a rationalization of the inter-disciplinary work already being conducted and would take advantage of the newly available land for a more concentrated and intensified screening of germplasm with special reference to disease and pest resistance. Other noteworthy activities in the programme were the testing programme for flood and deep water tolerance to be established in Thailand, the timely socio-economic investigation into constraints on improved rice production and the programme on environment and its influence. In connection with the latter he referred briefly to the need for additional funds to make the newly installed phytotron fully operational.

74. Capital increases which were substantial, related to the new land development (although the land itself had been made available by the Government of the Philippines), conference and training facilities, laboratories and screen-houses, and staff housing.

75. Comments of members were in the main restricted to discussion of the machinery proposal and the request, which some members considered somewhat unrealistic for a well-established institute for some \$ 2 million of capital funds.

76. The initial reaction to the machinery programme proposal was unequivocally negative. Members pointed out that the payoff of the project in its nine years of operation had not yet resulted in an offtake of machinery even equal in value to the annual costs of the programme. An analysis of the level of adoption of improved equipment was deemed necessary before a firm decision could be taken even on retention of the programme. The programme, with others of the same kind, suffered from the drawback of being outside the manufacturing sector and unable to compete with commercially available equipment.

77. The Chairman commented on the possible need for the Committee to be consistent in its recommendations regarding the IRRI programme on machinery, foreseeing similar requests from other centres if it was decided that a real need existed for such work; and although he personally agreed with the comments expressed so far with regard to IRRI he would like to hear other views, if any, for consideration.

78. Speaking in general terms in respect of farm machinery development in the developing countries of the tropics Dr. Pereira pointed out that a very real gap existed.

Most countries had some ongoing research on machinery requirements and very frequently - as was the case with IRRI - experimental prototypes resulting from research were brought on almost to the point at which commerce could take them up. The need then was not for more research but for development assistance of an entrepreneurial nature to close the gap. This type of funding was lacking and he would like TAC to make that point to the Consultative Group. He was strongly supported by Drs. Sauger and El Tobgy who pointed out that the mechanization needs of the developing countries were not being adequately met by established commercial sources. Firstly because the available equipment supplied was frequently not adapted or adaptable to specific local conditions, and secondly because manufacturers were reluctant to finance a high risk operation on specifically designed equipment in view of the uncertainty of markets. They felt therefore that there was scope for a continuing, and perhaps even strengthened, programme of machinery research, with a concomitant effort aimed at interesting industry in the subsequent development process.

79. Turning to other aspects of the programme Dr. Swaminathan wished to bring to the attention of Dr. Brady the tremendous current upsurge of pest and disease problems in Asia. In particular he mentioned the brown and green plant hoppers, vectors of grassy stunt and 'tungro' virus diseases respectively. A tremendous step-up was therefore needed in the screening of materials for resistance to these pests if an impact was to be made with new high-yielding varieties in the more traditional rice growing areas, at least in India. Thus, he would prefer to see more funds applied to the evaluation process rather than to an additional capital programme.

80. The Chairman observed that there was obviously some difference of opinion in the Committee with respect to the mechanization programme and invited Dr. Brady to speak on that issue and others which might be raised by members.

81. Dr. Brady informed the Committee that the machinery programme, operating as an integral part of IRRI's disciplinary programmes, although specially funded, had in fact been quite a success in the Philippines with local manufacturers of small farm implements, especially the small tiller, of which it was expected to sell up to 7,000 in the next year. Similar programmes were to be mounted in two other countries, with resident extension engineers to guide local operations. Additional fields where developments could be expected were machinery for fertilizer and pesticide application and village level crop drying equipment. The latter was most important in support of the two-crop system, as one crop would be harvested at the height of the wet season. Similarly new tillage machinery was required for the second rice crop which would be going in during the rains on the stubble of the first crop.

82. Additional work on milling equipment was also needed, again at the village level, to handle the non-commercialized sector of the crop. Present milling levels were very low - up to 30% of the crop ending up as stock feed. None of these experimental operations held much attraction at present for commercial enterprise. However, if a regional agricultural machinery institute were to be developed, as had been suggested, IRRI would be happy to relinquish the programme. At present he believed it had the expertise, and several other advantages, to enable it to carry out a role which was needed, which would not be fulfilled by any other body, and which could be carried out without prejudice to other aspects of the core programme. Some years previously, when the project was first mooted as a special project, he had questioned whether it ought not to be in the core programme. If a different mechanism, such as restricted core should be proposed, IRRI would be very willing to agree. He reiterated however that IRRI was not in a position to advance capital for the further

commercial development of machinery, but he was hopeful that the model of support which had been obtained in the Philippines would be repeated elsewhere.

83. In reply to a question from the Chairman regarding the necessity for, and possibility of, phasing the very large capital request, Dr. Brady pointed out firstly that the proposals for laboratory additions were the first since 1961-62, and the expanded programmes of IRRI made new laboratory space absolutely essential. It could be argued however that the training and conference centre buildings could be delayed, but he would prefer not to delay the training possibilities if this could be avoided. IRRI's training facilities were well below the standards of the other centres and an expanded training programme in connection with the new cropping systems work and rice production training made better facilities an imperative. Sources of funds for this programme had been identified and approached and he was confident that IRRI's needs could be met. The Philippine Government had been very generous in making land available and it was incumbent upon IRRI to develop that land as early as possible to meet programme requirements. He therefore felt that the funds requested for land development also merited a high priority.

84. In reviewing the discussion on IRRI's programme the Chairman emphasized that although members had eventually expressed a general view that research work on small machinery should be continued, considerable resistance had been shown to transfer of this programme to the core budget. Such an operation would carry implications which he felt should not be encouraged, particularly as insufficient notice had been received of the proposal to permit proper study. He suggested therefore that means be found to continue the studies for another year outside the core programme, during which time the Committee should examine the proposal, not only from the point of view of transfer to core but the wider implications of machinery research as an integral part of IRRI's programme. It was a programme that probably needed a further three or more years before an adequate evaluation of its potential could be made.

85. It was subsequently agreed that a special review of the machinery research programme should be undertaken by the quinquennial review team, the Committee having reached agreement with Dr. Brady that IRRI should be the first Centre to host such a review mission, in late 1975.

86. Supporting the Chairman's views some members suggested that as a major bottleneck could easily develop between experimental design and commercial manufacture, particularly with respect to power sources, an approach should be made by IRRI to major manufacturers with an interest in the region, to investigate modern developments in power sources rather than attempt their design. It was considered that IRRI might report to the Committee the results of such an approach in order to assist future discussion.

87. With respect to the capital programme members were unanimous in recommending support for the land development programme and suggested that laboratory and training facilities should have priority over other capital works proposed. Some degree of urgency was seen however in the need to improve the security of housing for the germplasm collection which was currently at considerable risk. The Chairman was able to report that the completion of the phytotron support equipment would be accepted by the original donor. Members agreed that priority should be given to support of the core programme and that capital needs should be met on a phased basis if financial constraints were encountered.

CIMMYT

88. The programme of CIMMYT was introduced by Dr. El Tobgy who remarked that the programme and budget was a very stable one and well in line with already approved development. The increase in the core budget of \$ 1.3 million was accounted for by a particularly high (20%) inflationary increase, the remainder of the increase was accounted for in the main by new staff appointments which had already been approved in 1973. A reduction had been noted due to discontinuation of the Puebla Project and this had helped to keep the total within reasonable limits. A moderate and expected capital expenditure of only \$ 286,000 brought the total budget to \$ 7.2 million.
89. The two major programmes of wheat and maize had similar total costs (\$ 1.3 and 1.2 million respectively), of which in each case the breeding programme accounted for approximately \$ 280,000. As the Triticale breeding programme was also costed at nearly \$ 280,000 he expressed some concern over the relatively low allocation for breeding work in wheat and maize which he felt should be the main focus of the improvement programmes. He drew particular attention to CIMMYT's proposal to conduct, in both programmes, what was referred to as "collaborative research" in partnership with national research efforts outside Mexico, to be funded from the core programme. In the case of wheat and barley the proposal was to conduct disease resistance trials in the Middle East and North Africa and in the case of maize for testing disease resistance in specific locations in Africa, Central America and South East Asia. The rationale for these proposals had grown out of the observed need to test resistance to specific diseases in specific localities before the widespread issue of materials, and this work could not be done in Mexico. A further new proposal for which financing was not sought in 1975 but on which the opinion of the Committee had been requested, was the concept of staffing and financing from the core programme regional activities, which the centre had called "regional services to national programmes". These would entail the posting of CIMMYT staff at regional centres with the task of providing advice and assistance to national research, training and development activities. The opinion of the Committee had been sought on both of these proposals, the first in relation to the 1975 programme and budget and the second to guide the preparation of the 1976 budget.
90. Opening the discussion the Chairman sought clarification of the significance of germplasm banks and the development of new germplasm under the wheat and maize programmes of the Centre. Dr. El Tobgy explained that although CIMMYT was recognized as the world genetic resources centre for maize (with some 10,000 accessions) in the case of wheat they maintained only a working collection, albeit a very adequate one, relying on the germplasm bank of the United States. There was no doubt however of the leading role that CIMMYT occupied in the collection and evaluation of the germplasm of both these major crops.
91. In an attempt to resolve Dr. El Tobgy's doubts regarding the relatively small funding for actual breeding work, Dr. Pereira felt that this might be the result more of the accounting system utilized, which did not properly reflect the tremendous expenditure involved in the maintenance of up to 7 sub-stations and travel between them, all of which formed an essential part of the maize and wheat breeding activities. He was supported by Dr. Hopper who referred to the fact that the recent study by the Ross Group had indicated considerable differences and some confusion in the accounting systems used by the various international centres and had made some far-reaching proposals regarding the standardization of accounting systems at the Centres, which would enable true costing of the various sectors of the Centres' activities to be established.

92. Speaking on the two really substantive issues which had been raised by CIMMYT and which could in the future have implications for the other centres, namely the inclusion of considerable off-station activity in core budgets, Dr. Swaminathan strongly supported the regional disease screening programmes as valid for inclusion in core budgets. He considered the testing of CIMMYT's accumulated germplasm in both wheat and maize, in selected centres around the world, to be a most rational and far-sighted innovation. He cited downy mildew in Asia, maize streak in Africa and maize stunt in the Caribbean as serious problems, for which certain sites might be regarded as "hot spot" locations where there was a considerable amount of natural infection. He concluded that, as a matter of policy, TAC should encourage the identification of such locations, not just with reference to disease but to other problems such as aluminium toxicity and other soil factors, and include screening in such locations as a vital constituent of core programmes.

93. Dr. Swaminathan was less happy regarding the outlined proposal of CIMMYT to station outposted staff at regional offices or laboratories, believing that this might eventually lead to the establishment of regional organizations paralleling those of the UN agencies. He recognized nevertheless that the practical experience of the Centres indicated the need for regional contacts to facilitate arrangement for outreach work etc. but wondered to what extent existing arrangements between the Centres for undertaking work on behalf of one another might not be improved. He suggested that the Committee study this proposal closely, from the point of view of future policy, considering not only relationships between the Centres for regional work but between the Centres and national organizations.

94. The Chairman reminded the members that a problem of this nature had been recognized in relation to the activities of the proposed Near East Centre which it had been recommended should be utilized as a vehicle for CIMMYT operations in that area. The question could therefore be expected to be a subject for considerable detailed future discussion.

95. Dr. Marcano raised the question of CIMMYT's activities in Latin America, particularly with respect to the wheat programme which he felt had had little impact in that region. There were many problems, such as aluminium toxicity and particular diseases, which were rather specific to the region and which limited production, especially in the more Southern countries and he suggested that the Committee seek the views of CIMMYT with regard to its activities in Latin America.

96. Dr. Camus, as Chairman of the Programme Committee of CIMMYT, agreed that the CIMMYT proposal for a regional service in the Near East might now be viewed in a somewhat different light and reconsidered in connection with the proposal to establish a new Centre. Nevertheless the problem remained with respect to other regions and CIMMYT had a dual concern, on the one hand to facilitate linkages and coordination in the research work being carried out in a given ecological area, and on the other hand to utilize to the best advantage those personnel whose presence was considered indispensable to the carrying out of CIMMYT core research work. As far as Latin America was concerned he would refer specifically to the case of maize, which he felt should remain completely open, and he shared the view of Dr. Swaminathan that, although some international Centres could provide relay facilities for each others' work there were ecological areas where no international institute could play this role. In this connection he referred specifically to the remainder of Latin America, apart from Colombia where CIAT could provide relay facilities for most work.

97. The Chairman recorded his appreciation of Dr. Camus' indication of his personal interest in the CIMMYT programme and informed Dr. Camus that the question of regional relay activities had been discussed in the past by the Committee and it was a constant expectation that Centres would avail themselves of such facilities to the fullest possible extent, rather than establish their own regional organizations. The point, raised also by Dr. Marcano, regarding procedures where no such Centre facilities existed, was a valid one and would probably have to form the subject of separate discussion by the Committee at its next meeting.
98. Supporting the proposal to move certain outreach activities into the core programme of CIMMYT, Dr. Pereira pointed out the very practical consideration that it would go a long way towards solving the question of staff security, which he had found disturbing in the past. Hitherto many outreach and regional programmes had been staffed on a temporary basis, subject to the continuity of special project financing. The current proposal of CIMMYT would establish valuable continuity of staff on a permanent basis.
99. Following the formal Centres Week presentation of the CIMMYT programme and taking advantage of the presence of Dr. Hansen in the discussion, Dr. Marcano reiterated his concern over the apparently less developed programmes of CIMMYT in Latin America in comparison with activities in Africa and Asia. He sought further information on CIMMYT's plans for work in the region and questioned the validity of placing a strong effort on wheat in Ecuador which was not a major wheat producing country.
100. Dr. Hansen replied that what CIMMYT wanted was a testing ground for stripe rust resistance and this need not necessarily be in a country with high production. Final selection of a country had not yet been made but the most important consideration would be high disease incidence as found in Ecuador, Bolivia and Peru. CIAT had accepted responsibility for maize work in the Andean countries and some others and CIMMYT's wheat work in the South had so far been restricted to Southern Brazil and Argentina although discussions were now taking place in Chile also on the establishment of CIMMYT nurseries. In response to further questions on CIMMYT's plans for regional support services to national research, Dr. Hansen referred to the trustees proposals for a wheat/barley collaborative programme in the Mediterranean and Near East, the wheat disease programme in Latin America, possibly a third wheat programme in the East African highlands and maize programmes in South East Asia, East and West Africa, Central America, the Andes and the Southern area of Latin America. Each programme envisaged starting with one officer and possibly increasing to not more than two. The consulting services anticipated would be for a production agronomist on training and a breeder/agronomist to work in collaboration with national programmes. The views of the TAC were sought on the eligibility of this work for core programme financing to ensure its continuity. Special project support from some donors had already been assured.
101. In reply to a question on problems created by the location of CIMMYT with respect to staff housing, Dr. Hansen indicated that efforts were being made to solve the problems of adequate housing and schooling near CIMMYT to avoid heavy staff travel, and felt that at some future date CIMMYT might need to reconsider its housing policy.
102. The Chairman agreed that the Committee would discuss further at its next meeting the questions raised by CIMMYT with regard to its regional research service proposal, and sought further views of members on the question of relations with the rest of Latin America.

103. Several members referred to the better transferability of CIMMYT's technology in an East-West direction rather than a North-South direction. There was some feeling that one solution would be placing a major programme within the southern cone but this raised the question of considerable additional investment. Dr. Hopper felt that the problem had two basic components - the biological differences of constraints to production in the South (soil toxicity, specific diseases, etc.) and the already well established national programmes in the area which were justifiably proud of their own efforts and perhaps a little resistant to approaches from CIMMYT. The basic problem was apparently one of gaining acceptance. It was generally agreed that further dialogue with CIMMYT was desirable on the resolution of both the biological problem, to solve which new varieties were clearly necessary, and the problem of national policies in the region. Members had little doubt that appropriate materials would find acceptance and CIMMYT should be urged strongly to examine the real needs of the region and initiate programmes to meet those needs.

CIP

104. Introducing the programme of work and budget of CIP Dr. Elgueta made reference to the excellent start which had been made by the centre, partly as a result of its having taken over existing programmes in Peru and Mexico and, perhaps even more importantly, as a result of its having adopted a "contract research" programme with centres of advanced research on potato in both developed and developing countries. Particularly great strides had been made in developing disease and pest resistant germplasm of potentially wide application, in association with the University of Cornell. The centre had a tremendously active collection programme and had amassed a most impressive and important collection of germplasm. A detailed exposition of the activities of the centre and its proposed programme of work and budget was presented by Dr. Sawyer who was congratulated by the Committee on his excellent presentation of the account of a very successful and determined attack on the problems of a most important staple crop.

105. The increase in the 1975 core budget of CIP, of some 23%, was made up in approximately equal proportions by programme expansion (12%) and inflationary increases (11%). The Centre was relatively new (1972) and the programme expansion, mainly in the nematology and physiology programmes, was in line with planned increases and would contribute greatly to further strengthening of the major research effort already assigned to pest and disease resistance work.

106. The one aspect of the research programme however which Dr. Elgueta, supported by several members of the Committee, wished to question was the breadth of the programme devoted to attempts to establish the potato in the hot and humid conditions of the low country tropics, hitherto generally considered as being well outside the ecological range of the crop. Clarification was sought of the real objectives of this programme, mention being made of the probable inability of the potato to compete in terms of calorie production per hectare under humid tropical conditions with other, better adapted, root crops such as for example cassava. Some members also feared that efforts devoted to this aspect of adaptability to the lowland tropics would divert efforts from adequate testing programmes at higher elevations where there was no alternative root crop and where the potato formed one of the main staples.

107. It was pointed out in reply that low country tropical testing of the potato did not form a major programme per se but was part of one of the 10 major research thrusts of CIP, that of adaptation to a wide variety of conditions. It was necessary to include hot and humid conditions for several reasons, firstly the potato was already being grown in many such areas and numerous requests had been received from developing countries for varieties adaptable to such conditions. One objective of the programme was therefore to ascertain just how far adaptability could be taken in order to establish some parameters. Additionally two major diseases, late blight and bacterial wilt, quite virulent at lower elevations, were also priority diseases in the highland tropics. The low country testing ground, which was only a testing ground and not anticipated to become a major facility, provided ideal conditions for resistance tests on these two diseases. It was not however ideal for true tropical testing as, at its elevation of 800 meters, minimum night temperatures were very often below 21°C, commonly accepted as the critical level for potato production, and over 50% of the materials tested there survived.

108. More critical perhaps was photo period, and preliminary screening tests indicated that germplasm materials were available which were non-sensitive to photo period. It was part of the widespread testing programme of the Centre to distribute such materials for screening under as diverse conditions as possible.

109. The Centre did not regard the potato as a potential competitor with cassava but rather as complementary to it, and the real objective of the programme was to create or select varieties which could close the current widespread gap between potato and cassava production. Indications were that temperature tolerant varieties would give an opportunity in the lower latitudes of developing the area currently under potatoes without in any way affecting cassava acreages. It was fortunate therefore that the potato was a short-season crop (80-90 days) which could readily be incorporated into cropping systems. Close contact was retained with cassava research work and there was ample opportunity for parallel development of improved varieties of both.

110. Noting that a strong outreach effort was proposed in India Dr. Swaminathan pointed out the need to emphasize resistance to bacterial diseases rather than late blight for most parts of Asia and suggested that an effort be made to find one or two "hot spot" type of testing grounds for collaborative work with the national programme.

111. The Committee recognized the validity of testing programmes at lower elevations in the humid tropics but emphasized that it would not encourage a major activity which had as its basic objective the establishment of the potato as a major commercial enterprise in the low elevation humid tropics.

CIAT

112. The discussion was opened by Dr. Marcano who emphasized that CIAT was still in process of consolidation and that the increase in proposed operating costs from \$ 4.5 million - \$ 5.4 million was, in the main, due to normal planned growth. Although new activities were indicated these were essentially the additions of new staff to expand existing programmes to full working levels. Capital expenditure showed a decrease, as capital works neared completion, and the total programme showed a net increase of only 7% despite an

inflationary increase in operational costs of 12%. Dr. Marcano reaffirmed, in reply to a question from the Chairman, that the 28% increase in the field bean research programme was not in any way related to the projected cooperative regional network proposal. This was confirmed by Dr. Grant who reiterated the enthusiasm of CIAT for this project and confirmed that budgetary proposals in respect of the network would figure in the 1976 programme of work of CIAT.

113. A question was raised by Dr. El Tobgy regarding the modus operandi adopted by CIAT for handling the regional programmes on rice and maize in cooperation with IRRI and CIMMYT. Dr. Marcano informed the Committee that following a recent Board decision discussions had been arranged between the Directors General of the two Centres with a view to resolving the problems inherent in this type of regional operation. The Rice Programme in particular had had considerable impact in Latin America and the future handling of programmes had already been discussed between Drs. Brady and Grant. Dr. Brady indicated that the basic premise on which they would wish to work, subject to Board and Consultative Group approval, would be to develop a truly joint programme, the technical and coordination aspects of which would be the responsibility of IRRI and the administration and management aspects the responsibility of CIAT. Such a programme would remove any possible element of competition and should lead to greater effectiveness. Dr. Grant continued, informing members that it had been suggested to pool both core and special project resources of an agreed programme, utilizing the staffs of both institutes, as appropriate. He confirmed the impact that the lowland rice programme had had in the region using, in the main, rices developed at CIAT from IRRI materials.

114. There was need however to move faster with the development of the upland rice programme especially seeing that a very high percentage (70-75%) of the rice grown in Latin America was upland rice. A third project which had been discussed was the development of the so-called "modified Asian system" for Latin American conditions and the Directors had agreed that this was basically a development problem which should not perhaps constitute a major activity for CIAT and IRRI. CIAT was however willing to assist a pilot project, especially with regard to personnel training aspects. The Committee was assured that there was no duplication of effort and adequate safeguards against this would emerge from the joint programme.

115. In connection with the beef production programme of CIAT members recognized that although it might be necessary in the future to discuss the possibility of organizing beef production research as a separate autonomous activity the present programme of CIAT, particularly with respect to the production systems work, was a major contribution of CIAT in the region. Dr. Bommer referred in particular to the very strong recommendation of the recent Beef Production Seminar that CIAT should be regarded as the focal point for research in the region, including the possibility of CIAT serving as the Centre of a Beef Research Network. One aspect of the animal production programme to which Dr. Bommer drew particular attention was the need for strengthening the collection and evaluation of forage legumes and grasses in Latin America, now perhaps of even more importance in view of the fertilizer shortage situation in the region and the urgent need to improve vast areas of rangeland. It had been proposed that a specific request should be made to the International Board for Plant Genetic Resources (IBPGR) for assistance to CIAT in a regional collecting, conservation and evaluation programme.

116. Dr. Grant confirmed the need for such activities expressing the belief that the germplasm base of forage crops with which CIAT was working was not sufficiently broad. He referred in particular to the need for disease-resistant varieties of *Stylosanthes* and the need to search for better varieties of the native grass *Pasto Negro*. He emphasized the urgency of this operation and his belief that a relatively small financial input could initiate an activity with far-reaching potential. In reply to a question from the Chairman he indicated that a formal request had not yet been submitted to the IBPGR although an inventory of Genetic Resources activities had been submitted.

117. Speaking on behalf of the IBPGR Dr. Bommer indicated that the programmes of the Centres had been brought to the attention of the Board but that it had not proved possible to deal with them in detail at the first meeting. He supported Mr. Oram's contention that pasture and forage crops had not been given a high priority in the TAC and Consultative Group recommendations but indicated that the Board would necessarily have to discuss questions of priority problems as soon as possible. In reply Dr. Grant agreed that, although he could not classify the proposed operation as one of emergency collection and therefore able to qualify for the emergency funds of the IBPGR, he did nevertheless give it a very high priority which he hoped would be reflected in subsequent decisions by the IBPGR.

118. In response to a request for some details regarding CIAT's work in the beef improvement programme, with particular reference to the aspects of better nutrition, pasture improvement through the use of legumes etc., Dr. Grant informed the Committee that he believed CIAT now had the basis of a workable "package" for the alluvial soils found in many regions of the South American rangelands. The basic objective of the "package" was the use of legumes, especially *Stylosanthes* in controlled grazing, which not only prevented the traditional weight loss but actually maintained weight increases of approaching a pound a day right through the dry season. The pastures utilized, with mineral supplements, provided palatable feed of 7.5-8% protein in comparison with the relatively unpalatable local pasture which provided only 3.5-4% protein, insufficient to sustain animals without supplementary urea. He felt that with additional control in breeding reproduction rates could be raised from 50-80%. In parallel with the improvements in animal feeding, trials were continuing with some success on the production of basic food crops, and CIAT was now in a position to set up prototype farming units to test the economics of the operation.

IITA

119. The programme and budget of IITA was introduced by Dr. Pereira who reminded the Committee of the heavily increased costs of development of the Institute resulting from delays in construction. It was now nearing completion however and costs had levelled out. Of an increase of approx. \$ 730,000 some \$ 400,000 was related to inflationary and incremental increases; of the balance of \$ 311,000, expansion of existing programmes to target levels accounted for \$ 269,000. That this 5% increase would bring the institute to full development was reflected in the long-term projections which indicated no further major staff increases. Although administrative costs might appear high, following the addition of four senior posts to administration, this might be justified by a total scientific staff amounting to some 85 people at graduate level. In addition to the Director-General there would be Directors for Research, Outreach and Administration, and Deputy-Directors for Finance and Physical Plant. The research operational budget was allocated on a basis of approximately 40% to Farming Systems and 20% each to Cereal, Grain Legume, and Root

and Tuber Improvement Programmes. The allocation was in line with programme development previously approved. Training, Outreach, Library and Information services were provided for adequately.

120. In respect of the capital programme a modest (although very expensive) housing project was planned and a tentative budget was submitted for a low country, high rainfall (2,500 mm) area sub-station. The latter was considered necessary to provide facilities in the very humid tropics for IITA to carry out its full mandate; the headquarters at Ibadan falling in the 1,000-1,250 mm rainfall area.

121. The Chairman took the opportunity of referring to the addition of staff to existing programmes to raise the general question of staff budgeting or forecasting at the International Centres generally, in order that the Committee might be provided with some frame of reference when considering programme expansion as distinct from new activities. He requested the Secretariats of TAC/CGIAR to attempt to prepare such a statement, based on past predictions of staffing requirements, for consideration later in the meeting and at future sessions. With respect to the proposed high rainfall sub-station he questioned whether perhaps an existing national station could not supply adequate facilities. This view was strongly supported by Dr. Sauger who believed that a satisfactory solution could be found through a review of existing facilities, and dialogue with the Nigerian Government.

122. Further questions were raised on the sub-station proposal with respect to its siting, the extent to which it might withdraw staff resources from the headquarters and the ultimate provision of operating funds (currently suggested to be covered by savings in other programmes) which would form part of an increased, and recurrent, core budget. Taking up the question of savings from other programmes the Chairman resolved to bring to the notice of the CGIAR Secretariat the need for some attention to be given to the disposition of savings at the Centres generally, especially in view of the recent provision of working capital reserves and contingency funds, presumably formerly covered by savings. He hoped that clarification could be provided on this point in the future.

123. Dr. Albrecht responded to members' questions on the sub-station proposal, firstly pointing out that, far from detracting from the efforts of the headquarters, such a station, expected to be staffed by only one permanent junior scientific staff member, would enable IITA to extrapolate its results to probably 80-90% of the West African humid tropics, whereas at present its soil and climatic conditions (at Ibadan) were representative of only about 30%. It would also offer considerable advantages to the plant breeders, permitting early and more frequent testing of resistant materials in a different environment without the necessity of crossing frontiers to find suitable circumstances. In reply to a question from the Chair on the need or otherwise to purchase land for the station Dr. Albrecht indicated that Nigeria was expected to provide land in response to a formal request, and that although an exact location had not been decided it would probably be at one of two possible sites in the south-east of the country. Proximity to commercial air services would be an advantage and once alternative sites were available the IITA soils and climatological specialists would make the final selection.

124. Confirming that operational costs of \$ 40-50,000 were expected to be met from contingencies or off-station research budget, at least in the first year, Dr. Nickel sought to allay members' fears that such a modest recurrent sum might prove "the thin end of the wedge". He assured the Committee that it was not the intention to post international scientific staff to the sub-station but instead to ensure its accessibility for necessarily frequent visits by scientists. The Committee nevertheless recorded its reservations on the question of the future staffing needs of the sub-station which it felt would probably escalate.

125. Requesting clarification on the question of IITA's participation in a sorghum and millet programme of USAID in Nigeria, Dr. Pereira wondered whether this might not become a responsibility of the proposed ICRISAT relay programme for Africa, unless of course IITA was expected to assume a regional responsibility for all crops. Dr. Albrecht pointed out that although IITA was not specifically working in the semi-arid areas, its own programmes (maize, cowpea etc.) took it well towards the North and it seemed logical to accept responsibility for the whole programme, not just in its own working areas, rather than to make separate administrative divisions within the country. The programme was not a research effort but part of a larger accelerated food production programme. Dr. Cummings confirmed that ICRISAT had not been prepared to take up this programme, but was at present training some staff who would be involved in the programme. Subsequently ICRISAT hoped to be able to provide some assistance to the programme through its association with SAMARU. The arrangement was an administrative one and no conflict was foreseen.

126. Dr. Marcano raised a question regarding the assignment of rather broad scope to research programmes (e. g. Roots and Tubers) which could cover many crops and consequently leave the way open for additions, and wondered whether IITA should be more specific in its programme designation. In reply Dr. Albrecht pointed out that IITA was only working on crops of high priority to the region and which figured largely in its farming systems. The number of crops had, in fact, been gradually reduced and had now reached the level at which he believed it could be satisfactorily handled.

ICRISAT

127. In presenting the programme of ICRISAT Dr. Swaminathan emphasized that the proposals conformed in most respects to the activities foreseen by the Committee and had been prepared bearing in mind the financial ceiling imposed on both core and capital costs for the period 1974-1977. Programme expansion was concomitant with the stage of development of the Centre and there was only one substantial new item which would warrant examination by the Committee. This was the addition to ICRISAT's mandate with Board approval, of a major programme, albeit modestly costed, on groundnuts. This proposal had been developed by a mission led by Prof. Bunting which had made a very strong and he thought valid recommendation for this addition. He reminded members that, from the initiation of discussion on ICRISAT, groundnuts had always been foreseen as a probable future crop for work at the Centre.

128. The proposal had considerable merit, not only in terms of economy of scale, in association with the work on the other legumes, but perhaps more importantly by virtue of the significance of groundnuts in the cropping systems of the semi-arid areas of Asia and Africa. There was considerable potential for inter-cropping with groundnuts both with sorghum and pigeon pea and he felt that, if accepted by the TAC/CGIAR, the proposal would need to be sharpened up by the inclusion of such work in any allocation of priorities within the programme. Other problems, such as aflatoxin, some specifically regional, would also need to be considered. The important groundnut collection of Dr. Gregory in North Carolina could now be made available to ICRISAT and there were fears that this collection would languish unless active work was continued elsewhere. From limited work already carried out there appeared to be tremendous potential for selection from crosses between the Spanish and Virginian types and this work should be pursued vigorously.

129. He believed that the addition of groundnuts to the existing legume programme of ICRISAT would considerably improve the possibilities of making a real breakthrough on legumes. There was some divergence of opinion however with regard to the staffing pattern suggested by the Bunting Mission but he believed the preparation of a detailed programme based on the relatively modest budget of approximately \$ 300,000, should be left to the Director and the Board of ICRISAT after discussion of priority issues.

130. Some members, recognizing that ICRISAT was only really beginning its operation and that a good deal of construction and capital outlay had still to be made and that consequently budget constraints were fairly high, questioned the timing, although not the principle, of the addition of groundnuts to the ICRISAT mandate. There was some feeling that the groundnut programme could perhaps more readily be phased into ICRISAT in some two or three years time.

131. In reply Dr. Cummings indicated that although ICRISAT staff were already well loaded with the development of existing programmes and a lot of additional energy would be required, the advantages in taking over the groundnut programme right away outweighed other considerations. Dr. Gregory was approaching retirement and his collection had reached the stage of inter-specific crossing. This should be continued in order to bring into the germplasm complex resistance to Cercospora, which was probably one of the greatest constraints to yield throughout the major groundnut regions. It was anticipated that Dr. Gregory would be able to continue to participate in the programme at ICRISAT, particularly in the training and orientation of ICRISAT scientists, at least on a consulting basis. He also feared that if the programme were delayed for two or three years neither the range of materials nor the appropriate expertise which Dr. Gregory would be able to bring to the programme would still be available.

132. Urging support for the programme Dr. Sauger, supported by Mr. Oram, stressed the urgency for the collection of varieties, particularly from West Africa, to halt the very rapid disappearance of local varieties with important genetic variability. Furthermore the groundnut was a most important constituent of the farming systems in Africa, in which ICRISAT's two other legumes did not find a place. A further, very practical angle in support of the transfer of the programme to a tropical environment was the very high cost of maintaining the collections in North Carolina throughout the winter.

133. The Chairman stressed that the really important issue was however not one of preservation of the collection but its utilization in a dynamic way; this he felt could be undertaken by ICRISAT.

134. The Committee reached full agreement to support the addition of the proposed groundnut programme to ICRISAT's mandate and would give its firm recommendation to this end to the Consultative Group. It would also stress the importance of initiating an inter-specific crossing programme and the collection of West African materials as soon as possible. Further breeding and agronomic research should be carefully phased, on the basis of a programme to be prepared by ICRISAT, taking into account staff availability and the needs of its already existing programmes.

ILCA

135. The Committee noted that the Memorandum of Agreement formally establishing ILCA had been duly signed and expressed its complete satisfaction with the programme and budget as presented, giving particular emphasis to the short-term search, review and documentation of existing information as a basic necessity. It reiterated its approval of the approach to research adopted by ILCA, through "concerted and associated programmes", and applauded the decision of the Board of Trustees to initiate long-term work in the fields of the relationships between drought, transhumance and nomadism and the acclimatization of exotic breeds of cattle in Africa; both of these programmes could be carried out pending the development of physical facilities at the headquarters. Congratulations were extended to the Board and the Director-General, Dr. Pagot, and the Committee wished them "Godspeed" in the development of their programme.

ILRAD

136. The Committee expressed deepest sympathy at the untimely death of Dr. Sadun, the Director of ILRAD.

137. Observing that the Progress Report and Budget Presentation of the Centre followed very closely the original recommendations approved earlier it gave its full support to the presentation. Noting that development of the centre in Nairobi was proceeding it expressed the hope that the setback occasioned through the recent loss could be soon made up on the appointment of a new Director and senior staff.

138. Particular reference was made to the proposals for a cooperative relationship between ILRAD and ILCA, in part through reciprocal attendance at Board Meetings, and it was expected that close relationships at the working level would be developed once both centres got fully under way. Similar note was made of the desirable cooperative relationships being developed with ICIPE and EATRO, and the provision of funds for contractual research (cf. CIP). The Committee recorded its satisfaction with developments to date.

AVRDC

139. The Chairman referred to the difficulty in which the Committee found itself with regard to the Asian Vegetable Research and Development Centre, reminding members that the Committee had supported the original capitalization of the Centre and had expressed its willingness to consider any proposals for a transfer of the Centres' activities to another country. He regretted the inability of the Committee to have participated in a recent evaluation mission to the Centre at very short notice, and had so informed Dr. Chandler. He reiterated his view that the Committee would be willing to consider proposals in the vegetable field and to judge them in relation to priorities and feasibility and the views already expressed by the Committee.

140. A strong case had been made in discussion of the AVRDC programme for assigning high priority to vegetables, in the light of their economic and social importance, and some members felt that the Committee might consider the association of vegetable research with

that of fruit, for which latter a proposal had already been received. It might therefore be possible to overcome political constraints by the establishment of an associated station elsewhere, to conduct horticultural research, comprising as many such stations already did, work on both fruit and vegetables. There was general agreement however that this had not proved a satisfactory combination elsewhere and should not be further considered.

141. A further solution recognized was the possibility of commending vegetable research to bilateral donors for consideration.

142. The Chairman recognized the various approaches suggested and took note of the possible changes in viewpoint regarding the priority needs of vegetables. Notwithstanding this the Committee would need to consider very carefully its general views of priorities and, leaving aside the question of desirability for a changed location, would have to decide on the basis of scientific feasibility, whether any move into vegetable research was justified. He reiterated his view that such discussion could only proceed when the Committee was presented with a firm proposal and would so report to the Consultative Group.

IBPGR

143. In opening discussion on the International Board for Plant Genetic Resources the Chairman sought clarification of the relationships proposed between the Board and the FAO Panel of Experts on Plant Introduction, which the Committee had understood would be one of the principle sources of scientific advice to the Board. Dr. Bommer pointed out that this question could best be handled by FAO, to which organization the Panel was an advisory body and which also provided the Secretariat of the IBPGR. He assured members, as a member of the Panel, that he foresaw no difficulties arising in FAO making the findings of the Panel freely available to the Board, and suggested that arrangements could be found for some type of reciprocal observer status between the two bodies over and above the present common membership of one or two individuals.

144. Members had studied the report of the first meeting of the Board and recognized that the Board's programme was not yet available for review. It was however to be finalized by the Executive Committee, meeting in Rome in late September. This would clearly preclude discussion of the programme by the Committee before the Consultative Group meeting and it seemed desirable therefore that the Committee should decide on a suitable procedure to be followed with regard to review of the programme in order not to delay the operations of the Board. It also seemed necessary to designate a point of contact, in view of the different administrative arrangements set up for the Board. In this latter connection it was suggested that the Secretary of the Board be requested to act as contact point for technical questions and, in general, to fulfil those functions carried out vis-à-vis the Committee by the Directors of the other established Centres.

145. The Chairman proposed that as the Board had given full authority to its Executive Committee to prepare the programme, this programme might be cleared by mail with the members of the TAC in order to permit its presentation to the Consultative Group in due time. Holding the programme for clearance by the TAC in February would create an unnecessary delay as he did not foresee any need for the TAC to undertake a detailed review, assuming that the programme would be prepared in line with, and within the financial limits set by the proposal already recommended by the TAC to the Consultative Group. It was more essential that the programme be got under way. Should members find

any serious issues however, that would not hold up the development of the remainder of the programme, then these could perhaps be referred to the next meeting of the Committee. He sought members' views as to whether the Board had been given sufficient flexibility with regard to its priorities, mentioning the expressed needs for work at CIAT and IRRI. Members did not believe that the hands of the Board were tied in any way. The TAC document had given some guidelines on the work required at the proposed and existing centres and the Board would have adequate flexibility to develop its own priorities. Furthermore provision had been made for an emergency fund, for urgent collection of materials in danger of erosion and the Board was the best qualified to decide how these should be used.

146. There was full agreement that the programme of the Board should be cleared by members by mail, with an opportunity being provided for discussion of any outstanding issues at the February meeting.

WARDA

147. The Chairman opened the discussion on WARDA informing members that a number of serious issues were raised by recent reports and the proposed new programme of WARDA. Firstly the Committee had laid down at its mid-1973 meeting a number of conditions under which it would recommend support for the WARDA Coordinated Trials Project (Project W-1) and WARDA had made considerable efforts to meet those conditions. In order to be satisfied that sound scientific direction was available the TAC had recommended establishment of a Steering Committee. This Steering Committee had met and the members themselves had considered their Terms of Reference unacceptable - preferring to function in an advisory rather than a 'steering' capacity. This must prove unacceptable to the TAC and it was to be hoped that this problem could be resolved with the assistance of the Executive Secretary of WARDA.

148. A second issue related to the request for additional financing for the balance of the research programme of WARDA (Projects W2 - W4) for which bilateral financing had been expected. This financing had shown a shortfall however and in view of the TAC's expressed wish to see these projects conducted in an integral manner with the Coordinated Trials, the question of further support was now referred to the Committee.

149. The Secretary confirmed the above and felt that clarification of the current request should be sought from the Executive Secretary, Mr. Diouf. He raised a third important issue in respect of the training programme. A weakness of the Coordinated Trials programme appeared to be the dearth of qualified supervisory staff; aware of this WARDA had designed a training programme to be operated in collaboration with IITA at its Ibadan headquarters. Only one course was held at Ibadan however and WARDA had to turn to its own resources to conduct further training. This could put an undue strain on already heavily committed research staff, possibly to the detriment of the rest of the programme.

150. Sharing Mr. Oram's concern over the relations between WARDA and IITA the Chairman referred to an undertaking given by IITA which should have ensured adequate support for the WARDA programme. It would not be profitable he felt to analyze past relations but he felt that the Committee should determine to enforce the conditions under which its recommendations for support were made, before entering into any further

commitment. It might be necessary to slow down development of the trials programme, rather than seek to expand it at the present time, and at the same time to attempt to ensure support for the associated trials W2 - W4 on varieties, fertilizer use, and pests diseases and weeds.

151. Reverting to the Report of the Steering Committee the Chairman again reminded members of their expressed need for sound scientific supervision of a programme aimed basically at improving food production in 14 countries, which would provide outreach and relay opportunities for the work of IRRI, and IITA, which could, at the same time, help to strengthen national capabilities. It would also, very importantly, act as a test case for other similar undertakings which might be put before the Committee. Basic to his disquiet was the question of scientific management and although there had been some suggestion for rationalization of scientific direction by amalgamating the role of the Steering Committee with that of WARDA's own Scientific Committee, he was not convinced that this would meet the requirements of the TAC. He could therefore see little justification for changing the earlier decision of the Committee and sought members' views on this point. There was some agreement with the Chairman's approach - most members believing that TAC should adhere to its original requirements but recognizing also that WARDA already had a heavy Committee structure.

152. It was agreed that in discussion with the principle officers of WARDA and the Centres concerned an attempt should be made to find a compromise approach which related the grant of funds to some degree of oversight by a competent body answerable to the Consultative Group.

153. During the session with Centres' Directors the Chairman outlined to Mr. Diouf, Executive Secretary of WARDA, the concerns of the Committee with respect of the WARDA programme, indicating that a major concern was over scientific management of the programme supported by the Consultative Group. The Committee had noted that a Scientific Director had now been appointed and would appreciate clarification of his role vis-à-vis the research programme, both Project W1, and Projects W2 - W4. He invited Mr. Diouf to explain briefly the hierarchy of management, including the standing Committees and their procedures.

154. Mr. Diouf in reply stated that the Terms of Reference for operation of the W1 programme remained those as expressed in an exchange of correspondence with the Chairman of the Consultative Group. Direct day to day management would be in the hands of the Scientific Director, Dr. Will, appointed, as requested by TAC, in consultation between the Steering Committee and the Executive Director, and subsequently approved by the Governing Council. Some difficulty had been experienced in implementing projects W2 - W4 in an integrated manner due to shortfall in funds. Consequently funding was sought from the Consultative Group to make up this shortfall and to permit their integrated operation also under control of the Scientific Director. The Steering Committee, which had the responsibility for planning the trials and overseeing their operation, had itself, with the support of the Governing Council, suggested that its proposed functions could best be carried out by the existing Scientific Committee of WARDA. The composition of the two was almost identical, and the Steering Committee suggestion was to add to the Scientific Committee those elements which would bring the latter into line with the TAC recommendations. This would entail addition of IITA, a new representative from IRRI to replace Dr. Chandler and an independent scientist. Steps had been taken to put this recommendation into effect later in the year. WARDA also had an overall Advisory Committee which had representation from international and regional organizations, as well as national governments, and which could offer considerable

scientific and management expertise. Referring to financial control Mr. Diouf assured the Committee that a separate account was maintained for the internationally supported trials programme and that expenditures could only be authorized jointly by the Scientific Director and himself. Accountability reports would be submitted to the Consultative Group Secretariat as requested.

155. In reply to questions regarding the somewhat complicated administration structures, which indicated some degree of overlapping and joint membership, Mr. Diouf reminded members that the Steering Committee was not one of the original WARDA bodies but had been established in response to the felt needs of the TAC. The remaining management bodies of WARDA were part of the original machinery approved by the Governing Council and had clearly defined and non-overlapping functions. He remarked in passing that the Governing Council of WARDA was itself a highly technical body, comprising many Directors of Agriculture and of national Agricultural Research Centres. This composition went a long way, he felt to ensuring sustained interest in scientific programmes and ensuring adequate transmission of results to member countries.

156. In introducing a member's question on the involvement of IITA and IRRI in WARDA operations the Chairman recapitulated briefly the involvement of the Committee, emphasizing the experimental nature of the Committee's approach to the concept of a regional cooperative organization which might be used as a model, and underlining the Committee's anxiety, from the start, that the two major institutes concerned with rice research in the region should be deeply involved.

157. On behalf of IITA Dr. Albrecht expressed the continuing interest of his Centre in the WARDA programme. IITA had been represented on various WARDA bodies since its inception and had, he felt, made a not insubstantial contribution to the development of its programmes. He felt that some original difficulties in association were in the process of being ironed out and he anticipated adequate expedition of the programmes. The testing programmes of WARDA could be, he believed, made more extensive and should attempt to reach a level of sophistication higher than that currently attained.

158. Dr. Brady on behalf of IRRI expressed the conviction that, despite IRRI's distance problem it had always attempted the fullest possible cooperation with WARDA in the provision of not only materials and opportunities for training but advice on whatever aspects of the programme were relevant. He believed that regional programmes lent themselves to many different types of organization. That of WARDA might not have been set up in just the same way by IRRI but it had been established to fill a regional need and IRRI would continue to cooperate. Further discussions had just been held regarding areas in which IRRI's materials, chemicals and testing programmes could be relevant to WARDA's programme and continued close cooperation was envisaged.

159. Replying to questions raised by members, and referring to difficulties expressed by Dr. Albrecht, Mr. Diouf gave a brief historical summary of WARDA's programme development. From the outset an applied research role had been envisaged. The original very broad research programme had first been reduced to ten projects, and subsequently, at the request of TAC, to the existing four, W1 - W4. In all the programming discussions IRRI and IITA scientists had been involved and every effort had therefore been taken to reduce duplication and ensure complementarity. With specific reference to projects W2 - W4, not earlier included in the request to the Consultative Group, various donors had shown interest. Unfortunately, for various reasons bilateral donors contributions had not covered

all aspects of those projects mainly because of the various constraints applied by those donors to their contributions. Consequently it had been resolved to request the shortfall as a once only contribution.

160. Recognizing the wish of the Committee to see these projects conducted integrally with the widespread trials programme the Chairman summed up the views of the Committee as the need for an assurance that there was adequate overall scientific direction and support for the whole WARDA research programme and that these programmes reached an acceptable standard. In the absence of such assurances it might be necessary to consider withdrawal of support. This would be a serious step to contemplate and he had no desire to create difficulties. On the contrary the Committee felt a genuine desire to assist in resolving difficulties which might exist in order to continue support to the programme. The Committee wanted to see a rational approach to scientific direction and it appeared that some irrationality had been introduced. He would therefore like to accept a suggestion that the Scientific Advisor to the Consultative Group, a representative of UNDP and a representative of the TAC Secretariat, visit WARDA with a view to advising the Committee and the Consultative Group on a suitable course of action. The objectives of the support to WARDA would bear reiteration. Benefits were seen not only in permitting a widespread outreach activity on behalf of the two international centres concerned but, and perhaps more importantly, an opportunity was seen to improve the capacity of national research organizations. Over all was the recognition of a food situation which could only be improved in the long-run by improvement in local productive capacity. The Committee sought proposals consistent with recognition of the sovereignty of WARDA and the objectives expressed by the Committee and was most sympathetic towards the project. Nevertheless there had been criticism of the standard of the trials programme and it was in the interest of the Committee to make every effort to support its own original judgement and recommendation.

161. Members were in general agreement with this proposal, Dr. Swaminathan expressing the view that more time and further assistance, particularly in the provision of trained personnel, should be given to WARDA. He had agreed to provide specialist assistance in the organization of trials and, supported by Dr. Pereira, urged that other donor organizations be encouraged to follow suit in the provision of the much needed graduate staff.

Research Needs of the Near East and North Africa (Agenda Item 8)

162. Opening the discussion, the Chairman indicated that he would like the subject to be dealt with in two parts. The first, in which Dr. Havener would participate, would be concerned with informing the Committee on developments since its last meeting; the second would allow them to reach their own decisions on outstanding issues related to the development of this new Centre.
163. In this respect he reminded members that the main item before them was a decision on the location of the Centre, most other matters bearing on its programme and objectives had already been agreed by the TAC at its last meeting and he did not wish to reopen these.
164. Concerning location he would ask Dr. El Tobgy and Dr. Havener to advise the Committee, he would also give them an opportunity to discuss the paper prepared by the Secretariat at his request on factors affecting location.
165. Referring to recent events, he informed the Committee of his visits to Iran and the Lebanon.
166. In Iran, which had been invited by the Chairman of the Consultative Group to join the Group in the general interest of agricultural research in the developing countries, he had been approached by a senior representative of the Plan Organization and by the Director of Agricultural Research. They had asked him for information on the work of the TAC; the implications of joining the Consultative Group; and for details on the further procedure relating to the proposed Near East Centre, concerning which they were already aware of the TAC recommendations.
167. He had explained that the decision now rested with the Consultative Group to accept or reject the TAC's proposition for a Centre, and also to decide its location; both officials had expressed very real interest in its establishment and in Iran being a joint partner in the work, but after some initial expressions of hope that the Centre might be located in Iran, had made no further attempt to influence the decision.
168. During his visit to the Lebanon he had been assisted by Dr. El Tobgy and Dr. Havener, and had been able to devote adequate time to visiting the Bekaa Valley. He had assumed that an International Centre of the type envisaged by the TAC would require 150-200 ha of irrigable land, with access to a larger area for research on rainfed agriculture; and rather to his surprise had concluded that, if the government was willing, the amount of land required could be found within the Valley itself. This ranged from moderately high to quite low rainfall. It would not, of course, cover all soil types; he doubted if any one location could, and it might be that in the final event it would be wise to try and arrange for additional range and rainfed agricultural land to be put at the Centre's disposal in Syria. This, he believed, could be found reasonably close to the Bekaa.
169. He had not had official discussions with the Government, although he had met with the Director-General of Agricultural Research, who had been most anxious to cooperate - even to the extent of making available to the Centre one of the Government stations in the Bekaa with around 70 ha of irrigated land.

170. He wished members to consider this as up-dating their information on the site which they had already tentatively chosen as headquarters for the Centre, but without prejudice to their consideration of alternative locations. Dr. El Tobgy and Dr. Havener would be able to elaborate on the information he had given.

171. In reply to questions concerning the suitability of the Bekaa Valley as headquarters for a research centre which had to deal with a wide agro-ecological range, the Committee was informed that the rainfall gradient within the Bekaa Valley ran down from 1,000 mm in the south to less than 200 mm on the Syrian border. At Tel Amara it varied from 345 to around 800 mm, with a mean of 622 mm, and at the drier rainfed station at Furdan from 550 mm to below 300 mm. This was fairly typical of the range of variation in much of the rainfed area of the Region, but it would also be possible to use controlled irrigation to simulate alternative rainfall patterns.

172. The agriculture practised in the Bekaa was quite diverse, including vines, fruits, vegetables, sugar beets, and wheat and barley. Rainfed agriculture and winter cereals still predominated, but a master plan for the irrigation of the valley was being worked out which could radically alter this situation within ten years. The pattern of land ownership varied, but much of the land was leased to cultivators by owners living in Beirut. A problem was that permanent sheep flocks were not found there; these, as well as much of the agricultural labour, were generally transient. This perhaps gave rise to rather specific socio-economic problems; but as variations in ethnic groups, tribal patterns, and national policies influenced socio-economic aspects of agriculture differently in practically every country of the Region, socio-economic research had to be regarded as fairly location-specific and it would be unreasonable to expect results obtained in the Bekaa to be applicable everywhere.

173. In respect of accessibility the distance to Beirut was only 60 km, and the road, although mountainous, was now being widened and shortened as a 4-lane highway throughout. Temporary blockage with snow occurred on around 10 days in winter, but was a relatively minor problem. Lateral communications within the Bekaa were fairly good.

174. The Valley was a delightful place to live in, and apartments were available at far lower cost than in Beirut. Medical facilities were reasonably adequate, as was primary schooling. More advanced level international schools, and university facilities were available in Beirut. The base for an International Centre therefore existed, although the necessary logistical support services would have to be built up there, and an office might have to be maintained in Beirut.

175. Although difficult problems had been anticipated in finding a sufficient area in a country where good arable land was scarce and correspondingly expensive, and existing government stations were really all too small for the needs of an International Centre; it had in fact proved possible to locate two or three places, including one adjacent to the government station, where land up to 1,000 ha could be purchased. The largest area adjoined the American University Farm, which was irrigated from tubewells, and it seemed fair to assume that this land could also be irrigated from the same sub-strata. The AUB farm had adequate water to irrigate some 60 percent of its land in summer, and the whole area in winter, although winter irrigation was rarely necessary. A further 230 ha was available for sale near the ALAD dry farming station at Furdan: this was currently irrigated somewhat below full efficiency, but an irrigation system was installed. If the main site was located in the 500-600 mm rainfall belt it might be desirable to have a low rainfall station at

the northern end of the Bekaa in the 250-300 mm zone. In this area a large landowner with 2,500 ha or more was currently offering his land for sale, but it was some 70 km from Tel Amara on a rather poor road.

176. The Government of Lebanon operated a total of five stations where crop research and testing was carried on, three in the Bekaa and two in the coastal zone. These spanned the rainfall patterns of the country rather well. The main station was at Tel Amara, where there were around 60 ha of groundwater irrigated land, adequate for year-round cropping. The soils, however, were rather gravelly with consequent droughty spots. It was understood that the Director-General of the Agricultural Research Institute would be willing to indicate in writing that he was prepared to transfer this station to the new Centre, plus additional adjacent land up to 100 ha, which could be obtained relatively easily and was in fact of somewhat better quality than that at the government station.

177. However, in view of the apparent availability for purchase of larger areas of land with irrigation potential in the Valley and legal mechanisms to permit this if the Government so wished, the TAC might have reservations about the wisdom of taking over the main government agricultural research station. Instead it might be considered preferable to develop a collaborative arrangement similar to that now existing between ALAD and the Government, whereby facilities for research were made available at the five government stations, pending the completion of the necessary land purchase for the Near East Centre.

178. Dr. Havener explained that ALAD had experienced a number of constraints in its operations, particularly uncertainty as to budgetary support, combined with having to operate several separate bank accounts on behalf of donors, which he imagined would be overcome by the establishment of an International Centre. Security had really presented no worse problems than might be experienced now in almost any other country in the world, despite the troubled times in the Region. The main constraints were the small size of ALAD's staff, and lack of full control over their research facilities. The Lebanese Government had been a most congenial and cooperative host, giving all facilities free and willingly, but distinct difficulties had been experienced in not having control over most of the labour force, as well as over the irrigation schedule, which had to be planned to meet the needs of the whole station, not just the crops on which ALAD were working. Moreover, with the land and staff resources available to them it had not proved possible to undertake much agro-biometric, agro-economic, or soils research, their programme had been almost entirely confined to crops development and sheep breeding. A major challenge which they had not been able to address related to the improvement of farming systems through introducing forage and grain legumes into the crop rotation; their inability to tackle this lay primarily in a lack of physical facilities, staff time and competence to address the problem, and was not due to biological or scientific problems impeding efficient working.

179. In reply to a question concerning the need for additional associate research stations outside the Lebanon to represent major ecological conditions which would not be covered by a main centre in the Bekaa, Dr. Havener agreed that a station in North Africa, representative of the true Mediterranean climate would be both technically and politically advisable. He felt that a high elevation station, either in Iran or Turkey would also be needed. Although the Bekaa was at an altitude of around 1,000 meters and had an average of 55 days of frost in the winter, it was still not really representative of the high plateaux.

180. He recognized that operating on at least two, and possibly four locations, would pose difficult management problems, but nevertheless believed that the new Centre should have stations under its own management and control in at least the true Mediterranean, intermediate, and high elevation cold temperate zones of the region. It would not rely totally on these for its research output, but would also have to build a network of collaboration with national research systems; however, despite the intellectual and economic advantages of collaborative research, it was extremely difficult to control compared to a centrally managed and operated programme. It might still prove possible to achieve cost reductions by using the facilities of a national research station as an associate station of the Centre for a specific ecological zone, but the research planning, implementation, machinery and labour force should be under the control of the International Centre. In his opinion all of the stations comprising the Centre should be under a single International Board of Management Trustees, and a single Director responsible for carrying out its wishes. This would not preclude the establishment of technical or other committees, which could advise on the activities appropriate to the out-lying stations of the Centre.

181. He did not feel competent to comment on the desirability of locating the main facility of the Centre in Syria rather than the Lebanon; for one thing, he did not know how easy it would be to attract resident staff and their families to Syria compared to Lebanon, where no difficulties were experienced in recruiting first class people. The situation in Syria was evolving positively, crossing the border had become much easier, and ALAD had good working contacts there, for example with the University of Aleppo and the Arab Centre for research on desert lands. There were as yet no direct air links between points in Syria where it might be desirable to locate an International Centre, and Beirut; one could fly from Aleppo via Damascus to a number of points, or to Beirut and out from there. Driving from Aleppo to Beirut was a hard five and a half to six hours; but there were other areas of Syria much nearer to the Bekaa, which could serve very well as an outreach station for an International Centre. For example, there was a good, low rainfall, agricultural area, as well as range grazing land around Homs and Hama about 50 kms north of the border, and he saw no insuperable problems in moving research staff back and forth between a station in Lebanon and a second one in that area of Syria.

182. The Committee subsequently discussed the paper on the location of the Centre prepared at its request by the Secretariat.

183. Mr. Oram explained that initially he had set out to try and find a broadly representative site which would, if possible, enable the Centre to undertake the bulk of its research programme in one country, thus minimising problems involved in crossing borders, simplifying management, and reducing costs of developing associate stations. In order to do this, countries had first been screened agro-climatically to eliminate those which were strongly atypical; then those which appeared the most promising had been examined further on the basis of their range of soil types. This narrowed down the field to seven countries, among which Lebanon was probably the most marginal. Of these countries, three - Algeria, Iran and Syria - appeared to offer a rather wide range of agro-climatic conditions, but no single country could be considered adequately representative of the whole Region. On purely technical grounds, it appeared that a combination of at least two, and possibly three countries would be required to meet the research needs of the Near East and North Africa. The analysis had therefore been taken rather further to examine possible sites for the headquarters of the Centre and/or associate centres in the seven most suitable countries somewhat along the lines adopted by the study team for ICRISAT. This analysis had taken into account the probable availability of research facilities, trained support services,

schooling and university facilities, housing, communications, accessibility and freedom of movement.

184. The Secretariat paper had been supplemented by a letter from Dr. Carter, who had been a member of the Skilbeck Mission and had since worked in Algeria; and a memorandum from Professor Nour, FAO's Assistant Director-General for the Near East Region, both of which gave additional ideas on a possible location for the Centre.

185. Opening the discussion the Chairman drew members' attention to the fact that he wished the Secretariat paper and supporting memoranda to be restricted to the TAC. They should not be put into circulation nor treated as part of the Consultative Group documentation.

186. While members commended the guidance on coverage of climate and soils provided by the Secretariat paper, there was a wide measure of agreement that no single country, much less a single location for a centre, could be adequately representative of the full agro-climatic range of the Region. This implied first that at least one, and possibly more associate stations would be needed in addition to the main or headquarters site of the Centre; and secondly, that it would be necessary to reach a decision concerning the headquarters as much on the way it measured up to other requirements as on purely technical criteria. It was suggested that a good national administrative infrastructure, ready availability of trained supporting scientific and technological staff, a central location with easy access by air from all directions, and a congenial working and living atmosphere for the scientists on whom the success of the whole Centre would depend should be major factors to be taken into consideration in making the choice.

187. As a result of the subsequent discussion, it became clear that although it was accepted that the Lebanon did not represent such a wide range of climate and soil conditions as some other countries, members considered that this drawback was outweighed by the excellent way in which it met these other criteria. Indeed the main reservations expressed by speakers were that living conditions and the level of agricultural development there might be too sophisticated compared to the harsh conditions of many other parts of the Region.

188. A further important factor influencing the Committee's decision to recommend the Bekaa Valley as the most suitable site for the headquarters of the Centre was the reported availability of adequate irrigated and rainfed land for purchase. This allayed previous fears of several members that land would be a major constraint on establishing the Centre in the Lebanon. There was a consensus, however, that it would be undesirable for the new Centre to start by taking over any existing government station in Lebanon for its operations, both on technical grounds and because there was a feeling that this might damage relations with local research staff. If, on further investigation, it proved impossible for the government to purchase adequate land with irrigation facilities in the Bekaa, the main Centre might have to be located in another country - possibly Syria.

189. In this connection the Committee recognized the need to offer guidance to the government of Lebanon concerning the area of land which it considered necessary to support an International Centre with the programme which it was recommending. To some extent this would depend on any arrangement which might be entered into with Syria to enable the Centre to use range and rainfed arable land across the northern border from Lebanon as part of its rainfed agriculture research. An order of magnitude of perhaps a thousand hectares of low rainfall land could be required for this part of its programme; this might be in the northern

part of Lebanon or just across the border in Syria, but several members saw merit in locating some of the research in Syria as perhaps representing harder conditions and more difficult social as well as technical problems than the Lebanon. However, any work which might be undertaken there was envisaged as an integral part of the central programme managed from the Lebanon, and not as a separate associate station operation. The Committee recommended that if the Consultative Group agreed to support the Centre, the executing authority and/or Board should be empowered to explore the question of the availability of rainfed land in the Lebanon with the Government; but should not be discouraged from seeking an agreement with the Syrian Government which would enable it to broaden the scope of its rainfed research programme in partnership with the Centre in the Bekaa.

190. As far as the latter was concerned, the Committee considered the crucial factor to be the availability of adequate irrigated land to enable the Centre to undertake the plant breeding, crop improvement, intensive cropping systems, and soil-water management aspects of its programme for which a reasonable assurance against loss from drought and good moisture control were essential. Bearing in mind the experiences of other International Centres, particularly IRRI, in this sort of work, members were of the opinion that 200 ha of land with full irrigation must be set as the absolute minimum, and that 250-300 ha was preferable.

191. In respect of the location of associate stations in appropriate ecological zones to complement the work of the main Centre, the Committee confirmed its earlier tentative recommendation that at least two such stations should be established. One should be in Tunisia or Algeria to handle the problems of the Western Mediterranean, and the other in Iran or Turkey to handle the problems of the winter snow, high plateau areas. Close co-ordination with the main Centre under common management was foreseen, although it was suggested that the possibility of an overlapping Board of Trustees should be considered to permit adequate representation of the three host countries without becoming too unwieldy.

192. After considerable discussion on the combination of countries which would best cover the research needs of the Region, the Committee decided to leave the final decision on the location of associate stations open for further examination by the Board of the main Centre. It was pointed out that any theoretically optimum coverage of soil and climatic conditions might prove unattainable in real terms since even with associate stations in three or four countries it would be impossible to undertake research on every ecological permutation. The best that could be achieved would be broad coverage of the major problems of the three principal agro-climatic zones in the Centre's overall research programme, with the gaps and more location-specific aspects of research being filled by collaborative research with national programmes or by other arrangements. On this assumption the aim in developing the associate stations to complement the main Centre in the Lebanon ought to be to obtain the most efficient working combination consonant with adequate research coverage of the main problems, and fine distinctions between the percentage of climatic and soil types covered by various permutations of countries were unrealistic.

193. While members were anxious to see the headquarters of the Centre established in the Lebanon as first priority, assuming suitable land was available, the TAC stressed that, provided there was no financial constraint, it did not see the necessity for a long time lag between the establishment of the main Centre and its associate stations, and that it considered the latter essential for a full coverage of the Region.

194. The Chairman reminded members that there was one other matter on which they had requested further opportunity for discussion at this meeting, and on which the Secretariat had also prepared a paper. This related to the staff complement of the Near East Centre. Since it was likely that he would be asked to report the TAC's general ideas on the size, staffing and order of cost of the proposed institute to the Consultative Group he would welcome their comments on this subject. He invited the Secretary to open the discussion.

195. Mr. Oram explained that in preparing the Secretariat note it had proved essential to draw up an organizational structure related to the work programme which the TAC had assigned to the new Centre. He realized that this was open to argument on numerous counts, perhaps especially in the rate of build-up envisaged for the core staff within a five-year period from the Centre's inception. This, however, had been done deliberately so as to arrive at an approximate estimate of what the complement and consequent recurrent costs of the Centre would be when on full stream. He had also raised the costs per senior scientist and per trainee used by the Skilbeck Mission to bring them in line with those current at CIAT, IITA, and IRRI (the institutes with a programme most closely resembling that proposed for the Near East Centre), as well as using a higher rate of inflation of 10 percent compound. Although he did not wish the paper to be considered as more than offering a starting point for discussion by the Committee, he believed that it indicated rather strongly that by almost any criteria the staff proposed for the main station of the Centre by the Skilbeck Mission was too small in relation to the work programme assigned to it. The staffing pattern proposed by the Secretariat covered only the programme of research, training, and information at the Lebanon or Lebanon-Syria complex, and some elements related to the needs of the associate stations which could be undertaken at the headquarters of the Centre, e.g. the initial crop and sheep breeding work. As directed by the TAC, the associate stations had not been taken into account in preparing the paper, but their management and technical staff costs would certainly not be of the same order of magnitude as the main Centre.

196. It was apparent from discussions that most members agreed that the Skilbeck report seriously under-estimated the staffing requirements of the main Centre, and although there were differences of opinion on the details and timing of the staffing pattern suggested by the Secretariat, this was nevertheless considered to be a closer approximation of what would eventually be required.

197. It was decided not to table any document for the Consultative Group which might be taken as a blueprint for the organization and staffing of the Centre, both because members felt that they would not have time to consider this in depth during their current meeting, and because this might better be the responsibility of the Board of Trustees and Director of the Centre.

198. The TAC agreed, however, on the need to indicate to the Consultative Group its judgement on an approximate order of costs for the Centre. This is estimated to be of the order of \$ 6-8 million by 1980 at current prices, including associate stations.

199. In asking the TAC to consider the resolutions which had been drafted expressing the main conclusions of their discussion of this and other major items on their present agenda, the Chairman stressed the need to leave no room for ambiguity on important issues. He therefore urged members to raise verbally any difficulties they had over the notes, or to elaborate as they wished on the written comments which they had given him. He did not

preclude rediscussion of matters which had already come before them, provided this helped them to formulate clear and sound recommendations to the Consultative Group.

200. A case in point was the question of relations between CIMMYT and the new institute proposed for the Near East and North Africa. The TAC's conclusion had been that in the case of bread wheat the primary status would remain with CIMMYT, but it had recommended that CIMMYT's staff outposted in the Mediterranean would be based at the new centre, which would largely act as a relay station for CIMMYT on bread wheat, although it might also have to do some adaptive research on wheat in connection with its farming systems programme. The TAC had rather cautiously proposed that the new Centre would eventually take over the main responsibility for durum wheat, as it would be working in the developing region where this species of wheat was of the greatest importance. However, he knew that Dr. Camus was worried on this point and invited him to give the Committee his views.

201. Dr. Camus explained that he believed the issue at stake was not merely one of responsibility for work on wheat between CIMMYT and the Near East Centre, but the wider one of relationships between the earlier strictly crop-oriented institutes with a worldwide responsibility, those more oriented to farming systems such as IITA, and those of a regional or inter-state nature such as WARDA, which were now being established. In expanding the number and type of centres, he felt that they should be cautious in working out responsibilities, so as to avoid taking all the substance from the older institutes which so far had proved rather efficient.

202. He agreed that a really strong centre should be developed in the Near East, and believed that when it was adequately staffed to do so it should take on the main responsibility for barley breeding despite the short-term arguments on grounds of existing expertise which could be advanced for leaving this with CIMMYT. He also concurred with the TAC's decision concerning the bread wheat relationship which he believed to be very wise. His difficulty lay with the durum wheat programme, which was run concurrently by CIMMYT with its bread wheat work, employing largely the same staff and facilities. If the main durum effort was to be transferred to the Near East Centre, he wondered how many years it would take before it would have the capability to do as well as CIMMYT, what additional staff would be needed, and where an equally suitable team leader could be obtained. He recognized the force of the geographical argument in favour of doing this work at the Near East Centre, but in the particular case of wheat did not believe it outweighed the human factors in the equation, which could not be ignored or treated in abstract terms. In this light he considered that the formula on page six of the TAC report which stated that CIMMYT would retain the primary responsibility for wheat, for which a relationship with the new Centre's programme would have to be worked out was perfectly satisfactory, and he doubted if CIMMYT would object to it.

203. Replying to a request for clarification from the Chairman, Dr. Camus confirmed that he was referring specifically to the TAC's decision to recommend that the main durum wheat effort should be transferred in due course to the new Centre, and not to the bread wheat programme, which would in any case remain with CIMMYT, or to the nature of relay relationships, which was a matter to be worked out. The Chairman asked Dr. Hopper, as convener of the TAC Sub-Committee on the Near East Centre to re-state its opinions on these issues.

204. Dr. Hopper reported that in the case of barley the Sub-Committee had weighed the issue of the benefits of common overheads which might be obtained by leaving the main breeding work at CIMMYT against those of locating it nearer the centre of origin of barley, and in that part of the developing world where this crop was most important and where the bulk of the adaptive research would also have to be done. They had decided that the main focus should be at the new Centre and he believed that decision was correctly made.

205. Their approach in respect of the durum wheat question had been rather similar. It was one of the major cash, as well as food crops of the Near East and North Africa, and both in the Sub-Committee and later in the TAC discussion concern had been expressed about whether the quality of durum wheats being developed at CIMMYT reflected adequately the market needs of this region, and how responsiveness to those needs could be improved. This had been a major factor in their recommending that when the new Centre was able to absorb the durum programme without loss of initiative and momentum, the main breeding work should be transferred there from CIMMYT. The new Centre was not foreseen as being small, and experience had shown that International Centres could reach a fair degree of maturity and competence rather quickly because of their ability to attract good international staff.

206. He reiterated, however, that the Sub-Committee had no intention of suggesting that the durum work should be transferred from CIMMYT until a very careful seedbed had been prepared in the Near East. As a means of ensuring this they had foreseen that the CIMMYT staff now located in Algeria, Tunisia, Turkey, and elsewhere in the region would be absorbed as part of the staff of the new Centre and its outreach effort. CIMMYT would then use that Centre as a basic relay station for its spring and winter bread wheat work in the region, and initially for the durum wheats also, although the latter would eventually be transferred to the Near East Centre.

207. The issue raised by Dr. Camus was essentially one of where worldwide responsibility lay, and how it was best discharged. This was a critical matter which the Sub-Committee had tried to resolve by emphasizing that the relationship between the CIMMYT operations in the Near East and North Africa and the new Centre there would have to be worked out in discussions between the two Boards of Trustees. The same principle would apply to the activities of ICRISAT in the area. Perhaps this point did not emerge clearly enough from the draft resolution now before the TAC.

208. Dr. Camus informed the Chairman that in his opinion the wording on page 6 of the draft resolution in respect of durum wheats was perfectly acceptable. He was, however, unclear as to what was implied by a "relay relationship". Dr. Hopper had seemed to use this term to refer to the Near East Centre absorbing the CIMMYT team currently working in that region, whereas in the draft resolution relay was being used in the sense of certain staff from CIMMYT being outposted to the new Centre. This was very different to absorbance, and he believed would be a psychologically preferable solution as far as CIMMYT was concerned.

209. Dr. Hopper agreed that there was a need for better definition of what was meant by "relay", which was a concept first used by ICRISAT when considering how they might develop a programme on sorghum and millet with stations in Africa. These relationships needed further thought, and perhaps experimental designs to test them. In the case of the Near East the TAC Sub-Committee had originally envisaged the CIMMYT staff being

absorbed by the new Centre mainly because it had not wished to see two simultaneous sets of activities going on, basically with the same donors and objectives, but with scientists owing allegiance to two different institutes. It had felt that the Boards of the two organizations should sit down and work out how their activities would mesh and inter-relate, rather than the TAC spelling this out in great detail, and for this reason it had perhaps left the wording of its recommendation a little obscure. If it proved impossible for the Boards to reach agreement then the matter could come back to TAC, and for this reason he agreed with Dr. Camus that the general question of responsibilities should be discussed further by the Committee at a future session.

210. In the light of the discussion, the Chairman proposed an amendment to para. 14 of the draft resolution at the top of page six. This would read as follows: "In respect of durum wheat it is recommended that CIMMYT continue to have the main responsibility for breeding and germ plasm collection in the immediate future. However, once the new Centre is fully operative it may be logical to focus the main thrust of the durum effort there rather than in Mexico, and this possibility should properly be a matter for discussion in due time between the trustees of the two institutes in consultation with the TAC." This recognized the argument advanced by some members that durum wheats had a stronger affinity to this region than elsewhere, but also emphasized the need not to jeopardize the work that was already going on. As regards so called "relay" relations he was a strong believer in evolution rather than in trying to blueprint every situation, and if in due course the question arose as to whether the main research resources should not be in the region he felt that this was a matter for the two Boards of Trustees, with the assistance of TAC if necessary.

211. The Committee endorsed the wording proposed by the Chairman, stressing the need for a very close and continuous collaboration between CIMMYT and the new Centre in the Near East. It was agreed that the Chairman would report to the Consultative Group along these lines, indicating the willingness of the TAC to discuss with the respective Boards of Trustees any problems which arose in reaching agreement on the allocation of responsibilities in the Region.

Plant Nutrition (Agenda Item 10)

212. The Chairman stressed the importance of this topic, which was a very wide one. In their initial discussion he invited members and observers to range freely over the field according to their particular interest. He asked Dr. Bernstein to open the discussion by explaining the U. S. AID proposal which had been circulated to members.

213. Dr. Bernstein indicated that in their consideration of measures required to increase food output AID had concluded that there was a critical gap in work on fertilizer technology, with a piecemeal approach to research but no organized effort of the type needed to make real progress. Their concern had been deepened by the shortage of food, petroleum, and chemical fertilizers, and following a meeting which they had organized in the fall of 1973 they had identified two main directions in which action was urgently needed for developing countries in the field of plant nutrition. The first of these related to the improvement of chemical fertilizers for tropical conditions, on which very little had been done; the second was the development of efficient alternatives to chemicals for plant nutrition.

214. In respect of the first, they had asked TVA to develop its ideas on what might be done and how best to utilize the unique capabilities of its Muscle Shoals facilities. This was an installation for the development of new fertilizer technology which had a very large pilot plant and laboratories, and employed about 230 scientists and engineers. It did a great deal of work on behalf of the United States fertilizer industry and its service capabilities were widely used by both other developed countries and in the developing countries. There appeared to be a significant difference between the distribution of research on chemical fertilizers and that of research on other forms of technology in the world, in the sense that there was nothing else comparable to Muscle Shoals and a very large gap existed between the concentration of effort there, and the rather limited research dispersed among petrochemical industries and a few public installations elsewhere. They were therefore examining how best to take advantage of the Muscle Shoals complex for the benefit of developing countries, since to duplicate its installations would be extremely costly. U. S. AID had estimated that the saving in capital costs plus major external economies from access to TVA's laboratories and highly skilled staff and services which could be made available if a suitable arrangement could be worked out, would be at least a hundred million dollars.

215. Their interest in developing efficient alternatives to chemical fertilizers was increasingly being stimulated by information on pieces of ongoing research which seemed to indicate that a good deal might be possible. However, there seemed to be an urgent need to develop an overview of all this work, leading perhaps to a more coherent approach; and this, together with the difficulties of mobilizing the TVA facilities for an international initiative, led them to think in terms of an international plant nutrition institute.

216. The purpose of this institute would be to develop improved technologies and systems of nutrition for the principal developing country crops, with special attention to the needs of small farmers. This implied a low capital/high return per unit of investment on plant nutrition, and the combination and complementarities of more efficient chemicals with other sources of plant nutrients, as well as research on a wide range of alternatives, would have to be studied on a comparative cost/benefit basis.

217. How it would be organized would obviously require careful thought, but their present concept was for an institution with multiple components, with a headquarters and central facility in an appropriate developing country close to a centre of scientific activity working on biology, chemistry, and physics as applied to the inter-relations of plants, soils, micro-organisms, fertilizers, and weather. This headquarters facility should be responsible for planning and managing an overall research programme involving some centralized research - particularly on alternatives to chemical fertilizers, cooperative research with other institutions, and a link to Muscle Shoals for research on production, design, and marketing of improved chemical fertilizers for developing countries. It would also undertake training and information management functions related to the overall system. In addition to the research which might be undertaken at TVA and at the Plant Nutrition Institute itself, a wide range of cooperative or contractual linkages was foreseen, both with institutes with specialized capabilities such as the controlled climate research centre in the U. K., and in order to test across a wide range of ecological and socio-economic conditions in developing countries. Separate donor funding arrangements might be envisaged for such research as in the case of the potato centre.

218. A question had arisen about whether the focus should be crop-oriented or otherwise: he felt that this was not so important as the priority of the subject area, and whether a clearly

identifiable and relatively self-contained research target could be located within this area on which a concentrated inter-disciplinary scientific effort could be focussed, rather than drifting along in a piecemeal fashion. He thought that both these criteria applied to plant nutrition: this area of research seemed to be the most important single technological gap in developing countries' agriculture, there appeared to be a great potential for improving the available technology and farmers' yields as a result, and he had been encouraged by a number of papers published recently to believe that a number of discrete and important research objectives could be located, on which a product could be expected from a serious institutionalized approach.

219. It seemed that fertilizer would be an important issue at the World Food Conference, and it was essential to be able to convey to the Conference not only the conclusion that additional research in this field was urgently needed, but also that vigorous initiatives were in hand to organize a strong new effort. There was thus a further virtue in moving ahead as rapidly as possible, and he hoped that the TAC would take a lead in this respect.

220. Introducing the paper provided by Dr. Dart on biological fixation of nitrogen, Dr. Pereira pointed out that global estimates of how much the world's crops obtained in terms of nutrition from biological fixation as compared to chemical fertilizers were weak, but the former was certainly several times great. Some vital crops such as rice had subsisted for many hundreds of years without chemical fertilizers and without declining soil fertility entirely as a result of biological fixation, mainly from blue-green algae in the paddy fields.

221. Research on the role of legumes in nitrogen fixation was by no means new, and it had been known for about a century that accumulation of nitrogen in the soil by free-living bacteria in the absence of legumes was possible. The techniques of measuring nitrogen yields from these sources by conventional soil chemistry were slow and inaccurate, but there had been a major breakthrough recently through the discovery that nitrogenase could be used to reduce acetylene to ethylene and thus measure the nitrogen-fixing power of the soil. A further highly significant advance was the demonstration in Brazil of a new group of bacteria actually living inside the root cortex, which fixed nitrogen almost as efficiently as rhizobia, and more important were able to do so in vitro, which was not the case with root-nodule bacteria. These newly identified bacteria also used the C4 pathway, and thus required less energy for photo-respiration. There appeared to be real possibilities of progress in combining these rather efficient bacteria with cereal crops. The recent revival of interest in developing commercial processes for leaf protein extraction consequent on the high cost of conventional protein feeds for livestock suggested to him that increased interest would also be shown in nitrogen fixation associated with tropical grasses.

222. He saw two main objectives for research. The first was to increase the yields of the legumes; which, despite some encouraging progress on groundnuts and soya beans, were still by and large well below the levels which had been shown to be feasible for the cereals. Work in Africa had shown that leaf disease was one major limiting factor, but Australian research pointed to the need for a broad approach including soil amendments.

223. The second task was to exploit as fast as possible the new knowledge and techniques related to nitrogen fixation, on which a concerted effort was needed involving work within crops and farming systems at international centres in a network with national stations to help clarify the plant-soil relationships, supported by contracts to universities and other

institutions to tackle some of the more difficult and basic problems such as the possible transfer of nitrogen-fixing mechanisms from one crop to another.

224. He believed that the bulk of the biological work, including recycling of waste, had to be done in association with farming systems which took into account local ecological and social conditions, and that working with existing institutions along the lines he had just suggested offered a viable approach. While he fully agreed with the need to strengthen research on the improvement of chemical fertilizers, which was a major gap, and saw a very strong case for attempting to use the Muscle Shoals complex for this, he had reservations about the need for an independent institute to work on biological fixation, probably involving heavy overheads, and would want to know more about the advantages claimed for this.

225. Dr. Swaminathan pointed out that the energy crisis had at least some beneficial fall-out, in that it forced people to think about problems of nutrient supply and alternatives to chemical fertilizers.

226. In his paper to the February 1974 TAC meeting he had stressed the need to develop integrated nutrient supply systems for each major farming system, depending on whether these were based purely on crops, or on mixed crop-livestock enterprises. He felt that this approach had not received the attention it deserved because research was too narrowly crop-oriented. Experiments had shown that economics in use and increased residual efficiency of fertilizer could be achieved by applying it differentially to the crops in the rotation. This kind of research was highly location-specific, however, and needed to be built into agronomy and soil science research at all places, rather than lending itself particularly to the International Centre approach.

227. He drew the Committee's attention to certain misconceptions in the literature concerning the nutrient requirements of high-yielding varieties, implying that these varieties were only viable at very high levels of fertilizer application. This was erroneous; while the short-strawed varieties would respond well to high levels of nutrient supply, their efficiency in the use of available nutrients was better than that of traditional tall leafy varieties at all levels down to zero fertilizer application, both because of their greater resistance to lodging and most particularly due to their better harvest index (grain: straw ratio). This was supported by experimental evidence, and he would like to see the TAC make an authoritative statement to this effect, since there was evidence that the confidence of some countries in the new varieties was being undermined by confusion on this issue, with a tendency to cut back in their area, and seed and other programmes essential for their wider adoption by farmers.

228. A second point raised in his paper concerned fuel trees, which had an important bearing on the potential for using biogas plants described in an interesting appendix prepared at his request by three engineers from the Institute of Science at Bangalore. While there seemed to be great opportunities for such plants, not more than 5 percent of people in the average Indian village had more than the minimum of four head of cattle needed to operate an individual plant. A great many villagers were landless labourers owning no cattle at all. Competition could thus arise between their fuel requirements and the raw material requirements of biogas plants, which would result in greater pressure on forests and roadside trees for use as fuel. There was thus great urgency in trying to develop alternative sources of non-commercial fuels for rural people, and he had been discussing with

foresters the possibilities of using existing species or developing breeding programmes for quick yielding fuel trees, but without finding too much information. Nevertheless, he felt that this was a matter worth further study, possibly by the TAC or FAO, since unless the situation could be improved it could be difficult to exploit the full potential open for biogas generation.

229. He welcomed Dr. Bernstein's proposals as most timely, and although he felt the organizational aspects needed further study, saw merit in a concentrated international thrust on those aspects of the biological nitrogen fixation problem requiring sophisticated work and from which the general benefits could be very great. While the fertilizer shortage consequent on the energy crisis was undoubtedly serious in its immediate impact he felt that if an integrated attack were launched on plant nutrition, it could be turned into a great opportunity for the long-term good. For example, given some further research and proper organization such as developing alternative fuel sources, the total crop depletion in India could probably be replaced by the application of recycling principles alone.

230. Opening the floor to discussion the Chairman assured Dr. Bernstein that he need have no worry about the seriousness with which the Committee viewed the fertilizer situation and indeed the whole subject of plant nutrition. They rated this as a very high priority, and he invited members and observers to give their views both generally and in response to the three introductory statements.

231. Dr. Brady agreed with other speakers that the fertilizer crisis had forced everyone to take a more careful look at a subject which should have been receiving more attention all along. Referring to Dr. Pereira's statement he emphasized the importance of the association between the rice plant and the rhizosphere in paddy fields, which they suspected led to fixation of around 60 kg of Nitrogen per hectare per crop. This was of real significance in the rice economy, especially for the small farmer.

232. His main concern related to how further research on such intriguing aspects of plant nutrition might best be pursued, and since important components of these kind of studies were location- and/or cropping system-specific, you would probably have to reproduce a great deal of the work of centres such as IRRI and IITA if you attempted to undertake it at a single new centre relatively independent from other centres. His preference would therefore be for a combination of resources, whereby the research on fertilizer technology and the tailoring of fertilizers to the needs of the tropics, and perhaps some of the basic biological studies, might be done at one location - perhaps in association with an appropriate university - and there would be a series of cells located at existing institutes to handle location-specific problems. These cells would have a dual relationship; to the institute at which they were located and to some kind of inter-centre headquarters.

233. Dr. Bernstein explained that USAID did not think that there need be competition between existing institutions and the new capabilities which they were proposing. The range of possibilities on which more research was needed was wide; some aspects were location-specific and would clearly best be undertaken by existing institutions, other problems seemed to call for marshalling an appropriate inter-disciplinary group of scientists with strong financial backing and let them go after a solution. He saw the secret of success as being able to get the right degree of generalization of effort at the right echelon of the system; some of the research needed seemed to have rather general application, but a point always occurred beyond which the results had to be tested at a narrower level in specific

environments and cropping systems.

234. There was also an important need to integrate these various efforts, both as between different and possibly complementary sources of plant nutrients, and between research at different levels of generalization. They were therefore thinking largely in terms of a place which would be able to assist in programming and where people could come together to see how their efforts could best fit in a coordinated attack on the problems, but where some of the research which lent itself to centralized treatment might also be done. In developing the sort of concerted effort required full use would have to be made of all the existing facilities, including the many institutions involved in straight agronomic trials on nutrient requirements.

235. Referring to experiments on nitrogen utilization by rice in Asia, Dr. Yamada and Dr. Boon-Long stressed the need for an integrated approach to research on plant nutrition. Dr. Yamada pointed out that there had been a great deal of work on the yield increasing effects of fertilizer - type, quantity, timing and method of application etc. - but the recovery of nutrients from fertilizers by plants was still very low, and this important aspect of research had been neglected, partly through lack of good experimental techniques for detecting the movement of fertilizers in soils and plants. Results of research sponsored by the FAO/IAEA joint division under contract with scientists in many countries suggested that around fifty percent of applied nitrogen was lost without being absorbed by plants. This was serious, not only because of the importance of nitrogen to crop yields, but because it also required the largest amount of energy for its production.

236. On the other hand there was experimental evidence from paddy fields that substantial quantities of nitrogen were obtained by the crop from mineralization of soil organic matter, and biological fixation. These considerably exceeded the uptake from applied nitrogen, which appeared to have a very low efficiency under tropical conditions and might even depress microbiological nitrogen fixation. Work was therefore needed not only to increase the efficiency and minimize the losses of chemical fertilizers in the tropics; but also to study inter-actions between chemicals, organic sources of nitrogen in the soil, and microbiological transformation of nutrients in relation to the major crops.

237. Both speakers were attracted to certain aspects of the USAID proposal, as a focal point for coordination of research, information, and training, but they also stressed that many of the research components already existed. One of the main objectives of any international mechanism which was created to reinforce work on plant nutrition should be to utilize existing facilities to the best advantage so as to minimize costs. This could include contractual arrangements for specific research tasks.

238. While not disagreeing with the need to take a broad view of research requirements related to plant nutrition, and to reinforce work on non-chemical sources of plant nutrients, several speakers argued that this should not be at the expense of continuing research in respect of fertilizers. Both long and short-term objectives had to be pursued, and while the potential for biological fixation of nitrogen was clearly very large, and there were several attractive research objectives in this field, it should not be imagined that a major breakthrough was around the corner. This was an area of high promise, but one which was still unfolding, and despite some substantial advances in understanding of the basic principles, much remained to be done to develop practical applications.

239. In respect of bio-gas production from waste organic material it was pointed out that a good deal of work was going on, and some aspects of developing biogas plants had been pretty well researched, for example in India, and presented mainly engineering problems. Doubts were expressed whether this presented a major potential for an international research activity. The large-scale use of urban sewage, which contained not only biological wastes, but also household, office, and industrial wastes presented difficult engineering problems and could be extremely expensive. There were also physical difficulties in transporting and distributing waste materials which tended to be bulky and thus uneconomic.
240. Although agreeing that it would be worthwhile for the TAC to review what was going on in this field neither Dr. Hopper nor Dr. Bommer was optimistic about finding quick solutions in this field as an alternative to chemical fertilizers.
241. By contrast, they felt that a significant pay-off could be achieved in the relatively short-term by concentrating more effort on developing fertilizer formulations which were more effective and economical for the soils and crops of developing countries, and improving the generally low efficiency of fertilizer use by farmers.
242. Whatever might be achieved in the biological field a substantial proportion of the world's plant nutrient requirements would have to come from the fertilizer bag, particularly in Asia where the projected growth of demand for fertilizer for irrigated land was very high. Not only was fertilizer needed for sustained high yields, but it introduced an important element of flexibility into the system, enabling plant food to be supplied when most needed. They therefore attached great importance to the USAID proposal for better utilization of research capacities in the production of more effective chemical fertilizers. This was an area where research capabilities were unevenly distributed and in which few, even among developed countries, were very strong. The United States did have an outstanding facility at Muscle Shoals; and TAC should explore how best to utilize this and other important chemical complexes, in conjunction with the international research centres and other institutes in developing countries to develop and test new materials under tropical conditions as rapidly as possible.
243. Dr. Bernstein pointed out that different approaches to improving plant nutrition might be needed in different regions of the world. In Asia an enormous increase in fertilizer use was projected, and the emphasis had to be on improving the efficiency of use of existing formulations by farmers and on developing unconventional materials. This was where the TVA resource could be most useful. In a number of African countries fertilizer use was limited and seemed likely to rise slowly; here biological systems, especially the introduction of legumes into the cropping pattern, assumed great importance. A problem here was the acidity of many tropical soils, and the low availability of phosphate. Costs of lime were prohibitive over wide areas in the tropics, and there was a need to find species tolerant of low lime and phosphate.
244. In response to the Chairman's invitation for contributions from representatives of the International Centres, Dr. Finlay referred to the need for clearer understanding by national planners and research organizations of the objectives and intentions of the Consultative Group International Centres complex. In CIMMYT's attempts to develop collaborative research networks they often found that existing national research could not be fitted in well without some modification. Some small financial input was generally required to permit an adjustment or addition which would make a national programme fully relevant

to the collaborative effort, but because of the lack of understanding he had mentioned earlier, this support was not forthcoming. He wondered how the Consultative Group and Centres could influence national research councils to help make such changes, which might be of great use to work on testing fertilizers and new approaches to nutrition.

245. The Chairman suggested that Dr. Finlay enlarged on this matter in respect of the next item on their agenda.

246. Dr. Chandler supported the view that the basic work on new and better fertilizers be done in the affluent countries, particularly the USA, with the International Centres co-operating and using their facilities and networks to national programmes as testing grounds. In the case of the biological aspects he believed that a useful first step would be for the soil scientists, microbiologists, and crop management staff of the Centres to get together and determine what needed to be done, who should do it, and where the main emphasis should lie.

247. In reply to a question from Dr. Havord asking whether there was an adequate basis of comparative information on performance of high-yielding varieties at different levels of fertility to support Dr. Swaminathan's earlier statement on this point, Dr. Grant referred to CIAT's work on screening crops in low-fertility highly acid soils.

248. This suggested that high yield potential was not necessarily linked genetically to fertilizer responsiveness, this applied for example to most of the productive forage species well adapted to the tropical environment. In screening germplasm more emphasis might therefore be placed on selecting cultivars with ability to yield an acceptable harvest in spite of adverse soil conditions. This could be of more importance than aiming for maximum potential yield under ideal conditions in countries with poor infrastructure. Tolerance to low or high PH, low soil nutrient status, or toxic levels of aluminum or manganese could be important crop selection criteria in the low-land tropics. Screening showed not only that some species were much better adapted to acidity and other adverse soil factors than others, but also that there was great genetic variability within species such as rice, corn and cassava. He therefore believed that a good deal of progress could be made at relatively low cost by selecting the species and varieties which would respond best under these conditions. CIAT's studies also pointed to the very great importance of testing new fertilizer formulations both under a wide range of conditions and across a wide selection of germplasm. More collaborative research should be developed along these lines, and the Centres could play an important role.

249. Dr. Cummings considered that the experience of ICRISAT in general supported Dr. Swaminathan's conclusion that the high yielding varieties of cereals also performed best under conditions of nutrient stress. ICRISAT used a technique of testing its accessions to the limits of their performance, and then re-testing the best under stress and across thousands of lines they had found that those which had shown ability to produce very high yields under favourable conditions also had the potential to perform well under stress. One point that had to be watched, however, was the difficulties the short-statured varieties sometimes had in competing with weeds.

250. Dr. Albrecht stressed the suitability of the International Centres to play a key role in research on plant nutrition. IITA had in fact been established principally for investigations on soil-crop management, and this was receiving increasing prominence in the programmes of several other Centres. These now provided a broad coverage of the different conditions

in the tropical world, and their increasingly close research and information links with institutions in developed countries was leading to fruitful collaboration both in basic and joint programmes of applied research. This would strengthen their input to their expanding cooperation with national programmes in the developing countries; and he believed that the proposal now being considered by the TAC not only fitted very well into the Centres' mandate, but would be a further accretion of strength to the overall network of research on plant nutrition.

251. Dr. Sawyer supported the proposal. The idea of the Centres cooperating as cells in a global effort which would be backstopped by a plant nutrition institution which could both promote some basic research and help in indicating priorities, seemed logical and would be followed with interest by CIP.

252. Referring to his own experience both in manufacturing and end-use of fertilizers when he was working in the fertilizer industry, Mr. Oram remarked that he had been struck by the extent to which the farming community, and particularly small farmers in the tropics, was in the hands of the industry. They often had to take more or less what fertilizer was available, and this did not always correspond to the needs of their soils or crops. The fertilizer industry had done a good deal of research on raw materials for fertilizer production, and on manufacturing technology; but little had been done in respect of formulating materials for tropical conditions or means of economizing in fertilizer use in a situation of scarcity.

253. He therefore warmly welcomed Dr. Bernstein's proposal in respect of the TVA facilities, which could help to fill a significant research gap. Means should be found, however, to develop links between any work undertaken along the lines which USAID were proposing both in the research and development aspects, and the research and manufacturing capabilities of the fertilizer industry in the world. A link would also be needed on the demand side to the developing countries to achieve a better understanding of their fertilizer requirements, and the type of materials likely to be best suited to their soil-plant environments. It seemed very logical to use the International Centres, national stations, and other appropriate organizations working on soil fertility problems in those countries to establish the necessary two-way flow of information to any institution working on research in fertilizer manufacture and formulation.

254. Most of the discussion so far had focussed on nitrogen; he wished to draw attention to the question of phosphate. Unless means could be found to use low-grade phosphate deposits more effectively, or to reduce phosphate losses through fixation etc., this could become a limit to growth in agriculture, especially for the poorer land-locked tropical countries where the cost of getting a bag of fertilizer from the port to the place where it was to be used equalled or exceeded the cost of the fertilizer exfactory.

255. He was encouraged that some work was going on phosphate utilization and fixation at certain of the International Centres, and agreed with the Centres' directors that in the overall effort the existing system be utilized to the fullest extent possible. There was a role for FAO in developing the applied research beyond the Centres in collaboration with national programmes. Not everyone knew that in addition to its projects with UNDP and other bodies, FAO had a cooperative programme with industry; which in the case of fertilizers was sponsoring a coordinated programme of fertilizer/variety trials in many developing countries. More advantage could be taken of this in developing the network.

256. Dr. Bernstein was encouraged by the range of comments in the discussion. Reverting to the broad perspective with which they had started, he stressed that very great increases in yield would be needed, particularly in the poorer countries, if the problems of hunger were to be coped with. He queried whether current research programmes, including the work of the Centres, plus the likely access to fertilizers for the millions of small farmers would be adequate, although he recognized the problem of financing any additional Centres which were not of very high priority.
257. It was important to keep in mind the timing of the possible results from any research, and here it seemed probable that progress from work on improving chemical fertilizers would be faster than that in biological areas. Nevertheless they had to consider whether their current assumptions concerning research would be enough to generate the much higher yields which would be imperative towards the end of the century; and if not, to identify what required to be done over the longer term to achieve a major leap forward, when the work should be started, and who would do it. This was not to say that accelerated work within the shorter time frame would not yield significant results or was not urgently required; indeed it might be easier to generate support for longer-term research if it were linked within an institutional apparatus with something from which results were coming off the line more rapidly. He hoped that the Committee, in recalling its discussion, would bear this in mind and determine which combination of short and long-term approaches seemed likely to fit the needs of the future best.
258. The Chairman assured the meeting that the TAC recognized that its task was not bound by a five-year time horizon, nor did they think only in terms of short-term payoffs. Several references had been made in discussion of the role of the Centres in plant nutrition research, and it was clear that because fertilizer and the efficiency of its use was of major importance to crop production they were unlikely to overlook it. Nevertheless he saw merit in some monitoring of what was going on at all of the Centres, so that any gaps or bottlenecks could be identified and timely help given.
259. He was delighted to hear more and more reference to the use of the universities in dealing with particular problems, but would like to see further exploration of ways of utilizing the enormous research experience of developed countries and marshalling the work going on there in support of the needs of developing countries. The possibility of taking advantage of the TVA facilities was a case in point and it seemed to him the height of folly to try and duplicate this elsewhere, because of the enormous investment which would be required.
260. In reaching its conclusions on this important item the TAC would have to grapple with the issue of balancing short and long-term components of the potential fields of research in plant nutrition and their related investment costs. They would have to decide whether in addition to action to maximize current research efforts some new thrust was needed, and whether this required a new centre or could be approached by agreement between existing centres and appropriate adjustments to their programmes. He hoped that Dr. Bernstein would leave the meeting with a sense of encouragement, and while he did not promise that the TAC would present a whole articulated system to the Consultative Group next week, he was confident that they would be able to give a pretty clear indication of what they felt the next steps should be.

261. Introducing the closed session the Chairman suggested the lines along which he felt the Committee might wish to formulate its recommendations on this subject based on his reading of the discussion in open session. He felt sure from their discussion at their previous meeting that they considered it a priority area; that the United States initiative in making a specific proposal was welcomed, and that the TAC recognized the three main elements of the problem, chemical, biological, and organic. It was also apparent from the discussion that while economies in the use of chemical fertilizer might well be facilitated by the results of work on the other two aspects of plant nutrition, or by more efficient fertilizer formulation and use, it was not considered that the overall need for the expansion of supply of chemical fertilizers would lessen. For this reason the Committee wished to examine further the best means of capitalizing on the relationship with TVA in designing fertilizers for use in tropical conditions as proposed by USAID.

262. In the area of more efficient use of chemical fertilizers the TAC noted the work going on at the International Centres, and stressed its importance. It saw the need to maintain close contact with such work to ensure the maximum use of research in and outside the centres, to establish workshops and training programmes, and to support research on the more location specific problems.

263. He believed that much the same sort of comment applied to research on biological fixation of plant nutrients, and on organic recycling, and suggested that the TAC might decide to establish a working party to function as one of its sub-committees, to study the best means of utilizing the experience of TVA and other bodies in fertilizer technology, and to monitor work going on at the International Centres and elsewhere in the three fields, along the lines he had just suggested. This Sub-Committee would be empowered to discuss matters relevant to its terms of reference with any other organizations or individuals, and would report to the February 1975 meeting of TAC.

264. In reporting to the Consultating Group he would make it clear that the TAC attached high priority to this subject, but did not necessarily envisage a new and comprehensive centre for regional research covering all these fields. Instead it foresaw an instrument of coordination, which might supplement research and training efforts already apparent within and outside the Consultative Group centres.

265. He sought the Committee's reactions to this form of approach, or to any other aspect of this topic. He also raised the question of whether, as a separate issue, the TAC wished the matter of crop protection materials to be placed on its agenda for a similar examination.

266. In respect of chemical fertilizers the TAC supported the need for additional work in designing fertilizers more suited to the needs of developing countries, and particularly for tropical soils. It noted that the industry had not, in the past, invested a very high share of its sales in research, and recognized a need for greater public sector investment in such research. It therefore greatly welcomed the USAID proposal for developing a link with the TVA facilities to reinforce current efforts on behalf of the tropical countries, but stressed the need to mobilize the chemical and engineering capabilities of the entire industry - public and private - to increase the efficiency of fertilizer manufacture, formulation and application. In this connection appropriate groups of the industry should be contacted, and the work being done by such organizations as the American and International Potash Institutes, the Centre d'Etude d'Azote etc. should be examined. This should be a task for the proposed TAC Sub-Committee.

267. While recognizing that many fertilizer plants in the developing countries were operating at low efficiency and that it was important to improve their performance, it was agreed that this was not so much a research problem which should come under the purview of TAC, but a compound of factors often outside the control of individual fertilizer plants. The TAC was pleased to note that the World Bank was putting in special resources to help remedy this situation.

268. The Committee agreed that any research at the industrial end aimed at improving fertilizer efficiency would need strong support in field testing the products under tropical conditions. It did not, however, believe that a technical case had been established for a single centre to do this work, since it could not be adequately representative of the wide range of conditions in developing countries. The International Centres were nearly all concerned with plant nutrition research in a multi-disciplinary role as well as with seminars and training, and these should be utilized as the nucleus of the tropical testing network, which would also involve national programmes. Work on improved methods of fertilizer application by farmers, on the fertilizer requirements of individual crops and on fertilizer interactions within cropping systems should also be carried out within this network. One of the tasks of any TAC Sub-Committee should be to identify important gaps and problems requiring attention in given conditions and draw these to the attention of the appropriate institutes.

269. It was pointed out that in examining the need for reinforcing existing research programmes the Sub-Committee should not necessarily confine itself to applied research, but also to more basic studies. Nor, in this respect, should it restrict its analysis of what was going and what more was needed to the developed countries; instances were given of first-rate micro-biological research going on in Brazil, and also at CIAT. Such research could have much wider implications, and the TAC should not hesitate to recommend additional support for a really imaginative and possibly far-reaching programme whether at a national or an international centre. Possibly this might be done on a contract basis. This should be emphasized in defining the terms and tasks of the Sub-Committee.

270. In respect of chemical fertilizers it was agreed that the terms of the Sub-Committee would include all nutrient elements, major and minor, and not just nitrogen. One of its first tasks should be to examine the current state of knowledge related to fertilizer materials and sources which might be suited to use under tropical conditions, especially those such as basic slag as a source of phosphate suited to acid soils, or other local products or by-products, which by suitable technological research could provide solutions to some of the problems of fertilizer supply in developing countries. There was a strong feeling that the fertilizer industries of the world, including those now being set up in the oil-rich countries, were still concentrating largely on the production of the conventional fertilizer formulations which had been developed historically for temperate agriculture; and that there was a need for new materials to be developed to meet the specific needs of the semi-arid areas and the humid tropics.

271. Guidance was urgently needed to those developing countries now investing in fertilizer industries (which would often have to be oriented largely towards exports), as to what processes and products they should adopt. The TVA facilities were seen as potentially a great source of strength in this respect; but options should be kept open to involve the fertilizer industry in other parts of the world, possibly through contractual arrangements, in specific aspects of research.

272. It was pointed out that the present fertilizer shortage had arisen not only because of the high cost of feedstocks consequent on the rise in oil prices, but also because the substantial quantities of aid money and loans for fertilizer purchase, which were going to developing countries in the late 1960's, had been discontinued. This had led to a depression in the fertilizer industry and the scrapping of many old or inefficient plants. When demand rose again installed capacity was inadequate to meet it, but this situation was fast being remedied. This might even lead, in a matter of three years to some short-term excess capacity; on the other hand most of current fertilizer utilization was in the developed countries, and there was a tremendous potential additional demand from developing countries. This raised the question of who took the risks in establishing the necessary increased capacity to meet this demand in an industry which was prone to instability and cycles of excess and shortage in production. This was the sort of issue which emphasized the need for a world food policy research institute; but the Sub-Committee should endeavour to maintain close contacts with the outlook and projections on world demand and capacity for fertilizer production so as to keep the TAC appraised of developments.

273. On the subject of biological research three main aspects were identified for attention by the Sub-Committee; first, the symbiotic fixation of nitrogen, secondly, the role of the free-living organisms; and third, the crop/micro-organism relationship, with particular reference to identifying the crops able to fix nitrogen and the mechanisms by which they did so, bearing in mind the long-term possibility of transferring such mechanisms between crops. A good starting point in relation to the main aspect of symbiotic nitrogen fixation by legumes would be the TAC seminar on grain legumes, being held in Delhi in September. It was suggested that, at an appropriate future date, the TAC might find it useful to convene a similar small expert group on the free-living organisms, as some interesting research results were appearing.

274. It was agreed that in view of the wide range of work under way on biological nitrogen fixation and on the role of soil micro-organisms in phosphate availability, the first need was for a thorough review of the state of progress and the potential for accelerating progress by channelling additional support to priority areas of existing research. Better integration of current programmes might be beneficial, but no clear case was seen for a new institute or laboratory working in this field, nor was it felt that much of the work required could be easily centralized. One member suggested that a better approach might be to establish an International Plant Nutrition Association, which the International Centres and all other main institutes working in this field could join, whether from developed or developing countries, and which could act as a focal point for information exchange and the building of research networks.

275. Concerning the wider use of organic matter for plant nutrition, especially recycling, the TAC agreed that not only technical but also social and economic problems had to be taken into account in reviewing the potential. What might be considered organic waste in one socio-economic situation might have a number of competing uses in another, e.g. for domestic or industrial fuel, feed, or processing. This was particularly true of rural areas. In the case of urban wastes from large cities, including sewage, it was pointed out that the problem was complicated by all sorts of chemical impurities, which were both technically difficult and expensive to remove, and unless this could be overcome it would be misleading to hope for much from this source for agriculture.

276. The TAC placed strong emphasis on the need for applied research on plant nutrition within the cropping system. This might either involve studies of the role of the individual components of nutrition, such as fertilizers, or the complementarities and interactions of chemical, organic, and microbiological sources of nutrients within an integrated nutritional approach. These combinations would vary widely with the environment and cropping systems, and this work had therefore to be undertaken at a number of locations. It was felt that consideration might have to be given to reinforcement of the International Centres, to give them flexibility to expand their activities in agreed aspects of plant nutrition, both directly, and possibly through funds for them to contract to appropriate national institutions to cooperate in work on specific problems.

277. The Chairman said that, following their further discussion on this subject, he felt that the Committee were substantially in agreement with the approach he had outlined at the beginning of the closed session, as well as with the need to establish a Sub-Committee to go further into the need for additional research on priority problems related to plant nutrition, and to suggest suitable approaches. He would arrange for a resolution to be drafted for their consideration, but meanwhile would like them to consider the question of a Sub-Committee. This should include a basic element of TAC members, but need not be confined to TAC, and he envisaged a total of from five to eight people.

278. He suggested that either Dr. Hopper or Dr. Bommer might act as Chairman, and that Mr. Oram, who had a personal contribution to make, could act as a formal convenor, working with the Chairman. He himself would like to participate whenever possible. He asked if Dr. Camus, Dr. Swaminathan, and Dr. Pereira would be prepared to help; Dr. Dart, if permitted by his Director to participate, might also be a valuable member.

279. Those members all agreed to participate; it was also suggested that Dr. Graham, now head of the bean programme at CIAT, and previously its micro-biologist, might also be asked to attend when possible. Since both Drs. Dart and Graham were Australians, this fitted very well with another suggestion that the Sub-Committee should draw on the very great Australian expertise in soil fertility and biological fixation. A further suggestion was for access to expertise in the fertilizer equipment industry, such as was available from the Kellogg Foundation.

280. In reply to a question from Dr. Pereira as to the terms of reference of the Sub-Committee the Chairman stressed that it was not just being expected to review the literature or know what was being done at the International Centres, but must develop active contacts with TVA, with the fertilizer industry, and with leaders of research in soil microbiology, and those working on organic problems. As an outcome of its work, following the example referred to by Dr. Pereira, it might come up with a conclusion that no new centre was needed, but that work should be done in collaboration with TVA and with selected industrial firms, with financial backing being provided to support pilot plants tests by other fertilizer units in developing countries. Another conclusion might be that not enough was being done at the International Centres in respect of more economical ways of using fertilizer within the system, and that more support was needed from the Consultative Group for such work.

281. What he really envisaged was therefore a sort of monitoring role for the Sub-Committee, which would certainly not itself get involved in pilot plant operations etc., but which would be able to identify specific needs which might entail financial commitments and draw these to the attention of TAC for its consideration.

282. In opening the discussion on the draft resolution of the TAC's conclusions on this subject for his presentation to the Consultative Group, the Chairman informed members that since their previous meeting, Dr. Bernstein had communicated to him what seemed an extremely generous offer from the United States Government.

283. What the United States was prepared to consider particularly, without prejudice to any other approach to strengthening research on plant nutrition was to establish an independent, private, non-profit corporation under an International Board of Control and with a multi-national staff, which would be able to undertake work on the development of fertilizer products suitable for tropical soils, with access to the skilled staff and facilities of TVA at Muscle Shoals. The U. S. Government would fully fund the operation, which would include the provision of land for office buildings, free access to the TVA library, and an agreement with TVA for use of its laboratories and pilot plant on a cost for service basis.

284. The Corporation would be established under a Charter which would provide for its absorption into any broader international institute dealing with plant nutrition, should the Consultative Group decide to establish one at some later date, and wish to incorporate the Muscle Shoals Corporation. The TAC Sub-Committee would be empowered to discuss very closely with the United States the terms and role of this corporation, but he sought the Committee's guidance on how to frame his recommendation to the Consultative Group in respect of this development.

285. The TAC welcomed the new United States proposal in principle, as a substantial contribution to the one aspect of research on plant nutrition in which it had recognized an immediate need for some new facility. While members had felt that work at existing institutes in cooperation with the International Centres could probably be expanded to cover the microbiological side; and that suitable networks could be created to cover crop-nutrient relationships, with the Centres acting as catalysts; no such focal point existed for chemical fertilizers. This proposal offered a solution which would save an estimated 100 million dollars in capital costs, plus avoiding the creation of what had seemed to the Committee as a superfluous international institute.

286. The objectives proposed, e.g. the design of new types of fertilizers tailored to the needs of developing countries; related issues such as improved production and marketing processes; the use of lower cost materials, and other factors designed to improve the cost/efficiency ratios of fertilizers etc. were strongly supported.

287. Nevertheless as this proposal represented a new development since TAC's earlier discussion, members sought clarification on a number of points, in particular the nature of the private non-profit making corporation and its relationship to the commercial aspects of TVA's operations. They also wished to know what, if any, funding was being asked other than the commitment agreed on by the United States Government.

288. The Chairman explained that the establishment of the proposed new organization as a private non-profit making (and also non-taxable) corporation was necessary under the United States law. There would be an International Board of Trustees with three United States representatives. Basically all of the existing international centres were set up in a similar way, as private non-profit making corporations in the countries in which they were located. In connection with the TVA fertilizer operations Dr. Ruttan, who had personal experience of working at TVA explained that the Tennessee Valley Authority was a river

development authority, the chemical plant had long been established there and the fertilizer facility had now been designated as the National Fertilizer Laboratory. It was supported by an appropriation independent of the power operations of the public corporation which was the Tennessee Valley Authority. As he understood the proposal, it would enable the Corporation to have access to all the facilities and expertise of the National Fertilizer Laboratory, without in any way impinging on any commercial operations of the TVA.

289. In respect of funding the Chairman pointed out that his understanding of the United States offer was of \$ 15 million over three years, of which approximately \$ 5 million would be for capital costs and the remainder to cover recurrent expenditures. This provided a short-cut to getting work under way which was urgently needed on the problems of fertilizers for tropical soils and growing conditions; with access to existing facilities as well as the establishment of some new facilities. The value of the latter alone was estimated at \$ 19 million, to duplicate the entire testing and pilot plant facilities would cost over \$ 100 million. It was very difficult to imagine the Consultative Group being able to provide this sort of funds.

290. A point which he agreed required further clarification was the duration of United States backing for the Corporation. He understood from the informal discussions which he and Dr. Hopper had had with Dr. Bernstein that the initial funding period envisaged by the U. S. Government would be three years. By the end of that time a decision would have to be reached as to whether some wider coordinating body or other institution was needed, possibly under the auspices of the Consultative Group, which might absorb the Muscle Shoals corporation. However, the first step was for a detailed project to be worked out by the United States and submitted for discussion.

291. In reply to questions concerning any announcement which might be made on this proposal to the World Food Conference, thus possibly pre-empting recommendations by the TAC or its Sub-Committee, the Chairman explained that since the Conference was in November, TAC could not be expected to reach a decision on the detailed proposal before the Conference. He understood that all the United States would do there would be to announce their willingness to establish a Corporation of this order, with the objective of accelerating research on plant nutrients for tropical areas. As Dr. Hopper had pointed out this was a follow-up to an earlier statement by Dr. Kissinger of his Government's willingness to help in this respect, in his address to the Special Session of the General Assembly on world resources. What Dr. Bernstein was urging was that the TAC would encourage them to go ahead with this initiative, and that if so it present this view to the Consultative Group.

292. If the Committee supported the United States initiative, which the Chairman personally considered a generous one, it would require some amendment to the resolution before the Committee. He had asked the Secretary to try his hand at drafting one, and requested him to read it out for their consideration.

293. Mr. Oram proposed the following amendment to para 4 on page 2 of the draft resolution. After the words "fertilizer industry" in the last line but one insert a full stop. Then continue as follows: "It believes that industrial research on the development of chemical fertilizers suited to tropical soils and on fertilizer plant adapted to the needs of the less advanced countries has been inadequate, and that accelerated activity in this field might bring rather rapid benefits. It recognizes however, that this requires considerable investment in laboratories and pilot plant and therefore particularly welcomes the offer of the United States Government to examine ways and means of capitalizing on the research

and production engineering facilities of T. V. A. for the benefit of developing countries. TAC encourages the Government to table a definite proposal for its early consideration and urges that this be framed in such a way that it can eventually be linked to other internationally supported activities in the field of plant nutrition in a manner that would facilitate support from the Consultative Group."

294. The Chairman stressed that this wording did not imply immediate support. The amendment and the draft resolution was accepted, subject to modifications proposed by Dr. Swaminathan. He suggested altering the wording in para 4, under sub-item (b) to read: "designing fertilizers adapted to the needs of tropical soils and growing conditions." He also pointed out that since the TAC Sub-Committee would be charged with examining not only the details of the United States proposal, but also the wider requirements for research on plant nutrition it would be better to avoid any implied commitment in the latter respect in the wording of the resolution. He therefore proposed deleting the rest of the final sentence of Mr. Oram's draft amendment after the words "early consideration". This was agreed by the TAC.

Strengthening National Research Capabilities (Agenda Item 11)

295. In opening this item the Chairman reminded members of the formal position of the Committee. In the terms of its mandate it advised the Consultative Group on international research and its institutional forms. Recognizing however that the results of such research would have less impact if national systems were not fully adequate to the task of cooperation and the utilization of technological advances, the Committee had a clear and close interest in the strengthening of national research. Its views had been expressed in its Priorities Paper which had also made some suggestion for further work in this field. He invited Mr. Oram to report on the recent Bellagio VI meeting on the subject.

296. Referring to the essential complementarity of international and national research endeavours Mr. Oram stressed the need for improved dialogue between them to ensure proper orientation of the international effort to national needs, and optimization at the national level of international findings. Unfortunately recent studies of national research capabilities indicated considerable weaknesses in many national research efforts and a decline in bilateral assistance to them. In financial terms it had been calculated that an increase in national research expenditure from \$ 236 million in 1973, to over \$ 1 billion in 1980, could be required to meet national needs fully.

297. The report of the recent Bellagio meeting had been circulated to participants so he proposed only to highlight certain ideas arising from the meeting. Firstly a need was felt for the TAC and the Consultative Group to be better informed on the activities of the aid donors with regard to support to national research. Efforts were fragmented and uncoordinated and an overview could point up gaps and overlaps and thus assist in a better definition of needs. Secondly there was a clear indication of a need for better information on national research establishments themselves, their staffing, financial resources and main lines of work. This could be supplied by the CARIS project which was currently under discussion. Thirdly it was felt that once an information base was established, including

reports of regional meetings such as that held recently in Latin America (q. v. below), and others scheduled to be held by FAO there and in the Near East in 1975, a conference might be held of all interested parties to decide on further action. This might include some new mechanism outside the Consultative Group, including perhaps the institution of an international advisory service on research organization, management and resource allocation to meet priority needs. This service was to some extent being provided already by FAO, the World Bank and some bilateral donors, but a need was seen for reinforcement and coordination of these efforts. Another suggestion related to the possible establishment of an international body to provide specialized scientific staff services to be made available to fill gaps in national establishments. Such an effort might prove very expensive to maintain however, as experience showed that costs of maintaining permanent professional cadre of this sort could snowball alarmingly. The better identification of training requirements was also urgently needed as there was no clear idea of demand at the moment; FAO anticipated initiating work in this field in the near future however.

298. A more crucial question was how the international centres could best develop their outreach relationships, their involvement in international programmes and cooperative research networks aimed at improving the critical mass of research, and what should be the role of international agencies of the U. N. system in the overall effort? There had obviously been insufficient dialogue on this as yet and he referred to useful suggestions already made to the TAC and CGIAR by Mr. Evans. The Committee would clearly need to keep the question under continuous review taking into consideration the requirements and wishes of the developing nations themselves.

299. He reported to the meeting that the last FAO Conference had recommended that agricultural research should form a major topic of the 1975 Conference. It was envisaged that the strengthening of national research and the role of the Consultative Group system would be major topics for discussion and he hoped that the International Centres would be able to participate and contribute. The forthcoming brochure on their activities would do much to foster recognition and a better understanding of their activities both in relation to the FAO Conference and the coming World Food Conference. He personally felt that the FAO Conference could probably cater for the need seen by the Bellagio meeting for a conference on national research, and could provide the basis for subsequent informal discussion by TAC/CGIAR leading to a concerted international effort.

300. Speaking on the recent FAO/UNDP/CIAT workshop on the application of technology in Latin America, Mr. Mashler (UNDP) informed members that a report and evaluation of the meeting would be made available shortly to all interested parties. Meanwhile certain conclusions from the meeting could be drawn. The most significant of these was the general lack of information on the work of the International Centres at national level. Steps now being taken to prepare a brochure would help but would not be sufficient. All international aid programmes should assist this process through their own technical staff. As initiators of programmes it was in their own interests to ensure complementarity of effort and to catalyze mutual understanding. Other modalities to establish linkages would also be proposed when the final conclusions were drawn, as many useful suggestions had been made by regional participants in the meeting. The view was shared by the sponsors of the meeting that it had served a most useful purpose and should be followed up by similar meetings elsewhere, in order to gain further views on what might be done at the world level to improve linkages. He believed that the Centres themselves could take certain steps to improve linkages in their own interests and should follow the example of some of the older Centres which had shown the necessity of strong outreach programmes in order to ensure a payoff.

301. Mr. Yriart (FAO) shared and endorsed the views expressed by previous speakers but wished to make some points reflected by the experience of FAO. So far the problem of enhancing national research had been examined from the international point of view, that of the Centres and the co-sponsors of the Group. However FAO believed that although advances could be made by the international approach they would be necessarily limited, and would not come to grips with the problem until the initiative came from the developing countries.

302. Considerable pressure was now being felt from the developing countries for assistance in developing their own national research capabilities. Although the support of the governing bodies of FAO had readily been accorded to participation in the efforts of the Consultative Group they had also intimated very clearly that work in support of strengthening national research capabilities should have a special priority. In response to this mandate work was proceeding on a number of efforts, workshops, expert consultations etc. aimed at providing a suitable environment for the authorities concerned with agricultural research in the developing countries to indicate their priorities and their needs for assistance. It was clear that such assistance should be offered in strict accordance with the priorities arising from their own production and development plans. One role of FAO in this exercise would therefore be to indicate how existing international efforts could help to hasten the development of national capabilities.

303. Referring to the next FAO Conference which would focus on Agricultural Research, Mr. Yriart anticipated a considerable effort on the part of member nations to reach agreement on the combination of international and national resources and efforts. He was also authorized to say that the fact that the FAO Conference was to focus on research should mean the introduction into the next biennial Programme of Work and Budget of special resources and programmes that could serve as a follow-up to the Conference. He reiterated the willingness of FAO to initiate informal consultations with the TAC/CGIAR and the Centres regarding inputs both to the Conference and to further follow-up programmes.

304. From the donor point of view Mr. Evans saw something of a dilemma over support for national research. A successful research project, either at national or international level was capable of producing a very high payoff and consequently rated high economic justification. On the other hand research that did not pay off could lead to tremendous wastage of resources; this he felt might account for the observed falling-off in support. There was thus more importance than ever in using wisely and in a coordinated fashion for high priority research items, those resources which remained available. Donors had also often underestimated the importance of training and ensuring availability of adequate staff to carry out specific projects which they were supporting. He therefore supported the proposals made in the Bellagio VI report for better coordination and the need for appropriate meetings to achieve this coordination in respect of agreed priority problems. Donors had different guidelines and it seemed essential for these to be discussed between them. This might help to avoid instances of competition and duplication between donors and stimulate more support for national programmes.

305. Whilst recognizing the sovereign right of countries with respect to their priorities and the need for international efforts to align their core and outreach work to national needs, he also felt that in the identification of national priorities some special priority might be given to areas which could expect to benefit from the International Centres' work and which were relevant to the programmes of a centre.

306. Mr. Evans reiterated his earlier suggestion to the TAC/CGIAR that, as a first step to achieving more basic information and laying the foundation for better coordination, a tripartite meeting should be organized between the co-sponsors of the CGIAR-FAO, UNDP and the World Bank.

307. In closing he acknowledged the suggestion that the International Centres should be prepared to backstop national research, but warned against both overburdening them and transforming their function into one more of extension, than the long-term research which formed their basic mandates.

308. Confirming the need for better contacts between International Centres and national organizations, and developed and less-developed countries which had been highlighted at the Bellagio VI meeting, Dr. Bukar Shaib (Africa - Nigeria) explained the situation in Nigeria with respect to contacts with IITA. The Nigerian research organization was well developed and financed and of its eleven rather independent research institutes many were concerned with research into crops of interest to IITA. The directors of the institutes had however shown a considerable divergence in their attitudes towards IITA. Some welcomed the contacts available, and willingly cooperated in joint activities; others however viewed it as a possibly rival organization and eschewed contacts. It was interesting to note that proximity had not necessarily increased contacts, and often those institutes further away were the most interested. He believed therefore that some research was needed into the attitudes of senior national research personnel towards international centres and his Ministry had already initiated some enquiries into this question of cooperation.

309. Speaking generally he agreed that there was a great need for Governments and national administrations to be better informed on the activities of the International Centres, in order to engender the degree of confidence and mutual respect that was necessary for the development of cooperative programmes. Below the political level, at that of the senior scientists, there was also a need to ensure understanding. The scientists needed to be convinced that the International Centres were not competitors and in no way detracted from national efforts or diverted aid from their national programmes. He saw the need for considerable efforts by the Consultative Group to achieve these levels of understanding if full cooperation was to be attained.

310. In view of existing reductions in donor aid to national programmes he supported the need for the members of the Consultative Group to find new mechanisms for supporting national research, perhaps through the establishment of international cooperative programmes which would assist the developing countries, whilst at the same time involving them as partners. In this connection he referred to the programmes of WARDA, and the need to encourage both IITA and IRRI to greater efforts in support of those programmes.

311. Dr. Boon-Long (Asia - Thailand) supported the need for considerably more dialogue with governments aimed at convincing them of the value of research as an investment. He also referred to the loss of national scientists to administrative posts in order to achieve promotion and called for a more rational approach to staffing of national services. Supporting the need for better contacts with international centres he urged more bilateral assistance for training programmes at International Centres, foreseeing that the trainees would form an essential link in contacts on return to their home countries. There was also a need, he felt, for improving the quality of experts assigned to assistance projects in developing countries. Financial assistance could be improved, he maintained, by encouraging loan agencies to include assistance to national research programmes in their loan programmes.

312. Urging more systematic contacts and visits from International Centres to national organizations Dr. Casillas (IDB), referred to his recent findings in Central America in connection with the proposed IDB assistance to research in Latin America. He found that training needs were very relevant to the capacity of the International Centres and the Bank would be looking at those needs. Secondly it was proposed to establish some form of international exchange or rotation scheme for scientists, taking in the International Centres. As a parallel he foresaw the need also for better and more systematic exchange of germplasm.

313. Recognizing the importance of socio-economic studies in the transfer and exchange of technology, for which no blue-print existed, he informed members that the IDB would also be including such studies as an integral part of their programme. He pointed out however the difficulties which IDB had experienced in deciding priorities, in view of its various constraints on expenditure, and sought the assistance of the TAC in providing guidelines which would assist donors in the proper application of their resources to the strengthening of national institutions.

314. Mr. Diouf (WARDA) stressed the importance of improved information services in the light of the increased attention currently being given by governments to research. WARDA had so far been very fortunate itself but in its contacts with countries it had come to realize the dearth of information actually available on internationally sponsored efforts.

315. He also wished to highlight the language problem, especially with regard to the activities of the International Centres, and urged that attention should be given to this problem if the Centres were to achieve their objectives of providing effective assistance and support to the whole of the developing world. It was perhaps most important at the training level, the level at which transfer of knowledge began.

316. The Chairman thanked the speakers, commenting that the question of national research as a continuing item on the TAC Agenda could clearly be confirmed. New facets of the problem were constantly arising and he had taken note of the many useful comments made. The Co-sponsors of the Consultative Group would certainly be encouraged to meet, and in its subsequent discussion the Committee would bear in mind the expressed need for closer, if not more relationships, between Centres and national units. He would however observe the warning expressed against the Centres risking too much diversion from their basic research tasks.

317. On reopening discussion in closed session the Chairman drew attention again to the proposal for the Co-sponsors to meet, and to stimulate some additional action, and he would so remind them. He sought members' views on the proposals of various speakers for the development of guidelines for donors wishing to assist national research, particularly as to whether this should relate to linkages with international centres or to their own bilateral programmes.

318. As a means of ensuring a better understanding between donors Dr. Hopper urged the compilation of a listing of bilateral donor activities in support of national research. This had been attempted unsuccessfully in the past, but some donors had recently conveyed information on their projects to the TAC and he felt the time was ripe for a collation of all these in a standard form. He was supported by Dr. Sauger, always a firm exponent of research coordination and the establishment of networks, who also urged obtaining the

U.S. Academy of Sciences recent study on national research capabilities in Africa. This, and similar studies for other regions of the world, would provide an excellent basis for further deliberations which he felt should be continued at the February meeting of the Committee.

319. Dr. Sauger readily supported Mr. Evans' proposal for the donors to define their priorities and guidelines for support jointly, undelining the need for this to be done within a framework of expressed national needs and priorities. This should go a long way towards eliminating much of the ineffective aid given in the past and should alleviate frustrations on both sides. The level of achievement and efficiency expected by the international centres should also be considered, and assistance should be given to cooperating countries to meet the demands made of them to reach those levels. He emphasized the diversity between countries and regions in levels of development and fields of development within the overall framework, and proposed that plans for assistance should be regionalized to the fullest possible extent, rather than generalized, in order to meet widely ranging situations.

320. He expressed the wish that study of the Bellagio VI and other recommendations should take into account the result of past and ongoing research and current research capability at the national level, and should not overlook existing outside assistance.

321. The Chairman acknowledged and approved the proposal to obtain a study of bilateral donors relations with national bodies, and agreed that a more profound discussion of the Bellagio VI report should be made at the next meeting, with a view to formulating some proposals but bearing in mind the observation of Dr. Sauger regarding the lack of homogeneity on a global basis. In reply to a further intervention by Dr. Sauger regarding the validity of TAC itself constituting the apparently parallel body proposed at Bellagio, he reaffirmed that, although the mandate of TAC enabled it to discuss national research it was not empowered to accept proposals for financing such research. It could however formulate proposals for discussion by the donors comprising the Consultative Group and he believed this would be appropriate before any other body was considered.

322. Recognizing a parallel between the TAC's role in guiding international research expenditure and the current requirements for guiding expenditure on national research, Dr. Marcano observed that the same donors were included in each case. It would appear logical therefore for the Committee to accept an advisory role with respect to national research. It had already made some efforts in this direction, in the field of cooperative programmes, and it did not appear unreasonable to recommend strengthening of specific national endeavours in order to secure a worthwhile contribution to an international effort. Specific needs could probably be drawn out of meetings, such as that recently sponsored by FAO/UNDP/CIAT at Cali, and the International Centres could be expected to contribute other proposals.

323. Supporting the need for greater involvement of the International Centres in national programmes, Dr. Elgueta suggested that they could play a very considerable role in assisting bilateral donors in the formulation of proper policies for assistance at the national level, and in the establishment of adequate teams to conduct research projects. He believed it was incumbent on the donors to seek the best advice possible on means of avoiding past wastage and this probably existed in the International Centres.

324. Mr. Oram referred to the recently completed register of FAO's activities associated with research which included many projects sponsored by bilateral donors.

These donors had made their criteria for support quite clear, both in terms of priorities and conditions, and these could be made available to the Committee. He further suggested that as the Register was prepared on a project basis and was compatible with CARIS it might prove a suitable model for other donors, enabling a composite production to be prepared in due course in collaboration with the Consultative Group.

325. Dr. Camus confirmed the imminent issue of the U. S. Academy study which was being prepared in two languages. He reminded members that although no doubt much loss had been occasioned in the support of national research projects the continued introduction of men and money would probably continue to be the best way of improving national research capabilities for the next 4-5 or possibly 10 years. A research worker needed up to 7 years to become properly trained and he questioned whether this had been adequately understood by the International Centres in their training and other relations with national centres. In outreach the results were generally good and the programmes worked efficiently, but faced with national shortcomings the policy had been to put up what was necessary to enable the programme to continue. He supported Dr. Marcano's contention that the role of the Committee and the Centres might go further than it had to date. This topic could, he felt, usefully form part of the discussion at the next meeting, particularly as a series of new ventures were anticipated by ICRISAT, for which some guidance might be needed.

326. Following up on the above Dr. Ruttan expressed some concern which dated from his time as an international centre staff member. The process of a new institute attempting to establish its credibility placed the staff members in an unenviable position. The success of such a venture rested, he believed, on the closest reaction between the international and national personnel from the outset. It had to be acknowledged that most of the new knowledge relevant to the impact of the International Centres' work and output would come out of national centres and the International Centres would be instrumental in speeding up the use of that knowledge. It seemed therefore that some human sociology mechanism was required to overcome the problems of interactions between scientists. The network programmes, such as that proposed for beans, might go some way to overcoming the problem by ensuring a professional partnership basis.

327. The Chairman commented on the essential two-way relationship of the International Centres activities at the national level, which would enrich both partners. Many speakers' interventions had implied this relationship which he believed to be basic to the whole concept of such cooperation.

328. Supporting the need for further discussion in depth Dr. Bommer commented on some of the proposals of the Bellagio VI meeting. In particular the possible establishment of new international bodies to handle advisory work and to supply trained staff raised very interesting possibilities. He felt that the establishment of too many networks, although an excellent concept, could place an untoward strain on international organizations. He stressed his support for the need to stimulate governments to take a more pragmatic attitude to research, especially the maintenance of professional cadres, as so much donor assistance, for example in training, had been subsequently lost. If an international research staff cadre were to be established he could see benefits to be gained by assuring national researchers of a long-term career in their own countries through such an arrangement.

329. Dr. Pereira was disturbed by the suggestion that International Centres relied heavily on national research outputs which they then disseminated, feeling this to be something of a reversal of their true role. It was normally assumed that dissemination of results was a national responsibility and that the true role of the Centres was to produce results from a concentration of scientific knowledge and adequate facilities. Although a two-way relationship was essential he felt that the main concern of the international centres was the appropriate use of science and the resolution of bottlenecks in the application process.

330. Welcoming the decision to discuss the problem more fully at the next meeting, Dr. Swaminathan commented on the need for clear answers which would, in the short term, help establish the role of the international centres. The problems were not only scientific but clearly human and personal as well, some rational and some irrational. There were two aspects of the problems which the Committee needed to approach: the strengthening of national research in relation to countries' own agro-ecological and socio-economic situations, and the complementary working relations between national and international organizations.

331. In the latter connection he had repeatedly for example stressed the advisability of international centres issuing unnamed rather than named varieties of improved crop plants. This gave some opportunity for national efforts in adaptability etc. to achieve some recognition. He agreed with Dr. Sauger on due recognition being given to variability in national requirements and the careful selection of projects for support, after consultation with countries themselves, to avoid any suggestion of imposition by outside agencies of projects which might not necessarily be relevant to national needs.

332. Also supporting the need for further discussion Dr. Muriithi doubted the possibility of reaching early decisions on this subject, in view of the complexity of questions raised by various speakers. Regarding loss of valuable research personnel to other duties he did not believe this stemmed from deliberate government policies to discriminate against research, but resulted rather from expediency in the use of professional personnel. Recognizing the usefulness of International Centres' outreach programmes as a means of stimulating national programmes, he reiterated his conviction of the need to concentrate on training, in order to make national inputs meaningful and real strengthening possible. Ways must then be found to improve incentives for the research worker in order to avoid the 'brain drain'.

333. Summing up the discussion the Chairman expressed his surprise and pleasure at its wide-ranging nature and the number of constructive suggestions made. He welcomed the fact that the Committee had concluded its business on several substantive items and should therefore have time in future to devote to more general but fundamental questions such as this. The question needed to be approached both intellectually and practically - seeking solutions for real problems, even those more concerned with human attitudes and reactions than technical matters. He would urge a meeting of the Co-sponsors and would ask the Secretariat to collate available and pertinent documentation. An approach would also be made to the Consultative Group Secretariat to initiate, in collaboration with the World Bank and FAO, the compilation of data on bilateral assistance activities and relationships with national research programmes.

Socio-economic research. Report of the TAC Sub-Committee on the World Food Policy Institute proposal. (Agenda Item 12)

334. The Chairman informed the Committee that he had invited representatives of FAO, as well as the other principals to this proposal, so that questions of relationships with FAO and other relevant organizations could be raised and clarified prior to their consideration of the Sub-Committee's report in closed session. He asked Dr. Hopper to introduce the subject.
335. Dr. Hopper explained that the Committee had met in Washington on 3rd May under Sir John's chairmanship, with himself, Dr. Ruttan, and Mr. Oram as members. Prior to going into executive session it had the benefit of the latest thinking of Mr. O.V. Wells on what he would for the time being refer to as a World Food Policy Institute.
336. The Sub-Committee gave unanimous support to the proposal to establish a new Institute, which would have as its mandate the general study of global socio-economic problems affecting world agriculture, but recommended that its role be circumscribed primarily to research and related activities concerned with the major issues affecting food production, utilisation, and trade.
337. Referring to the functions which the Sub-Committee considered as potentially important to the proposed Institute, he stressed that these were suggested without prejudice to the decisions of the Board of Trustees or Policy Body of such an organization. Basically the Sub-Committee felt that the Institute should have a small core staff who would keep the current food and agricultural situation under an independent surveillance. This would be a main responsibility unique to the Institute. It would not be collecting original data for this but would use the intelligence network of the Food and Agricultural Organization and other sources, such as the World Bank, USDA and other appropriate bodies that produced or gathered information with regard to agriculture.
338. The Sub-Committee had given careful consideration to the problems of collection of statistics but felt that this was more properly a function for the Food and Agricultural Organization rather than the Institute, and its recommendation in this respect was in keeping with the proposals of Mr. Wells. The Sub-Committee felt that the gathering of short-term agricultural intelligence and the issuance of short-term intelligence reports was also properly the function of FAO and it therefore welcomed the recent moves of the Organization to strengthen this work as part of its regular programme.
339. The Institute's staff would be enjoined to examine selected major problems, especially those which involved relationship between and among countries, but it would not be prevented from investigating those arising within countries, where they were likely to have an important bearing on world food and feed production and utilisation over the longer term. Stress was laid on the need for the Institute to be concerned with the national public policy implications of the results which were emerging from the collective network of international agricultural research centres (for example for increasing productivity, for production input requirements, the need for better irrigation, and so on); and conversely the effects on the technology developed by those Institutes of external factors such as global shortages or high costs of fertilizers and pesticides.
340. The Institute would also have an important information role, and would have to have a fairly strong information component for the dissemination of its findings and its results.

It was envisaged that it would produce two publications annually. One would be an annual World Agricultural Policy Review which would be related to an annual outlook for food and agriculture. The Policy Review would review significant changes that were occurring within the countries of the world, particularly the developing countries, as they sought to promote agricultural development. The annual outlook for food and agriculture would be an examination of the likely impact of these policies on the longer term development of agriculture and the longer term production and availability of food and feed supplies.

341. The Institute would have only a limited training role, probably involving mainly graduate level research associates, plus a few fellowships available for in-house research activities. It would sponsor workshops and seminars bringing people together to discuss given problems in the agricultural area but it was not foreseen that it would have a major training responsibility similar to that carried on at the other International Institutions.

342. In general, it was felt that the personnel of the Institute should probably consist of a core staff of five or six with support staff, and that there might be as many as six to ten fellows in residence at any particular time at the Institute, but not on its permanent payroll.

343. They had had a substantial discussion of the organization of the Institute and its operational linkages. He believed that the preference of the Sub-Committee was for the Institute to be located in Rome, and that it should develop working arrangements with the Food and Agriculture Organization that would allow it to operate in association with that organization.

344. At the same time it was considered of paramount importance to maintain the independence and flexibility of the Institute; and its association with FAO would be dependent upon some careful negotiations with the world organization to assure the autonomy of the Institute. It was felt that the Institute would and must have an independent Board of Trustees, which would establish its policy activities. FAO would certainly be represented on this Board but the Board should have the power to make staff appointments and to conduct the affairs of the Institute in the same manner and with the same freedom as the Boards of Trustees of other international research institutes.

345. He stressed, however, that if that autonomy could be assured - it was the opinion of the Sub-Committee that there would be very many advantages in some sort of an associateship with the Food and Agriculture Organization. The TAC would find in the report before them some additional information supplied by Mr. Oram, concerning which they had been uncertain at the time of their meeting, setting out the Articles of FAO's Constitution, which described the kinds of association which might be formed between FAO and an Institute of the type they were discussing.

346. The Budget estimate for the Institute, based for convenience on FAO's standard costs, started at around \$ 750, 000 per annum, rising to the order of about a million dollars in the future. It was not foreseen that there would be substantial capital costs, but a fee for servicing arrangements with FAO was anticipated in the costings.

347. It was hoped that the Institute would be able to gain access not only to the data bank at the Food and Agriculture Organization, but also to its libraries and to the use of its computing facilities. This would be paid for by the Institute in agreement with FAO. The Sub-Committee had also foreseen a fairly close collaboration between the Institute's staff and appropriate members of FAO's staff, perhaps a series of honorary joint appointments,

and certainly joint associations with the work of the economic analysis group at FAO. Seminars would inevitably be joint affairs with invitation to each group.

348. As the proposal now stood, therefore, the Sub-Committee endorsed the principle of establishing an Institute with appropriate authority and autonomy to undertake the tasks he had outlined, and its preference would be for some associated link with FAO, and for it to be located in Rome. However running through the Sub-Committee's discussion was the feeling that should assurances of the autonomy of the Institute be difficult for FAO to provide under its constitution, or should other difficulties arise which made an association with FAO or a Rome location difficult if not impossible, then the importance of the Institute's mission was such that the implementing Committee should seek other arrangements to ensure its establishment on whatever basis appeared most feasible and most reasonable.

349. The Chairman reminded the Committee that, as clearly stated in Mr. Oram's covering note, the details concerning the legal aspects of a possible relationship with FAO were added afterwards at the Sub-Committee's request for the advice of the Committee and were therefore not strictly part of its report. The subject that they were now discussing arose as part of their general consideration of socio-economic research, and they had recognized it as a particular question requiring separate examination and advice to the Consultative Group from that of the socio-economic research work of the International Centres. With this as background he requested Mr. Yriart, Assistant Director-General of FAO, to inform the Committee of FAO's views on the proposal.

350. Mr. Yriart assured the TAC that the Director-General of FAO had taken the utmost interest in this subject, and would be happy if FAO could be useful not only in making available any information it had to the proposed Institute; but also in lending its constitutional capacity to help establish it.

351. In respect of assuring the independence of such an Institute, he believed that FAO could come to a legal arrangement whereby this would be possible. FAO had, in fact, been looking into this matter in connection with the development research institute it had been considering setting up; as one of the questions to be answered by a working party of which Dr. Bhattacharjee, Director of FAO's Economic and Social Policy Division was convenor. Dr. Bhattacharjee would be able to advise the TAC further on matters of detail if required.

352. However, FAO had a certain mandate from its member nations, and a constitution; and in order to enable it to be associated or to permit the use of its legal capacity to establish such an Institute it had to think of its mandate, and the analysis that its governing bodies would make of whatever tie or association was arrived at with other parties. In this connection he wished to refer to two instances of points which required clarification and concerning which the Director-General had written to the Chairman. For example in the function of the Institute in paragraph 20 a) research - the Sub-Committee report suggested three main tasks. The first task listed was "to keep the current global food and agricultural situation under independent surveillance" - and as far as FAO understood the proposal this would directly overlap with one of its own main tasks, and one for which the last Conference had endowed FAO with resources to strengthen this function.

353. As far as the information activities proposed were concerned the two publications, an annual World Agricultural Policy Review and an annual Outlook on Food and Agriculture - (especially the latter) seemed very likely to duplicate FAO's State of Food and Agriculture.

354. Before he could indicate more definitely to TAC what sort of an association FAO could envisage with such an Institute, he therefore sought clarification of what was intended by the surveillance function and what the scope of the Outlook on Food and Agriculture publication would be.

355. In reply to questions from the Chairman and members as to how FAO felt that there might be avoidable duplication between its activities and those proposed for the new Institute, Dr. Bhattacharjee explained that FAO had itself been considering the establishment of a Development Research Centre. In its thinking on this matter it had been influenced by the TAC's review of the field of socio-economic research, and the gaps identified at the policy level, and FAO had been seeking how best to cover some of these. The conclusion they had come to was that there was a need for some research set-up, the purpose of whose programme would be to influence policies through directing studies towards the decision makers, planners and administrators on the one hand, and secondly through better information of the public as well as the research and analytical people concerned at the various organizations. They saw a need to restrict its efforts to research related to development policy rather than the much more general field of socio-economic research, but were not thinking solely in terms of food but rather of agricultural development. Even here, however, the research would clearly have to be focussed on priority areas of urgent concern, and he saw no great differences of opinion if it was established having as its initial programme priority the area of food production, consumption, trade, and related issues such as prices.

356. FAO saw the main focus of its proposed Development Centre as being on inter-country and inter-regional problems at three levels. The first was that of global crises such as that of energy; the second related to development issues on which there were large areas of uncertainty and which had a bearing on the activities and policies of international agencies, such as the anatomy of poverty, malnutrition and food consumption, trade and payments etc.; the third concerned the improvement of research methodology - for example in the formulation of the priorities for research.

357. Consideration had been given to whether analysis of the current food and agricultural situation should be a major focus of this Centre. However, this fell naturally under FAO's charter and mandate, and was something on which its activities were currently being improved and intensified. A comprehensive fertilizer information scheme had just been approved by the Council, an early warning system on food shortages was now in operation, and a new quarterly bulletin on the food outlook and food situation had been instituted covering production, prices, trade, stocks and current changes. A crop outlook forecasting system was being worked out. Given all these expanding activities it was not felt that the current situation and its analysis should be a task for the FAO Development Centre; this was an intelligence gathering and information public relations exercise more than a research job, and there were a number of more urgent and genuine research priorities it could tackle - some of which corresponded to those indicated by the Sub-Committee for the World Food Policy Institute.

358. For this reason FAO (as indicated by Mr. Yriart), would also have difficulty in reconciling the surveillance function proposed for the World Food Policy Institute, which again was essentially a matter of monitoring and current information gathering, with the Institute having a major role in research. If it were to place its major emphasis on short-term surveillance it would certainly involve considerable overlapping with FAO's mandate in this field, and to the extent that it drew on other sources for its information and

published conclusions which conflicted with those of FAO, could possibly be a source of embarrassment to the Director-General if the Institute were under its sponsorship or umbrella.

359. In other respects FAO's thinking was close to that expressed in the TAC Sub-Committee's report. FAO agreed that there should be no major training functions. It felt that there should be concentration on workshops and seminars etc., and a strong emphasis on public information; not an annual "state of food and agriculture" but certainly an annual bulletin or review in which the results of its main research could be brought out, with a changing focus according to current problems. If it was associated with FAO the Institute could use the forum of FAO's annual meetings of government representatives, in addition to special meetings where some of its main research results could be discussed at an equally high level, but which Government or other senior officials could attend in an individual capacity. FAO were also not thinking of a very large staff establishment for the Institute, but of starting modestly and building up over time depending on whatever support was available.

360. The Chairman said that he could understand FAO's concern over the reference to an Annual Outlook on Food and Agriculture in the Sub-Committee's report, and believed that this could be removed quite simply by talking about an Annual Publication by the Institute. On the question of "surveillance" he thought there was some ambiguity which again could be removed by changes in wording. He saw every need for FAO to continue publishing as much as possible, because that data had to be used by all people who wanted to analyse the agricultural problems of the world. He doubted, however, if FAO was fully as free to undertake the analysis itself if this required it to be somewhat critical of the policies of various partners. It might well happen, for example, that the data emerging from the early warning system or other forms of intelligence might be interpreted as conveying certain problems and this needed analysis by a group of people who had the same freedom as agricultural research workers anywhere to publicise their own analysis. He suggested, therefore, that "surveillance" be changed to "analysis and review", with the word "current" being dropped.

361. The Sub-Committee had felt strongly that a process of continuous review and analysis was needed of factors affecting World Food Policy, drawing on the most up-to-date information from FAO, from individual staff members, from associations with international centres, and from contacts in various countries. It considered that an independent World Food Policy Institute could play a valuable role in undertaking and publicizing the results of this analysis, but that it should not act as an original data collecting body for this aspect of its research. The TAC had consistently agreed that this was an important and essential function of FAO, the recent critical world food situation had only made it the more imperative to improve performance. He therefore saw no potential or actual dispute in that area. In view of the fact that the Sub-Committee had drawn heavily on Mr. Wells report in considering this aspect of the World Food Policy problem, and this report had been commissioned by the Ford Foundation, he called on Dr. Hardin for comment.

362. Dr. Hardin expressed reservations about the ability of a small group of the type proposed for the Institute to accomplish the many things indicated in the Sub-Committee's report.

363. He informed the TAC that the Foundation had attempted to survey leaders in many developing nations by personal letter concerning the value to them of an Institute with some of the functions suggested, and generally it appeared that (although not always entirely certain

what the benefits would be), they would definitely like to have those services available to them. They felt that the industrialized nations could pay for or acquire intelligence and related analysis which was more difficult for them to come by. They believed that the industrialized nations would continue to be better in their analysis of the outlook and the taking of quick and responsive action than they, but that an organization such as this might help them close the gap. However, they had also stressed that if this kind of an organization was to be created it should not duplicate what was being done by agencies like FAO, USDA, etc.; and that if it competed for funding with existing institutes or international consortiums as they called it, they would rather see it funded outside the consortium. In other words they did not see this as something that ought to compete too much with the funds required for existing production-oriented centres, but rather as an added component. There was considerable support for the idea that the new Institute should develop an internship programme; not a massive training effort, but one which would gradually enable planners in developing countries to build up a special organic relationship with the Institute and to participate in its processes.

364. The strength of the responses from regions and nations could be graded, just about as one would predict from the severity of their food problems, but there was a definite demand for something more to be done in this field, and the sample suggested that countries would like to see the Consultative Group be instrumental in getting this launched. An important question which the TAC would have to decide was whether any organization already existed which could perform the sort of functions envisaged, or whether FAO would be able to do it in the future if they could put in motion the plans reported to TAC. He believed, even so, that there were merits in having any set of conclusions debated in open forum by others who had independently looked at the data and come up with their own analysis; so that the potential users could decide which of the components of the analyses they wished to use as a basis for their policy and action decisions.

365. Commenting on the proposal at the request of the Chairman, Dr. Pino explained that the Rockefeller Foundation had collaborated closely with the Ford Foundation and others in their analysis of this problem, and in their own work had found the need for machinery which could respond quickly to the changing situation which existed today in the world. He was pleased to hear that the FAO was gearing itself up to take on a broader responsibility and to enable it react more quickly to emergency situations; but he was not worried about competition from an additional institution which might be developed with a complementary role, particularly if it was able to respond flexibly, quickly and authoritatively, and, more importantly, apolitically to emerging problems. By this he did not mean that it would not expound on questions which might have political implications but at least it would not be impeded in its ability to do this. The task was an enormous one just as the task of technical research was enormous; and just as when the first International Research Institute was established there existed many other agencies conducting similar kinds of research, he saw nothing wrong with some degree of duplication in focussing on the socio-economic problems of future development. However, he doubted the wisdom of looking for a safe umbrella for the proposed Institute, this might well neutralize it. No matter how it was associated it must be able to function completely authoritatively, independently, and rapidly in response to new situations, and unless this freedom could be assured it would have little appeal to his organization.

366. In reply to requests from Dr. Ruttan for clarification from the FAO representatives as to whether FAO intended itself to go ahead and establish an autonomous institute with the kind of flexibility indicated by the TAC, or whether it would welcome the establishment of

of such an institute with external support in cooperation with FAO; Mr. Yriart informed the Committee that either course was open to consideration if constitutional problems of overlapping or duplication could be removed. FAO was already expanding its activities on food monitoring, for which it had the resources. It was examining the possibility of going ahead itself with a Development Research Centre with a rather wider mandate than food policy; however it did not at present have an assurance of financial resources for this.

367. The Chairman pointed out that as he read the Director-General's letter to him, he could only interpret FAO's position as being in line with the second of Dr. Ruttan's postulates. Para. 2 of the letter read:

"While we would certainly welcome the establishment of such an autonomous research institute in appropriate association with FAO you will realize that it might be difficult to present a case for such an association to our Conference and Council if it did involve any substantial duplication of work for which funds have been provided by FAO".

He had therefore taken the issue to be the sense of duplication that the Sub-Committee's report had apparently conveyed to FAO; and received confirmation from Mr. Yriart that this interpretation was correct.

368. Dr. Ruttan suggested that a three-level framework might be needed for research in the policy and socio-economic fields related to agriculture. First he visualized a small institute or centre of the type they were now considering. Clearly there was an additional global level of activity demanding much greater resources, dealing with the kind of longer run indicative planning work that requires and builds upon the construction of rather sophisticated statistical models and the development of the relevant data. He viewed this as a second level at which work was needed, and perhaps only FAO would be capable of tackling it. Finally he foresaw a third level of activity that would link the microeconomic studies going on at the institutes and at national centres, and that was directed towards improving the efficiency of agricultural production and marketing. The problem facing TAC seemed to lie in deciding where and how best these several things could be linked together.

369. Dr. Swaminathan believed that there was an urgent need for the kind of institute envisaged. Referring to FAO's warning that a serious situation was developing in relation to availability of pesticides, and inter alia to the need for better information on pesticide supply and demand he argued that in addition to intelligence, analysis was needed to indicate the kind of options and strategies open to developing countries in a situation of scarcity, as a guideline to their policy actions. There was a similar need for looking at the implications of global weather studies and to devise alternative cropping systems to suit different weather models. There were many published reports circulating produced by different agencies, but few of them went far beyond the stage of intelligence to analysis aimed at trying to develop ideas for advance action on behalf of countries which lacked adequate mechanisms of analysis and interpretation. He saw considerable merit in an Institute able to undertake concrete analyses of this type, but seriously doubted whether the staffing pattern proposed by the Sub-Committee would be adequate to the task.

370. Dr. Pereira expressed reservations about the value of generalized models in fields such as weather studies to planning cropping strategies at the farm level; but agreed that the kind of work envisaged within the framework of the proposal before the Committee was needed, and would be useful to developing countries.

371. Dr. Sauger pointed out that in his own Institute there was now an urgent need for a framework of macro-economic studies within which to fit the results of their micro-economic research, so as to improve the efficiency of the national agriculture. He therefore also saw a need for the type of work proposed by the Sub-Committee. Nevertheless many bodies were already carrying out studies of this kind - FAO, the World Bank, UNDP, Foundations and bilateral development institutes - and he wondered whether it might not be better and cheaper to try and develop this extensive network more efficiently, perhaps on a task sharing basis, through a coordinating body, rather than trying to establish a new institute which might be located in an environment remote from the areas under study.

372. Dr. Hopper, arguing from Dr. Swaminathan's analogies, was not too worried by the small size of the staff proposed for the Institute, because he felt that to explore the pesticides issue further required mainly one or two knowledgeable people, who could on the one hand tap the technological base of the industry to ascertain the gravity and possible duration of the shortage, and determine the products most likely to be in short supply; and on the other hand contact the technical organizations and research institutes which were involved in the use of these materials, and discuss what the implications were likely to be for their research policies and national production policies. One of the reasons why he had argued so strongly for a close association between the Institute and FAO was that it would afford it access to interaction with the best technical staff assembled in the broad field of agriculture in the world. An informal interaction of this nature between the two organizations should yield handsome dividends.

373. Referring to Dr. Sauger's comments, the Chairman said that he did not really think their viewpoints were too far apart. He agreed that a great many reports, both published and unpublished, were available in the World Bank, FAO, UNDP, ILO and other agencies. These contained a wealth of information on agricultural systems, supply problems, employment, national aspirations and objectives; and their implications and lessons for national and wider agricultural and economic development cried out for analysis.

374. However, while he would like to see a coordinated attempt to use this material as a basis for authoritative comment on critical issues his experience of coordinating committees was not encouraging. He would prefer to see an autonomous group with access to all this information, able to collaborate with the agencies responsible for its production, as well as with industrial or other bodies, to get to the roots of global problems such as the threatened pesticide shortage, and work out with them appropriate solutions. This was not duplication of past work, but rather re-examination in a systematic fashion of valuable material which might otherwise remain on shelves, in order to get more mileage out of it.

375. He had been wrestling with the problem of how best to do this for some years, and had originally been against a single institute attempting it. But as he had become more involved with the analyses and policy decisions being made by important development agencies the more he had felt the need for in-depth analysis of certain macro-economic problems on a scale which was not now available. For this reason he had become strongly wedded to the notion of some independent capability to deal with these problems, and he believed that this would be of value both to the major world institutions and to national governments.

376. He foresaw that any institute established to undertake such a task would have to develop means of ensuring that its output received wide attention; for example by discussing its conclusions with the Council of FAO, or the Board of the World Bank, as well as with individual countries. If it could create this base of dialogue, and its work was good it would soon earn such a reputation and authority that people would be anxious to seek its opinions.

377. Mr. Yriart informed the Committee that within the past few months FAO had greatly expanded and deepened its analysis and information of fertilizer and pesticide supply problems, and had discussed these in emergency session of Council. It had set up a special office with both an information gathering and an operational role on fertilizers, attempting to reconcile demand and supply for the worst hit countries. In response to the Sahelian emergency a significant structural change had occurred within the Organization. Without denying the need for the kind of institute the TAC was now considering, he wished to emphasize that FAO could be very flexible when necessary and he was not sure that its ability to respond to crises or its recent actions in this respect were sufficiently known outside the Organization.

378. He appreciated the Committee's clarifications and had no problems in accepting that there were great issues which needed to be better reviewed and analyzed for the benefit of policy-makers, and for which FAO could be one of the major sources of factual information. He was, however, somewhat concerned at labelling the proposed Institute a policy institute. Policies were made by governments and he felt that the Institute might more appropriately be called a policy research institute.

379. The other point concerning which he again had to express FAO's reservations concerned the publications which appeared to duplicate its work. This could make it difficult to convince its governing bodies to participate, and if the TAC accepted that an association between the Institute and FAO was virtually essential, then it was important to be able to sit down with FAO and set up the Institute in a manner which would enable the Organization to contribute to it most effectively, as well as devising a mechanism which would not only give the Institute the necessary freedom but be palatable to FAO's governing bodies.

380. The Chairman agreed that it would be wise to include the word 'research' in the Institute's title, because that was its objective. He also assured Mr. Yriart that he would draw attention fairly to the concerns expressed about relationships with FAO in the Director-General's letter, and to the TAC's view on the matter. He thanked the organizations who had participated in the discussions, prior to proceeding to closed session.

381. Introducing the closed session he indicated certain questions the Committee should answer. The Sub-Committee report carried an implication of the desirability of a close working relationship with FAO, but it also stressed that the price for this should not be the impairment of the Institute's independence and ability to make and publish its own analysis. They had been informed that the Director-General of FAO welcomed the proposal to establish the Institute provided matters of duplication could be avoided. He was personally convinced that the institute would not succeed unless it had the advantage of access to the reports and assessments of operational agencies such as FAO and the World Bank, so there might be some dilemma here.

382. However, if the TAC accepted that the Sub-Committee's report could be amended on the points of sensitivity in such relationships, he wished members to make it clear

whether they endorsed the purpose and functions of the Institute as set out in the report, and if it endorsed the need for complete autonomy and independence in its operation.

383. Finally he reminded them that it was for the Consultative Group to decide if they supported the Institute, in principle, and if so whether they wanted it financed inside or outside the Group. The TAC should therefore include this operation in its general judgement on priority questions. He asked Dr. Hopper to speak further on the subject in the light of the previous day's discussions.

384. Dr. Hopper suggested two changes in the text of the Sub-Committee's report to take FAO's concerns into account. The first was in paragraph 20 dealing with the functions of the Institute, under sub-item (i). Here he proposed deleting the word 'current', and substituting "continuous review and analysis" for "surveillance". This sub-item would then read "To keep the global food and agricultural situation under continuous independent review and analysis". The second, (and he believed very significant change), which he proposed was in para. 25 concerning publications. He agreed that the heading of sub-para (2) "An annual outlook on Food and Agriculture" seemed to imply elements of duplication with FAO's annual publication on the 'State of Food and Agriculture'. This impression could be avoided quite simply by dropping these words, and linking the last sentence of sub-para (1) with the last part of the first sentence of sub-para (2) to read as follows: "This would be, inter alia, an attempt to define likely trouble spots related to food supply, input availability etc.; related to a longer term time horizon and a broader perspective. It would incorporate and draw conclusions from special studies of the Institute, as well as from analysis and critical appraisal of other relevant research etc." The Institute would thus have only one annual publication, and the opening sentence of para. 25 should also be amended accordingly.

385. In reply to a question from the Chairman he also agreed that the Institute should have "research" incorporated into its title, although "World Food Policy Research Institute" might make an impossible acronym !

386. Reverting to the suggestion by Mr. Wells and the Sub-Committee that the Institute of Strategic Studies might be considered as a model for the World Food Policy Research Institute, Dr. Pereira questioned whether the ISS would have achieved its success and reputation if it had been too closely under the wing of FAO. He recognized the need for an institute which seemed to have a very small team for a very big job to have the fullest access to fact gathering and data analysis machinery, and if a close association with FAO was essential he hoped that it could be established in Rome as an independent entity, but with a clear arrangement for access to FAO's files and data. A possible alternative might be to attach the institute to the World Bank, and he asked whether this had been considered by the Sub-Committee since it was not discussed in its report.

387. The Chairman replied that he understood that given goodwill on both sides a suitable arrangement could be negotiated with FAO; the Sub-Committee had not seriously discussed the Bank as it had felt that perhaps the Institute's functions were nearer those of FAO. He sought confirmation from Dr. Hopper on this point.

388. Dr. Hopper informed the Committee that the idea of establishing an Institute with the kind of tasks outlined in the Sub-Committee's report had its roots in the concern felt for some time by the Ford Foundation and others that many countries had difficulties in coming to grips with the policy issues raised by new technologies, shifting world market situations, and changes in domestic demand. The idea had been shelved not so much because of a lack

of need but because of uncertainties of how to set about it. Events in the past two years had made the creation of this kind of analytical base more urgent, and he believed it fitted logically into the TAC's concern for reinforcement of socio-economic research related to agriculture.

389. Subsequent to the 1973 Washington Seminar on this subject, exploratory talks had been held between the Foundations and certain governments, which revealed considerable support for the idea of an institute, but reservations about their involvement as governments until it was well established and had earned world respect, because of the delicate issues on which it would be working. Some governments had argued that this was a function of FAO. While he agreed that in theory this should be the case, FAO had to serve its member nations, and it was likely to prove difficult for FAO to provide independent leadership in terms of the policies that those countries might follow when it was also in the position of a servant to them. OECD had faced similar problems with its member countries in the work of its Development Centre, for example on the use of the special drawing rights of the IMF for financing development activities. He believed that FAO would find itself in a similar position with any institute it established.

390. For these reasons the Ford and Rockefeller Foundations and the IDRC were willing to finance the Institute up to the annual recurrent expenditure level of around a million dollars envisaged by the Sub-Committee, for the period of its first five years activities. They would like to be able to do this through their membership of the Consultative Group; and if this did not prove possible they would have to reassess their assistance to the Institute which might still be created but perhaps on a different basis.

391. The reason they would prefer to channel support through the Consultative Group was that the institution could be considered as a risky venture initially, although the Foundations believed that it could be a success given the proper conditions, and provided highly competent staff could be identified. The latter would not be easy, but it would obviously be less difficult if reasonable continuity of financing could be foreseen for the Institute.

392. While the Foundations felt that one of their functions was to underwrite risky but worthwhile activities they would prefer not to have to sustain their long-term financing; and if the Institute had proved its value after five years they would like to be able to seek from government and other member organizations of the Consultative Group the continued financial support necessary to attract good staff.

393. As far as the location of the proposed Institute was concerned he understood that the Ford Foundation was not greatly enamoured with Rome. They feared a long-drawn out negotiation with the government before it could be established as an autonomous foundation under Article XV of FAO's Constitution. They were dubious about the ability of such an institution to escape from the U.N. bureaucratic rules; to have the last word on the appointment of staff; and to pay the high salaries required to attract really outstanding people - especially the Director - without being bound by FAO's grades and categories. While recognizing the benefits of a close link with FAO, the recent experience of certain of the Foundation's staff of working in Rome as part of the World Food Conference effort had reinforced these doubts, which were compounded by the difficulties of mail, telephones, and the whole structure of national services which were so critical to the smooth functioning of any international organization.

394. They had therefore been discussing alternative locations, and the first to come to mind was Washington; but independent of the World Bank or the Consultative Group secretariat as were the other international institutes. Washington not only had the advantage of access to the staff of the World Bank, IMF, IDB, OAS, and thus to a diverse group of people involved in world-wide agricultural and economic development activities, but also to the very large data banks of the World Bank and the USDA and its network of reporting units. The administrator in charge of the USDA's economic activities had indicated that he would welcome the location of the Institute in Washington, and in so far as was consonant with security regulations would make his material available to it.

395. Some concern had been expressed over the connotations of capitalist agriculture which might attach to an Institute based in Washington. However, the three present sponsors nevertheless felt that if it could be established with the concurrence of the Consultative Group but independent of the Bank or the individual Consultative Group sponsors in the same sense as the other international institutions, Washington would be their first choice for a location as an alternative to Rome.

396. Their second preference would be Geneva, where there would soon be a large UN data bank installation through the Inter-Organization Board with co-axial linkages to all the UN computers, including that of FAO. A location in a Scandinavian country had also been suggested as a geographically convenient solution to some of the other problems he had mentioned.

397. Of course any location involving an autonomous institute for which international privileges were sought would entail reaching an agreement with the government concerned; and while this might be relatively easy in Switzerland he believed it might be difficult to obtain full international privileges in Washington unless the Institute were under the wing of the World Bank. However, given the circumstances in the United States it was conceivable that such privileges might not be essential.

398. In conclusion he strongly endorsed the need for such an organization. He agreed with the functions proposed, and emphasized the need for its independence. If it could function broadly in the field of world food policy research, with direct contacts with international and national research centres and scholars, and if its Board were able to bring it to focus narrowly and continuously on the critical issues which were foremost in holding back world food production, he believed that it could perform a really useful function. The question of its location and associations with the various U. N. bodies was something that should be open to discussion.

399. In subsequent discussion the TAC endorsed the proposal. However, it was agreed to delete the second sentence of para. 13 in the draft TAC resolution, since it contained references to funding arrangements which members felt were the prerogative of the Consultative Group.

Review Procedures (Agenda Item 15)

400. The Chairman gave members an opportunity to express some preliminary comments before meeting with Centres' Directors to discuss this item. In opening discussion he expressed his growing unease over what appeared to be inflexible and bureaucratic procedures being developed in respect of the annual review of Centres' programmes and would like to develop, say a triennial system of budgetary review, placing some emphasis on long-term programmes with guaranteed continuing financing. This would preclude to some extent the current short-term notice of programmes and changes proposed to the TAC and would give directors much more freedom of action. This apart the TAC had decided on quinquennial scientific reviews and the Secretariat had produced a background paper, in no way binding, outlining possible procedures. This document had been shared with the Centres' Directors and he was hopeful that, following discussion with the Directors, common ground would be found for proceeding with a programme of reviews.

401. Mr. Oram outlined the main points of the Secretariat document stressing that it had been prepared with a view to causing the least possible disturbance to Centres' Directors and Boards - foreseeing wherever possible the combination of TAC reviews with other reviews planned by donors or the CGIAR. Suggestions had also been made for combining major reviews with the ad-hoc programme change reviews, when an opportunity was offered. Questions were raised on the procedures for conduct of the reviews, starting with the need for background information from the Centres - what sort, how far in advance etc. in order to provide review missions with adequate early briefing. The paper also raised the question of composition of review missions and the need for a well advanced schedule to obtain the calibre of people required for up to a month at a time. Some outline terms of reference had been indicated, suggesting questions to be asked, including problems of evaluation of impact, in the short time available. The question of contacts with Centres and reporting to the Committee was raised, including procedures for discussion of reports with Centres' Directors and Boards prior to finalization. A possible schedule and timetable had been outlined, based to some extent on the age of Centres and questions already raised on their programmes, and finally some proposals were made for ad-hoc programme change reviews. In closing Mr. Oram stressed the need for an early start to be made on compilation of a list of possible participants in reviews.

402. The Chairman recognized the modest programme suggested for 1975 and hoped that CIAT would be willing to accept a mission then. He reiterated that there was nothing binding on members in the background paper and that he anticipated a full and free discussion with Centres' Directors.

403. Several members expressed concern at the suggestion that review missions should be composed in the main of consultants, often with little continuing interest in, or background knowledge of, the Centre to be reviewed.

404. Dr. Swaminathan felt that a decision should first be taken on what was the basic purpose of reviews and the membership of the missions adjusted accordingly. He pointed out that most of the Centres already had much of the best technical expertise in the world on their own programmes, or at least participating in their internal annual programme reviews, and he could see little benefit to be gained by duplicating this type of activity. There were many problems which could legitimately form the subject of TAC reviews and one which had been in the forefront of many recent discussions was the question of linkages and working relationships between Centres themselves and national services. Dr. Pereira

agreeing with Dr. Swaminathan, was very firmly of the opinion that reviews should be conducted to the fullest extent possible by TAC members themselves, augmented where necessary by particular expertise, at the level of world authority, when there were specific technical problems to be sorted out. The most essential need was to present a team which could be respected by the International Centres and to this end he noted the need for TAC to bear very firmly in mind that its own membership should continue to consist of people who were respected in the scientific world.

405. The Chairman took the point made that high level technical reviews were already under way as a regular feature at the International Centres but he could not escape the fact that the Consultative Group had charged the TAC as an independent group with what might be described as a "watchdog" function with respect to the scientific value of the Centres programmes. It was not essential for the question to be resolved at this meeting and, if members wished, he would be perfectly prepared to make provision for further discussion at the next meeting of the Committee. He would point out to members however that, if they accepted the contention that review missions should in the main consist of members, then members must expect to have to double the amount of time they gave to TAC in any one year in the light of the rather loaded schedule of review missions. Some members had already indicated that this might raise difficulties which could only be overcome either by shortening the time spent in the field, which was probably impracticable, or by phasing Centres reviews over a longer period.

406. In stating the position of the Committee for the benefit of the Centres' Directors, the Chairman indicated that it had a clear responsibility to the Consultative Group to periodically assess the value of the scientific programmes of the Centres and decide whether they should be continued or modified in any way. He hoped that it would prove possible to define the best possible mechanism to enable both parties to such missions to work together. He informed the Directors that, in preliminary discussion, the fundamental question had been raised as to whether the missions should be composed of TAC membership or a group of consultants appointed after due discussion with the authorities of the Centre. He sought the views of the Centres' Directors on the type of review mission which they thought would best serve mutual interests on a 5 year basis, and requested their reactions to the suggested schedule, especially the possibility of beginning with CIAT.

407. Dr. Pereira expanded on the Chairman's remarks, believing that this topic was one of the most important with which the Committee had been faced. In the first place it was necessary to decide what a review was attempting to achieve, given that the Centres themselves had probably the best available expertise in their specific fields of work. It appeared that TAC had to assure the Consultative Group that the operations being funded were being carried out in line with declared policies and to the full international standards which had been laid down. It was necessary therefore for TAC to become much more fully acquainted with the Centres and have more opportunity to talk to Directors. A solution that offered itself as solving both problems would be to have one annual TAC meeting at each institute in turn and associate that meeting to a review mission of a number of its members ahead of the regular meeting. Where appropriate, international consultants could be retained to advise on specific scientific problems.

408. As spokesman for the Centres' Directors meeting Dr. Brady presented the Directors' reaction to the background paper. They had recognized the advantages of TAC members knowing more about the institutes. The Directors however had to look both towards donors, for whom the TAC would be conducting reviews, and to their own boards.

Both were interested in programme quality and research priorities. Thus the Directors saw the proposed reviews as serving two functions which could be handled together. One was that of assisting the Centres to improve their programmes, and the other was giving assurance to the Consultative Group donors of programme quality. The Directors were in general agreement with the proposed review procedures, and, with regard to the make up of the missions, felt that these should have representatives from both TAC and specialized consultants, with enough flexibility built in to permit variation in accordance with the situation. The Directors welcomed the setting up of a systematic, comprehensive review system and felt a 5 year interval to be most appropriate. This interval would not unduly burden Centres' staff and yet was frequent enough to permit adequate external evaluation of overall programme quality.

409. The Directors would also be pleased to work with TAC in arranging for ad-hoc reviews of programme changes and a mechanism had been suggested to the Chairman to permit some involvement of the TAC in annual programme reviews. The collaboration of the Committee was sought in identifying appropriate members for specific subject areas, to participate every year and ensure a continuing feed-back of information to the Committee.

410. Assuming that reviews would be in line with the Bell Sub-Committee proposals and would have the two major functions foreseen by the Directors of assisting in programme improvement and assurance to the Consultative Group of programme quality, the Directors recommended that any given review should be worked out in consultation with the Centre Director concerned, and that the Centre should participate in the selection of review team members. This joint participation in the development reviews was considered essential and basic to a satisfactory working arrangement which could be authorized by Centres' Boards.

411. The Chairman expressed considerable satisfaction with the statement of the Centres' Directors and anticipated little difficulty in reaching agreement on detail. He sought, therefore, the reaction of the Director of CIAT, Dr. Grant, to the suggestion that the first review mission might go to CIAT in 1975. It was pointed out that Dr. Grant was retiring and that it would seem fair to the new Director to permit him some time to undertake other proposed administrative and organizational changes before hosting a review mission. In addition the CIAT Board was undertaking a detailed study of two of its programmes during 1975 and would probably not welcome an additional mission. It was, therefore, considered that the suggested schedule would need to be revised following further discussion with the Directors.

412. Referring to the composition of missions the Chairman sought further reactions of the Directors to a mixed group of TAC members and others, or of TAC members only. If the latter would it be a sensible policy to conduct a regular meeting at the Centres in turn in conjunction with the review mission?

413. Dr. Brady said that he would welcome the opportunity to host a TAC meeting at IRRI. He did not feel, however, that it would be fair to charge TAC members only with handling all the types of question which might come up in a review of the nature proposed. He reiterated therefore the consensus of the Directors that joint missions, consisting of TAC members and outside specialized consultants, would provide the best solution. This view was supported by Dr. Bommer who felt, however, that it would be a mistake to try to combine a TAC meeting at the Centres with a review mission. He believed, therefore, that the review

should be regarded as a separate activity with combined teams, acceptable to both TAC and the Centres participating. This view was supported by most members of the Committee, Dr. Hopper adding that despite the attraction of holding TAC meetings at the Centres in turn the logistics would be likely to provide a nightmare, despite all the goodwill and assistance which the Centres might be prepared to offer. He therefore urged that another way be found for TAC members to become more familiar with the activities of the Centres.

414. In response to a comment by Dr. Sauger on the two levels of work which would be required within review missions, at the highly scientific level and at the level of general evaluation of orientation and management, Dr. Brady commented that in his experience a very effective contribution could be made by the combination of specialists and generalists in such reviews and he could see no conflict whatsoever. It underlined however the importance of selection of members and the need for Centres to be implicated in that selection.

415. The Chairman welcomed the cordial and constructive discussion that had been held with the Directors and reiterated his assurance of full consultation on the preparation of missions. It was now appropriate to give some consideration to timing in the light of additional obligations and, in particular, to consider further the possibility of holding an annual meeting at a Centre whether as part of a review, or simply in order to better inform members of Centres' activities. He would in any case offer increasing encouragement to members of the Committee to visit Centres ensuring adequate prior consultation with the Directors. He informed the Directors of the ideas he had expressed to the Chairman of the Consultative Group regarding provision of budgetary requirements over a three or four year period that assured continuity of financing and built in inflation. This, he felt, would give the Directors a much greater degree of freedom than they had at present. He anticipated a continuing discussion on this proposal with the Consultative Group Secretariat and invited the Directors to submit any comments.

416. No comments were immediately forthcoming and after discussion of general procedures it was agreed that the Centres should continue to communicate directly with the Consultative Group Secretariat on all programme matters, as primary channel of communication, but that where appropriate, correspondence would be copied to the Chairman and Secretariat of TAC.

417. In summing up the discussion with the Directors the Chairman expressed his pleasure that the Directors were willing to cooperate fully with whatever final agreements could be reached, and remarked that there appeared to be a consensus for missions to be composed of TAC members and mutually acceptable consultants. It appeared also that the general feeling was that the TAC reviews should be handled independently of others, and that the Committee should begin now on the process of organizing the first review towards the end of 1975. In view of the organizational and administrative changes to be made at CIAT however general agreement was reached that another centre should be selected to initiate the cycle of reviews.

418. After some discussion, in which it was pointed out that CIMMYT had recently had a thorough review at which TAC was represented, and that IITA was in a similar position to CIAT, it was finally suggested by Dr. Swaminathan that a start should be made with IRRI. The new Director was well settled in and various programme expansions were contemplated; furthermore the Centre was one of the oldest, and fairly representative of all of the international Centres. Dr. Hopper added that a review of IRRI would provide an excellent

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opportunity for a full review of the rice mechanization programme which had recently taxed the Committee. He further suggested that if IRRI were to be selected then the mission, or some members of it, should spend some time in Indonesia and in India examining the impact of IRRI's programmes; it might also be worthwhile to examine relationships, through brief visits, with IITA and CIAT. The Committee had already decided to try to examine relationships between Centres and IRRI had been a pioneer in this field.

419. There was general agreement with this suggestion and the Chairman agreed to discuss it with Dr. Brady. He would like to be able to suggest a fairly firm date, and also to be able to give an indication of the possible composition of the mission. He would hope to be free to join the mission himself, as an ex-officio member, and sought members' views on other possible members. Several members indicated their reluctance to participate, either because their future plans were unclear, or because they felt they had been too close to the IRRI programme in the past. Finally the Chairman accepted the suggestion of Dr. Swaminathan that the question would be left in his hands to decide. He would, however, appreciate hearing from those members whose plans were at present undecided as soon as possible and would appreciate receiving any further nominations from other members. Recognizing a point made by Dr. Bommer that all the TAC members were now becoming very closely associated with the Programmes of the Centres, and thus that outside participation might be more valuable, the Chairman believed that this was not an obstacle, and would in fact constitute a very grave loss of expertise to the missions if accepted as such. He had simply indicated in the past that he would appreciate declaration by members of any close relationship they might have with Centres when such Centres' programmes were under discussion, but he respected the intellectual integrity of members regarding their unbiased participation in missions.

420. He anticipated that the mission to IRRI would be of approximately one month's duration and hoped that he could have an outline at least of its composition prior to the close of the meeting. He felt that the Mission Leader could be given some flexibility in the assignation of various aspects of the review to members, thus reducing both time load and cost. He regarded it as essential however that all members should meet, on site, before the close of the mission. He sought, and obtained the agreement of members that a further discussion should continue at the February meeting, and that that meeting should also discuss further the question, so far raised informally, of possibly giving Centres' Directors greater flexibility through budgetting over a 3 or 4 year period.

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445. The Chairman...

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447. It was hoped...

Other Business (Agenda Item 17)

421. The Chairman regretted that time would clearly not permit detailed discussion on tropical fruit and water buffalo research at the current meeting. He therefore sought members' preliminary comments only, with an undertaking that an opportunity would be offered at the next meeting of the Committee for adequate discussion in depth.

422. Members recognized the importance of the buffalo to a very large sector of the rural population, especially in Asia, and foresaw possibilities for stimulating research in the essential fields of genetic improvements through cross-breeding. Recent developments in artificial insemination would indicate that the time was ripe for an intensive coordinated programme of breeding work aimed at improving the milk, meat and draught potential of the species. Given that the basic need was for genetic improvement some members saw advantage in bringing breeds together in one centre to facilitate a concentrated cross-breeding programme. Others felt that a coordinated programme, based on a network within which a number of key centres might be selected for strengthening, would offer a satisfactory approach, similar to that taken to aquaculture research, with an appeal being made to bilateral donors.

423. The question of relative priorities was raised by several members who felt that, in the face of increasing financial constraints, the Committee would need to view the question of further major research undertakings in the light of its own accepted priorities for international financing.

424. The Chairman recognized the alternative proposals made by members and expressed clearly the feeling of the Committee that the question of buffalo research was sufficiently important to warrant consideration at its next meeting. It had so far been insufficiently studied to permit a clear indication as to whether a major international centre or separate, but coordinated, efforts would provide the best solution. He would therefore reflect to the Consultative Group that the question of both tropical fruit and buffalo research were still open and that a position would be defined at the next meeting of the Committee.

Date and Place of the Next Meeting (Agenda Item 18)

425. It was agreed that the Ninth Meeting of the Committee would be held in FAO Headquarters during the week 3-7 February, 1975.

CHAIRMAN'S SUMMING-UP (Agenda Item 19)

426. The Chairman's summing-up was presented to the joint meetings of the Consultative Group, TAC members and Centres' Week participants on 1-2 August 1974. The Chairman of the Consultative Group on introducing Sir John Crawford indicated that three major topics would be presented; the proposed programme of in-depth reviews of the International Centres; TAC views on the 1975 programmes of the existing centres and the study of new proposals by the Committee.

I. Review Procedures

427. Referring to the important discussion which had taken place with the Centres' Directors on review procedures, the Chairman reported that decisions in broad terms had been reached, and were sufficiently far advanced for him to express with some confidence that quinquennial reviews would begin in 1975. The decision had not been as easy as might be expected because of the various changes currently going on in the management of different Centres. He reminded the Group of the earlier decision of the Committee which had been to conduct the reviews on a 5 year basis. The next decision taken, and which needed to be tested in practice, was that the missions undertaking the reviews would be composed both of TAC and non-TAC members, normally comprising 5 or 6 people. Membership of the missions, at least that of non-TAC members, would be decided only following discussion with the Director of the Centre concerned. Indeed the whole operation would depend very much on the nature of the relationship being developed with the Centres.

428. The Committee had expressed its considerable pleasure at the agreement of the Centres' Directors with the proposals, and with the fact that the Directors had requested that both the comprehensive and ad-hoc reviews should have two major functions. Firstly, to assist the Centres to improve their programmes, and secondly to provide assurance to the Consultative Group, the donors, of programme quality.

429. He would add to that statement a small elaboration, indicating that the TAC would take "improvement of programmes" to include deliberate changes of emphasis if these were thought necessary. It could, for example, take the form of recommending deletion of some programmes and addition of others; the word 'improvement' had therefore to be interpreted in the broadest possible sense. Given the broad Terms of Reference, the timing and membership of a mission would be discussed with the Director; the missions would be under TAC leadership and would also cover a matter which had been raised several times elsewhere - the relationships between Centres themselves and the Centres and regional and national programmes and bodies. This was essential in view of the concern of the TAC to assist, not only itself, but the Centres' Directors and the Consultative Group, to an understanding of the functional operation of relations between Centres. In addition, when undertaking to review the work of a Centre, the Committee had taken the opportunity of including in that review consideration of not merely on site programmes, but other programmes that came under the responsibility of the Centre, whether called 'Outreach' or 'Special Projects' etc. In other words the Committee wished to be allowed to review the Centres' overall research programmes regardless of differentiations in terminology.

430. Thus, when initiating the review programme, the Committee would suggest to the Director that the mission, or one or two members of that mission, should visit countries where there were outreach programmes, to examine the manner and efficiency of the operation, and its impact.

431. Although the discussion had not resolved many difficulties of procedure it was quite clear that the Committee would wish the mission to report to the TAC itself, and the TAC would wish to discuss with the Director and his Board any findings that it was proposed to report to the Consultative Group; thus giving both parties an opportunity to understand one another's viewpoints should differences arise. This he regarded as an essential part of the operation.

432. The hope had been expressed that reviews could start with IRRI late in 1975. Apologizing to Dr. Brady for the short notice of this change he pointed out that, in view of forthcoming management changes at other Centres it was not feasible to start elsewhere. The decision to start with IRRI was supported by other reasons, not least that it had developed a system of linkages with other Centres and also had an extensive outreach programme. He did not wish to commit Dr. Brady to agree immediately, respecting the problems he might have in being first on the list, but had indicated his hope that agreement could be reached. In any case the Committee would not be ready until the second half of next year and it would be wiser to aim for the late fall of the year.

433. A discussion would now be initiated with Dr. Brady. Some names had been proposed for the mission and the Committee had authorized him to complete a decision on membership which would then be discussed with Dr. Brady. Only one Centre had been mentioned to date as the remainder of the programme had not been finalized. The Committee had a lot to learn, and Dr. Brady would in a sense be the victim of that learning process. As he would participate in that process however he might subsequently be able to help his colleagues. Thus, the Committee had decided on its type of approach and the ambit of the review, and was hopeful of reaching agreement that a start could be made with IRRI as the first "subject", paying every respect to an understanding of the Directors' plurality of attitude towards the review procedures

434. In closing he had to bring to the notice of the group that TAC would be unable to undertake the task assigned within the limits of its present budget; there was an understanding however, from previous discussions, that support would be made available for this work and he would submit an appropriate request. He referred again to the probable need for TAC to make some change in its meeting schedule in order to permit it to be fully effective in its annual reporting to the Consultative Group and he would also like to seek the collaboration of the Centres through an early advice to TAC of contemplated changes in their programmes.

II. The International Centres

435. Remarking that once again the Committee's discussions of Centres' programme had suffered from lack of time, the Chairman expressed the hope that ways and means could be found in future to permit more time for presentation and discussion with the Committee. He would present the Committee's reaction to the major points raised on individual Centres' programmes and would refer members of the Consultative Group to the Committee's report for additional material.

IRRI

436. Referring first to the programme of IRRI the Chairman indicated three issues which had been raised; in connection with the machinery research programme, the capital budget and, arising out of the latter, the housing of the germplasm collection. The proposal to transfer machinery research from 'special project' to 'core' funding raised the question in principle of the difficulty of doing a good job at short notice. The Committee was not satisfied with this proposed transfer and was not prepared to let such a precedent pass without comment. This would imply acceptance of it not only as a valid part of the integral research programme of IRRI but also as a possible model to be followed by other Centres. Even should this prove desirable considerable further discussion was clearly needed before the Committee could formulate firm conclusions. The Committee had therefore decided that the programme should continue to be supported on present lines pending a full review which it was hoped could be undertaken as part of the quinquennial review. Agreement had been reached that this latter programme should begin with IRRI in late 1975. The Committee had in no way condemned the machinery programme but felt that some evaluation of its impact and questions of follow-up should be answered. Time had not permitted this; he therefore hoped that the desire of the Committee to delay its decision would not be misinterpreted but regarded as an expression of the Committee's desire to be better informed before endorsing transfer of the programme to the core budget.

437. The Committee had commented on the large capital sum requested, not disputing its need, as the inadequacy of much of IRRI's older capital facilities was well recognized, but with the desire to see some phasing on priority grounds, of capital expenditure. Firstly, the Committee regarded the development of new lands as essential; secondly it believed that new laboratory facilities were necessary and thirdly endorsed the need for additional space for the training programme, a vital part of IRRI's relationships with its associated countries. In the face of possible financial constraints, therefore, the Committee would endorse the foregoing requirements as a priority order, possibly phased over two years instead of one.

438. The Chairman remarked on the concern expressed over the security of housing of IRRI's unique rice germplasm collection, and although the question had not been discussed in detail wished to bring to the notice of the Board of Trustees of IRRI, and the International Board of Plant Genetic Resources, the question of safe conservation of genetic stocks. It would seem appropriate to give some thought to this problem whilst a major capital building programme was still under consideration.

CIMMYT

439. The Committee had examined two principle questions in connection with CIMMYT's programme neither of which was of immediate financial significance although likely to have financial implications for the future. The Committee had shown considerable interest in the proposal for the development of regional services, although it had not completed its discussion and still required clarification as to whether the proposal was aimed at rationalizing the location of existing staff or called for additional staff over and above existing average levels. The interest of the Committee went much deeper however. On no less than six occasions during its discussion the question of centres relations one to another, to outposted

staff, and to national programmes, had been raised. Centres' practices differed, sometimes they were not easily understood and on occasions were not always conducted without friction.

440. This question had therefore been placed on the agenda of the next meeting of the Committee in February 1975. Before this date further dialogue would be required with CIMMYT in order to ensure adequate discussion. The question would not be limited to the CIMMYT proposal however but would have much wider relationships.

441. The second question related to CIMMYT's activities in Latin America. Despite many evident efforts to resolve difficulties it had been pointed out that CIMMYT's programme seemed to have had greater impact on an East-West than a North-South basis. Resolution of this problem might call eventually for some financial expansion of CIMMYT's activities. Wheat was a highly important crop in several Latin American countries and doubts existed that the full benefit of CIMMYT's work had been translated into effective national or regional work in the area. He made no attempt to assign responsibility and was not even sure that it was reasonable to say that there should be CIMMYT programmes in South America. However the question had been raised and the Committee believed it was an important one, calling for further discussions with CIMMYT. He closed by reiterating that if there were possibilities for further work in the area, then there might be implicit in these possibilities the need for future expansion of the resources available to CIMMYT.

CIP

442. The Chairman indicated that the Committee had unanimously approved the programme proposals of CIP and had raised no serious questions. Doubts had however been expressed about the scientific value of varietal testing aimed at extending the potato into the lowland humid tropics. Although these doubts had been allayed by the Director-General of CIP the Committee had recorded its view that it would not consider valid a large expansion in this activity which had, as its prime purpose, development of the potato as a major crop in the low and humid tropics.

CIAT

443. The Chairman referred to two specific matters which he felt the Committee should report to the Consultative Group. Firstly he reiterated the willingness of CIAT to serve as a coordinating centre for a regional cooperative network of field bean research pointing out that further time was needed for the preparation of exact proposals on structure and costs. This would be presented with the 1976 programme and budget proposals of CIAT at which the views of the Committee would be appropriately expressed. Secondly, the Committee had been very encouraged by the striking results being shown in CIAT's beef improvement programme, particularly the improvement in fertility of the trial animals. Much of this improvement related to improved pastures and CIAT had expressed some concern about the limited germplasm base available to them for pasture improvement work. A need had been expressed for a major collecting mission on grasses and legumes to improve this base, with concurrent conservation and evaluation work at CIAT. Remarking that this interest was not confined to CIAT, but that there were other parts of the world equally interested, the Chairman felt that this was an area in which there were opportunities of collaboration amongst interested country research institutions. He hoped therefore that this could be referred to the IBFGR for consideration.

IITA

444. Discussion of the IITA programme had concentrated on two issues. First was a proposal to establish a high rainfall area sub-station. The Committee had unhesitatingly supported this need in order to ensure wider application and effectiveness of the work of the Institute through enabling it to work in an agro-climatic situation varying from that of its headquarters. Doubts had been expressed about the costing of the sub-station and the feasibility of staffing it on the basis suggested, which members felt was inadequate. The second issue was not specific to IITA but had emerged from discussion on several of the Centres. This was the question of relations between the Centres themselves - in the case of IITA with IRRI, CIMMYT, CIAT and ICRISAT - and the Centres with regional bodies such as WARDA, and national services. It was an important question and one bound to arise continuously. A great range of relationships could be contemplated and to some extent IITA had been a testing ground for several. The Committee had resolved to discuss the question in detail at its next meeting, looking closely into possible improvements in functional relationships, and could no doubt benefit in this task from the views of IITA. It was proposed that a working paper should be developed and submitted to the Centres for comment prior to the next meeting.

ICRISAT

445. The major question raised in TAC discussion was the addition of groundnut research to the ICRISAT mandate. The Committee had no doubts about the wisdom of adding this at the present moment having been assured that ICRISAT had adequate land and intermediate level staff available to accept the addition without putting too much strain on its programme as a whole. The Committee believed however that development of the programme should proceed cautiously, beginning with priority activities based on inter-specific crosses utilizing the germplasm collection of Dr. Gregory from North Carolina. It was also important to initiate collection of the rapidly disappearing local cultivars in West Africa which possessed valuable disease resistant germplasm. The remainder of the programme, further breeding and agronomic improvement for example, should be built up in a phased manner from the genetic resource base. The Committee had based its recommendation on the importance of the crop as a source of food, oil and income in the semi-arid farming systems of both Asia and Africa. It was therefore, in the judgement of the Committee, relevant to ICRISAT's mandate and fitted well within the originally foreseen programme of the Centre.

ILCA

446. The Chairman observed that the Committee had approved the programme proposed by ILCA and was looking forward eagerly to seeing the Centre in full operation, to which end the Committee had wished it 'Godspeed'.

ILRAD

447. It was hoped that the setback suffered by ILRAD could be quickly made up and that development could continue apace. The programme presentation was accepted and approved without comment.

AVRDC

448. The Chairman referred to the apparent need for the Committee to make a clear statement regarding its attitude to the work of the Asian Vegetable Research and Development Centre. Firstly he reminded the Consultative Group that TAC had recommended the completion of the Centres' capital programme and had also suggested some programme changes which had been met. Nevertheless it appeared that doubts had been expressed regarding the serious interest of the Committee in the work of the Centre. He wished to allay those doubts and made it quite clear that the Committee maintained a continued interest and would be willing to examine further proposals in the area. The original doubts of the Committee, both about location and priorities to be assigned to vegetables remained however, and would be reexamined should further proposals materialize. He gave a firm assurance to the Group and to the Director of AVRDC, that the Committee would examine proposals on their scientific merits. Priorities were not likely to remain immutable and unchangeable, and an indication had already been given that the Committee would be very interested indeed if the work could be expanded to associated centres in other Asian countries - and Thailand had already been mentioned as an appropriate area. He would not wish to pre-empt the decision of the Committee however, so whilst assuring all concerned of the Committee's willingness to examine new proposals urged that any proposal should be prepared bearing in mind the earlier comments of the Committee.

IBPGR

449. The Chairman referred to Mr. Demuth's statement that the Executive Committee of the Board would prepare a programme of work for ratification by TAC at its next meeting and indicated that the Committee wished to suggest an alternative approach. As the Board had been working towards a specific programme, already outlined in the foundation document, and had authorized its Executive Committee to finalize that programme in September, the TAC did not believe it necessary to wait for ratification until its next meeting in February. Provided the Consultative Group was in agreement, he would suggest on behalf of TAC, that the Executive Committee refer the programme through the Secretariat to the members of the TAC. Provided that the programme fell within the limits already recommended by the TAC members could convey their attitude by mail or cable to the Secretariat. He felt it most important that the Board's programme should not be delayed, possibly until July, 1975, and hoped that the offer of the Committee, to collaborate in obtaining an early answer as outlined, could be accepted.

WARDA

450. The Chairman referred to WARDA as a test case of a principle, aimed at strengthening national research, improving the outreach facilities available to Centres such as IITA, and helping countries which had shown initiative in helping themselves to raise the standards of their national efforts. He had to record quite firmly, but not uncharitably, that the Committee was not satisfied that the research was yet of an adequate standard and that it could be treated as though it were fully equivalent to the quality of the work expected at the Centres. The Committee felt that it was right, and remained right, in insisting on adequate scientific backstopping in the control and direction of the programme and it was not really satisfied on either head. It believed the problems were soluble however, as it would

otherwise have to come regretfully to the conclusion that support should be withdrawn. It did not want to do this and the Chairman emphasized most strongly that the Committee did not believe it would be necessary to do this, provided advice given could be accepted and modified if necessary by the circumstances of the locality, but not to the extent of defeating the Committee's intention of providing for the maintenance of proper standards.

451. During the course of the meetings it had been indicated that the scientific advisor to the Consultative Group would be available, possibly with a UNDP colleague, and he would hope with a member of the TAC Secretariat, to visit the WARDA areas very soon to discuss with the WARDA executive and others concerned, ways and means of meeting the suggestions of the Committee and enabling the programme to proceed. He recalled that the Committee had suggested that the WARDA research programmes W2 - W4 would make better sense if integrated with project W1 which had been recommended for support and he hoped that this need would be borne in mind in any examination. The Committee would welcome the help of the visiting group, in the form of a report to the Committee as it was most anxious to find an answer to difficulties in an area which had an importance beyond West Africa as it was a serious test of one way of strengthening regional and national efforts.

452. His report was therefore made with considerable goodwill towards WARDA and in the belief that answers could be found. Answers must be found, and if they required some rationalization of the administrative structure he felt that this ought not be beyond the capacity of WARDA. Similarly if it required some rather more formal understanding between WARDA and other research bodies in the area then this ought not to be impossible to arrange. It was clear however that an effort must be made to improve the situation.

III. New Proposals

453. The Chairman opened his statement on new items with some brief general comments. In the first place he felt that at this meeting the TAC had concluded the initial rapid developmental stage of its work, which during the first three years had been to ensure a major contribution to the research needs of each region of the world. He was, of course, not promising that it would never bring forward another major proposal, but he now thought that the Committee had reached a point where it would be able to take more time to look at what was happening in the scientific work of the Centres, and outside, and to study the total impact of the whole system on productivity.

454. In specific terms this implied a process of continuing reviews of the Centres, and members would have to be prepared to give more of their time in order to carry out the review function. There was a need for closer working relations between the TAC and the Centres, and between the Centres themselves, to ensure that the system worked smoothly both in the aggregate sense and in the relation of the various parts. This was something to which the TAC wanted to pay particular attention at its next meeting.

455. Looking at the cost estimates that he had submitted to the Group a year ago he believed that the proposals he would be making were consistent with those figures in real terms. However, he had read with interest Dr. Bernstein's paper on ceilings, and felt that not only was it important to find further donors but also for some of the donors to do more than they were doing at present.

456. As far as particular matters were concerned, after working for more than a year on the Middle East Centre, the TAC had reaffirmed its earlier position that a genuine case had been made for a substantial internationally supported research centre in the Near East and North Africa. It now recommended that a new Centre be established with headquarters and its main research programme located in Lebanon, subject to confirmation of the availability of suitable land, and probably some additional land in nearby Syria.

457. The TAC saw the need for associate centres in order to cover the region thoroughly, and it thought in terms of one being located in Iran and another possibly in Algeria. However, it envisaged the whole as a single operation under one board covering the work at the three locations.

458. In relation to the proposals it had received for establishing a Plant Nutrition Institute, the Committee had been reviewing a large and complex field of research including chemical fertilizers, biological fixation of nitrogen, and organic manures and wastes. There were beneficial contributions from each of these, and TAC had seen an urgent need for monitoring the research already in progress at the International Centres and elsewhere, and for improving the coordination of the overall effort. To take this further they were establishing a working party to function as a sub-committee of TAC. The Committee particularly welcomed an offer received from the United States Government during the meeting to examine ways and means of capitalizing on the research and production engineering facilities of TVA with respect to chemical fertilizers. This had been conveyed in a letter which would be made available to the Consultative Group along with other notes on the major items which the TAC discussed during its current meeting.

459. The third major item with which they had dealt was the World Food Policy Research Institute. Here they were recommending the establishment of an institute with independence, competence and flexibility to undertake studies on key policy issues related to world agricultural development.

460. To the fullest extent possible this institute would complement and reinforce the activities of Agencies such as FAO, the World Bank, UNDP and others having major responsibilities in agricultural policy analysis. However, its emphasis would be on the food problem; they were not proposing to establish an institute to deal with the manifold problems of general agricultural development.

461. In concluding his introduction he referred briefly to several other matters with which they had dealt; not necessarily of less moment, but with smaller financial implications. One of these was the proposal for a bean research network in Latin America which had already been discussed in relation to CIAT's work programme. CIAT had asked for more time to develop its ideas of what this involved and so TAC could not offer a final report at this stage.

462. National Research had always been foreseen as a continuing item of importance on the Committee's Agenda for reasons that he would elaborate when speaking later on this subject. It was a matter on which TAC believed it could give further help to the Consultative Group and it was therefore placing it as a priority item on its next agenda.

463. Aquaculture was another subject with which they had been wrestling for some time and concerning which they had a major proposal at this meeting of a large expenditure on research. However, the Committee had reconfirmed the cautious position it took at its last meeting and was recommending a modest sum for one or two specific research projects where the Consultative Group or bilateral donors would help. A striking aspect of aquaculture was the availability throughout the world of a considerable amount of capital investment but a dearth of personnel and infrastructure, which made a special effort to train people imperative in this important field.

464. A matter on which the TAC had concluded its deliberations was the CARIS proposal. The Consultative Group would recall that its members had supported a pilot operation in West Africa which had now been completed and evaluated. The TAC were recommending the expansion of this project to cover all developing countries in a modified form which was rather less ambitious but still considered by the Committee to be extremely valuable to scientists, particularly in the developing countries.

465. He regretted that to some extent for lack of material, but mostly through lack of time, the Committee had been unable to give fair-minded consideration to tropical fruits, and the same applied to water buffalo for which a number of representations had been received from interested countries. With the agreement of the Chairman, he would now speak at greater length about some of these decisions.

Proposal for the Establishment of an International Centre for Research
In the Near East and North Africa

466. He reminded the Consultative Group as background history that TAC had appointed the Skilbeck Mission, which had reported quite fully on the general question of what research was most needed in this semi-arid winter rainfall zone covering the majority of the countries of the Near East and North Africa.

467. That mission made recommendations to TAC that there should be a major new Centre with three broad categories of functions. These were: firstly, to improve the staple grains of the region, i. e. wheat, barley, broad beans, and lentils; and possibly also the annual oilseeds and cotton. Secondly, to increase the productivity of soil and water resources through the development of improved management and conservation practices, and agro-climatological studies. Thirdly, to develop better farming systems, both in irrigated and rainfed areas, with emphasis on crop-livestock integration and replacement of annual fallow by fodder crops, and the general intensification of land use in arable lands.

468. They proposed a Centre located in the Lebanon, with associate centres elsewhere. The TAC had considered that report, and while in agreement with its main conclusions, thought it was asking for too much at once. They had therefore asked a working group of their own members to examine it in more detail, in consultation with Skilbeck, some of his colleagues on the mission, and other people.

469. The Sub-Committee had reported to the February meeting of TAC at which conclusions had been reached on everything but the site. These conclusions were set out in the Committee's last report.

470. At the present meeting the Committee had supported the contention of the Working Group and reaffirmed the view expressed at its SIXTH Meeting that a genuine case had been established for a substantial internationally supported research effort in the Region comprising the Near East and North Africa.

471. It had considered a view expressed to it by an observer, that a small coordinating centre or 'relay' station would offer an adequate solution. It did not believe this approach was sound for a region which is unique ecologically in the developing world and which presents difficult research problems.

472. The TAC agreed with the three main programme elements that had emerged from the Skilbeck report and from that of its own which were first crop improvement, secondly soil and water management, and thirdly sheep husbandry, but it viewed these all as components of improved farming systems. He would like to stress this, since improvement of farming systems should be the ultimate aim of the new Centre.

473. In the case of crops TAC recommended that genetic improvement work should be confined to wheat, barley, and the grain legumes; in the case of the cereals in close collaboration with CIMMYT.

474. Work on other crops should be confined to the use of well-adapted varieties in cropping systems; and it was envisaged that one way that such a feed-in of varieties could be obtained was through the development of relay relations with other International Centres, especially CIMMYT for maize, and ICRISAT for sorghum, millet, and chickpeas.

475. In the matter of livestock the Committee urged that the ALAD sheep breeding work be continued as part of the new Centre's programme, but that the main emphasis should be on improved husbandry and feeding, with the focus on the stratification of the sheep industry between range rearing and finishing of immatures on arable land through the introduction of forage crops into the arable rotation. This, of course, would eventually create a demand for improved stock animals from the breeding programme.

476. A strong effort on climate, soil, and water management was considered essential in a region where erosion and aridity are critical constraints, but the TAC saw the main thrust as being aimed at the improvement of cultural techniques in rainfed areas, with the Centre acting mainly in a catalytic capacity in relation to irrigated agriculture, as a source of transfer of information and methodologies to national programmes. They were not recommending that the Centre devote large resources to original work on irrigation: limited research of a collaborative nature might be undertaken, in the development of intensive cropping systems, but by and large this was not being put in the forefront.

477. As in the case of the other International Centres they saw the new Centre progressively building up a strong training and seminar programme as a means of assisting countries of the region once it began to be effective in developing better agricultural systems. In view of the considerable history of research both in the Region and in areas outside it with comparable problems, e. g. Australia and the S. Mediterranean, the establishment of an information data bank with storage and retrieval facilities was also strongly recommended.

478. The TAC recognized that delicate issues are involved in defining relationships between International Centres, where more than one is having to undertake a programme of any magnitude on the same crop.

479. It saw a clear need for such a programme on wheat and barley in the Near East and North Africa, where those crops are of critical importance, and there are significantly different problems of climate, soil, disease, and consumer requirements in this area compared with those pertaining in Mexico or elsewhere.

480. The TAC believed that such a programme should be of a multi-disciplinary nature, and should be based at an International Centre in the Region, with central supporting laboratory facilities; but that it should have strong links to CIMMYT with which some common facilities might be shared.

481. They envisaged that the principal responsibility for barley breeding and germplasm collection be gradually taken on by the new Centre, although a continuing role was foreseen for CIMMYT in wide crossing between barley and wheat, and in adaptive research in Latin America.

482. CIMMYT in their judgement should retain the primary responsibility for bread wheats, for which a relay relationship to the new Centre's programme would have to be worked out with the possible outposting to the Centre of CIMMYT regional staff.

483. In respect of durum wheat it was recommended that CIMMYT continue to have the main responsibility for breeding and germplasm collection in the immediate future. However, once the new Centre was fully operative it might be logical (and he hoped the Consultative Group would note carefully the words he was using) to focus the main thrust of the durum

effort there rather than in Mexico. This possibility should properly be a matter for a discussion in due time between the trustees of the two institutes with consultation with the TAC. In short they were indicating a direction of thinking, but preferred to look at the situation when there was an ongoing operation in the mid-East.

484. Referring to the site question he explained that at its seventh meeting the TAC decided that it was necessary to explore further the suitability of a headquarter site proposed in the Lebanon, in the light of uncertainties as to the availability of adequate land for a Centre there, and reservations expressed by some members about its ecological suitability.

485. They had now had a further review of these issues. He had been able to make a short visit there and had useful discussions on an informal basis with some Lebanese Government as well as ALAD representatives.

486. It now appeared to him and to others with whom he had checked, that sufficient land - including irrigated land - could, with Government concurrence and assistance, be obtained in the Bekaa Valley, where there was a fairly wide rainfall gradient; and this would enable the major elements of the programme to be undertaken there.

487. Consideration, however, might need to be given (and in his opinion wisely so), to reaching agreement also with the Syrian Government for the provision of additional rainfed land in an adjacent area of Syria directly to the North of the Lebanon for range/crop/livestock integration work in the farming systems programme.

488. In almost every other respect - accessibility, availability of trained supporting staff, housing and services, etc. - Lebanon was almost ideal, and the TAC recommended the establishment of the headquarters and main research programme there, subject to confirmation of the availability of suitable land.

489. In making this recommendation they had taken into account the fact that on technical evaluation no single country could be found which was adequately representative of the full range of conditions in the region, and that therefore there would in any case have to be at least one and possibly two associate Centres to complement the main one, no matter where it was located.

490. One of these should be in the cold winter zone, and the TAC therefore would welcome an interest on the part of the Iranian Government in the proposal.

491. The other should be in a North African country, representative of the true Mediterranean climate and possibly this could be Algeria.

492. It was envisaged that while the Associate Centres would be established in close proximity to appropriately located Government Stations and might even share some of their facilities, they would be under the control of one International Board and the management of the Lebanon Centre, and would accordingly be funded as part of the core programme. The TAC believed that these Associate Centres should be planned to be phased in at a relatively early stage of the Centre's operations.

493. The TAC had further reviewed briefly the staffing proposals of the Skilbeck Mission, and he had to admit that it considered these inadequate to the task to be undertaken. They

did not wish to prejudge or prejudice the judgement of the Board and management of the Centre and it was therefore difficult to be precise as to the likely staff component and recurrent costs.

494. However, it was undoubtedly a big enterprise that they had in mind, and a very preliminary assessment by the Secretariat indicated an order of magnitude of six to eight million dollars for the core programme of the headquarters and Associate Centres, when it was fully established, say after a five year period.

495. The TAC fully recognized that this implied a considerable funding commitment. Nevertheless he commended the proposal to the Consultative Group as one of very high priority affecting a large number of countries and the nutrition, employment, and livelihood of some 250 million people.

Plant Nutrition Research Needs

496. The Chairman emphasized that the Committee considered this an item of major importance, and he hoped that some statements he would be making would find their way into the World Food Conference documentation.

497. At its seventh meeting in February the TAC had discussed the need for improving the effectiveness of fertilizer use in the tropics and had expressed grave concern at the effect which increased costs and reduced availability of chemical fertilizer might have on the impact at the farm level of the research which was being supported by the Consultative Group. It requested that this matter be drawn to the attention of the Preparatory Committee of the World Food Conference and urged that the Committee consider placing the subject on the agenda of the Conference. It had also noted a suggestion received from TVA that further research was required on fertilizer formulation for tropical conditions, and had asked that a more definitive proposal be prepared for consideration at its next meeting.

498. At the same time the Committee felt that the question of chemical fertilizer should not be considered in isolation, but as part of a wider effort which would attempt to integrate research on all potential sources of plant nutrients. It had agreed to pursue this matter further in July. He stressed that the subject had already been on their agenda in those terms, because he had been much encouraged by subsequent communications, which seemed to confirm the correctness of their approach.

499. Following that discussion the TAC had received papers dealing with the three main elements of chemical, microbiological, and organic sources of plant nutrients. They had noted that research was proceeding at a number of centres in both developed and developing countries on various aspects of the overall problem of plant nutrition.

500. TAC had also received prior to its present meeting a specific suggestion from the United States Government that an International Plant Nutrition Institute should be established, and they appreciated the United States initiative in asking TAC to examine this and related matters. During the meeting it had received another letter to which he would refer later.

501. Before talking about various research possibilities he would like to make one point clear to the Consultative Group. This was the Committee's judgement that while economies

in the use of chemical fertilizer might well prove possible as a result of an integrated research effort on plant nutrition, it should not be assumed that the need for expansion in fertilizer supply was likely to lessen, if food production was to match population and income growth, and the requirements of improved nutrition in the developing countries.

502. He therefore wished to reiterate for the attention of the Consultative Group their earlier resolution of concern about the difficult chemical fertilizer supply position. Turning to the problem strictly before them on the research side the TAC had stressed the need to encourage work on, first increasing the efficiency of fertilizer use; secondly in designing fertilizers adapted to the needs of tropical soils and growing conditions; and thirdly reducing the cost of production of fertilizers, and in this latter context he was talking principally of chemical fertilizers. With these aims in view, they wished to examine further the best means of cooperating with the fertilizer industry on these questions, since it was their belief that industrial research on the development of chemical fertilizers suited to tropical environments, and on fertilizer plant adapted to the needs of the less advantaged countries had been inadequate, and that accelerated activity in this field might bring rather rapid benefits.

503. The Committee recognized, however, that this required considerable investment in laboratories and pilot plants, and therefore particularly welcomed the offer of the United States Government received during the meeting, to examine ways and means of capitalizing on the research and production engineering facilities of TVA for the benefit of the developing countries.

504. This offer had been received in the form of a letter, which he had distributed to the Consultative Group, outlining the possibility of forming a non-profit company under an international board to develop research in new fertilizers for tropical conditions with access to the staff and equipment of TVA and the possibility of developing new equipment that might be necessary. He wished to make it very clear that TAC warmly encouraged the Government of the United States to table a definite proposal for its early consideration.

505. In the course of discussing this and other matters the TAC noted that the current shortage and high price of fertilizer had led to some concern about the relevance of the plant breeding work of the International Centres, since it was widely believed that the varieties with a high yield potential developed by such Institutes were not of value without large quantities of fertilizer. While it was correct that such high yielding strains could give economic responses to high levels of fertilizer it was not true that they were unsuited to conditions of sub-optimal or limited fertilizer availability. The available data, both from national programmes and International Centres clearly indicated that locally adapted dwarf varieties of wheat and rice could give higher yields than the traditional tall strains at low or even zero fertilizer application. This was because of the ability of the high yielding strains to divert more of their total dry matter to grain production. Hence they were even more relevant under conditions of fertilizer scarcity, and developing nations with limited fertilizer stocks would do well to multiply and distribute good quality seed of locally adapted high yielding strains as rapidly as possible.

506. The TAC was thus convinced that the plant breeding research at the International Centres remained highly relevant, and it stressed the importance it placed on this, and on the work on the more effective use of fertilizers at the farm level which was now underway at the Centres and in national programmes. It accorded high priority to research on crop-fertilizer interactions, not only in relation to the development of highly responsive

varieties, but also because of the economies in fertilizer use which appeared possible when plant nutrition requirements were viewed in the context of the farming system rather than the isolated needs of the individual crop.

507. Turning to the area of biological fixation of nitrogen and microbiological breakdown of otherwise insoluble soil nutrients, the TAC noted the important work in progress in a number of countries, and inter alia the interesting possibilities of transferring nitrogen-fixing bacteria from legumes to other crops. While recognizing that this was a long-term objective likely to require highly sophisticated research it emphasized the need to encourage and accelerate this and other advanced research on this aspect of plant nutrition.

508. The Committee had also stressed the need to develop links between research teams in developed countries and those working in this field at the International Centres and in national programmes in developing countries. He would like to reiterate his earlier statement to the Consultative Group that much yet remained to be done to marshal the work going on in the developed countries. There appeared to be some tendency to think that the only worthwhile research was that done in a developing country itself, but faster progress might be made if the resources of developed countries could be tapped for specific purposes.

509. The TAC was aware that interesting results were already emerging from centres and other programmes which might selectively be reinforced. However, it had neither concluded at this stage that a single centralized effort was necessary or feasible, nor had it rejected this notion. They had just not completed their thinking on this subject.

510. On the organic side the TAC recognized the potentially important contribution of organic matter and recycling of organic wastes to the plant nutrient supply, and had noted the imaginative work under way in India to improve the utilization of organic materials on the land, and to find substitutes for the use of manure for fuel. At the same time there did appear to be formidable logistical, technical, and socio-economic problems impeding the more effective and complete use of organic materials in general, including wastes, and relatively little research appeared to have been focused on these problems, especially in the tropics.

511. There was thus a large and complex field of research to be studied in dealing with plant nutrition, and progress made so far in all the fields he had mentioned was quite uneven, while the research required in future was at various levels of sophistication. The TAC therefore saw an urgent need for monitoring the progress of such work, to ensure the maximum impact and integration of research both in and outside of the International Centres, in developed as well as developing countries; by organizing workshops, collaborative research networks, and other means of continuing dialogue between research workers. This should ensure that research was adequately supported on specialized aspects, as well as improving coordination of the overall effort.

512. Although they recognized that there might well be a case for some special machinery to undertake this role the Committee wished to be informed further on all aspects of this highly complex field before making a recommendation for specific action to the Consultative Group. It had accordingly decided to establish a Working Party of its own to function as a Sub-Committee of TAC, to examine the best ways and means of giving effect to the need to mobilize the experience of many bodies, including TVA; how best to monitor work at the Centres and elsewhere in all the relevant fields, and how best to stimulate

further needed research in each of the three main elements of chemical, microbiological, and organic aspects of plant nutrition.

513. They had asked the Sub-Committee to feel free to contact all major organizations and leading scientists in fields of research relevant to its terms of reference, and they had asked them hopefully to report to the February meeting of TAC.

514. He felt that it would be obvious from his comments that the TAC attached the highest importance to this whole field of enquiry, and he wished to assure the Consultative Group of the priority it was giving to the subject. It would be equally apparent that they did not at this moment conclude that a new and comprehensive Centre for original research to cover all aspects of plant nutrition was needed, but rather an instrument of coordination and supplementation to research and training efforts already in existence within and outside the International Centres network.

515. Although not strictly in the context of the subject he had just been discussing he wished to inform the Consultative Group that in the course of its current meeting the TAC had also noted with concern the probability as reported by FAO of a widening gap between demand and supply of pesticides in the world. Since these were not only extremely important in their own right as a means of increasing productivity of crops and livestock, but could also have a high degree of complementarity with fertilizers and high-yielding varieties, this might pose a further serious threat to world food supplies. The Committee therefore attached considerable significance to the question of pesticides, and proposed at its February meeting to examine whether a comparable approach to that it was following in relation to fertilizers, would also be relevant to reinforcing chemical and biological research in crop and livestock protection.

516. In conclusion he wished to repeat that the net result of the Committee's discussion on fertilizer was to show very great interest and encouragement to the United States to develop its specific proposal further TAC's own Sub-Committee had a major complementarity task and would report to it in February, but they were not making any particular proposal at the moment requiring financing from the Consultative Group.

Proposal for a World Food Policy Research Institute

517. The Chairman reported that in response to initiatives of members of the Consultative Group the TAC had had under consideration for some time socio-economic aspects of agricultural research, and the world food problem. In its statement of priorities it had already stressed the relevance and importance of the work being done on the economic side at the International Centres, although it had recognized that many of the problems raised at the Centres were problems for national policy and national consideration.

518. It had also become more and more apparent that there was a strong feeling that there were many problems in a worldwide area which were of concern to national governments, but they were also problems about which they could do very little as single entities, and very often had an inadequate basis for complete understanding.

519. They had therefore given recognition to the fact that there was a need for policy studies related to certain problems affecting groups of countries or even the overall pattern of world agriculture, hopefully leading to better management of the world's food and agricultural resources, and the avoidance or at least the alleviation of recurrent famines, scarcities of critical inputs, price fluctuations, and other crises which would be lessened by, as it were, international management.

520. It had been suggested that the TAC might have the possibility of making a contribution here, and after discussion they had concluded that research on world food policies was both within its terms of reference and highly relevant to the objectives of the Consultative Group and the work of the International Centres. They had had the benefit of talks with Dr. Wells, whose report had been made available to the Consultative Group, as well as with Mr. Yriart and his colleagues at FAO and many other people.

521. The TAC had followed its normal course of establishing a Sub-Committee once members' general agreement with the idea in principle had been obtained. The Sub-Committee came back with a report which unanimously recommended the establishment of an institute with the independence, competence, and flexibility to undertake studies on key policy issues bearing on world agricultural development, and particularly those which might have sensitive political or social connotations. Research in the social sciences did of course lead to more political discussions than that in the natural sciences, so it would inevitably be addressing problems that were sometimes controversial.

522. The Sub-Committee felt, however, that no single institute could deal adequately with the full wide field of studies related to agricultural and rural development. So, in view of the likelihood of continuing difficulty and uncertainty over the world food situation, it recommended that the task of the proposed institute should be restricted to research and related information and some research training activities bearing primarily on world food policy. This would also enable it to provide most useful guidance to the work of the TAC, Consultative Group, and commodity research centres.

523. Within this general mandate TAC considered that the institute should be given terms of reference broad enough to enable it to keep in view the current problems and policies of major producing and consuming nations and their probable impact on the short-term food situation in the world, with particular reference to the outlook for developing countries; but also it should, and perhaps more importantly, be able to select key policy issues for analysis, so that this could be the basis for guidance to national and international

planners and governments on the measures required to improve the management of agricultural production resources to increase world food supplies, and to achieve a more equitable distribution of available food.

524. The TAC was therefore proposing that an Institute should be established with the following mandate. First, to keep the global food and agricultural situation under continuous independent review and analysis, supply and demand, stocks, and short-term outlook for the major agricultural products, as well as fertilizer and other inputs, price and trade development and prospects. In this respect he wished to emphasize that its main source of intelligence for this purpose would be secondary data, drawn from FAO, the World Bank, and other appropriate bodies including organizations like the U. S. D. A. ; utilizing both published and unpublished information. It was not proposed that it should be a major collector of data in the sense that FAO was. Its second task, and to him the most significant part of its work, would be to examine selected major agricultural policy and trade problems related to food, particularly those involving sensitive relationships between and among countries, such as for example, the distribution of fertilizer or other inputs in short supply; food and other aid policies; export and other trade policies related to food, etc. He saw a particular need for an authoritative analysis of the whole question of existing policies and future needs for the production and distribution of fertilizers and other inputs in short supply.

525. The objective would be to help national planners identify the possible impact of problems or actions arising outside their countries on their internal economies and policies.

526. They would want the Institute to identify and research emerging and future problems of global concern likely to have an important bearing on food production and utilization (including competition between supplies for food and feed) in the longer term, and an obvious category here was the use of the world's available resources for food production.

527. This should involve an analysis of the requirements for bringing in large areas of land not previously used for food production, for example the Amazon Basin, and the llanos of Colombia, to which the work of CIAT provided an encouraging pointer in respect of meat production. It would also entail studying the redevelopment needs of old land in need of reclamation action, for example the saline areas of India and the Sahelian zone of Africa. The TAC was of the opinion that resource-allocation problems in food production policy were currently receiving inadequate attention both vis-à-vis short-term emergency action and long-term perspective planning, and that the new Institute could make a significant contribution in this area of research.

528. If the TAC's views were accepted, the Institute would transmit its work not only in the normal way of publication, but it would directly communicate with policy-makers, through seminars and workshops on selected topics, and other specific devices such as an annual conference to discuss the main functions and implications of its most recent research, the results of which would be published in its annual report.

529. The TAC had been impressed with the analogy drawn by Mr. Wells between the role of the Institute of Strategic Studies and that of the World Food Policy Research Institute in its work and approaches, and would hope that through its analyses and its inter-relationships with other agencies and national authorities in the transmission of its results the latter would soon earn a similar degree of respect and authority.

530. The TAC had very much welcomed the recent initiatives of the FAO Council and Conference in strengthening the Organization's work in data-gathering, food intelligence, and the establishment of an early-warning system; and it had also noted with satisfaction action by the United States and some other national agencies in this field. He stressed that TAC did not therefore feel that such activities should form part of the work of the proposed new Institute, although it should draw on relevant data as a feed-in to its analytical work and clearly could not do the work TAC proposed without good working relationships with FAO, the World Bank, and many other bodies.

531. TAC took the view, however, and he believed correctly that it would be relatively easy for such a body to publicize analyses of difficult controversial questions, which it might be rather difficult for some international body to publish freely and analytically; and it both saw value in the independence of the proposed Institute and the necessity of close working relations with other bodies.

532. The TAC envisaged that much of the research of the Institute, including the kind of studies he had briefly indicated, would either have to be undertaken on a task force basis by teams of research fellows and associates, or by sub-contracting to appropriate universities or other research institutions. The "core" staff of the Institute would be relatively small, and in addition to participation in task forces where feasible, would have an important "conceptual" role in identifying researchable topics, screening for priority, and working out methodology in collaboration with members of the task forces. A clear need was foreseen to associate staff of the International Research Centres, with the work of this Institute, and of course also the agencies of the UN system.

533. They saw the Institute not only as highly competent in its own right, but as a legitimate member of the system participating not only in the pleasure of reporting to the Consultative Group, but more significantly maximizing the use to be made of the data pointing to world-wide food problems.

534. The location of the Institute had naturally been a subject of considerable discussion, and bearing in mind the advantages of strong working links with other agricultural development agencies, members saw merit in basing it in Rome in close association with FAO as the principal agency in the field of food and nutrition policy; provided adequate autonomy and flexibility for the Institute could be guaranteed. In this respect it welcomed the wish expressed by the Director-General in para. 2 of his letter to the Chairman for such an association, and recognized the need for the Institute to avoid any substantive duplication with FAO's functions.

535. Members also saw similar advantages in Washington, for example for a relation between the World Bank and the Institute; Geneva was also considered as a possible site. Clearly the advantages and disadvantages of each would have to be weighed further once agreement has been reached in principle to establish the Institute, and he was therefore not prepared to advise the Consultative Group on the question of location at this moment.

536. Regardless of the actual location, however, the important thing was that the Institute be accepted as a highly competent body worthy of linkages with the major international resource bodies such as FAO, the World Bank, and UNDP, and so on. The TAC therefore assumed that a form of international board appropriate to the nature of its work and location would be set up for the governance of the Institute and would prove one way of assuring the necessary close relations and access to documents, library and other facilities available in the major agencies represented on this governing body.

537. The TAC commended the proposal for a World Food Policy Research Institute to the Consultative Group as a worthwhile undertaking. This was a conclusion reached after much serious discussion, an important contribution to which had come from the seminar on socio-economic research organized by the Consultative Group. The TAC suggested that once funding is available, whether through a consortium of private donors or the Consultative Group itself, a Steering Committee be set up to examine questions of staffing and location further, and to open negotiations for the Institute's establishment and the appointment of the Board.

538. Since this Institute was working in such a new field for international research, the TAC would not object if it were decided, for example, to establish it for a trial period of five years, and to make it quite explicitly the subject of reconsideration after this trial period. At the same time he personally had confidence in the outcome, and believed, with the TAC, that the Institute would prove worthwhile.

Current Agricultural Research Information System (CARIS)

539. The Committee had examined at its seventh meeting the two directories prepared by different methods during the Pilot phase of the CARIS project. Although no decision had been taken at that time regarding the future extension of the project to global coverage a useful preliminary discussion had indicated a number of key questions which it was decided to bring to the notice of the evaluation team and other competent authorities with a view to providing the Committee with adequate material on which to base its subsequent judgement.

540. Principal amongst the questions raised were the user value of the information provided by the system; its technical feasibility, based as it was on the voluntary submission of data; the soundness of the methodology employed and its compatibility with other information systems; adequate means of filling gaps in the data supplied, and finally the relative costs of the system when compared with other alternative means of achieving the same objectives.

541. The Committee, having now had the opportunity to study the IDRC evaluation report and other views on user reaction, and to examine the FAO proposal for the expansion of the project to cover all developing countries, had reached the following conclusions. (i) That there was considerable interest and enthusiasm amongst scientists, not only in the countries covered by the Pilot Project but in other countries which would wish to be included in any expanded project, for the provision of an information service of the CARIS type. (ii) That the information coverage of the project should, however, be less ambitious than the Pilot Project directories with regard to the depth of detail recorded on ongoing research projects. This had regard both to the difficulties of collecting the vast mass of project data required and its early obsolescence, thus requiring frequent updating, and to the implied additional heavy costs of these operations. (iii) That whilst there was no need to record project data as fully as in the Pilot Project there was a need to indicate in general terms what research work was being done where. Three items were recognized as suitable components of an expanded project: a directory of research stations and establishments; a directory of research scientists; and an indication of the main lines of ongoing work at each station recorded. (iv) That an approach on the above lines would be technically feasible and that the data could be presented either sectorally, or in a classified directory as prepared under the Pilot Project.

542. The Committee also saw considerable merit in establishing linkages between the AGRIS and CARIS projects and had noted that the AGRIS project could be expanded to permit cross-linkages with particular reference to the inclusion, not hitherto foreseen, of data on published research from the developing countries and the institutions where this had been carried out. It thus urged FAO, in consultation with the AGRIS authorities, to undertake the necessary revision and restructuring of the proposal for a worldwide CARIS project, with links to AGRIS, taking into account the restricted nature of the research data coverage recommended by the Committee, and to present a revised proposal to the forthcoming (Oct. 30/31) meeting of the Consultative Group.

543. A considerable momentum had been generated by the Pilot Project and the Committee believed that this momentum should not be lost, and every advantage taken of the initial investment already made in establishing the Pilot Project. It therefore recommended that support should be given to an expansion of the CARIS project to cover operations until such time as the project may be absorbed into the Regular Programme activities of FAO during the 1976-77 biennium.

Aquaculture

544. The Chairman explained that the TAC had recognized aquaculture as an area of research of great importance and had accordingly appointed an expert Sub-Committee to advise on the prospects for achieving the breakthroughs necessary in an attempt to domesticate wild fish species. The report of the Sub-Committee which had been made available to the Consultative Group members went a considerable way to improving the state of knowledge on aquaculture research. However the Sub-Committee had recommended a global programme of some \$ 15 million, over five years, which had been rejected by the Committee, not merely on procedural or financial grounds but because it had been made quite clear that the dearth of trained technical personnel would not permit programme development to the scale envisaged for some considerable time; secondly the Committee felt it most advisable to move cautiously into the area of aquaculture research.

545. The advice of the Committee was therefore to approach one or two specific research problems, amongst which carp, milkfish and mullet in S. E. Asia had been selected, including the provision of inputs for the training and development of skilled personnel. An expenditure of up to half a million dollars annually was suggested for this activity. He suggested that details could be worked out between a Sub-Committee which would be established by TAC, and the Secretariat of the Consultative Group.

Bean Research Network in Latin America

546. The TAC had recommended at its last meeting that CIAT should serve as the co-ordinating and servicing centre for a cooperative research network on field beans in the Latin American region, rejecting an alternative proposal for a separate coordinating centre outside the ambit of CIAT. The Chairman reported that the CIAT Board of Trustees had accepted this role and had agreed to develop an appropriate proposal for implementing

such a network with an appropriate Steering Committee. However, more time was needed to fully develop their ideas and permit adequate consultation in the region before a decision could be taken on structure and costing. Consequently the Committee had accepted CIAT's wish to present its formal proposals with its 1976 Programme and Budget. Following discussion of these the views of the TAC would be conveyed to the Consultative Group.

Strengthening National Research Capabilities

547. The Chairman had already indicated to the Consultative Group the keenness with which the Committee had approached this subject; not with a view to recommending large expenditures but in an attempt to suggest ways and means by which a concerted effort could add to the strength of national research. Although the primary role of TAC was to advise the Consultative Group on international research, its organization and forms, any such advice and subsequent research output would be to no avail if the absorptive capacity of national agricultural research services were inadequate. TAC had therefore, in its "Priorities" statement stressed the need to strengthen national services through, inter alia, training activities and such devices as regional and global networks and projects designed to link research to development and thus provide two-way feedback between national and international activities. The role of both bilateral donors and the international agencies in this process was highlighted and it was suggested that the efforts of the latter should be strengthened.

548. The Committee had now had a further useful discussion on this subject with the Centres' Directors, representatives of the Co-Sponsors and members of the Consultative Group. It had reviewed the report of the 6th Bellagio Conference and resolved to discuss further at its next meeting the proposals contained in that report and those arising from its recent discussions. In particular, it had noted the proposal for a meeting of the three Co-Sponsors of the Consultative Group to review ways and means for effective complementary action in this field and had recognized the request for guidelines to be made available to those members of the Group desiring assistance in the planning of their activities in the support of national research services. Particular attention had also been called to the need for closer relationships between the International Centres and national institutions and the Committee had commended a recent initiative of UNDP and FAO towards this end. It had emphasized, however, that in the forging of such linkages caution should be exercised to avoid overloading the international centres with activities of an extension rather than a research nature.

549. The Committee would be discussing the question in some detail at its next meeting and the Chairman sought the assistance of the Consultative Group Secretariat and the Co-Sponsors in the compilation of information on the bilateral relationship between donors and national and regional research efforts. Material had already been made available by some donors but the Committee's discussions would be aided by a picture of the total effort.

Other Business

550. The Chairman explained that pressure of work had not allowed the Committee to complete its deliberations on tropical fruit and buffalo research. The importance of both, but especially the latter, had been recognized by the Committee but further information was still

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ANNEX I

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

24 July - 2 August, 1974
Washington, D. C., U. S. A.

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

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Mr. B. N. Webster, Assistant Secretary, TAC;
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- Item 1 Adoption of the Agenda
- Item 2 Adoption of the report of the 7th Meeting
- Item 3 Annual Report, Discussion of Working Group proposals for funding specific research projects
- Item 4 CARP, Report of evaluation of Pilot Project and discussion of future evaluation of the project including ASPAC proposal
- Item 5 Grain Research Network in Latin America Further discussion of Working Group report and CIAT proposals for participation
- Item 6 Clarification and definition of technology used in relation to programmes of international agricultural research
- Item 7 The International Centre: discussion of 1975 programme proposals
- Item 8 Research needs of the Near East and North Africa: Discussion and formulation of recommendations to Consultative Group
- Item 9 Formulation of recommendations on Items 3, 4 and 5
- Item 10 Plant nutrition
 - (i) Proposal for an International Plant Nutrition Institute
 - (ii) General discussion on plant nutrition research requirements
 - (a) Biological fixation of nitrogen
 - (b) Chemical fertilizers
 - (c) Organic manures, nutrient recycling, and integrated approaches to plant nutrition
- Item 11 Strengthening national research capabilities
- Item 12 Socio-economic research: Proposal for a World Food Policy Institute
- Item 13 Formulation of recommendations on Items 10, 11 and 12

ANNEX II

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

24 July - 2 August, 1974

Washington, D. C.

REVISED AGENDA

- Item 1 Adoption of the Agenda
- Item 2 Adoption of the Report of the 7th Meeting
- Item 3 Aquaculture. Discussion of Working Group proposals for funding specific research projects.
- Item 4 CARIS. Report of evaluation of Pilot Project and discussion of future evolution of the project, including ASPAC proposal.
- Item 5 Bean Research Network in Latin America. Further discussion of Working Group report and CIAT proposals for participation.
- Item 6 Clarification and definition of terminology used in relation to programmes of international agricultural research.
- Item 7 The International Centres: discussion of 1975 programme proposals.
- Item 8 Research Needs of the Near East and North Africa. Discussion and formulation of recommendations to Consultative Group.
- Item 9 Formulation of recommendations on Items 3, 4 and 5.
- Item 10 Plant nutrition:
 - i) Proposal for an International Plant Nutrition Institute.
 - ii) General discussion on plant nutrition research requirements.
 - (a) Biological fixation of nitrogen
 - (b) Chemical fertilizers
 - (c) Organic manures, nutrient recycling, and integrated approaches to plant nutrition.
- Item 11 Strengthening national research capabilities.
- Item 12 Socio-economic research. Proposal for a World Food Policy Institute.
- Item 13 Formulation of recommendations on Items 10, 11 and 12.

- Item 14 **The International Centres: discussion of 1975 Programme Proposals with Centres' Directors.**
- Item 15 **Review Procedures. Discussion with International Centres' Directors.**
- Item 16 **Formulation of recommendations on International Centre's proposals for 1975.**
- Item 17 **Other business:**
 - (a) **Research on Tropical Fruits**
 - (b) **International Research on Water Buffaloes**
- Item 18 **Date and Place of Next Meeting.**
- Item 19 **Chairman's summing up.**

Revised Agenda	Item	Language
DDDR:IAAR/74/10 Restricted	Item 1	E
DDDR:IAAR/74/18 Restricted	Item 2	E, F, S
DDDR:IAAR/74/25 Restricted	Item 3	E
DDDR:IAAR/74/28 Restricted	Item 4(i)	E, F
DDDR:IAAR/74/28bis	(ii)	E
DDDR:IAAR/73/32 Restricted	Item 5(i)	E, F, S
DDDR:IAAR/74/15 Restricted	(ii)	E
DDDR:IAAR/74/19 Restricted	(iii)	E
CGIAR Document entitled "Budgeting and Accounting Procedures and Practices of International Agricultural Research Centres"	Item 6	

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

24 July - 2 August, 1974

Washington, D. C.

LIST OF DOCUMENTS

<u>Revised Agenda</u>	<u>Languages</u>
Item 1 Revised Agenda DDDR:IAR/74/19 Rev. 2 Restricted	E
Item 2 Draft Report of the 7th Meeting of TAC DDDR:IAR/74/18 Restricted	E, F, S
Item 3 Report of the TAC Sub-Committee on Aquaculture DDDR:IAR/74/25 Restricted	E
Item 4(i) Proposal for a Current Agricultural Research Information System (CARIS) with a Worldwide Coverage DDDR:IAR/74/26 Restricted	E, F
(ii) CARIS Pilot Project Evaluation Report DDDR:IAR/74/26bis	E
Item 5(i) Proposal for the Establishment of a Cooperative Programme for Field Bean Research in Latin America and the Caribbean Zone DDDR:IAR/73/32 Restricted	E, F, S
(ii) Explanatory Note to the Proposal for the Establishment of a Cooperative Programme for Field Bean Research in Latin America and the Caribbean Zone DDDR:IAR/74/15 Restricted	E
(iii) Cooperative Bean Production Systems Program - CIAT Proposal DDDR:IAR/74/10 Restricted	E
Item 6 CGIAR Document entitled "Budgeting and Accounting Procedures and Practices of International Agri- cultural Research Centers"	

Revised Agenda

Languages

- | | | |
|------------|---|---------|
| Item 7 | WARDA Proposals
Vegetable Research correspondence | E |
| Item 8(i) | Location of the Proposed International Centre for
Research in the Near East and North Africa
DDDR:IAR/74/23 Restricted | E |
| (ii) | Suggested Staffing Pattern, Headquarters, Inter-
national Research Centre for the Near East and
North Africa
DDDR:IAR/74/33 Restricted | E |
| Item 10(i) | US Proposal International Plant Nutrition Institute | E |
| (ii) | Biological fixation of Nitrogen
DDDR:IAR/74/22 | E |
| (iii) | Organic Manuring - Integrated Approach to Plant
Nutrition
DDDR:IAR/74/27 | E |
| (iv) | The Possible Impact of the Petroleum Crisis on
Agriculture (FAO)
Members only | E |
| (v) | Emergency Measures in regard to the Supply of
Fertilizers and Pesticides
CL 63/2 (FAO)
Members only | E |
| Item 11(i) | Strengthening National Agricultural Research
Services (Notes on Bellagio VI Conference)
DDDR:IAR/74/28 | E |
| (ii) | Needs and Opportunities for Strengthening National
Research Systems as Seen by FAO
DDDR:IAR/74/29 | E |
| Item 12 | Proposal for a World Food Policy Institute
DDDR:IAR/74/24 | E |
| Item 14(i) | Research on Tropical Fruits
DDDR:IAR/74/30 | E |
| (ii) | International Research on Water Buffaloes
DDDR:IAR/74/31 | E |
| (iii) | Research on Non-food Crops: TPI Interim
Comments
DDDR:IAR/74/32 | E |
| Item 16(i) | Review Procedures
DDDR:IAR/74/20 Restricted | E, F, S |
| (ii) | Review Procedures: Assessment of Research
Productivity
DDDR:IAR/74/21 | E |

COMMENTS ON
THE REPORT OF THE SUB-COMMITTEE ON AQUACULTURE

Terms of Reference

The Sub-Committee's report expresses its difficulty in satisfying or fulfilling the terms of reference numbers (3) and (4). While paragraphs 16 to 28 satisfy terms of reference (1) and (2), an explanation is given for the omission of the detail requested for terms of reference (3) and (4) in paragraph 11.

It has been explained that there was a serious difficulty, almost an impossibility, in formulating the precise requirements of equipment and personnel for the various projects or systems described. This was largely because it would have been necessary to obtain a clear indication of what personnel, installations, facilities and services at the various regional stations will be made available by governments for the research systems outlined in the report. They found it difficult to get such indications without implying some commitment. The Sub-Committee felt that it would be preferable to submit the programme with global figures for each region and system which they deemed necessary and they described this as an indicative budget which will need to be refined in detail at each regional centre when and if the programme was approved in principle.

In this regard the report then does not describe the cost estimates for each individual project and due to the same consideration of imprecise knowledge of staff and facilities available they declined to provide a clear-cut time-frame for the duration of each research project.

It should be noted that the Sub-Committee had prepared detailed estimates for the research problems relating to culture systems and found it an impractical exercise because they were torn between deciding whether the estimates should be based on the total requirements or how much regard should be paid to the contributory services and facilities of the proposed regional centres. I am informed that research costs are very high compared with agriculture.

The report implies (paragraph 43) that though the need for food production indicates an urgency for start in Africa the present state of development and existing scientific capabilities in research and extension suggest the Asia region. The budget also indicates the biggest initial expenditure in the Asian region thus confirming the Sub-Committee's thinking that the best results are needed and obtainable there.

It is considered that the choice should be made for a start on part of this programme and after some consideration of the reasons given and the aptitudes and traditions of the peoples involved in each region it was considered most appropriate and realistic to provide assistance to a programme in Asia. The technical reasons for this choice relate to existing scientific capabilities, installations, the considerable development potential for the application of results, the on-going technical assistance inputs and food production needs.

Three systems seem to be recommendable for support, namely culture of various carps in freshwater and of milkfish and mullets in brackish water (para 16). The programme summary, tabulated in appendix 1, indicates these as the first two systems with the research problems which have to be resolved. Given a suggested limitation of a total budget of no more than \$ 300, 000 over a three-year period it is judged that studies on reproduction physiology, nutrition requirements and some work on natural foods and artificial feeds is all that can be undertaken on these two groupings. These are considered the highest priority for the most fruitful new research effort.

It has been emphasized that (as indicated in Appendix 1) there are many related problems which can with greater economy be ~~simultaneously~~ undertaken. These include genetics and selective breeding which could easily be associated with achievement of efficient and reliable reproduction of the species concerned but will be of a longer term nature. Similarly, culture systems intensification can be simultaneously researched, given sufficient quantities of species obtained through controlled reproduction. The same may be said of the research on ponds, inhibitive factors in management such as metabolites or of economic studies. There is evident economy that can result from integrated study of associated problems. There is also the economy of scale to be derived from the simultaneous research on the various systems outlined but there are no funds for all programmes.

What seems regrettably necessary however is to confine our initial recommendation to a start on the two priorities in one region. However, the Committee may wish to consider the endorsement of the total programme in principle but to consider that the initial activity be confined to reproduction physiology, foods and feeds of carps, milkfish and mullets. Thus:

Location - Barrackpore, India, and Ilo Ilo, Philippines
Funds - \$ 175, 000 carps
 \$ 125, 000 milkfish and mullets
Period - 1975 to 1977

'Once tangible results are obtained then the justification for further aspects of the programme can follow.

W. H. L. Allsopp
July 24, 1974

(1)	Review Procedures	E. F. a
(2)	Review Procedures: Assessment of Research Productivity	W

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ANNEX V

WBG ARCHIVES

DRAFT REPORT OF THE SEVENTH MEETING OF THE
TECHNICAL ADVISORY COMMITTEE OF THE CONSULTATIVE GROUP ON
INTERNATIONAL AGRICULTURAL RESEARCH

Document DDR: IAR/74/18 Restricted

CORRIGENDA

The following amendments to the above draft report were approved at the 8th Meeting of the TAC:

i. Page 7, paragraph 38, end of line 6. Revise sentence to read:

"He foresaw that ICRAI might eventually be in a very good position to conduct barley research. Furthermore he foresaw that future work on wheat/barley crosses will require a different approach from the traditional one, such as cell fusion etc., and therefore it would not be necessary to keep both of the wheat and barley breeding programs in a single center."

ii. Page 9, paragraph 43, last sentence. Revise to read:

"Although this approach would not preclude a research role for the new entity, it would emphasize the primary role of coordination."

iii. Page 48, paragraph 227, second sentence. Revise to read:

"Being particularly impressed by the potential offered by advances in plant breeding to improve the level and quality of protein, especially in cereals, e.g., high lysine maize and sorghum, an opportunity appeared to be offered for the international centers working on maize food crops to broaden their involvement in research on nutritional problems with high potential impact."

iv. Page 69, paragraph 315, line 6. Add "zone" after "temperate".
line 9. Substitute "mitigate" for "defeat".

