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CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE

Seventh Meeting, Rome, 4-8 February, 1974

REPORT OF THE TAC WORKING GROUP ON THE RESEARCH NEEDS OF THE NEAR EAST AND NORTH AFRICA

(Agenda Item 3)

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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Report of the TAC Working Group on the Research Needs of the Near East and North Africa

1. Background

At its sixth meeting in Washington in July 1973 the Technical Advisory Committee to the Consultative Group on International Agricultural Research discussed in detail the report of its Mission to study the research needs of the Near East and North Africa. This Mission, under the leadership of Professor Dunstan Skilbeck, visited a number of the countries of that region between March and May, 1973.

2. The TAC concluded that the Mission had made a clear case for strengthening agricultural research in the region and that it had done an excellent job in analysing and presenting the broad problems requiring priority attention there. However it was felt

i) that the details of the research needed within these broad priorities should be more clearly specified, and non-essential items deleted; and

ii) that the modus operandi for undertaking research on the items clearly identified as of high priority should be further examined to see whether the approach of establishing a major international research centre recommended by the Mission offered the most effective operational means of strengthening and supporting existing efforts in the Region, or whether any alternative - possibly of a less costly nature, might be preferable.

3. In order further to examine these matters (for which no more time was available at its Washington session), the TAC decided to establish a sub-committee to meet with selected members of the Skilbeck Mission, and any other appropriate persons with knowledge of problems of the Region; and to report their conclusions to its next full session, to be held in Rome from 4 - 9 February, 1974. The TAC nominated Dr. Hopper, Dr. Swaminathan, and Professor Bommer to represent it, and requested the Secretary to convene a meeting in Rome at a mutually convenient date.

Attendance

4. The meeting was held at FAO headquarters on 12th and 13th November, 1973 the following members of the TAC, the Mission, and other organisations attended:

TAC Sub-Committee	Dr. D. Hopper (Chairman)	President, Canadian International Development Research Centre
	Professor D. Bommer	Institutsdirektor, Institut für Planzenbau und Saatgutforschung Braunschweig-Völkenrode Federal Republic of Germany
	Dr. M.S. Swaminathan	Head, Indian Council of Agricultural Research

TAC Research Mission *	Professor D. Skilbeck	Mission leader, late Principal Wye College, University of London
	Ir. J. Koopman	Deputy Director, Projects and Research, Royal Tropical Institute, Amsterdam
	Dr. A. Abu Sharr	Senior Agronomist FAO/IBRD Cooperative Programme
A.L.A.D. (Beirut)	Dr. R. Havener	Director Arid Lands Agricultural Programme
FAO - Cairo	Professor M. Nour	Assistant Director General, Near East Region
"	Dr. Hafiz	Chief, Near East Field Food Crops Project
"	Dr. Wahhab	Research Officer, Near East Regional Office
Rome	Dr. R. Peterson	Chief Crop and Grassland Production Service
"	Dr. J. Rendel	Chief-Animal Production Service
"	Dr. A. Demiruren	Specialist in Transhumance
"	Dr. H. Horning	Senior Officer, Water Development and Management Group
Secretary of the Meeting:	Mr. P.A. Oram	Chief-Research Development Centre FAO Secretary-Technical Advisory Committee

Programme

5.

12 November	09.45	Preliminary discussion and agreement on working procedure (TAC)
" "	10.00-12.00	First meeting with Mission members
" "	14.00-16.00	Meeting with Director ALAD and Mission members
" "	16.00-18.00	Closed session: TAC sub-committee
13 November	09.45-12.30	Discussion with FAO regional headquarters staff and mission members
" "	15.30-18.00	Closed session: TAC sub-committee

Summary of Discussions with the Mission

6. In its first preliminary discussion the sub-committee members agreed that there had been a consensus at the sixth meeting of TAC in support of a significant international effort to reinforce existing national and regional research programmes in and on behalf of the countries of the Near East and North Africa. Their task was therefore not to call into question the need for such a new international effort, with which they also concurred; but rather to try and give a sharper focus to the nature of the research to be undertaken and then to decide how best the major problems identified could be tackled.

7. This was made clear to the Mission in opening the dialogue, and the Chairman asked its members if, in the light of the TAC discussion, they now felt able to be more selective in defining the research tasks as compared to the rather too comprehensive list presented on page 42 of their report.

* Dr. P. Barbero Dean of Economics & Banking, University of Siena, economist on the Mission; unable to attend, but discussed his views with the Mission Leader and the TAC Secretary on the evening prior to the meeting.

8. In reply Professor Skilbeck said that he had attempted to do this in listing the three main objectives of the Centre in his introductory remarks to the sixth meeting of the TAC (see report of this meeting paras. 192 and 193). However he believed that if the broad priorities in para. 168 on page 35, of his Mission's report had been more closely related to the list of individual items for research shown on page 42 (para. 190) the need for the latter would have emerged more clearly. Even after reading the comments of the TAC and other agencies (CIMMYT, FAO, IBRD and UNDP) on their report, and further discussions among themselves, his team did not see any substantial modification of these broad priorities as being desirable. They should form the main programme elements of any attempt to reinforce ongoing research in the region, although he agreed that the list of individual lines of work related to these programme elements on pa ge 42 of their report might involve some overlapping and could be presented more concisely. He reiterated the need for a centre in the Region which would make a significant impact on its agricultural development and form an integral part of the agrarian economy. To achieve this it could not merely be a post box or relay centre for other people's work but should have a strong research component of its own, which would also be essential for training and to enable it to provide inputs of real value to national programmes.

9. In view of the team's re-emphasis of its basic priorities, and the fact that these also formed the main framework for the discussions and conclusions of the TAC Sub-Committee paras. 192 and 193 of the sixth TAC report are quoted below for the convenience of readers. Reporting on his Mission's conclusions Prof. Skilbeck said:

"192.Their opinion, however, was that amongst the most important tasks to be established from the outset were: (i) surveys or seminars through which the centre could learn more of the basic problems and difficulties of the Region and by which it could early make its presence felt throughout the Region; (ii) cooperative and outreach programmes with national, regional, and international institutions and agencies, so that the Centre could become closely linked with these from the very start of its work; and (iii) to develop as soon as possible its own "on site" research programmes.

193.In respect of (iii), the Mission believed that priority should be given to (a) farming systems analysis in order to identify conditions determining success and failure in attempts to modify traditional systems; and the testing of more intensive systems, with special reference to the irrigated zones, the reduction of fallow, and to crop-livestoock integration; (b) The improvement of field food crops, with priority to wheat and barley, followed closely by the problems of legumes and oilseeds; here it appeared likely that the centre could assist in making a relatively early and important impact; (c) field scale research on the more efficient use of land and water, both under irrigation, and in the rainfed zones, since so much of the future development of the agrarian economy of the Region must depend on the improvement of water efficiency."

10. In answer to specific questions by the Sub-Committee, Mission members restated their views on priorities. These were:

i) Research on the more efficient use of land and water: this was clearly of crucial importance in this particular region, where scarcity and erratic distribution of rainfall placed major constraints on agricultural production; where irrigated land represented a higher proportion of total cultivated area than in other developing regions; and where serious problems of salinity and difficult soils existed.

11. Better water utilisation was not considered merely a matter of applying existing knowledge; when this was attempted further research was always found to be needed because imported technology was rarely simply transferable. This was an important reason for the emphasis on improving methodology in their report.

12. There was a need to find practical answers to fundamental questions, and the work presently being undertaken in the region was not really getting off the ground because there was no strong resource base. Current work was disintegrated and fragmented and could not be significantly reinforced or coordinated by the small FAO regional office staff of two men in Cairo who were substantially isolated from laboratories or field plots. The programme recommended by the Mission attempted to develop an integrated approach covering the main regional needs for improving the natural resource base, and it was not considered feasible to leave out any major component.

13. Replying to Dr. Hopper's remark that the Mission did not always make a clear distinction in its priorities concerning rainfed and irrigated land, Dr. Koopman explained that this was not always possible, nor even desirable. There was no "either - or" choice. Significant progress was possible with water harvesting in rainfed areas, and by extending the irrigated area through low intensity irrigation of rainfed land at peak rainfall periods; while even in irrigated "command" areas much theoretically irrigable land was partially rainfed or irrigated inadequately due to weakness in delivery systems, poor levelling, unsatisfactory drainage, bad organisation or lack of knowledge on the part of farmers. Both in research and development a great deal remained to be done in rainfed and irrigated areas and in many respects the two were - or ought to be - inter-linked.

14. Research on plant - soil - water relationships, including plant physiology, was of basic importance to a better understanding of improving productivity of crops and farming systems in the Region. He agreed with Dr. Swaminathan that because of the site-specificity of problems related to irrigation and salinity, a single centre would have to function mainly in a catalytic and ground-breaking role and in developing methodology which could be applied in coordinated outreach or network programmes. However, this could probably be done with relatively limited laboratory and land facilities, by drawing on and attempting to adapt and re-cyle to national programmes ongoing work on analogous problems in advanced countries. Model-building and simulation could play an important part in this work.

ii) Crop improvement

15. Two main tasks were foreseen by the Mission: first to develop specific breeding programmes at the proposed Centre for selected crops of major importance to the Region not being covered adequately by existing arrangements; secondly to act as a relay point to the Region for the work of other international Research Centres.

16. Food crops on which specific breeding work was recommended at the Centre were: Barley, durum wheat - the two major cereals of the Region, certain grain legumes (broad beans, Vicia faba; and lentils); possibly, at a later stage, oilseeds, especially sesame. Work on legumes and oilseeds would be built up over time on a cooperative basis with other programmes, drawing especially on advice from the ongoing FAO/UNDP field food crops programme in the Region as to how far to go on breeding of these crops. Initially, breeding work on oilseeds or other crops than cereals and legumes would not form a major part of the work of the proposed Centre; but it was considered that a strong cereal/legume programme was vital not only to the food needs of the Region but to the impact of the Centre itself in research and training. Work on fodder crops and pastures might also have to be undertaken but this was a decision which could be deferred pending testing of improved nature species already available, e.g. re-introductions from Australia.

17. In respect of the relations between the proposed Regional Centre and other International Research Centres, Professor Skilbeck emphasized that there was no implication of "unique regional jurisdiction" in their proposals as suggested in CIMMYT's comments on their report. Evidently CIMMYT had misunderstood their intentions. The Mission had envisaged any Centre related to the Near East and North African region as playing a similar role vis-à-vis other international centres as did IITA or CIAT. For example in respect of wheat it was expected that CIMMYT would do the basic breeding and physiology and transfer segregating materials to the Centre in the Region for further adaptive research in cooperation with national programmes. A similar relationship could be envisaged with CIMMYT for maize and ICRISAT for millet, sorghum, and chick-peas.

18. He agreed with Professor Bommer and Dr. Hopper that a major function of the proposed Centre would be to assist in a "relay" capacity in outreach programmes on cereals in cooperation with CIMMYT and ICRISAT; a centre in the region could have an important role to play in adapting the genetic material produced in other centres to the specific ecological conditions, pests ,diseases, and weeds, and to consumer preferences prevalent in the countries of the Near East and North Africa. This could only be done by forging close links with national programmes, and while he agreed with Dr. Swaminathan that this might initially weaken CIMMYT's linkages to countries in the Region which, together with India and Pakistan had been the main focus of its work outside Mexico, he believed that in the long run the closer involvement that would be possible by locating a Centre there would be beneficial both to the countries and to CIMMYT. The very fact that CIMMYT had had to outpost so many staff to that region argued for a centre of strength to work on cereals there.

iii) Development of improved cropping systems and crop-livestock integration

19. In respect of irrigated land it was agreed that cropping intensities were far below what appeared technically feasible in most countries of this Region, and that the development of more productive systems of land use was of high priority.

20. To achieve this would not only require require research on the problems outlined in (i) above but also to find more profitable combinations of crops which would in turn justify the costs of high level research and resulting new irrigation techniques, systems, and equipment. Wheat, maize, cotton, vegetables, and fodders were among the crops on which attention should be focused, but it was not considered that breeding programmes should be attempted other than for crops listed under (ii) above.

21. High priority was accorded by the Mission to research on rainfed cropping systems, with particular attention being devoted to the role and value of the fallow in the conservation of moisture and fertility (see (i) above); and to the promotion of closer crop-livestock integration.

22. Remarking on the important contribution of the livestock sector to GDP from agriculture in many countries of the Region, Dr. Bommer said that research on animal production systems seemed to merit strong support. He wondered if cooperation with ILCA offered a means of achieving this.

23. Although recognising that links with the work of ILCA on methodology, and range management, would be valuable, the Mission did not envisage close cooperation between the proposed Centre and ILCA on developing production systems except in Sudan and Somalia. In most of the Near East and North Africa ecological and sociological conditions were very different from those within ILCA's terms of reference, and the predominant livestock there were sheep and goats, not cattle.

24. In reply to the questions on the need for breed improvement Dr. Skilbeck explained that the Mission had some hesitation initially in making firm recommendations since they had felt that the capacity of local unimproved breeds to benefit from improved nutrition had first to be clarified. There was a need to explore what was already going on in the Region in this respect. Their final conclusion, as expressed in para. 107 of their report, was to give first priority to nutrition, including pasture and fodder crop research, rather than to breed improvement, and to work with sheep rather than goats. Dr. Bommer pointed to parallels with breeding on certain important crops such as cotton which it was not proposed that the Centre should cover, and suggested that consideration be given to sub-contracting such work to appropriate institutes in the Region where good work was known to be going on. The Sub-Committee noted however that a decision not to undertake sheep breeding at the Centre would raise the issue of what to do with the ALAD breeding flock if the proposed Centre were to be established in the Lebanon and to take over main elements of ALAD's programme. Dr. Swaminathan suggested that the Centre might possibly follow the ICRISAT example, and allocate a block of land to national scientists who would work on breed improvement in collaboration with the centres staff concentrating on fodder production, nutrition, and the economics of the system.

The structure and concepts of the proposed Centre.

25. Dr. Swaminathan asked in what respect the Centre, the proposed structure of which appeared to him to be quite conventional, represented any new concepts, as claimed in the Mission report.

26. Professor Skilbeck explained that the staffing indicated on page 44 of the Mission's report should be regarded as indicative. He agreed that the structure shown was conventional; they had considered setting it out on a 'programme' or problem-oriented basis, but had not wished to appear to commit or pre-empt decisions of any future Board and Director by doing so. The staffing pattern proposed was the minimal complement of senior scientists for the headquarters centre, he believed that at least two associate research centres or sub-centres would be eventually needed to complement the work of the main centre in the cold high plateau conditions such as prevailed in much of Iran and Turkey, and also to cover the semi-arid rainfed areas of N. Africa. The staff required for these would be for decision later.

27. While the proposed structure might appear conventional the strong emphasis ab initio on an analytical and systems-oriented approach and on helping countries improve methodology represented a departure from the norm of existing centres, as did the flexibility proposed in tackling different problems according to their nature, susceptibility to a centralised approach, degree of site-specifity, and level of ongoing research in the Region. A major objective of the systems work would be to put together known facts, see why knowledge was not being used, identify the components of change and the opportunities for introducing new technology successfully which would catalyze further progress, select from this analysis specific problems for research at the centre and at the national level and feed back the results to countries.

28 The Mission recognized that this would have to be built up over time, as would its proposals to help countries upgrade their ability to collect and interpret technical, climatological, and socio-economic information essential to the planning of soundly-based long-term research and development programmes. This was why it was important for it also to have a significant applied research programme in plant breeding and crop improvement which would have an early impact on agriculture in the Region.

29. Dr. Swaminathan, while agreeing with the need for systems work, stressed the importance of identifying the opportunities for technical innovation in the main farming systems. He saw the need for a strong central research base, supported by links to sub-stations reflecting environments for which the Centre was not adequately representative. Criteria for the priorities of the Centre could be defined in human terms as:-

i) securing food supplies
ii) improvement of nutrition
iii) increasing employment
iv) raising incomes, especially in the poorer and most backward areas

While he believed that the quickest impact could come from the Centre helping national governments to apply existing knowledge, he hoped that in its main research efforts it would take the longer view with the aim of promoting broader social justice.

30. Summing-up, Dr. Hopper said that the Centre would basically be dealing with three zones:-

i) 50 - 350 mm. rainfall areas, mainly range and marginal arable areas with a high nomadic population of perhaps 10 million. Although the poorest segment of the region they represented a relatively small portion of total rural population.

ii) 350 - mm. upwards - in rainfed land. These areas were now largely under a grain-fallow rotation. This probably covered the largest number of people, and the rainfed arable system seemed to offer significant opportunities for raising incomes through crop livestock integration by substitution of fodders for fallow.

iii) the irrigated area: a high proportion of which was located in Egypt and the Sudan. This had the largest number of small farmers, and again offered opportunities for raising income and employment through intensification and diversification.

It was unlikely that international funds would be available to support research into all the problems of these areas, and their task was to decide what could be left out - at least for the immediate future, or left to others.

Discussion with the Director of ALAD.

31. Dr. Havener described the main focus of the ALAD programme, which now had a working budget of $ 1.0 - 1.2 million. It had two main components.

i. crop improvement focused on durum wheat, feed barley, and grain legumes (chickpeas, broadbeans, and lentils). There was a small wheat breeding/selection programme involving some 600 crosses based roughly equally on imported and local varieties. This was seen as complementary to CIMMYT's work, the problem was one of gaps rather than overlap. Delicate problems of inter-relationships between a new international Centre and existing centres and international agencies would undoubtedly have to be overcome. Good working arrangements with CIMMYT, ICRISAT and FAO would be essential to its success; but he felt that for political reasons, as well as for its own reputation and training functions, any new Centre must have its own research programme and not function only in a 'relay' capacity.

ii. sheep improvement, through breeding and nutrition with emphasis on improving fecundity and obtaining hybrid vigour. Under conditions of good nutrition this had been extremely successful both in terms of increased lambing percentage and increased meat output from F1 crosses. However the question of what would happen to these improved animals under stress conditions had not been resolved, and he foresaw risks, particularly for range-reared sheep. A problem facing ALAD now was whether to continue its breeding work, or to concentrate mainly on nutrition and management.

32. He was basically in agreement with the Mission's research priorities; in the case of sheep he would probably start with nutrition at any new centre, and with further testing of the Australian wheat/sheep system, although at the moment this was impeded by lack of trained livestock production specialists, and by the different socio-economic conditions and ownership patterns prevalent in the Region. He saw a need for research to improve the technology in parallel with an analysis of the constraints within existing systems of husbandry, since changes in a system were unlikely to work unless you could build something new and attractive technically into it.

33. ALAD was not undertaking any research on irrigation and water use, but was acting as an information relay centre between countries with advanced research programmes in this field and those in the Near East. This ought to be continued, and attempts made to adapt this advanced knowledge, some of which might prove difficult to apply under the conditions in the Region. This should be a task to be attempted at the proposed centre although he doubted if any institute could, on its own ground, adequately tackle site specific problems of soil-plant-water relationships, other useful work of a centralized nature might, however, be undertaken on screening crop varieties from within and outside the region for adaption to temperate and sub-tropical conditions - for example the Indian sorghums had proved largely unsuited in the Lebanon. Tests could also be made of how irrigated crops could be fitted together in more profitable combinations and intensive systems. There was great interest in irrigated agriculture in the countries of the Region and this could not be ignored by any international centre there.

34. Members of the Mission drew attention to the scarcity of expertise and basic data on development and management of irrigation systems in some of the difficult soils of the region e.g. gypsiferous areas. Dr. Hopper noted that from the discussion he saw two important problems emerging; first how to develop the data base from which site-specific research could be planned, second, how to improve national capabilities to undertake site-specific research using novel and virtually untested techniques.

35. Dr. Havener agreed that an international centre could play a valuable role in helping to solve these problems by developing and demonstrating broad principles, training local scientists in new techniques and then helping to orchestrate work on testing improved systems of irrigated agriculture at the national level on a cooperative basis.

36. At the same time he believed that high priority should be accorded to work on soil/water relationships in the rainfed areas, to water harvesting, and to low intensity irrigation which he believed offered the chance of a high pay-off.

37. After describing ALAD's relations with national programmes and with the new Arab Institute in Damascus, Dr. Havener stated in reply to questions that he believed that the only way of getting sufficient stability, continuity, high quality staff, and assurance of adequate funding to reinforce ongoing research on the key problems of the region, was to establish a major internationally supported centre there. ALAD had too weak a team to undertake this task and he saw it as becoming redundant if a strong international centre could be set up, although he would hope that the Ford Foundation would transfer its support to such a Centre.

38. The present land and facilities available to ALAD in the Bekaa Valley would not, in his opinion, be adequate for the long-term needs of a major international centre, and it would have to have full control of its labour force, input supplies, and land for which ALAD relied largely on government services. He believed it would be possible to acquire more land, both rainfed and irrigated (probably up to 200 ha. if necessary, irrigated from ground water), but at least three rainfed testing sites would be needed to cover the rainfall gradient from 150 to 550 mm. which could be found in the area. He believed the government would be helpful in making land available at a 'peppercorn rent', and also that economies might be possible by sharing certain services with government research institutes in the Bekaa. Problems might, however, arise in finding a broad enough spectrum of conditions and sufficient land for work on all aspects of rainfed agriculture, and range - crop - levestock integration. It might be possible to develop cooperative arrangements with Syria for such work. He also agreed with the Mission that associate research stations forming part of the international centre itself might be needed in Iran and North Africa to cover adequately the breadth of rainfed conditions in the Region. However, the distances involved were no greater than those faced by CIMMYT between El Batan and its sub-centres in Mexico.

39. Moreover he felt that these disadvantages were far outweighed by the advantages offered by the Lebanon in terms of accessibility, free movement of personnel and plant genetic material, the existence of a good University and well-trained local staff, schooling etc. In his opinion there was nowhere else in the Region which offered a c mparable combination of living and working conditions, and this was crucial to attracting first-class staff at the peak of their research output.

Discussions with FAO staff.

40. The Chairman invited Professor Nour, Assistant Director General for the Near East Region to open the discussion.

41. Professor Nour said that he had found the Mission's report constructive and stimulating and their analysis of the problems penetrating. However the itemized list of functions and recommendations for research in Chapters 5 and 6 seemed to cover too wide a scatter of problems and he agreed that a second look was needed at some of them. At the same time the approach to research on the needs of the Near East could not be as straight-forward as that of CIMMYT or IRRI, since in addition to any work on crop improvement the focus had to be on the improvement of agricultural systems involving both crops and livestock; this required study by a mix of technical and socio-economic disciplines. No national government or sub-regional grouping had yet attempted an integrated multi-disciplinary approach to research. In respect of research needing reinforcement he singled out:-

Crops:- Barley, durum wheat, lentils, broad beans (vicia faba), phaseolus sp:, and annual oilseeds. These were definite gaps on which no international effort was being directed appropriate to regional needs, and for which a major breeding programme was needed there (so far the durum wheats bred in Mexico had not been outstandingly successful and were not appreciated by consumers).
Bread wheats: sorghum, millet, and chick-peas; for which adaptive research was mainly needed.

Animals:- Sheep should have first priority, especially nutrition, both in closed systems and in the range (transhumance).
Adaptive research was needed on cattle. ILCA might help on this.
In the longer term work on poultry and rabbits might also be needed.

Farming Systems: The rainfed areas had been grossly neglected. There was a low political awareness of their great potential wealth. In the past there had been too much concentration on finding technical solutions, and too little thought concerning the social and economic factors constraining and conditioning the successful use of technology. It was urgent to rectify this imbalance since the region had a long history and traditions which would not easily be changed. Socio-economic realities must be taken into account if technical transplants were not to be rejected.

Irrigation: Badly needed an injection of new research: production had reached a plateau in some countries and a quantum jump was required. Even in Egypt and Pakistan resources were not utilised to the full, irrigation systems could be improved and water consumption reduced.

42. He believed that the structure of any new international research initiative in the Region should be adequate to reflect the needs of the main ecological systems. A main centre with appropriate connecting stations might be envisaged: one could think of the first as being located in the Lebanon or Syria: with connections in Iran and Algeria or Tunisia.

43. The Centre should also develop strong links with national centres for addressing specific problems; for example to the Sudan for sorghum adaptive research, and possibly for large ruminants: Afghanistan, Cyprus, Iraq, or Saudi Arabia for sheep: Egypt and Pakistan for irrigation.

44. In conclusion he urged that decisions be reached in 1974 to fund the much-needed Centre and on where to locate it. Its first task should be to select the questions to be answered, to examine their utility in the light of regional/national priorities, and to address them. FAO would do all it could to assist its work, and he saw their roles as being complementary. He believed that the ongoing UNDP supported Regional Field Food Crops Project led by Dr. Hafiz could be of considerable help; in respect of land and water resource development they had only two experts trying to cover twenty countries. This was far below the minimum critical need, and their contribution, although not negligible was insignificant compared to the magnitude of the task. UNDP were stalling on a proposal for reinforcing this work, but if given more support an FAO programme could form a bridge between the Centre and national programmes. Alternatively, as the basic research programme of the Centre built up the FAO programme could be replaced by outreach or cooperative regional networks coordinated from the Centre.

45. In reply to a question on how national stations could be best related to the work Professor Nour said that he saw the main centre as working on the more basic aspects of research on key crops; an outer ring of 'connecting centres' with a small staff for adaptive research, possibly associated with a University; and ad hoc research networks or programmes on specific problems in cooperation with national institutions. Outreach facilities could be strengthened by collaboration with existing regional programmes e.g. those of FAO.

46. In respect of the phasing of the Centre's programme he said that he saw the first 5 years as being a phase of appraisal, organisation, and building up of the basic research programme, with priority to cereals, grain legumes, sheep, and work on crop rotations and farming systems. The connecting centres would concentrate entirely on adaptive or 'relay' research, working on crops and problems of importance to their specific environments, and would be built up over time as the central research programme evolved.

47. Discussion was then focused on technical aspects of the work of any new international research centre which was established in the Region.

48. Concerning crop improvement Dr. Peterson pointed out that excellent work on durum wheat was being undertaken in Italy, while a number of European countries had strong barley programmes. Any Centre in the Near East/North Africa would therefore have to develop links to these programmes and not only to CIMMYT.

49. Such a Centre would, he believed, differ from the older International Institutes in that it could involve certain national programmes very early on its work through sub-contracting e.g. to Egypt on cereal diseases. This would enable it to widen its coverage of problems and accelerate its own research, as well as having a more rapid impact on the agriculture of the region. He tended to agree with Dr. Swaminathan and Dr. Abu Sharr that it was essential to move forward on crops before you could make much progress with improving systems, especially as systems work was more location-specific. However the proposed Centre should have enough land at its disposal both for its crop improvement work and for testing improved varieties in experimental models of farming systems. This would also be essential for training and the development of methodology in the systems work for transfer to national programmes. He saw a parallel with ILCA here.

50. These requirements cast doubt on the suitability of the Lebanon as a site for the Centre. It might be possible to provide enough land there for the plant breeding work, and to test new varieties adequately through a network of national nurseries covering a wider ecological range; but he foresaw problems in respect of the systems work, especially for rainfed conditions. Syria had a much broader spectrum of rainfed and irrigated conditions.

51. In respect of the work proposed on animal production Dr. Rendel agreed with the analysis of the Mission. However, he believed that a stronger emphasis was needed on certain aspects of the sheep programme, especially in relation to nomadic conditions, and concerning nutrition. He suggested that the staff should be augmented by specialists in transhumant animal husbandry, nutritional physiology (laboratory scientists) and applied animal nutrition. This would provide a more balanced team. In reply to questions he outlined the role of the nutritional physiologist as the solution of problems which could be expected to arise from the introduction of more intensive feeding techniques, and also as studying the availability and more efficient use of by-products and crop residues. In view of the stringency of conventional animal feed stuffs this was becoming increasingly vital.

52. The Centre should be located where a strong livestock systems programme could be established, as he did not like the idea of a separate livestock sub-centre. For this reason he agreed with Dr. Peterson that Syria, Iran or Tunisia might offer better facilities for developing a broadly applicable programme than the Lebanon. Each, however, also had some disadvantages which did not operate to the same extent in the Lebanon.

53. In reply to questions on the need for research on range management Dr. Peterson emphasized that this was the cheapest source of feed, and its future role should be that of an incubator for producing immature animals for finishing under an improved nutritional regime. A key problem, however, was to convince governments that range improvement was worth continuous investment and it would be necessary to study very carefully ex ante what an International Research Centre could do effectively under these circumstances.

54. In his opinion it should aim at developing stratification between the range and the high potential arable areas, and then studying the effects of this on the range and its human and animal population. A Centre could also stimulate other work, for example a proper systematic evaluation of range resources and trends in their exploitation, involving national programmes. This was essential if the results of research were to be extended, applied, and evaluated. At the moment rangeland was being ploughed up for cereals, traditional stock routes were being cut, but new systems of management were not being studied.

55. Dr. Horning explained that FAO's views on the Mission's proposals for research on soil and water management were set out in the note from Dr. Sauoma circulated to the meeting. The basic idea envisaged was the integration of improved soil and water management practises with the genesis of better varieties and farming systems, so as to raise resource productivity in the Region.

56. FAO agreed with the Mission's analysis and definition of problems, but not with the structure and detailed programme proposed, which seemed to lack cohesion. If this could not be remedied there was a danger that pressures already existing could force the creation of a separate water research institute. This could lead to duplication and waste of resources and would neither be necessary nor desirable provided an integrated research approach to the problems could be developed at the Centre the TAC was considering.

57. For this it would need a well-balanced team; a relatively modest central research programme requiring perhaps only 30 hectares of irrigated land; and a network of applied research projects in cooperation with countries of the Region. One Centre - however well equipped - could certainly not cover all needs; many problems of soil and water management were closely related to local conditions of soil, climate, water supply and topography; and provided that the minimum area of irrigated land required for plant breeding and the central soil and water research programme could be obtained, he felt the Lebanon would be adequately representative and offered great advantages in terms of accessibility.

58. Referring to salinity, he doubted if research was adequate even now; for example work undertaken in the United States etc. was not being applied in large scale irrigation projects, and not for ignorance of the results. A more specific approach was needed under conditions in the region, problems existed both at the river basin and project level and on-farm.

59. Nevertheless a Regional Centre could do much to adapt and re-cycle advanced technology; to simulate in its own research major problems of broad applicability and develop models and methodology for testing at the national level; and in training and information to assist countries to build up their own capability to tackle these difficult site-specific problems. By its very existence and accessibility the Centre could provide the key to accelerated progress.

60. In reply to questions concerning the proposal from FAO to UNDP for strengthening research in soil and water management, Dr. Horning said that, in his opinion, a FAO/UNDP network of the type proposed could co-exist with the Centre, but he felt that provided the Centre adopted the approach indicated in the FAO position paper, this would be more difficult and complex than the Centre taking the lead itself. The proposed FAO/UNDP project could then be regarded as a necessary 'bridging operation' which would phase out and disappear as the Centre's programme evolved.

Final questions to the Mission

61. Mission members clearly saw a fairly close measure of agreement between their views and those expressed by ALAD and FAO. Professor Skilbeck emphasized, however, that all priorities and decisions could not be formulated in advance; a certain degree of faith was required and miracles should not be expected too soon. Certain specific technical issues had been raised on which their considered opinion was the following:-

i. The proposed Near East Centre should be broadly involved in research on cereals, including the major responsibility for barley and durum wheats; and on fodders.

ii. The emphasis in livestock work, concentrating on sheep, should be on crop-livestock integration 'downstream', reaching back into the range later as a stage in the evolution of the Centre's programme.

iii. In research on soil and water management a main function at the Centre would be to study one or two major systems fully with an integrated team so as to develop knowledge and training, which could be extended to national programmes through networks for testing appropriate models of new systems.

iv. Para. 191 (a) of their report concerning methodologies for the collection and analysis of agro-climatic data had been inserted with the aim of unifying knowledge and approach amongst national workers whose training differed, thus facilitating transfer of data, the conduct of surveys, the identification of ecological sub-zones etc. Such information was essential for sound planning both of research and development, yet there was no integrated disciplinary approach in the Region at the moment and no unifying force or focal point for developing methodology for implementation by countries. The Centre could provide this.

v. The Mission concurred that if a strong Centre were to be established in the Region ALAD would no longer be needed.

62. Concerning 'connecting' or associated research centres under direct management of the International Centre the Mission believed that one in the Maghreb was essential because this was the most concentrated durum wheat and barley area; soil and climatic conditions were different, irrigation much less important than in the Near East, and erosion was a major problem. There were also political and psychological considerations - it was essential to involve the CIMMYT staff who were mainly located in the Maghreb, and to cut across artificial U.N. boundaries in working with national programmes.

63. Whether - and where - other associate research centres were required would depend on the location and facilities of the main Centre. It seemed doubtful if the Bekaa Valley was adequately representative of the colder plateau areas of the Region - e.g. in Iran, although it was pointed out that much of the agricultural production in Iran was from mountain valleys with conditions not too dissimilar from the Bekaa.

64. In any case the Mission still believed that the Lebanon offered almost unique advantages as the centre of a major international research effort for the Near East and North Africa; although it should be a firm rule from the start that staff working in a Centre there should live 'on campus' and not commute to and from Beirut.

Conclusions and recommendations of the TAC Sub-Committee

1. The need for an international centre serving the Near East and North Africa

65. The sub-committee concludes that a genuine case has been established for a a substantial internationally-supported effort to reinforce ongoing research in this Region, which differs significantly in its climate, natural resources, production pattern, and sociological environment from other developing regions.

66. Its research needs can hence be only partially assisted by the work of existing or envisaged International Centres, and the sub-committee considers that a small coordinating centre, or "relay" station would not offer a satisfactory solution to meeting these needs, the breadth and magnitude of which is quite formidable.

67. Following detailed examination of all possible approaches the Sub-Committee therefore recommends that a strong international research centre be established in the Region with Consultative Group support. The structure proposed will be discussed later. It tentatively suggests that this be called ICRAL (International Centre for Research on Arid Lands), and for the sake of convenience this acronym will be used hereafter.

2. Research priorities and approaches

68. Three main programme elements are envisaged for research, each of which is to some extent inter-linked, and each of which would ultimately feed into the evolution of improved agricultural systems. A separate 'systems' programme has not therefore been differentiated: systems analysis and improvement would from its inception form an integral part of the inter-disciplinary research of the Centre as well as a means of defining its main thrusts and approaches to the application of the results of its scientific work. It is therefore crucial to the whole programme.

The three main programmes envisaged are as follows:-

i) Crop improvement

69. a) Barley and wheat should be considered as of first priority; with a major barley research and breeding programme located at the Centre gradually absorbing the limited work and germplasm collection currently being undertaken by CIMMYT in Mexico. Support should be given to CIMMYT to continue their barley work on a temporary basis and on a modest scale until ICRAL can assume full responsibility. This could be of considerable help to the new Centre in its early stages.

70. Research and basic breeding effort on bread wheats and probably on winter wheats should continue to be conducted by CIMMYT, with a relay link to ICRAL. It is foreseen that ICRAL would have a direct staff relationship with CIMMYT, i.e. outposted staff of CIMMYT would be attached to the staff of ICRAL and administered by it, and ICRAL would undertake outreach work to the countries of the Near East and North Africa on CIMMYT's behalf and in consultation with its management. The Sub-Committee believes that this is the only way of ensuring coordination and avoiding overlapping in outreach effort.

71. In respect of the durum wheats 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 durum effort there rather than in Mexico, and this possibility should be taken into consideration in a special review of CIMMYT's work programme at an appropriate date

72. b) Maize, sorghum and millet: ICRAL would perform a 'relay' function on maize from CIMMYT; and sorghum and millet from ICRISAT, along lines similar to those indicated above for bread wheat.

73. c) Grain legumes: ICRAL should have the major breeding and germ plasm collection responsibility for broad beans (vicia faba), and lentils. For chickpeas it would act as a relay centre for ICRISAT; while ICRISAT could perform a similar function for ICRAL in respect of broad beans and lentils.

74. d) Fodder and pasture species: ICRAL should start with collection, selection and testing and of promising species from within the Region, and areas with comparable ecological conditions (Australia, Chile, S. Europe). Breeding might have to be undertaken at some future date but is not envisaged as an initial priority.

75. e) Other annual crops: e.g. other grain legumes (phascolus sp:), oilseeds, cotton and vegetables. While testing of these for their appropriateness to improved cropping systems, particularly under irrigated conditions, must form an integral part of the farming systems work, it is recommended that ICRAL draw on and screen the best material from national programmes in the Region or comparable conditions elsewhere rather than attempting varietal improvement on its own.

ii) Soil and water managment:

76. a) Agro-climatogical studies. These should form an integral part of the research of the inter-disciplinary team working on soil and water management. It is not foreseen that ICRAL should attempt to coordinate general agro-climatological work throughout the Region; other means should be adopted for this, for example the cooperative FAO/UNESCO/WMO programme. However if the work at ICRAL resulted in improved methodology or the development of new techniques, these could be transmitted to interested international or national organisations.

77. b) Rainfed agriculture. The focus should be on water harvesting, research into the role of the fallow, and the development and application of improved cultural techniques for soil and water conservation.

78. c) Irrigated agricultural systems. The focus should be on the development of intensive integrated cropping systems, working closely with national programmes with the Centre acting mainly in a coordinating and catalytic capacity for regional or sub-regional (ecological zone) networks. It would have only a small "core" research programme, mainly focussed on developing and testing models of improved cropping systems and attempting to adapt advanced irrigation techniques to the needs of the Region and recycle them to national programmes through the network.

79. d) Special problem soils/salinity management. The Sub-Committee recognised the need to assist research on special soil and water management problems (gypsiferous soils, salinity) which might be relatively site-specific but yet of considerable importance to a region where pressures on land for irrigation are very heavy. It is recommended that ICRAL is appropriately structured to offer consultancy services (possibly on a task force basis) to countries or groups of countries wishing to initiate or expand research on these specific problems. The duration of the consultancy might vary from an advisory visit to a working task force of several months according to need.

80. iii) Animal production systems:

The Centre should concentrate on sheep husbandry and nutrition with the focus on the stratification of the industry between range rearing and finishing of immatures on arable land through the introduction of fodder crops into the arable rotation, particularly in the better rainfed and irrigated areas. An approach involving the integrating of sociological, economic, and technical disciplines is considered essential.

81. iv) Ancillary Programmes. It is considered essential that the Centre should be provided with facilities to operate the following ancillary programmes:-

a) An information data bank with storage and retrieval capability.
b) A major training and seminar effort.
c) Consultancy services - see ii (d) above.

3. Structure of ICRAL

82. The Sub-Committee considered two alternatives:-

i) A large central structure with a major on-site research programme, linked to national programmes through outreach arrangements.
ii) A more flexible and dispersed structure, with a relatively modest central nucleus, plus associated or connecting research centres under direct management of the centre, located in the main ecological sub-zones not adequately covered by the central programme. There would probably be not less than two - not more than three of these. Links to national programmes might be developed through direct 'outreach' from the Centre or relay from the Centre through its associated centres e.g. on barley; through appropriate network type link-ups, with the Centre acting as the hub and feed-out/feedback point; or through co-operation with ongoing regional programmes being operated by Agencies such as FAO.

The second of these approaches is recommended; but with a clear understanding that the main nucleus centre would be established first, and that its associated research centres and outreach or network programmes would be phased in over time afterwards. Budgetary and personnel administration, and all ancillary activities - including germ plasm collections would be centralised.

83. As far as staff is concerned no distinction in status or merit ought to be made between members located at the main centre, or at associated research centres. For convenience outreach staff or task forces might be serviced either from the main centre or one of its associated centres in terms of their immediate working needs, but all would be considered as part of the one team, directed and administratively controlled from the centre. Administrative overheads at associated centres would be kept to the minimum.

4. Location of ICRAL and its associated centres.

84. The Sub-Committee considers this question, although not strictly within its terms of reference, as being closely bound up with the structure, work programme, and staffing requirements of the Centre.

85. After consultation with the Mission, ALAD and FAO representatives and exhaustive discussions in camera, the Sub-Committee supports the Mission's proposal to site the main central nucleus of ICRAL in the Bekaa Valley of the Lebanon, but recommends that serious consideration be given to working out arrangements whereby certain of its 'core' research could be undertaken in Syria.

86. It bases this conclusion on the excellent working conditions experienced by ALAD in Lebanon, the accessibility of Lebanon to staff and trainees needing to move throughout the region, the existence of an excellent University at Beirut, and the expressed willingness of the Lebanese authorities to provide facilities for an International Centre. On the other hand while the Bekaa Valley offers a rainfall gradient and climate fairly representative of much of the rainfed arable area of the region it does not adequately provide for the extremes of cold and aridity prevalent over considerable areas of the Near East and North Africa and the amount of land available for experimentation appears limited. Access to range areas is also inadequate.

87. Under these circumstances, provided an assurance can be given of the availability of around 75 ha of irrigated and rainfed land in the Bekaa, it is suggested that the main plant breeding and crop improvement research (including all germ plasm work) be centred in the Lebanon; that the initial irrigation cropping system, model building, and testing of advanced equipment and techniques also be undertaken there; that the socio-economic programme is located there; and that information, training, seminars, and consultancy services are based there. The question of whether to site the main research on rainfed agriculture and crop-livestock integration programme in the Lebanon or Syria would depend to a great extent on the availability of around 1000 ha of land in the Bekaa. This seems doubtful, and it considered that the possibility should be explored of obtaining facilities in Syria to undertake the work on rainfed cultural systems, mechanisation, the fallow problem, and stratification of sheep production between the range and arable land. Initial adaptive testing of certain irrigated cropping systems in pilot development areas might also be conducted there.

88. The Sub-Committee wishes to emphasize that it would prefer to defer a firm recommendation to TAC on the question of the location of the main centre's programmes until its members have had a chance to visit possible sites in the countries concerned.

89. In addition it is foreseen that, over time, research on farming systems would have to be undertaken at the associated research centres of ICRAL as a major element of their programmes. It is suggested that Iran and either Algeria or Tunisia would be the best locations for associate centres representative of major ecological sub-zones with conditions substantially different from Syria or Lebanon; but none of these countries is seen as ideal as the main site for the Centre itself. Exactly how these would relate to the main centre needs further study once a decision is taken to establish ICRAL, but the Sub-Committee has no doubt that there should be only one overall direction and board of trustees.

5. Staffing pattern for ICRAL (Table 1)

90. The Sub-Committee recommends certain adjustments in and reinforcement of the senior staff components proposed in Table 6 of the Mission's report (page 44); as follows:-

Assistant Director of Research (1)	Appointment should be advanced from year 1.5 to 0.5
Assistant Director of Administration	Appointment should be from year 1.5, not 0.5
Add. Head, crop quality laboratory (1)	Appointment should be from year 1.5
Agronomists (3)	One should be for work on the crop improvement programme as part of the rainfed farming systems team; one as part of the irrigated cropping systems team
Ecologist (1)	Delete; could be employed at later stage.
Agricultural Engineer	Add (1) from year 1.5
Animal Scientists (2)	One should be a specialist in nutrition, one in sheep management
Economists (3)	Delete (1), substitute social anthropologist (1) from year 2.5
Plant Breeders (2)	Advance (2) to year 1.5; add (1) from year 2.5. One for cereals, one legumes, one fodders.

Plant Physiologist (1)	Should be advanced from year 2.5 to year 1.5: specialised in crop/water relationships
Irrigation engineer (1)	Should be advanced from year 1.5 to 0.5.
Soil Reclamation and Conservation Engineer	Add (1) from year 1.5 for work in rainfed areas
Disciplines not determined	Should remain at 4 after year 1.5, as originally proposed by Mission. These would inter alia provide flexibility for the consultancy tasks recommended by the Sub-Committee.

91. The staffing pattern for the main ICRAL nucleus would thus (in terms of senior scientists) be as shown in Table 1 attached. This does not cover any requirements for ICRAL's associated research centres; the staffing of which would have to be determined later according to need. It is not, however, anticipated that their needs would be large.

6. Relations with other Centres or international programmes

92. If the Centre is established along the lines proposed it is expected that ALAD would phase out.

93. CIMMYT's direct outreach operations to the Region would also phase out and be re-established through ICRAL as a relay point for its breeding material. ICRISAT would develop a similar two-way relationship.

94. As far as relations with the UN system, and especially FAO, are concerned it will be necessary to clarify by mutual agreement which of its activities are essentially developmental, which are research oriented but complementary to that of ICRAL, and which might better be absorbed by the Centre as part of its core and/or outreach work. It is also conceivable that other forms of association might be worked out which would assist the Centre and the countries of the Region.

TABLE I

Senior Staff Appointments and Phasing

	Year .5	1.5	2.5	3.5	4.5
Management and Administration					
Director	1	1	1	1	1
Assistant Director, Research	1	1	1	1	1
Assistant Director, Training	-	-	1	1	1
Assistant Director, Administration	-	1	1	1	1
Librarian	-	1	1	1	1
Head, Documentation Unit	-	1	1	1	1
Head, Translation Unit	-	-	1	1	1
Head, Crop Quality - Laboratory	-	1	1	1	1
Scientific Staff					
Agronomists (3) 1/	-	2	3	3	3
Agricultural Engineer, mechanization (1)	-	1	1	1	1
Agricultural Engineer, reclamation and conservation (1)	-	1	1	1	1
Agricultural Engineer, irrigation (1)	1	1	1	1	1
Agricultural Climatologist (1)	-	1	1	1	1
Animal Scientists (2) 1 nutritionist, 1 sheep management	1	1	2	2	2
Economists (2)	-	1	1	2	2
Entomologist (1)	-	-	1	1	1
Pland Breeders (3) 2/	1	2	3	3	3
Plant Pathologist (1)	-	1	1	1	1
Plant Physiologist, crop/water relations (1)	-	1	1	1	1
Soil Chemist (1)	-	-	1	1	1
Soil Physicist (1)	-	-	1	1	1
Social Anthropologist (1)	-	-	1	1	1
Statistician (1)	-	1	1	1	1
Experiment Station Manager (1)	1	1	1	1	1
Disciplines not yet determined (4)	-	-	4	4	4
	6	20	33	34	34

1/ Agronomists — 1 crop improvement, general; 1 part of rainfed cropping systems team; 1 part of irrigated cropping systems team.

2/ Plant Breeders — Additional plant breeders would be attached to core staff from other International Centres for which ICRAL was acting as a regional relay station.