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THE UNITED STATES' ROLE

IN

AGRICULTURAL RESEARCH RELATED TO THE NEEDS OF THE DEVELOPING COUNTRIES

(Prepared for 1st Meeting of the TAC, Rome, 29 June to 2 July, 1971)

I. Explanation of Hobreviations Used

Many of the organizations, agencies and authorizations appearing in this document as abbreviations while familiar to the author and U.S. cooperators, need to be "de-coded" for the information and enlightenment of the readers. Among these "sets of initials" utilized herein are:

<u>AID/W</u> - The Washington Office of the Agency for International Development, U. S. Department of State (A.1.0).

USAID - The U.S. (A.I.D.) Mission in the developing countries.

- TAB The Technical Assistance Bureau of A.I.J.
- AGF The Office of Agriculture and Fisheries of TAB.
- KPA Key Froblem Area.
- PAM Problem Area Manager.
- LDC Less Developed Country.
- PASA Participating Agency Support Agreement, under which A.I.D. contracts for services of other U.S. agencies.
- USDA United States Department of Agriculture.

<u>211(d)</u> - Section 211(d) of the Foreign Assistance Act of 1966 authorized grants to U.S. educational and research institutions for building competence and expertise in selected areas related to international development problems.

- <u>PL 480</u> U. S. Public Law which permits sale and/or donation of surplus agricultural commodities to feed the hungry of the receiving countries -- generating counterpart funds.
- LA Latin American Regional Bureau of A.I.D.
- NESA Near East and South Asia Regional Bureau of A.I.D.
- FE Far East Regional Bureau of A.I.D.
- FY 72 U.S. Fiscal Year, 1972 -- July 1, 1971 through June 30, 1972.
- DCs Developed Countries.
- IRRI International Rice Research Institute.
- CIMMYT International Maize and Wheat Improvement Center.
- IITA International Institute of Tropical Agriculture.
- CIAT Center for International Agriculture (Tropical).

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II. Key Problem Areas Established for TA/AGF Concentrated Attention

The establishment of an International Consultative Group and its Technical Advisory Committee under the leadership of the World Bank is positive evidence of the concern of world leaders for the immediate need for strong and vigorous action in the agriculture sector. This adds confidence to A.I.D.'s decision to strengthen the agriculture sector, but it likewise places extra emphasis on the need for positive well-formulated objectives, plans and actions within the available resources.

During the past year AGF, working with the Regional Eureaus, has established five key problem areas for concentrated attention. These are:

- 1. Worldwide agricultural research network.
- 2. Crop production with major emphasis on high-protein crops.
- Sector analysis and agricultural economics, including marketing and trade.
- 4. Tropical soils and water management.
- 5. Tropical livestock production.

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It is believed that major advancement in these five problem areas is necessary; AGF will continue to concentrate in these areas of activity. It is becoming more and more evident, however, that the big payoffs are no longer coming from small isolated projects. The big payoffs are associated with the more complex, sophisticated and multidiscipline

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projects which have proper linkages, not only with institutions of the DCs but especially strong linkages with LDC institutions and people. It is because of this and in keeping with the general commitment of the Agency to give maximum freedom to the new successor to A.I.D. that AGF does not plan to start any new (unless one or some extremely high priority should appear) programs during FY 72. Major effort will be given to firming up an international network on those programs of high priority, with particular reference to linkages to LDC institutions and relevant scientists.

As a result of both inside and outside reviews, two present programs of research already have been identified as needing some additions and modifications to form or complete the world research network. These are the sorghum and soybean programs.

In the 211(d) program there are at least two areas in which U.S. competency should be greatly increased and as quickly as possible. These are in the science of dry land moisture conservation and use in the tropics and in the science of production and use of edible legumes in the tropics. While considerable U.S. competence exists in each of these for temperate climates, the knowledge for application and understanding for the tropics is almost completely lacking.

III. U.S. Programs Developing Research Capability and Utilizing Worldwide Agricultural Research Network

A. General

Genetic research at CIMMYT and IRRI, in Mexico and the Philippines, capitalizing on the development of dwarf varieties of

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wheat and rice and similar successes in the U.S. with the Japanese dwarf wheat germ plasm, led to the development of new dwarf varieties of the two crops which are highly responsive in yields to application of fertilizer, good water, and other management practices, and relatively insensitive to length of days. These varieties are suitable for adaptation globally within the latitudinal zones and temperature ranges suitable for the respective crops. However, they do require rather exacting soil and water conditions. Successes in yields and production of these two crops, followed closely by other spectacular research and production results with maize and sorghum, focused greater international attention on and support of international research. These successes gave rise to the creation of additional regional research centers in Africa (IITA in Nigeria) and South America (CIAT in Colombia) first under the support of Rockefeller and Ford Foundations, and later assisted by A.I.D.

Plans for creating new centers and expansion of work at IRRI and CIMMYT have been in response to research needs for improving other subtropical and tropical crops, as well as solving new problems arising from the use of the new, high-yielding varieties. Back of the impetus for accelerating research is the overall objective of meeting pressing food and nutritional needs of the people of developing countries and to provide greater employment and income opportunities in agriculture.

The expanded activities in international research have created heavy financial burdens on the Ford and Rockefeller Foundations, founders

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of CIMMYT and IRRI, giving rise to the need for increased financial support from international donors. The support problems, together with the rapid increase in worldwide research activities, call for closer international coordination in organizing support and in planning additional international research centers and programs.

At the same time, the need has been recognized for coordinating and integrating bilateral research efforts of the U.S. and other donors, and linking these efforts to those in the international and regional research centers, and to programs in research institutions in the LDCs.

Recognizing that LDCs have limited resources and potential for fulfilling all their requirements, A.I.D. and other assistance agencies must help requesting countries determine their priority research needs and capabilities. International coordination is required for sorting out the research needs that can be met best through research activities in regional and international centers, and those that can be provided satisfactorily within the LDC with its research capability supplemented, if necessary, by external assistance.

With this type of information available, assistance organizations can pool their resources in cooperation with LDCs to attack problems cooperatively at the various geographical levels on priority needs offering potential for solution through research. On the basis of current information and knowledge, AGF has chosen to continue its efforts in the development of LDC competence in research and to work with international organizations, foundations, and countries to continue

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the development and expansion of worldwide research linkages and networks among scientists and research institutions of developed and developing countries. Research achievements made in the high-yielding grain varieties and experience in the application of this technology provide guidance to AGF programming in this direction.

A.I.D. concurred in international arrangements for strengthening international research in agriculture. A.I.D. is committed, in principle, to help support the existing research centers (CIMMYT, IRRI, CIAT, and IITA) and the proposed two additional centers. A.I.D. also is interested in supporting a proposed international research center on potatoes to be located in Peru. For support of international and regional centers, A.I.D. now limits dollar contribution to not more than 25 percent of the additional capital and future operating costs of existing and proposed centers with an overall limit of \$7 million per year.

TA/AGF will continue to develop and expand research activities in the United States to utilize its best scientific competence on key problems in research in LDCs, coordinating with the international effort. In programming research TA/AGF will coordinate with the Regional Bureaus and will seek to focus on development of research competence in LDCs as well as to conduct problem oriented research.

TA/AGF also is building a small, hard core staff nucleus of research expertise with a few key direct-hire and consultant scientists to operate as a task force to help A.I.D. in programming research. This task force will be supplemented by AGF's own external agricultural consultative group.

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The Regional Bureaus are spending approximately \$8 million on agricultural research. With AGF's \$4.7 million, A.I.D.'s contribution to research in agriculture totals almost \$13 million. It is important to strive toward common goals in the use of these resources.

B. Regional Bureau Funded Research Projects in This Key Problem Area

(1) <u>Grant to IRRI for general support of IRRI</u>. 1970 grant of \$350,000. Projected grants of rate of \$750,000 per year for future years.

(2) <u>East Asia Vegetable Research Center</u> - The East Asia Vegetable Research Center is an international center supported by several Asian countries, the ADB and A.I.D. A.I.D. has agreed to contribute 40% or costs of first five years, or about \$600,000 per year on an average based upon current estimates. Center will operate under an International Board of Directors and a Technical Advisory Cormittee, objective is to develop better production technology for vegetables for tropical areas.

(3) Pakistan -- <u>Agricultural Research at EPAU</u> is a new project contracted with the Southern Consortium of International Education (University of Georgia System). Due to the civil war in East Pakistan the contract, signed in January 1971, has not as yet been implemented. The objective of the contract is to assist EPAU in increasing its agriculture research capabilities. Initial funding for the first eighteen months of the five year contract totaled \$287,000. The contract includes an eight-man team of full time professors, basic commodities, consultants and a participant training element. (4) India -- <u>Agricultural Production Premotion</u>. This project is located in seven different Indian States. It is not oriented exclusively to research but strong elements of research are included. These elements are: (1) Initiating research to solve problems retarding agricultural progress; (2) Assist the University and State to orient, through cooperation, their research facilities in assisting the Department of Agriculture carry out its responsibilities; (3) Through applied research, further refine a package of practices to be recommended for the High Yielding Variety Areas.

(5) Afghanistan -- <u>National Agricultural Development</u> - From the inception of this project in June 1952 through its life, ending in MY 1974, a total or \$5,313,000 will have been obligated. Of this total, \$1,138,000 was spent for commodities and research facilities; \$726,000 was spent training participants in various phases of research; and the remainder, \$3,459,000 provided advisory services for the staff located at the main experiment station near Kabul and in six field research stations located in strategic parts of the country. Evaluation reports of this project indicate that the capacity to conduct research by the Ministry of Agriculture and Irrigation personnel of the Royal Government of Afghanistan began with almost nothing and has developed a rather practical level. Wheat improvement was used as the main tool to develop this capability. Research now includes other cereals, fruits and vegetables.

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(6) Jordan -- <u>Agriculture research capability</u> in Jordan has materially improved from 1958-1962 when USAID/J provided an Agriculture Research Adviser to assist in the development of research in wheat and horticulture crops. A division of agriculture research in the Ministry of Agriculture was established at that time and continues to operate without direct USAID assistance.

(7) Turkey -- <u>Cereal Production (Oregon State University</u> <u>Contract</u>). This project is designed to improve wheat production in Turkey by demonstrating the value of weed control, fertilizer, better cultivation methods, summer fallow to conserve moisture, and use of improved varieties. These improved practices are then to be disseminated to farmers through an improved agricultural extension service, being assisted by a member of the OSU team. OSU has provided technicians to work in weed control and cultural practices. The contract can also provide assistance to the GOT in the culture of other cereals, and sorghum production is now being actively investigated. OSU personnel are also working closely with the Rockefeller Foundation team located in Ankara which is concentrating on the development of new wheat crosses suitable for winter production. Through the life of this project from January, 1968, through FY '73, a total of \$1,244,000 will have been obligated.

(8) Brazil -- <u>Agricultural Education</u>: <u>Four U.S. agricultural</u> universities are working with four Brazilian agricultural institutions to develop graduate programs in agriculture and improve their institutional

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capacities in teaching, research, and extension. Since these projects involve the concept of teaching, research, and extension as a package, it is impossible to distinguish the exact amount of input for research as such. In each of the universities, however, research is being accomplished through projects carried out by graduate students as a requirement for the Masters degree. Perhaps more important than this, is the potential for research resulting from training received in research methodology. Graduate programs which lead to M.S. degrees in most agricultural disciplines have been welldeveloped in three of the four universities. A number of research projects at these universities have been carried out in the various departments, where adviscr and student collaborate to build a highly respectable research capability.

(9) Brazil -- <u>Agricultural Research and Extension</u>: This project is to provide assistance to the Ministry of Agriculture in building research capability in the research division of that Ministry. It was funded at a rate of approximately \$750,000 per year from 1964 to 1969. In 1970, \$150,000 was made available. In March of 1971, a research loan was signed with the Government of Brazil in the amount of roughly \$11 million which will be used to carry out a program similar to that under grant funding.

(10) Guatemala -- <u>An agricultural development project</u> in Guatemala includes funds for the establishment of crop research programs which has a secondary objective of coordinating all research activities. Research is an important component of a new \$143 million Rural Development

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Plan for FY 71-75 focused on crop production and diversification, agricultural credit, marketing and storage, and ranpower institutional development.

(11) <u>International Institute of Tropical Agriculture (IITA)</u> (multi-donor project) - A.I.D. is making financial support available to the Institute to assist it in conducting research activities aimed at improving soil practices, crop varieties, cropping systems, economic policies relating to crop production, pest and disease control measures and other related crop production techniques. Training activities for Africans are emphasized. (Africa Regional).

(12) A.I.D. is providing technical assistance to the governments of <u>Tanzania</u> and <u>Uganda</u> in planning and developing their respective national agricultural research programs. This assistance includes analytical planning advice and technical assistance in strengthening the <u>administration of</u> research programs.

(13) <u>East African Crop Production Project</u> - A.I.D. provides technicians to the East Africa Agriculture and Forestry Research Organization (EAFRO) to conduct research activities on food crops.

IV. U.S. Programs of Research in Crop Production with Major Emphasis on High Protein Crops

A. General

High protein crops have been selected as a key problem area to fit into this scheme of research because of their potential for increasing the supply of protein and because current knowledge indicates the scientific possibility of improvement in yields, production, and use of these crops.

Support to three major food producing crops (cereals, food legumes, and roots and tubers) will be provided to the maximum extent possible. Well-known and traditionally utilized varieties of these crops are currently in the process of being improved not only for their ability to yield but for increased protein content and improved amino acid balances. This is especially true for all of the important cereals, i.e., corn, wheat, sorghum, oats, and barley. Special research support from A.I.D. will continue to be provided for corn, wheat, rice, and sorghum as these farm crops represent about two thirds of the world's food crop production.

Based on information available, the protein level of cereal grains can eventually be improved to the extent of possibly 100% for corn and 25% for the other three cereals. Special support will be given to a more centralized sorghum program especially designed to provide better plant materials for the tropics.

Food legumes (pulses), because of their genetic makeup and high protein content, also offer great potential for helping to overcome protein deficiency in diets of peoples of the developing world. One or more of the food legumes is adaptable to almost any agricultural area of the LDCs. Research is required to improve yields and to develop resistance to prevalent insects and diseases, especially in tropical and sub-tropical areas. Improved adaptation, cultural practices, and

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methods of production will be required in order to increase production and availability of these protein crops. Research must develop varieties responsive to improved soil fertilization and to conditions of both dryland cultivation and irrigation farming. Often production of these crops is limited because of a deficiency in one or more of the above factors: until that is corrected, increased production cannot be expected. An integrated program coordinating all factors of production will be required.

Of the food legume or pulse crops, the greatest opportunity for improvement of protein content and amino acid balance is with those crops most extensively utilized in local diets, i.e., beans, chickpeas, pigeon peas, peas, cowpeas, lentils, soybeans, and peanuts. Of these, according to a recently completed survey by the Rockefeller Foundation, beans, pigeon peas, cowpeas, soybeans, peanuts, and chickpeas are sufficiently important in the developing nations to warrant the major consideration for support to research at international research centers.

A.I.D. is in agreement with the recommendations made by the Rockefeller study that major international action for the six major legume crops be provided by the existing international centers (IITA, CIMMYT, CIAT and IRRI). Assignment of the legume crops among these centers will be based on the natural, climatic, and soil environments prevalent at each center.

Consideration is being given to food utilization and improvement of the soybean in view of the special competence provided by the

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University of Illinois. A research project on soybean production is being considered with this same university; this new project proposal will include a program in Puerto Rico to facilitate the identification and control of prevalent virus and other diseases of the soybean, as well as other adapted food legumes.

Part of TA/AGF's policy will be to work with foundations, other U.S. Government agencies, universities, private institutions, international agencies, and national institutions in the LDCs in developing an integrated, overall program of research and technical assistance in selected areas. Close cooperation will be maintained with the USDA in assisting with the worldwide germ plasm banks in the U.S., India, Brazil, and Colombia. Projects will place special emphasis on economics including the income distribution and labor intensive aspects.

An external advisory panel will be created to assure maximum input and cooperation from the academic and scientific communities.

B. <u>Centrally Funded TA/AGF Research Projects in This Key Problem</u> Area

A.I.D.'s contribution to the ongoing research program for increased production, especially high protein crops, is to continue supporting research being conducted on wheat, corn, sorghum and food legumes in projects at selected U.S. land grant colleges, U.S. universities and the USDA. These projects are as follows:

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(1) Improved Grain Legume (Pulse) Production

This PASA with the USDA supports research conducted in the Middle East (Iran) and Latin America (Puerto Rico). Direct support through this project to India was discontinued effective June 30, 1970. The major objectives continue to be to increase production of adapted leguminous crop varieties through breeding, selection, and crop management, and training of personnel. Major efforts are currently with teans, cowpeas, mungbeans, and chickpeas.

(2) Improvement of the Nutritional Quality of Wheat through Increased Protein Content and Improved Amino Acid Falance

This research project with the University of Nebraska supports the objective to select genetically superior high-yielding high-protein lines of wheat with good levels of lysine from worldwide collections and hybridize them with otherwise satisfactory wheat to increase total protein production and quality.

(3) <u>Inheritance and Improvement of Protein Quality and</u> Content in Maize

This research project with Purdue University supports the isolation of genetically superior strains of corn for total protein, lysine and related quality from worldwide collections and their hybridization with otherwise superior varieties to increase protein content and quality of the commercial crop.

(4) Inheritance and Improvement of Protein Guality and Content in Sorghums

This research contract with Purdue University primarily supports investigations relating to the inheritance and improvement of protein content and quality in sorghum. Thousands of varieties or selections from breeding nurseries and from worldwide collections are screened annually. Those with genetically superior protein are further evaluated in combination with otherwise adapted lines and fed into ongoing improvement programs throughout the world for possible use in programs subsequently developed to satisfy local protein needs. Recent studies have indicated biological evaluation of high protein cultivars is an added essential as all high protein cultivars are not equally responsive for food or feed purposes.

(5) Comprehensive Review of Cassava Literature

This project under contract with the University of Georgia with a subcontract with the University of Colorado to survey world literature on research on cassava. The monograph will also include the botany of the plant and its cultivation throughout the world. The document is to be completed and published in 1971.

(6) Development and Food Utilization of Sovieans

This project is with the University of Illinois, which has developed a simple technique of rapidly converting soybeans to edible food at the home or village level which eliminates complicated processing and fermentation. Some refinements, through adaptive research

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and testing of this and/or other processes for LDCs' use, will be conducted; however, the major effort will be in technical assistance in transferring the technology of the process and improved strains of soybeans to LDCs. This method serves as another means of getting more and better protein to people of the developing nations.

(7) Control of Weeds in LDCs

This Oregon State University contract provides for research on chemical control of weeds at its laboratories and at the University of Hawaii. Field research also is under way in Colombia, El Salvador, Nicaragua and Costa Rica and is being expanded to three other countries. Research on aquatic weeds will be undertaken in Hawaii.

Research is designed to: (a) identify the nature of LDC weed problems, (b) test known methods of weed control for effectiveness, (c) develop improved and new control methods, (d) train local scientists, and (e) increase weed control capabilities of local institutions.

(8) International Rice Research Institute. Agricultural Equipment Development Research for Tropical Rice Cultivation

This project relates to the rice producing LDCs, recognizing that basic to increased farm production and more intensive cropping is a reliable source of power, other than human and animal, at a cost that small farmers can afford. Animal and human power on rice farms in the Far East and other regions is generally inadequate for continuous and/or multiple cropping. The introduction of improved varieties increases the machinery requirement for soil preparation, cultivation, harvesting, threshing, and drying.

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IRRI conducts special research on the major paddy mechanization problems and assists in the development of new and improved rice machinery, suitable for small farms in paddy rice cultivation in Asia; the goal is to develop simple machinery for tropical paddy cultivation within the manufacturing capability of the developing countries.

C. <u>Centrally Funded TA/AGF Proposed Research Projects in this</u> Key Problem Area

Unlike corn or wheat which are handled as individual units at the CIMMYT, where all disciplines are brought to bear on improving the crop, or rice which is the single crop investigated at IRRI, sorghum improvement will be a real test, in action, of the worldwide network concept of research institutions. No one center is planned to deal with the entirety of the sorghum research package. At present the University of Nebraska is working on the physiology of sorghum under a five-year Rockefeller grant. The USDA has a program at Texas A & M for the transference of beneficial characters from tropical germ plasm onto U.S. cultivars and, because many of the tropical sorghums will not flower under Texas conditions, ruch of the breeding work is being undertaken in Puerto Rico. In Nigeria, India and Thailand work is in progress on the selective development of sorghum varieties and improved cultural practices for the production of higher yields under the tropical conditions experienced by a majority of the LDCs.

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It is considered that with a relatively small contribution the sectors of research still lacking can be filled in to complete the totality of the package approach to sorghum improvement.

(1) International Potato Research and Training Center, Peru

This is a new project with its major objective to establish a multi-donor supported international potato improvement center in Peru. During FY 1972 details of funding will be worked out with interested donors. North Carolina State University has the contracting responsibility. FY 71 TA/AGF funding amounts to \$65,000. In addition to the U.S., the German, Dutch, Canadian, French, British and Belgian governments have expressed interest in supporting this project.

D. Regional Bureau Funded Research Frojects in This Key Problem Area

(1) Indonesia - A new project was initiated in FY 71 to provide assistance in establishing and operating a country-wide research program to improve production of rice and complementary crops. Projected funding is at an average rate of about \$350,000 per year over the next five years.

(2) Jordan - The Wheat Research and Production project in Jordan is conducting research on dryland wheat production - emphasizing moisture conservation. This project was under contract with Oregon State University from 1968 to 1970. Due to the war the contract was allowed to expire but presently USAID/J is preparing the partial reactivation of this project. To date \$249,250 has been spent with an estimated \$110,000 used for the research phase. The contract included two full time staff members, consultants, commodities for testing and demonstration, and participant training.

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(3) Turkey - Over more than 15 years research advice was given in several additional projects including Forestry, Economics, Soils and Administration. A total of 17 man years was spent at an approximate cost of \$500,000. A major effort was the development of a new Research Service which led to a plan for the reorganization of the Ministry of Agriculture. About $6\frac{1}{2}$ man years of advisory services were given to the Plant Protection Directorate under the Regional Insect Control Program (RICP). The PFD has developed into one of the major research institutions in Turkey with programs to develop insect and disease resistant crops, as well as testing the major pesticides developed by the chemical companies.

(4) Pakistan - <u>Agriculture Research at WPAU</u> is a FY 1970 initiated contract with Washington State University. This three year contract is to assist WPAU to establish interdisciplinary research activities using research in pulses as the vehicle of establishment. The contract provides for one senior research advisor full time, consultants and participant training in research techniques and administration. As of March 31, 1971, \$59,000 has been spent on this contract.

(5) Pakistan - <u>Oilseeds Research in West Pakistan</u> is in the beginning stages. A four man USDA team of groundnut specialists returned from two months' duty in March 1971 and presented recommendations for groundnut production research. A second team will be fielded shortly on marketing and processing to be followed in January 1972 by a four man team for two years to assist the Ministry of Agriculture in conducting research leading toward a "package" of groundnut production practices.

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(6) Pakistan - Research coordination of all agricultural research activities is the objective of this phase of the agriculture research project. The major function is to assist the GOP in establishment and operation of the National Agriculture Research Council and the five Provincial Agriculture Research Boards. In addition, the coordination of research activities on wheat, rice, corn and oilseeds is stressed. One full time adviser who is a senior Research Coordinator is assigned to this project.

(7) El Salvador - An agricultural development project in El Salvador assists researchers to develop high yield, disease resistant beans and local hybrid corn. This involves approximately \$600,000 of A.I.D. funding, of which \$150,000 might be considered as being allocated to research in the crops noted above.

(8) <u>Regional Wheat Improvement Project.</u> - This activity provides technical assistance to <u>Tunisia</u> and <u>Morocco</u> in introducing and adapting improved varieties of dwarf wheats. Assistance is being provided for the training cf local technicians. The project has had a substantial impact in increasing wheat production, particularly in Tunisia.

(9) <u>Major Cereals and Legume Project in East Africa</u> - This project emphasizes research on corn, sorghums, and millets. Research activities are being carried out in Kenya and Uganda. The advancement achieved in developing improved hybrid corn varieties has had a significant impact upon increasing corn yields in Kenya. Some progress has been made towards developing improved varieties of sorghums and millets.

(10) <u>Major Cereals Project</u> - A.I.D. is cooperating with West <u>African countries</u> in the field testing of the adaptability of improved corn, sorghum and millet seed varieties that are more productive than those presently available. Basic research activities are involved and field trials presently are in progress in sixteen countries. The program is part of an Africa-wide program emphasizing research activities for improved varieties of corn, sorghum and millets.

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V. U. S. Programs of Research in Sector Analysis and Agricultural Economics, Including Marketing and Trade

A. General

Agricultural economics requires the development of certain basic resources as a first step, then a specification of program goals and the development of a technical assistance and research agenda, and finally a structuring of specific projects consistent with the agenda and with the priorities of LDC personnel who collaborate in these activities. Basic resources include improved instruments to mobilize U.S. talent, to relate graduate training of U.S. and foreign agricultural economists into the research and technical assistance programs, and the development of additional operational bibliographies. The work with LDC professionals is an essential contribution to the development of a research network that links U.S. and foreign agricultural economist ideally U.S. professionals under 211(d) grant support are linked by contracts with colleagues abroad on well programmed projects that contain research.

In trade and markets the basic strategy is to support exploratory analysis at the country level, but which through interaction will contribute to a region-wide and perhaps eventually a global pattern. Previous and existing work has been commodity related on broad world comparisons. All of them suffer from the poverty of analytical information on the agricultural trends and economic relationships among commodities and within countries. Such studies as have been done often do not lend themselves to integration into a more comprehensive statement. And the methodology for doing so needs to be tested and elaborated. Thus, we will seek to support on a small scale a few imaginative individuals and approaches, looking towards the later selection of the most appropriate methodology for a broader integrative project.

B. Centrally funded TA/AGF Research Projects in This Key Problem Area

(1) International Agricultural Economics Seminar

This project provides, through a contract with the Agricultural Development Council, for holding of research ievelopment and training seminars involving U.S. and foreign institutions and individuals of LDCs. The aim is to make the agricultural economic research and curricula of institutions more related to problems of development of LDCs. This is directly related to development of agricultural economics capability in sector studies with a strong policy orientation.

(2) <u>Analysis of Capital Formation and Technological</u> Innovation at the Farm Level in LDCs

This project evaluates how farm and rural infrastructure capital is formed as a consequence of agricultural innovations and of national policy affecting prices and incomes. Its principal focus is in comparing a variety of on-farm situations. This knowledge is essential to policy decisions on credit, taxation, and price policy and is helpful in making sector analysis and planning development. This project has been very effective in developing collaborative research in Brazil with several institutions with well over 100 individuals participating. The project will begin to function in India during FY 72. (Ohio State U.)

(3) Impact of New Technology on Rural Employment and Income

This project aims to determine the effects of the Green Revolution on the distribution of income and on rural employment in areas of the Far East. These are two important factors which will become more critical in the next decade as populations increase. Information obtained from this project will be important in any sector analysis undertaken and planning of development. (Cornell University)

(4) Adapting and Testing of Agricultural Simulation Model to Sector

This project will take the simulation model developed under a previous contract and apply it to Korea and Nigeria in whole or in part. These efforts are essential features in reducing the cost of doing agricultural sector analysis. It is hoped that at the end of this three-year project, there will be a set of procedures and instructions which will make possible a substantial expansion in sector analysis. (Michigan State University)

(5) <u>Rural Employment Generation in West Africa (Nigeria,</u> Ghana, Congo and Sierra Leone

This Michigan State project was approved in part on May 11, 1971. Through the approved \$50,000 a detailed research project will be planned with the West African collaborators. The research and training project involves evaluation of alternative labor using systems of production and marketing on selected crops in four African countries. A second phase is to assess alternative public policies (taxes, trade, price and land tenure) on employment generation by aggregating regional demand and supply data assembled on samples of firms. The project was jointly designed and programmed with African colleagues.

(6) Agricultural Diversification and Trade

This project is now in the planning phase involving the development of jointly designed and programmed research with colleagues from three U.S. institutions and possibly five LDC institutions. The project focuses on agricultural diversification, internal and external trade, and comparative advantage. The three U.S. institutions form a highly complementary group with exceptional capacities in the biclogical aspects, external demand and the necessary macro modeling of aggregate effects. The Economic Research Service work is financed under a PASA; North Carolina State University and the East/West Center under a contract.

(7) Institutional Development Grants (211(d))

These development grants support activities in each of the two previously discussed key problem areas, and for some institutions, inputs are made into both.

(a) The four 211(d) grants to Iowa, Cornell, Minnesota, and Michigan State have resulted in a talent sharing arrangement, a source

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of short term expertise and most significantly the strengthening of four departments around specialized areas in agricultural economics.

(b) The 211(d) grant on livestock systems analyes with Purdue as part of a four university group has been programmed.

C. Regional Bureau Funded Research Projects in This Key Problem Area

(1) Feru - Iowa State University and North Carolina State University are carrying out institutional development projects in crop and livestock production and in <u>economic planning and development</u>. Each of the projects have research components which are financed by A.I.D. at a level of roughly \$300,000. The agricultural production project has the three components -- teaching, research, and extension.

(2) Jordan - The Agriculture Economics Project in Jordan is designed to establish an Agricultural Economics Department in the Ministry of Agriculture. It is aimed at increasing the capability of GOJ to conduct economic research to provide more effective development planning in agriculture. This project was established in 1970 and terminated with the May 1970 civil war. USAID/J is presently making preparation to partially reactivate it.

(3) India - (Local Currency Funded Research) - The Mission has a number of rupee-funded research projects underway, mostly in agricultural economics; projects have such titles as Long Range Agricultural Adjustment, Rural Employment and Income Distribution Effects and Opportunities of New Technologies, Analysis of Demand for Tractors, Fertilizer

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Demand and Marketing Studies, Marketing Systems, Facilities, Practices and Services and Costs of Milk Production. In addition to the agricultural economics projects there is work on soil fertility and insect and disease problems on vegetables and soybeans.

(4) <u>Agricultural Research and Planning</u> - Through this project A.I.D. assists the Bureau of Economics Studies, Ministry of Agriculture, <u>Tunisia</u>, in improving its agricultural economic planning and analysis, planning policies and applied economic research. The project also includes assistance in training Ministry staff and conducting of seminars relating to economic planning.

(5) <u>Rubber Research Project in Nigeria</u> - Since June 1962 technical assistance has been provided by A.I.D. for the development of improved planting materials which would increase rubber production. Substantial progress has been made.

VI. U.S. Programs of Research in Tropical Soils and Water Management

A. <u>General</u> Water management at the farm level is a problem requiring research, education and technical assistance. Methods of delivering water and land leveling to utilize water efficiently and amounts and timing of water application are among the problems. People who practice irrigation often are using without change the methods passed down from centuries ago. Because these areas under irrigation, or to be irrigated, are mostly in the sub-tropical and/or tropical, humid regions, knowledge of practices in temperate climates is not always transferable directly. This emphasizes the need for adaptive research.

To be effective on a continuing basis involves understanding in depth of the tropical soil and water management problems that impade progress within a region and the forces and agencies that might compate or collaborate in the solution-seeking activities. The objective is to seek positive cooperative action rather than to accept a passive competitive attitude of LDCs. The main criteria for programs to be formalized and continued in the key problem area of tropical soil and water management are their usefulness and relevance to the society concerned. There is recognition that the development of competence must precede bids for additional responsibility.

In the final analysis the process shall, as far as possible, accurately visualize the type of activity or activities TA/AGF and A.I.D. would be engaged in, and the competence brought to bear on the solution

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of the key problems in the local environment. Assuming that adequate developmental elements are provided, the program will produce tangible results, trained personnel, and other benefits expected of it.

We will plan to survey the available information on major tropical soil and water management bottlenecks which limit the use of the main soils and water resources for sustained economic agricultural production. This will include not only the physical and biological characteristics of the soils, the rainfall distribution, stream flow, underground water, problems and potentials for irrigation and drainage, and related cropping patterns and practices, but also markets and their accessibility, infrastructure, technical assistance, and economic, sociological and legal aspects which hinder the development of soil and water resources.

In mobilizing external resources consultants will be brought aboard, and the resources of A.I.D. contractors will be utilized. Important among these contractors are the Utah State University, Colorado State University, New Mexico State University and the University of Arizona for water, and North Carolina State University, Cornell University, University of Puerto Rico, Prairie View A & M College and the University of Hawaii for soils. Agencies of the U. S. Government which have available expertise resources are the Soil Conservation Service and AFS of the USDA and the Bureau of Reclamation of the Department of the Interior.

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Tropical soil and water management studies in an overall broad fashion are relatively new to A.I.D. and other assistance agencies. It is only during the last decade that significant programs have been initiated in this vast and complicated area. In fact, these programs have barely touched and rarely understood the problems.

B. Centrally Funded TA/AGF Research Projects in This Key Problem Area

(1) Water Management Research in Arid and Sub-Humid Lands of LDCs - LA (Utah State University)

This is being carried out through USAID missions in selected cooperating countries in Latin America with support on the Utah State University campus. Studies include water use by crops; interrelationship between water, fertilizers, and plant populations; drainage and salinity control; water law and water rights, and economic aspects of water management practices. Brazil, Colombia, Chile, Venezuela, El Salvador, Ecuador, and Bolivia are cooperating.

(2) Water Management Research in Arid and Sub-Humid Lands of EDCs - NESA Colorado State University)

Colorado State University research in West Pakistan is directed primarily at on-farm water management. Land levelling, conveyances, water quality, drainage, salinity control, and salttolerant plants are major factors under study. Socio-economic problems of water use by farmers are also a part of the study.

(3) Agronomic-Economic Research on Tropical Soils (North Carolina State University)

As a result of needs resulting from previous studies, North Carolina State University is developing an improved method for predicting response of crops to fertilizers using limited soil test data. Field test information is largely from soil studies in LA.

> (4) Soil Fertility Requirements to Attain Efficient Production of Food Crops on Extensive, Deep, Well Drained but relatively Infertile Soils cf the Humid Tropics (Cornell University)

Soils in Fuerto Rico are similar to many in large areas of South America. Soil fertility studies on representative major soils are being carried out there by Cornell University in cooperation with the University of Puerto Rico and the USDA. Plans are under way to initiate similar studies in selected Latin America countries.

(5) Reserach Needs of Tropical Soils (NAS)

The National Academy of Sciences has appointed an expert committee to identify and report on the major research needs for the development of a sustained agriculture on soils in the tropics. This report is in the final stages of preparation.

(6) Tailoring Fertilizers for Rice (TVA)

Because rice is grown mostly under flooded conditions, nitrogen fertilizers can be leached out of the root zone or lost to the air as gaseous nitrogen. TVA is experimenting with slow release nitrogen fertilizers with the objective of increasing the utilization of the applied nitrogen fertilizer under flooded conditions.

(7) Ongoing 211(d) Grants --

(a) Three 211(d) grants in the field of water management were made in 1969, as follows:

University of Arizona Watershed management Colorado State University Water delivery, removal systems Utah State University On-farm management of water

This consortium held seminars and conferences, increased teaching subject matter in their curricula, engaged in limited research, trained graduate students, introduced new teaching techniques, improved library facilities and initiated other new aspects in watershed manage ment -- since the grants were made; continued progress is expected.

(b) Five 211(d) grants have been made to strengthen the competency of five universities to provide training, related research, technical assistance and consultation in soil science for increased food

production on tropical soils. The universities have established a collaborative program where each will specialize in a selected field.

Cornell University	Cultural systems of tropical soils
University of Hawaii	Biologic and Mineralogy of Tropical Soils
N. Carolina State Univ.	Soil Fertility Relating Plant Nutrition to the Physical and Chemical Properties of Tropical Soils
Prairie View A&M College	Soil Fertility under Tall and Short Grass Prairie Conditions
University of Puerto Rico	Conservation and Protection of Tropical Soils

The five institutions already have commitments to agricultural programs for developing nations, and each has an interest in developing greater depth in its tropical soil capability.
VII. U. S. Program of Research in Tropical Livestock Production

A. General The strategy for a vertical and integrated systems approach for improved animal agriculture by region requires multidisciplinary efforts for identification of constraints among technological, economic, and cultural factors and in government policies for the development of livestock and meat industry. The strategy will define criteria among all these related factors for establishing an integrated system that will meet development needs for: a) a forage and water base; b) control of diseases endemic to the region; c) determination of the genetic structure of animal populations; d) technical capabilities to translate technology into action programs; e) marketing structures and facilities (internal-external); f) interpretation of traditional cultural practices relating to animal agriculture; g) conversions of existing government policies to improve and stimulate animal agriculture and an improved slaughtering and meat processing industry; h) modes and systems of transportation for live animals and edible animal products; i) processing of animals and animal by-products linked to the packaging and marketing system; j) determining what livestock species to emphasize which are capable of making more intensive use of land resources not suitable for crop production and other uses.

Strategy also must take into account the extensive prior studies in animal agriculture by multi- and bilateral crganizations, foundations, and host countries, and seek to compile and consolidate

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such studies, define knowledge gaps, and coordinate resources in development of animal agriculture programs. The thrust is to identify those research activities which are strategic to the development of the sector -- which promise to open up significant gains in efficiency and offer opportunities for growth.

TA/AGF will make continuous review and technical evaluation of country progress to assure relationship of animal agriculture to development. Priority in evaluations will be given to the Livestock Institute in Nigeria, the Disease Research Institute in East Africa and follow-up activities in the development of animal agriculture in the highlands of Vietnam.

- B. <u>Centrally Funded TA/AGF Research Projects in This Key Problem</u> Area
 - (1) Control of Vertebrate Pests: Rats, Bats and Noxious Birds - Department of Interior (PASA)

Under a PASA, the Bureau of Sports Fisheries and Wildlife, Department of Interior, Denver, Colorado, conducts research at its laboratories on species of rats, bats and birds collected domestically and in LDCs for their general behavior patterns and response to control methods. Research scientists also are stationed in South America, Mexico, and the Philippines for field testing. A training program is being built into the project. Studies on rats and noxious birds have been made in a number of countries in South America and Asia.

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(2) The following interregional research projects are being conducted in specific areas of the world to solve animal agriculture problems:

- (a) Research on Hemoprotozoal Diseases of Food-Producing Livestock - Texas A&M
- (b) Research on Sterility Method of Tsetse Fly Control USDA PASA

(3) A new project, <u>Research on Ruminant Animal Agriculture</u> <u>Production for Meat in the LDCs</u>, will be evaluated during FY '72 for possible funding and implementation, with major emphasis on locations and linkages.

(4) Ongoing 211(d) Grants

(a) 211(d) grants to Tuskegee University, Texas A & M, University of Florida and Purdue University have been approved and are expected to be finalized early in FY '72; these grants will help to improve capabilities in U.S. institutions.

(b) International Aquatic Center, Auburn University

A.I.D, made a grant in 1970 to Auburn University to increase its competence for assisting LDCs in fresh and brackish water fisheries and for research and training.

> (c) <u>Development and Utilization of Marine Resources</u> -University of Rhode Island

Also in 1970 a 211(d) grant was made to Rhode Island University for developing U.S. competence in marine resources.

C. <u>Regional Bureau Funded Research Projects in This Key Problem</u> Area

(1) Paraguay - An institutional development project imple-

mented by New Mexico State University provides approximately \$500,000, of which about \$150,000 is for <u>research directed toward livestock</u> <u>improvement</u>. A livestock development center has been expanded and a new experimental station in the Chaco region of Paraguay has received funding assistance.

(2) <u>International Livestock Development Institute</u> (multi-donor project) - A.I.D. has made a commitment to provide financial support to this proposal. The project is presently in the planning stage. It envisages the establishment of an international institute which will be a part of the worldwide agricultural research network. The institute will undertake a collaborative research program in cooperating with existing centers and including work on breeding, animal diseases, ranagement of producer enterprises, nutrition, grazing practices, economic analyses (including those related to transportation, storage and marketing) and other research activities necessary for developing the livestock production potential of Africa's agricultural resources. (Africa Regional).

(3) <u>Regional Livestock Research Laboratory Project</u> - A.I.D. will provide technical assistance, equipment and operational support to finance the research component (Central Veterinary Laboratory in Mali) for regional livestock development and meat marketing programs in <u>West</u> Africa.

VII. Other Regional Bureau Funded Agricultural Research Projects

(1) East Asia and SEADAG Research grants - grants to

scholars, U. S. or Asian Nationals for specific projects usually of two years duration. 1971 grants totaled approximately \$65,000.

(2) <u>Thailand</u> - project for assistance in establishing and operation of a multidisciplinary research center for the Northeast area of Thailand. Project in operation about five years through a University of Kentucky contract. Projected inputs over next 4-5 years is at a rate of about \$675,000 per year.

(3) Afghanistan - Agriculture Education (Faculty of Agriculture) Kabul University, University of Wyoming Contract.

From the inception of this project in FY 1956 through FY 1972, a total of \$6,533,000 will have been obligated. While the amount of money spent on the development of a research capability in the Faculty of Agriculture of Kabul University cannot be determined exactly, developing research competence has been an important facet of the contract; and the contractor reports that faculty members have developed and are developing increased skills in agricultural research.

(4) <u>Nepal</u> - <u>Agricultural Education, Extension and Research</u> -This project began in FY 1957 Accumulative expenditures have been over \$2,000,000 but we have no practical way to determine how much of this was for research. Participant training, commodities, and A.I.D. personnel have been included in each aspect of the project. The major emphasis in the research area has been participant training and developing six new agricultural research stations. Some applied research primarily in cereals is underway. The research capability is low. In addition to the dollar inputs in this project, Indian rupees have supported participant training to some extent as well as some other phases. (5) <u>Turkey</u> - <u>Advanced Agricultural Training (Nebraska Contract)</u> This project was started in 1954 to assist Ataturk University located in eastern Turkey at Erzurum. A total of \$3,754,000 was obligated through the termination date of FY 1968. While the contract was designed to assist Ataturk University in all phases of university development, a considerable portion of the funds were spent in developing a research capacity, including provision of foreign advisors, laboratory equipment and participant training.

(6) <u>Afghanistan</u> - <u>Helmand Arghandab Valley Regional</u> <u>Development(Agricultur</u>). This project began in 1956. A total of over \$4,000,000 will have been obligated through its termination date, FY 1974. while this has been a general project. about 1/6 of the funds have gone to upgrade or develop a research capability at the research station in the area. Commodities and participants have been financed under this project.

(7) <u>Pakistan</u> - <u>(Local Currency Research)</u> (a) USAID/Pakistan has earmarked ten million rupees to be granted to a newly formed <u>National</u> <u>Agriculture Research Council</u>. The Council will have the responsibility of allocating funds to the five provinces according to expressed provincial needs. A provision of the grant is that 6.6 million will go to East Pakistan and 3.4 million to the four West wing provinces. At the provincial level Agricultural Research Boards are being formed to

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allocate research funds to research institutions according to established research priorities.

(b) <u>East Pakistan Regional Rice Institute (EPRRI)</u> was given a rupee grant of .7 million to assist in rice research peculiar to East Pakistan. This grant was made in FY 1970.

(8) <u>Pakistan</u> - <u>Agriculture Research Institution Building</u> The Agriculture Research Project in Pakistan includes four sub-projects:
(1) East Pakistan Agriculture University (EPAU); (2) West Pakistan
Agriculture University (WPAU); (3) Oilseeds Research (primarily on groundnuts), and (4) Research Coordination.

(9) <u>India</u> - <u>Agricultural University Development</u> - During the 1950's five U.S. universities were involved in assisting Indian states aevelop agricultural institutions throughout the state with relatively broad guidelines. In 1964 the seven contracts were rewritten to involve the U.S. university into developing a single Indian State Agricultural University using the general pattern of the U.S. Land Grant Institutions. Six U.S. agricultural universities are currently working with eight Indian agricultural institutions on this project. Viable research functions have been developed in each of the eight universities. In several of them research capability is highly developed and in some respects outstanding.

(10) Agricultural Research in Vietnam

The Agricultural Research Institute of the Ministry of Agriculture operates eight national research stations and five sub-staticns. These stations are located in a pattern which covers the country on a regional, climatic, and soils basis. The functions of the stations are to (1) conduct experiments directed toward increased production of crops and livestock and (2) develop foundation stocks of improved seeds, budwood for tree crops, and improved livestock for breeding purposes. The research staff of about a hundred specialists and technicians are not all college graduates and like all other government services has been affected by the military service. Most of the effort in recent years has been on adaptive research. A rice variety testing program with more than 100 rice varieties is being carried on and adaptive research continues on several new varieties produced at IRRI.

Adaptive research is being done on soils. fertilizer. pesticides and herbicides on rice and feed grain crops. A research committee has been in operation since 1968 and includes representatives from the GVN Plant Protection, Rice, and Soil Services and from USAID. For the immediate future, major production emphasis will continue to be placed on rice and on the newly initiated feed grains program; there probably will be a rice surplus after 1972. Limited research is being done on feed grains and it is planned for A.I.D. to enter into a contract with a university for a 4-man team to accelerate the adaptive research on this crop. The production of these feed grain crops is of particular importance as a substitute for the imported feed grains for the increased livestock program.

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In 1967, eight USAID agronomy advisers were sent to assist the Ministry of Agriculture in carrying on a program of applied research in order to achieve increased production. There are five U.S. agronomy advisers working in Vietnam at the present time.

During the latter part of FY 71, preliminary adaptive research work and feasibility analysis will begin on leguminous crops; similar work is proposed to be initiated on oil crops and fruits and nuts in FY 72, and on sugar cane in FY 73.

(11) West African Rice Development Association (WARDA) -A.I.D. is providing financial assistance to this multi-denor project. Its purpose is to assist West African countries in establishing an international organization which will sponsor research activities for increasing rice production and improving marketing. Fourteen countries have shown an interest in becoming members of the Association.

(12) <u>African Agricultural Research Capabilities</u> - This is an A.I.D. financed survey being carried out by the National Academy of Sciences (NAS). The study was initiated in April 1971 and is expected to be completed in about one year. It involves a comprehensive study of agricultural research activities in Africa and an assessment of the capabilities of African institutions for carrying out agricultural research activities.

(13) <u>Association for the Advancement of Agricultural Sciences</u> <u>in Africa (AHASA)</u> - This Association was established by African scientists in 1968. Its objectives are: to foster the development of agricultural sciences throughout Africa; to provide for the exchange of knowledge between scientists by means of meetings and publications; and to encourage Africans to avail themselves of opportunities to obtain training in the various fields of agricultural sciences.

IX. Agricultural Research Abroad Sponsored by the USDA Under PL 480

(1) The Research Grants

The Department of Agriculture was the first government

agency to take advantage of the research-grant provisions of PL 480.

This early start resulted in an extensive program of <u>more than 1,200</u> <u>grants, totaling over \$70 million as of the end of Fiscal Year 1970.</u> Grants have been made to scientific institutes and universities in 31 countries on all continents except North America. By policy, grants are limited to a period of five years, and the majority of them are made for that period of time. The Agricultural Research Service (ARS) has been designated as the agency in USDA for administration of the program, which spans the interests of the Department's research agencies--ARS, the Forest Service, the Economic Research Service, and the Statistical Reporting Service.

Included in the program are grants for research on all phases of agricultural production; for improved quality and uses of agricultural products; for better marketing and storage of agricultural products; production, protection, and utilization of forests and forest products; and economic analyses of agricultural technologies and systems. At the outset of the program, teams of agricultural scientists visited research institutes in the various countries to explain the program, assess research capabilities, and to develop proposals for research of mutual interest. As the program has developed, proposals originate either from the institutes directly or on the initiative of USDA. There are more acceptable proposals on hand than can be funded in any single year.

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From the outset, this foreign grant program has been based on the policy that the research should be of importance to the agricultural interests of both the grantee country and the United States. All proposals are thoroughly screened by agencies of both governments to insure their pertinence to research priorities and the needs of foreign and domestic agricultural programs. As a result, most grants have yielded benefits which have been of global value and produced significant improvements in agricultural and forestry development. Most striking are the collections and distributions of new crop germ plams; advances in biological control of harmful insects; useful knowledge about exotic animal diseases; improved human nutrition; and ctudies on various physical and chemical properties of form products such as cotton, wool, corn, wheat, soybeans, and leather which have contributed new knowledge for the processing industries.

(2) Upgrading of Research Facilities

Another very obvious benefit has been the upgrading of research facilities. The grants have provided funds for the purchase of scientific equipment. With the termination of the grant, the equipment, usually purchased on a cost-sharing basis, becomes the property of the institution.

Also, of apparent benefit to grantee countries, has been the opportunity for young scientists to further their scientific training while participating in the research. Conservative estimates show that

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at least 3,000 young scientists have been employed in the grant program. A great many have used phases of the grant research for their graduate degrees. A summary prepared by the Polish Academy of Sciences showed that during a 9-year period, 57 masters degrees and 41 doctorate degrees were awarded to researchers on 63 grants. In addition, seven scientists progressed to their docent degrees. In Israel, five M.S. and Ph.D. degrees resulted from the research in a single grant.

(3) Interchange of Ideas

More intangible has been the benefit resulting from interchange of ideas among scientists. The designation of a USDA scientist as a counterpart or sponsoring scientist in each grant has resulted in many associations that continue after the grant terminates. In fact. an official of ministry level in one of the participating countries remarked that his government felt the scientific contacts were the most valuable benefit of the program.

Although a primary objective of the Law, to use the abundance of American agriculture to combat hunger, has been met in some of the participating countries, the scientific spin-offs will continue for years to come.

(4) FY 70 Research Grants

During FY 1970, 77 new grants were made in seven countries, with a value of \$4.955 million. The distribution was as follows:

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Country	No.	Grants		Value (in	Thousands)
Ceylon		2		\$	56
Israel]	L7			1,727
Pakistan Poland	. 3	L1	4		582 691
West Germany Yugoslavia	1	1 12			32 955

The disciplines represented and number of grants in each are: Animal Science (7), Veterinary Science (6), Plant Science (18), Entomology (10), Soil and Water Conservation (4), Human Nutrition (3), Market Quality (9), Utilization (9), Forestry (6), and Agricultural Economics (5).

(5) The FY 71 and FY 72 Grant Programs

The FY 1971 program will result in funding 75 grants totaling approximately \$5 million in the excess currency countries; while the FY 1972 program proposes 132 grants totaling \$10 million.

In summary, we can say that this research grant program is of benefit to both U.S. and foreign agriculture and that it is making a major contribution to the solution of problems in the developing countries.

PAB: IAR/71/4

5 November 1971

THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

REPORT OF

THE FIRST MEETING OF THE TECHNICAL ADVISORY COMMUTMEE

ROME 1971

TAC SECRETARIAT

FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS

WS/B9628

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

29 June - 2 July 1971 FAO, Rome mont Agenda It on Bond A

The Director General of HAG, Dr. A.H. Boerna, veloomed the establishment of the Notestest Advisory Committee of Cropy YAMMUS e Group on International Apricultural Notestest. We stressed the need for a continued and erranded research activity if the need of the stress of the Worker Perplution", itself heatd on strong internation.

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Sir John Crawford - Australia (Chairman); Ing. Manuel Elgueta - Chile; Prof. Dr. Hassan Ali El-Tobgy - U.A.R; Prof. H. Fukuda - Japan; Dr. W.D. Hopper - Canada; Dr. Luis Marcano - Venezuela; Dr. I.E. Muriithi - Kenya; Dr. J. Pagot - France; Dr. H.C. Pereira - U.K; Dr. L. Sauger - Senegal; Dr. M.S. Swaminathan - India.

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Dr. G. Harrar - U.S.A.

Observers Present pitto this action to action a sublicity of the same face encounter, book of the interestional and national levels.

Mr. R.D. Demuth, Mr. L.J.C. Evans, and Mr. A. Kruithof (IBRD), Mr. J. Pino (Rockefeller Foundation), Dr. F.F. Hill (Ford Foundation), Mr. M. Gucovsky (UNDP), Dr. Omer J. Kelley (USAID), Prof. W.A.J. Flaig (Federal Republic of Germany). and a second avitation of the production of the source of the broad factors of the second second second second a

2. Provisional Agenda and antitutitari alasmo fermitaratir att vi Ferclever

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2. Opening statement by Director-General, FAO

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3. Report on current status of the Consultative Group in International

Agricultural Research of ord ad

4. Discussion of the role and precedures envisaged for TAC and related technical working groups uterrett maine

5. a) Programmes and prospective requirements of CIAT, CIMMYT, IITA , sidiand IRRI; to make, as

b) Reports on other existing international agricultural research teto too of blupprogrammes, bas apthute

6. Status of work related to specific identified gaps in agricultural research in developing countries od of thereas

7. Discussion of problems of agricultural research in developing countries

not adequately covered under items 5 and 6 8. Development of an appropriate agricultural research information system for developing countries

9. Recommendations for further action on items 5-8

10. VAny further business tor further action on items 5-0 11. Date of next meeting Bolgot seadt an in a state of of bad foldy satesta 11. Date of next meeting Bolgot seadt an in a state of of bad foldy satesta 11. Date of next meeting Bolgot seadt an in a state of of bad foldy satesta

The provisional agenda was adopted subject to proposed revision of items 9 et seq, following discussion of items 5-8. The revised agenda, as subsequently adopted, is attached hereto as Annex 2.

The UNOP welcomed the compositenty to marticipate in an overall view of world needs in are instrumed measure and it would undoubtedly take full commissions of the recommer defines of the Traintial Advisory Committee and the Consultative Group when considering its desistence on future financing. In addition to the priority areas already recognized, TT a limit that the meetions of monorement of tropical soils and of edible crotoics encoded and provide a sector by the Tetrical Advisory Committee in its former

FIRST MEETING OF THE TECHNICAL AIWISORI COMMITTEE OF THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

3. Opening Statements (Agenda Items 2 and 3)

The Director General of FAO, Dr. A.H. Boerma, welcomed the establishment of the Technical Advisory Committee of the Consultative Group on International Agricultural Research. He stressed the need for a continued and expanded research activity if the promise already shown by the "Green Revolution", itself based on strong international research efforts, is to be extended to other regions of the world and maintained on a global basis. Research, like development itself, had to be regarded as a continuing process and to maintain technological progress and achieve new break-throughs would require a major inter-disciplinary effort frequently beyond the resources of individual countries. As a co-sponsor of the establishment of the Consultative Group, FAO recordised the challenge facing it and believed that its unique central position fitted it to provide sound advice on research policies and priorities, based as they would be on a continuing inflow of information and ideas from its staff in the field, reviewed by headmarters' specialists meeting in committee and, hopefully, assisted by the establishment of an international agricultural research information system. Recognising the great significance of the new international approach to agricultural research, Dr. Boerne, omphasised that international and regional programmes are complementary to research at the national level and that FAO was devoting increasing attention to research ir its Regular Programme, both at the international and national levels, in order to assist member nations to develop the strong research base which would permit them to take full advantage of the new possibilities of international assistance.) onic

Gacovalcy On behalf of the IBRD, Mr. R.D. Demuth, Director, Development Services Department gave a brief historical resume of the origins of the Consultative Group, emphasising the need to develop similar technologies for the production of other crops and livestock, to those developed by the international cereals institutes. He pointed out the key role of the Technical Advisory Committee in advising the Consultative Group not only on priority areas for increased research efforts, but also on appropriate methodologies for the conduct of research programmes to be established. Recognising the wide membership of the Consultative Group, including nearly all major donor countries, international organisation and private foundations, and the proposed addition of five representative member countries from the developing world, it was clearly necessary to establish a mechanism through which all donors could be made aware of the programmes being supported and which needed support, without the necessity of each making an independent evaluation. Time was of the essence as it was necessary to make, as soon as possible, recommendations for financing in 1972, and he urged the committee to agree as soon as possible on initial priorities, the need for further feasibility studies and how these could be conducted, and the formulation of specific recommendations to the Consultative Group for its meeting to be held in December 1971. The tentative conclusions of the IBRD-itself with regard to priorities included further financing for the four existing international institutes; research in food legumes, particularly high protein sources; upland or rainfed crons including millets and sorghum, non-irrigated rice and wheat; animal health and livestock production in Africa; rice in West Africa; potatoes in Latin America and finally, water use and management. All of these items were already included in the agenda for the Technical Advisory Committee and it was hoped that as far as possible any additional studies which had to be carried out on these topics if they were to be considered by the Consultative Group, could be commissioned during 1971.

Administrator of the UNDP, outlined some of the research aspects of its programme, and stressing the need for continuous consideration and updating of such activities. The UNDP welcomed the opportunity to participate in an overall view of world needs in agricultural research and it would undoubtedly take full cognisance of the recommendations of the Technical Advisory Committee and the Consultative Group when considering its decisions on future financing. In addition to the priority areas already recognised, the UNDP believed that the questions of management of tropical soils and of edible proteins would undoubtedly merit consideration by the Technical Advisory Committee in its future deliberations. 4. The Role and Procedures envisaged for the Technical Advisory Committee (Agenda Item 4) ISHI bas ATIL TIMELO , TAID to atmosphere eviscogaging plases as a structure of the second sec

The Chairman endorsed the statements of the co-sponsors regarding the role of the committee and proposed a number of underlying principles for the conduct of its work, the basic premise being that research would yield cumulative dividends in the feeding and economic advancement of the peoples of the developing regions of the world. Recognising that resources were not infinite, the Consultative Group would require the soundest mossible advice, based on thorough investigation, before making its recommendations for financing on the basis of proposed priorities. To accomplish this task the committee must have adequate resources to undertake appraisal work, to make direct contact with the management of existing or proposed international research institutes, and to hold sufficient meetings of its own supported by adequate secretariat assistance. This was essential to ensure the necessary basis of knowledge for decisions on which the Consultative Group could place its full confidence. For the purposes of the committee he would define international research as research which, while located in a specific country, was of wider concern regionally and globally, indepednent of national interest or control, and free from political dictates of any one Government whilst retaining appropriate links with national research systems to ensure necessary testing of results and feed-back both of results and needs. Recognising the importance of the end use of research - application by the farmer aimed at increased and more efficient production, special links with extension and training must also be established.

The committee needed to be thoroughly informed in respect of ongoing work before developing its work programme, necessarily involving some appraisal work before decisions could be taken based on a collective judgement of priorities. It was recognised as being clearly impossible for the committee to cover the whole field and it was, therefore, necessary to select during this first meeting those projects requiring immediate examination leading to the formulation of decisions for recommendation to the Consultative Group at the next meeting of the committee. Amongst these it was fairly evident that the work of the existing international institutes should be included.

The committee had basically three methods open to it for the evaluation of proposals. It could either reach its decisions: if of the state of the evaluation of Stransport for the evaluation of stransport for the evaluation of the state of the evaluation of the state of the evaluation of the state of the evaluation of

- i) on the basis of a review of documentation (supported where possible by the personal knowledge of its members); to the contract of the second secon
- ii) by charging two or more of its members with the task of examining proposals on the ground, or,
- iii) by the establishment of specific working groups which might include the appointment of outside specialists.

The recommendations of the Committee for the conduct of work at such

The Chairman's statement was accepted without further discussion.

A brief closed session was held to consider the election of a Vice-Chairman and the establishment of terms of appointment of members.

It was agreed first to establish the terms of appointment.

i) In accordance with the provision made by the Consultative Group for rotation of membership of the committee, lots were drawn as follows:.

Appointment of 3 years duration: Dr. L. Sauger, Prof. Dr. H.A. El-Tobgy, Ing. M. Elgueta

Appointment of 2 years duration: Dr. L . Marcano, Dr. G. Harrar,

Appointment of 1 year duration: Prof. H. Fukuda, Dr. W.D. Hopper, Dr. I.E. Muriithi. Dr. J. Pagot

ii) Dr. M.S. Swaminathan was unaminously elected Vice-Chairman.

4. The Role and Procedures envisaged for the Fechnical Advisory Committee (Agenda Item 4) 5. a) Programmes and prospective requirements of CIAT, CIMMYT, IITA and IRRI ant to slow (Agenda Item 5a, Bibliography, Annex III, Item 1) sarohrs near tado est Sna saittanno

proposed a number of underlying principles for the conduct of its work, the as aginDr. F.F. Hill of the Ford Foundation presented a memorandum on the work of the four existing international agricultural research and training centres, giving details of their current and proposed work plus 'outreach' programmes; also projections indicating estimated capital and operating funds required for both 'core' budgets (continued operation of basic long-term programmes) and for proposed additional activities should these be recommended for financing. of . wrow lastance existence to assuce a final available available magement of enteting or proposed international research institutes.

of bas told suffi The committee took note that budgetary projections, based on a 5-7% "statutory" annual increase to take account of inflation, indicated a shortfall in the core budgets of the four existing institutes of \$ 1.6 million, in 1972, rising to \$ 6.1 million in 1975, assuming no increase in funding already pledged for the period. The committee further noted the suggestion of the Foundations study teams to establish an upland crops centre in Asia (with additional work to be conducted by IRRI), to establish an Animal Disease Laboratory and a Livestock Production Centre in Africa, and to initiate work on food legumes at IITA and at CIAT. These proposals had been very tentatively costed and were estimated to require \$ 32-40 million over the 1971-75 quinquenium for capitalisation Forderington of only fear and operating expenses.

With regard to future support for existing and/or proposed international institutes, it was recognised in the course of discussion that the committee would need to consider carefully the following points: and the southle for the constructes to cover the whole field and it

The needs of the institutes to sustain existing programmes;

i) 3 What should be the precise role of the existing and any future institutions? . ii)

- iii) To what extent did existing programmes contribute to filling of research gaps and what sections, if any, were over contributed? What new work could (or should) they undertake?
 - iv) Is the current administration and management of the centres satisfactory, particularly having regard to the relationship between the sponsoring foundations and the general management?
 - v) Were the institutes 'outreach' and training programmes, and affiliated programmes adequate, insufficient or too heavy, and did the institutes have an effective link with national research and extension programmes?
 - vi) What conditions were necessary for developing nations to take full advantage of the work of international institutes? I the advantage of failsionda ablaico to hemidalonda

The recommendations of the Committee for the conduct of work aimed at seeking some answers to the above points would be formulated under Agenda Item 9.

b) Report or. other existing international agricultural research programmes; France, United Kingdom, U.S.A., OAS, FAO. 1/

(i) Dr. J. Pagot, Director General of the Institute of Livestock and Veterinary Medicine of Tropical Countries, presented an account, supported by documentation (see Bibliography, Annex III, Item 5) of the activities of the French Government in international agricultural research.

Arguments of Syears durations Dr. L. Sauger, Prof. Dr. H.A. El-Tobry, ing. M. Elgueta

Owing to time constraints no oral presentation was made concerning FAO programmes. 1/ A paper by the Secretariat was tabled; see Bibliography, Annex III, Item 2.

Armstyles : coll year duration: Prof. H. Fukuda, Dr. W.D. Hopper, Dr. I.E. Murdithi, Ir. J. Parot

The committee, in evaluating the documentation presented, noted that French aid is furnished on the basis of a continuing dialogue with the interested governments. France cooperates in implementing scientific research programmes and projects worked out by governments; its aid, both financial and technical, is provided by its specialised institutes, the various countries entrusting to them the management of whatever stations or centres are necessary for the execution of their projects. There is joint financing by the governments concerned and France on the basis of half-and-half sharing of costs. As for the French Government, it finances in toto the laboratories and central headquarters supporting researchers working in the tropics. Although the work of research centres located in the tropics is done on a basis of cooperation with the country in which they are located, findings are disseminated among all countries helping to carry out these programmes. Activities were not restricted to projects financed by France and her associated countries but included projects financed by international and other bilateral donors. There was a growing cooperation between French speaking and English speaking research organisations, particularly at the working level, which had been fostered considerably by the bilingual Ford Foundation, IITA, IRAT Seminars and other bilingual activities organised by FAO and IITA, at Ibadan. Cooperation with IITA had already become well established and there appeared to be no obstacle to further cooperation and participation in the work of other international institutes, subject to the agreement of the governments concerned; it being understood that the work of the French institutes was based mainly on research centres belonging to sovereign states.

The Chairman, in summing up the discussion, requested members to study carefully the question of further improving cooperation and collaboration in research between French and English speaking countries, regional and international institutes, and to consider means whereby this might be effected.

Information on the current United Kingdom contribution to agricultural research (ii) in the developing countries was presented by Dr. H.C. Pereira, Director, East Malling Research Station, (Bibliography, Annex III, Item 16). C A THERE WERE

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It was noted that, following post independence "bridging" operations, during which British aid was given through U.K .- based specialised institutes, long term specialists and short term consultants in the field, there was now a changed policy simed at providing research teams to work in or based on overseas research institutes on problems agreed on mutually between the Overseas Development Administration and the country or region concerned. Whilst the merits of regional projects were recognised, political difficulties had hampered their establishment, and although much of the work now being carried out was of interest and benefit to particular ecological regions, practical considerations had necessitated negotiations with individual governments for the siting and placement of research teams. It was recognised that a strong 'neighbour effect' could be expected to stimulate the interest of adjacent countries in a particularly BOSH effective research programme, thus ensuring the regionalisation of the results of nationally based activities. 1 ... Crops, including allies and some and

PTART) (iii) Dr. Omer J. Kelley, Director, Office of Agriculture and Fisheries, USAID, presented details of his organisation's role in agricultural research related to the needs of the developing countries. (Bibliography, Annex III, Items 9 and 10.)

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The underlying aim of USAID assistance to research was always to upgrade national research institutions and systems, although the approach hed been shifted from one of direct operational responsibility to advice, support, and training, in order to ensure the essential continuity of research objectives and personnel. To the extent possible existing institutes and talents had been utilised during the upgrading process and a considerable effort in adaptive and environmentally oriented research had resulted. Aid was predominantly in the form of direct grants, to Governments, to U.S. Universities on a contract basis, or for the hiring of consultants. Regional and multi-national centres had been developed wherever an evaluation of priority problems showed them to be so unique as to warrant "extra territorial" activity involving more than one or two Smithal discussions waited in April 1970 and Rellardo & in Decemb countries.

Ils committee, in evaluating the documentation presented, noted that french all is formiabed on the basis of a continuing dialogue with the interested governments. From c

The committee took note of new proposals for the concentration of U.S. effort into five "Key Problem Areas", recognising meanwhile that other activities would continue; to them the management of whatever stations or "energy them trusting to them the management of ministers seatane of the restments

- i) Creation of world wide agricultural research network;
 ii) Crop production (emphasis on high protein crops);

- iii) Analysis and agricultural economics, including marketing, markets and trade;

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- iv) Tropical soils and water management;
- v) Tropical livestock production. a lo and her associates

With specific reference to support of international research, it was noted that AID was prepared in principle to provide up to 25% of additional funds required by existing and newly proposed institutes, to a maximum of \$ 7 million annually, provided that the remaining 75% is forthcoming from other donors and that efficient management could be assured. Regarding proposals for an administrative restructuring of USAID, the committee took note that U.S. assistance to research could be expected to continue at, or a little above, present levels, with the goal of mobilising U.S. research capacity to work with the developing countries in the five key problem areas and within a framework of international co-operation.

(iv) Ing. Manuel Elgueta, Director of IICA, Costa Rica, outlined the co-operative research programmes in meat and milk production, food legumes and soils currently being co-ordinated by IICA in Latin America.

It was noted that these programmes were based on the establishment of strong research teams at IICA, Turrialba, charged with the conduct of medium and long range research activities and also responsible for the co-ordination of short term research carried out in the participating countries, mainly of an adaptive nature. Of particular importance were the training programmes, for national research workers, carried out in the graduate school in collaboration with the University of Costa Rica. beasd -. H.U dyuotit nevit asw

Status of Work related to specific identified gaps in agricultural research 5. in developing countries spart to a part of bease to at whom of

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The Chairman stated that no decisions by way of recommendations to the Consultative Group would be taken at this first meeting and the order of the items as listed in the Agenda should not be regarded as reflecting any particular order of priorities. The discussion should therefore be considered initially as a continuation of the information process for the committee. Some items had obviously received more detailed study and preparation than others, but he would like as far as possible to have a clear presentation of the origin, importance and current status of the proposals.

6. a) Upland or Rainfed Crops, including millet and sorghum, (Bibliography, Annex III, Item 3, pp. 53-126) 20.001120 .0

The committee was informed that this project had originated from a consensus of the second Bellagio meeting; 1/, an initial overview paper had been prepared subsequent to this meeting, which stressed the need for strengthened research support to key food crops widely grown under rainfed conditions in Asia and Africa South of the Sahara, in particular sorghum, the various species of millets and food legumes. This had been , has any has severable doneeser to within the

1/ Prior to the formation of the Consultative Group on International Agricultural Research a series of discussions was held between representatives of a number of donor countries, aid agencies and private foundations. The first of these meetings (of Heads of Agencies) took place at the Villa Serbelloni, Bellagio, in April 1969, and this was followed by a second meeting of senior technical personnel in February 1970 (Bellagio 2). There have been two subsequent meetings of the so-called "Bellagio Group" to consider follow-up on the initial discussions; Bellagio 3 in April 1970 and Bellagio 4 in December 1970, the latter in New York.

endorsed by the Bellagio 4 meeting, which recommended the preparation of a detailed promosal for an International Upland Crops Institute, <u>plus</u> a world centre for genetic improvement of millet, sorghum, pigeon peas and chickpeas. (It was proposed to delegate work on other important food legumes to the four existing Institutes.)

Since then approaches had been made to India as a possible host country for an Upland Crops Institute, and a draft prospectus had been prepared by the Rockefeller Foundation for such a Centre together with the basic requirements for a work programme. The Foundation would like this to be considered further by a technical panel, which could be held later in the summer if desired.

Some doubts were expressed as to whether technology in sorghum and millet larged as badly as was implied in the report under consideration, (although it was generally conceded that work on the latter crop was less far advanced). Both in India and in West Africa considerable progress had been made in breeding improved varieties; in India a virtual breakthrough had been achieved in raising the yield potential and a big germ plasm collection had been established, but the report lacked adequate appreciation of programmes in Francophone Africa and appeared to some to be proposing a new Institute without giving sufficient consideration to existing work.

Several members felt that while certain technical problems undoubtedly remained unresolved, more consideration ought to be given to identifying the obstacles to capitalising <u>existing</u> technical progress, and to maximising ecological benefits and minimising ecological and economic risks. This might involve rethinking the approaches proposed and studying the technology of rainfed farming as a whole rather than concentrating on individual crops. In any case, high yield potential alone might not be the major objective: resistance to bird losses, drought survival, consumer accentability and improved protein content should also be important criteria.

It was agreed that a basic dilemma faced the committee on deciding whether a rather wide-embracing "systems" approach, or a more narrowly-based crop-oriented approach would be more fruitful in dealing with this problem. This dilemma was already evident in differences between the focus of the two older International Institutes (CIMMYT and IRRI), and the new CIAT and IITA, but the latter had not been in operation long enough to offer any guidelines.

If a review of current work in developing countries supported the contention that a technical breakthrough (e.g. in terms of higher yielding varieties) had been made but was not being adopted, then a systems-oriented approach probably ought to be followed; either through the development of a new Institute or by other means (regional co-operative programmes, use of ongoing or new UNDP or other projects as testing grounds, etc.). It had to be faced, however, that even if any new Institute which might be set up were crop-oriented, adaptive research would be required to adapt its concepts to national needs, and to fit its products successfully into farming systems.

6. b) Food Legumes, (Bibliography, Item 3: pp. 127-231)

The committee noted that this had also been identified as a critical research gap by Bellagio 2, resulting in a subsequent evaluation. This report had concluded that because of their ecological diversity it would not be feasible to cover the six major cultivated species at one centre. It was therefore proposed to intensify research and related training on individual key legumes at several different centres, through strengthening CIAT and IITA and/or attaching responsibility for certain species to the proposed new Upland Crops Institute. CIAT had already arranged for a specialist committee to discuss a possible programme on <u>Phaseolus</u> and soya, and to present a proposal to its August Board meeting, which, if approved, would be submitted to the TAC. USAID had agreed to prepare a monograph of all existing knowledge on the main food legumes, but might require extra financial assistance for this.

The committee expressed some reservations concerning the proposal to disperse or a detailed on food legumes amonst several institutes. While it recognized that such crops covered a wide ecological range there appeared to be a number of common problems related to the physiology of legumes; the balance between carbohydrate, oil, and protein content, and how this might be affected by increasing yields; nitrogen fixation, etc., which might best be resolved by a major integrated thrust comparable to that applied by CIMMYT and IRRI to their respective crops. such a Centre torether with the basic readi

There also appeared to be gaps in the species coverage proposed, particularly in respect of lentils (Lens. spp.) and broad beans (Vicia faba) which were of great importance in the Mediterranean and Near Fast. The suggestion that groundnuts and sova could be rated of lower priority because of work already undertaken (mainly in developed countries) was called in question; these were important (and potentially even more important) food crops as well as oilseeds, and their large area and low average yields underlined the need for intensified research.

It was felt that a proposal for a major centre working on the more basic aspects of research on food legumes was not necessarily incompatible with reinforced work on particular species related to certain ecological conditions or geographic regions. It would be necessary to maintain a careful balance between the two approaches, which should be complementary, and suggestions were made as to how this might be achieved in the case of Latin America.

6. c) Animal Health and production in Tropical Africa, (Bibliography, Item 3, np.232-319)

The committee were informed that this item also arose from the Bellagio 2. meeting. Subsequent to this the Rockefeller Foundation had undertaken studies on both the health and husbandry aspects of animal production in Africa South of Sahara, and had convened technical working groups to examine their results and to consider further action. While it had been agreed at the first of these meetings that action on problems of animal health could not in the long run be divorced from that related to production (including range management, marketing, and research on social and economic factors affecting livestock development), activities on the health side had moved ahead more rapidly. After a technical meeting in January 1971 a dialogue had been opened with the Kenya Government concerning the mossible establishment of an internationally supported animal health laboratory to work initially on East Coast Fever and trypanosomiasis. This had been welcomed by the Government, 1/ which had offered a site, and programme details were now being developed, taking into account other work in progress on animal health at EAVRO, EATRO and proposals for UNDP support for projects, including a Centre of Insect Physiology and Ecology (ICIPE)

in Kenya. In addition a task force had been selected, and was already in the field to study requirements for an Animal Production Research and Training Centre for Africa. Its terms of reference were to:

- 1. Survey the animal industry of Africa.
- Survey the animal industry of the second seco
- 4. Estimate budgeting requirements. 5. Draft an international centre charter. 6. Suggest proposed relationship with other countries.

an Arter para mare and It was hoped to complete its field work by mid-August and to prepare a report for consideration by a meeting of technical representatives of potential donors in Paris

That an encod to prepare a monograph of all existing knowledge on the main

1/ See letter received from President Kenyatta circulated to members.

The Chairman emphasised the importance of this subject, and expressed satisfaction that the task force included two members of TAC. Following questions by several members of the committee as to what specific commitments had already been made which might pre-empt its freedom of decision (i.e. to the Kenya Government in respect of an animal health laboratory) he requested clarification of the situation and stressed the need to avoid hasty decisions on this subject. The need was for co-operation not duplication, and close integration of national and regional or international efforts was essential. He wished to make it clear that if any request for funding were to be submitted to the Consultative Group it would have first to be considered by the TAC but not as a <u>fait accompli</u>.

The committee was informed that the Animal Health Laboratory was still an open proposal and no decisions as to funding had been reached. However, as had been indicated earlier, agreement had been reached in principle with the Kenya Government for the establishment of a major centre near Nairobi.

While welcoming the initiatives taken by the Rockefeller Foundation, the Committee considered that a thorough study was necessary, including an inventory, of the existing resources and ongoing research programmes in respect of both animal production and health in Africa to ensure that most effective use could be made of this effort, as well as to define the need for its reinforcement and the best means of achieving this. In the case of animal health the problems on which work would be concentrated should be clearly defined, and new approaches might have to be modified to take account of the differences between conditions in East, West and Central Africa. This particularly applied to work on trypanosomiasis where one centre might not be adecuate to cope with the diversity of problems.

Even if a major animal health laboratory were to be established in one region, or for specific diseases, a new livestock production research centre forming part of the same internationally funded complex might well be located elsewhere in Africa, and would probably require a working animal health component (if not a specific research section) to cope with other diseases and general health problems. Sub-stations or "out-reach" programmes utilising existing national facilities would need to be part of the overall research network, and links between any new centres and existing stations needed to be spelled out clearly from the start. The terms of reference of the task force should accordingly be widened to include health, and to take the TAC discussions fully into account.

6. d) Mater Use and Management (Bibliography, Item 3: pp. 320-337)

Arising out of field experience and a review of ongoing projects, which generally showed irrigation engineering practices to be sound but agricultural technology in irrigated areas to be poor, a study had been undertaken under the auspices of IDRC to evaluate means of closing this gap.

The committee were informed that this study had concluded that rather than establishing an institute it was considered preferable to approach the problem by selecting a few appropriate projects as models for research on water use and management, with the objective of developing them as centres of excellence which could also be used for demonstration and training. As an initial step it was proposed to ask a number of people actively engaged in operation and management of irrigated agricultural projects to attend a travelling seminar to visit a number of sites, so as to study what might be done to strengthen research in this field. The FAO Manila seminar and the study mentioned above had provided an excellent analysis of problems and synthesis of information; what was now needed was to strengthen research in the field. Preference would be given initially to humid Asia, and it was hoped that ADB would act as co-sponsors with TDRC. After this, and benefiting from the experience gained, it was expected that means of accelerating and strengthening research on problems of water use and management in the arid and semi-arid zones would be examined. There also appeared to be a need for more basic research on soil-cron-water relationships, as well as on groundwater development. In respect of the former, IRRI had indicated its willingness to initiate some work in humid Asia if the TAC recommended this.

There was general agreement on the need to improve field research on practical aspects of water use and management, although doubts were expressed as to whether faults lay solely in agricultural technology. Major canals were often the principal cause of water logging and salinity, and lack of drainage installations a further important contributory factor. There was also still no really cheap, simple and effective metering and measuring device to help in preventing over- or under-watering. While farmers should be trained in improving their management practices, and in building better and less costly field canals and drainage installations, this would not overcome major weaknesses in construction or engineering technology. In particular engineers needed training in the latest techniques related to construction and maintenance of terminal irrigation and drainage networks.

While recognising the need for continuing co-operation between engineers and acriculturalists in research and development related to irrigation, the committee stream the importance of achieving a better balance between expenditure on major structures and that designed to ensure most effective use of the water by farmers. Research on the latter would involve not only means of improving irrigation and agricultural technology (although how much new technology was required was not yet clear), but also socio-economic studies to find means of working with or manipulating the social structure to get projects moving and to adapt known technology to particular conditions.

The committee noted that action was already being taken by other Agencies (e.g. U.S. AID, FAO/UNDP, etc.) in various aspects of improving water use and management including research and hoped that means could be found of integrating this knowledge and experience with any additional research proposed in the future.

6. e) Rice Development in West Africa (WARDA), (Bibliography, Item 3: np. 425-465)

This programme was submitted to the committee as an illustration of an approach involving co-operation between fourteen countries of West Africa in finding solutions to improvements in technology of rice production, marketing and processing, based on a concept which did <u>not</u> involve the establishment of a major research institution but rather attempted to capitalise on existing resources.

It envisaged working with IITA/IRRI and IRAT on more basic aspects of research, and with 34 national stations on applied research, after discussing problems and agreeinpriorities required with the member countries. Four categories of rice cultivation irrigated, swamp, rainfed, and upland - would be covered, one principal station being selected for the major effort related to each category, with the remainder undertaking supporting or adaptive work. There would also be central documentation with the objective of data collection and information exchange on rice, both within the region and externally.

The committee requested information as to whether financial support was being requested from the Consultative Group. If so, a more precise budget would be required, although the concept was considered to be an interesting one. It noted that the WARDA project had been approved by the UNDP Governing Council and sufficient national ratifications had been received to qualify for UNDP support. U.S. AID had also made a specific offer of financial assistance. However, until its General Council met in the autumn, established its constitution, and confirmed the proposed programme and budget, work could not commence, nor could requests for assistance be formally made in the name of the Association.

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6. f) Potato Improvement in Latin America (Bibliography, Item 3: pp. 338-376)

This project had been prepared by North Carolina State University in co-operation with the Peruvian Government, with financial support in the planning phase from U.S. AID. It stemmed both from the staple importance of the potato in the diets of Latin American countries, and from the recognition that cultivation of this crop was now spreading to new areas of the world, including the tropics, as a result of changes in technology. The potato not only ranked high among food crops of the world but could prove to be the major unexploited source of calories, protein and vitamins for the tropics. Scope existed for the improvements in yield and protein content, as well as in disease resistance, which could permit further extension of its geographical coverage; and it was believed sufficient variability existed in unimproved wild species to make such progress feasible. The project therefore aimed to collect, identify, and maintain this germ plasm material; to elaborate research involving its use with the objectives outlined above; and to develop mechanisms to improve the training of scientists and to forge closer linkages with ongoing work on the potato crop throughout the world.

programs in the Lahanon. Much additional work of

A number of contacts had been made with Latin American countries, whose potato research programmes might be linked to those of such a centre, as well as with potential aid donors. The proposal had been very favourably received, and throughout the next year the goal was to complete the legal, administrative, financial, and scientific arrangements to enable the proposed Centre to become a working reality. A Director and five staff members had been appointed, and the PeruvianGovernment was prepared to make facilities available for the Centre as an independent non-profit making body. U.S. AID were prepared to donate part of the funds required for a core budget provided other donors could be found, and it was hoped to establish links with the Rockefeller Foundation Potato Programme.

The committee welcomed the proposal, but members considered that the prospectus did not pay adequate attention to seed quality and means of ensuring healthy seed, or to the pathology of the crop. These were the two greatest constraints in the tropics. Potato processing also appeared to have received scant attention. It noted, however, that the proposal aimed at keeping costs low by minimising the size of specialist staff at the Centre and maximizing links with other research programmes - e.g. in the U.S.A., Germany, Netherlands, to complement its work.

The committee recommended that any further development of this proposal should give greater weight to developing outreach programmes; not only those involving co-operation with the countries of Latin America but with the aim of spreading the benefits of its work to other regions and ecological zones.

6. g) Veretable Production in Asia and the Far East tests and the far East tests and the state of the state o

The committee was informed that this was an important research gap which had been under consideration for some time, and was now being filled by the creation of an Asian Vegetable Research and Development Centre in Taiwan. This aimed at improving yield and quality of vegetables, as well as marketing and utilisation. Its budgetary requirements had been estimated at \$ 7.5 million over 5 years, and 95 percent of this had already been pledged.

7. Discussion of Problems of Agricultural Research in Developing Countries not address address address of Agricultural Research in Developing Countries not address ad

adequately covered under Items 5 and 6, (Bibliography Annex III, Item 4)

1/ See SHELLOFFLER CADEN TIE, Ifem 18.

7. a) Improving systems of Agriculture, including livestock in Semi-Arid and Arid Areas (Near East and Africa)) solver antial at memovolatic education

It was generally agreed that this represented a major research problem which had not yet received adequate study. While the greatest need for additional effort probably related to the area North of the Sahara from the borders of India to Morocco, which was not yet properly covered by any of the ongoing or proposed international research activities, it was pointed out that the situation and conditions described in the introductory paper applied to an even larger area of the world, including much of Africa South of the Sahara and parts of South-East Asia. There was a need to improve production and cultivation techniques, to develop better rotations and systems of farming including livestock husbandry, and to introduce sound grazing management practices in these areas.

The committee was informed that at a meeting held recently in Beirut by the Ford and Rockefeller Foundations, proposals had been made for strengthening of the CIMMYT outreach programmes in the Near East and North Africa (for which additional financing might be sought) and for improving co-ordination of its activities with those of the Ford Foundation ALAD programme in the Lebanon. Much additional work was required; however, it noted that the FAO Near East Wheat and Barley Programme also had close links with CIMMYT and had recently been expanded to cover summer cereals in that region. FAO was currently undertaking a study of research establishment and organisations in the Near East countries which would contribute to a better assessment of research canability and what might be needed to reinforce it.

The committee considered that the magnitude of the area affected warranted careful and more detailed study. It was suggested that an analysis should be undertaken of existing work, and the results obtained, in order to establish what more was required and to determine a methodology for undertaking further research. Even if the diversity of conditions proved too great to be covered adequately by any single centre, a centralisation of the approach to the major problems might be feasible and lead to accelerated agricultural development in the areas of lower rainfall.

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7. b) Grassland and Range Management (International Grazing Lands Programme)

Several speakers stressed the close links between this and the previous items, since a high proportion of the grazing resources of developing countries were located in areas of low and unreliable rainfall, with a majority of animals depending entirely or the range, with high mortality due to drought, and heavy overgrazing.

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The committee noted with interest the proposal for an International Grazing Lands Project, 1/ which would attempt collection, synthesis, and feedback of research data on this subject, using latest techniques of systems analysis, simulation and optimisation models to aid in the design of operational field research programmes. This would be an inter-Agency (FAO, Unesco, WMO and other Agencies and/or Foundations project), including training and seminar components, and would concentrate initially on the Mediterranean/Near East area. It aimed at a co-operative programme to build future research on the existing base of knowledge, but investment inputs would be needed to push it ahead.

Members emphasised the need to develop an improved methodology for studying range and grassland management, and reference was made to a pilot computer study related to this subject in Niger, on which a report should be available by the end of 1971. Many problems required further study; there were particular difficulties in nomadic grazing areas of the Sudanian/Sahelian zone (which was nearing the limit of its resources)

1/ See Bibliography, Annex III, Item 18.

Environmental problems

and a meat deficit existed in the whole humid area of Africa which was unlikely to be filled adequately by the Sahelian zone. Pasture improvement was probably more feasible in the wetter areas and livestock breeding could be developed there, provided disease and other problems (including social ones) could be overcome. Perhaps these areas should receive priority in future research but in any case there was an urgent need for further study of conditions in Africa, and for a meeting of research workers in this field. Among other things, such a meeting might attempt to determine what common elements might justify the establishment of an international centre and appropriately be tackled by it (e.g. survival of grazing beasts, and related aspects of animal physiology). It could also examine the validity of the approach proposed under the International Grazing Lands Project, and what support and follow-up it might need. at mattaningwe . The bettern bus . DAT a

7. c) Developing Livestock Production in South-East Asia and other regions of the Wetter. Tropics and set also and provide the forther and to forther

the problems caused by the ban or pressonablering and

Committee members also referred to work under way on pasture and grazing lands improvement in Latin America and to the need for regional co-operation there. The Chairman indicated that he hoped to submit a specific proposal for a feasibility study to a future meeting of the T.A.C. He hoped also to involve Australian scientific interests in the proposal.

The normities not that best the Bank and INTO had been approx 7. d) Rodent Control aid and and and to sham gaind enneration) black aids at a reason

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Despite the tremendous economic damage and health problems created by rodents (examples of which were cited by members), the committee was doubtful whether rodent control should be considered as a suitable subject for an international research programme. For one thing research techniques already known and available to developing countries could not in some cases be adopted by them for lack of resources, and any assistance would probably have to be decentralised. Moreover, in many areas development programmes to make more effective use of known control measures and to mobilise human resources seemed to be needed, rather than additional research. The problem therefore had to be tackled mainly at the national level.

The committee were informed that the propercise of this

had been strongly supported by the recent meeting of the EAO Council.

Although the committee recognised the important potential for increasing outmit, income, and employment offered by multiple cropping techniques, doubts were expressed as to whether this was an appropriate subject for international research since each type of system presented its own problems. The main objective should be to seek mechanisms for successful transfer of techniques already developed in some Asian countries, and to iron out the obstacles to this (whether technical or socio-economic), by national aldera adaptive research. This needed to be done, and the benefit spread to other regions, particularly where irrigation projects were being developed. It might well prove attractive to individual aid donors or for FAO/UNDP, but was probably outside the terms of reference of the TAC .. balanthi tes of noticalloo stab of based of has state outhan

"AO's remional and field shift. Its objectives were to define what research 7. f) Socio-economic or environmental implications of new tadw driw , and we abortant at agricultural technology is to sould man has enorthets down to research at non teslute all individual research projects would more than double the estimated Economic aspects

The committee recognized both the wider need for such a project and "

There was a strong feeling that greater attention needed to be given to research on economic problems as the committee's work developed. This should perhaps cover not merely the agricultural sector but the trade-off between agriculture and other sectors. Either at the next or a subsequent meeting more time should be allocated to discussion of what ought to be done, and Dr. Hopper offered to prepare a paper for consideration covering the changing dynamics of agriculture.

Environmental problems

and a meat deficit existed in the whole humid area of Africa which was unlikely to be filled at al Some speakers considered that the progressive erosion of natural genetic resources under man's influence posed a grave threat to the continuing improvement of cultivated species... The proposals contained in the paper by Sir Otto Frankel tabled for information by FAO were supported in principle but certain reservations were expressed about its priorities. There was an urgent need for collection, preservation, and storage, and it was suggested that a global chain of linked seed storage aboratories was needed at ad vistaligorges bas entres landitantes

inacts, and related aspects of animal physiciany). It could also eramine the

meeting of the TAC, and invited Dr. Swaminathan to prepare a considered comment on Sir Otto's report.

vestock Production in South-East Asia and othe remons

Biological control of insects was also the subject of considerable comment. Speakers referred to the problems caused by the ban on organo-chlorine compounds in developed countries, which had led to the launching of major new research programmes on insect control. However, virtually no work of a similar nature or magnitude was under way on tropical insect pests, and this would lead to serious hazards if not soor, redressed. thi official activities a startific int. hearing and a

The committee noted that both the Bank and UNDP had been approached to assist projects in this field (reference being made to the centre for biological pest control ostablished in Trinidad, and to the application to UNDP for an insect physiology centre in Kenva, amongst a number of requests to UNDP). The use of chemicals clearly could not be discounted in all cases; what was needed was to integrate various control methods in a way which would most effectively counter a problem with minimum risk to the environment. This subject would probably have to be considered at a future meeting after more precise study and definition of the research needed. Vd betwork ad

to be decentralized. Moreover, in many areas development programmes to ⁹. Development of an appropriate agricultural research information system for developing countries (CARIS) and . dorasest lanoiting .faval [snalten ar"

The committee were informed that the preparation of this project for submission to TAC had been agreed at the last meeting of the Consultative Group, and this initiative had been strongly supported by the recent meeting of the FAO Council. The project as presented was limited in scope but had been designed so that it could be added to over time in respect of additional priority needs, and in a way which would enable it to be linked to other information systems. its restant for the due state orders as saw system presented its num probleme. The main objective should be to seek recharders

Criteria taken into consideration in its preparation were that it should be capable of being built up rapidly once the initial approaches and methodology had been agreed; that it should not be over-complicated or excessively expensive; that it should he easy to evaluate and capable of up-dating at minimum expense according to need, and that it should be able to provide information easily and quickly on request. In order to reduce costs and to speed up data collection it was intended to make maximum use of FAO's regional and field staff. Its objectives were to define what research work was in progress, where, with what resources, and who was doing it. Information would be recorded down to research stations and main lines of activity (defined by keywords): to include all individual research projects would more than double the estimated costs. the aspects

The committee recognized both the wider need for such a project and its potential value to its own work; but asked for clarification of the proposed methodology, particularly in respect of the three input forms. Reservations were expressed about the difficulties of collecting soil and agro-climatic data.

ext or a subsequent meeting more time should be allocated to discussion of covernet the changing dynamics of agriculture.

The committee noted that the environmental input data was intended solely to provide information on particular stations, the nature of whose work programmes made details on the conditions at the station essential to enable other stations (particularly those with similar environments) to understand and to benefit from the information. Full use would be made of FAO's World Soil Map and classification to define soil data. It was intended to seek consultant advice on agro-climatic data, which presented more difficult problems, and also to work closely with WMO in this respect.

Members also wished to know whether CARIS purported to be a documentation system recording <u>results</u> of past or ongoing work: if so, it might better form part of the UN Common Information System which was now under consideration. Assurances were given that the project was not meant as an abstracting service; it was designed to define the institutional base and information on main research thrusts. However, it would be linked to the United Nation's Agencies Inter-Organisational Board on Management Information (IOB) and FAO's International Information System for Agricultural Sciences and Technology (AGRIS) project, and research workers would be able to draw out from its directory information which would enable them to communicate with other workers or research stations to obtain their results and publications. It was also proposed to establish a question and answer service as part of the project.

The committee supported the proposal subject to expert scrutiny by computer advisers; but it was stressed that science could not be divided, the system could therefore not be concentrated <u>solely</u> on work in or on behalf of developing countries and means would have to be found of linking it to information systems related to ongoing work in developed countries. It was also suggested that the <u>quality</u> of stations and their main project lines as well as their capacity to undertake new research thrusts should somehow be assessed and indicated in the information provided by the proposed CARIS project, perhaps along the lines of the starring system radopted in the Guide Michelin.

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- 2. Recommendations for further action on Agenda Items 5-8
- 9. a) Introductory statement by Chairman on role of TAC

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The Chairman emphasised that the committee could not hope to cover the entire world agricultural scene; it should therefore consider only ideas which had been well formulated or proposals which were in an advanced state of preparation. A pragmatic approach was needed in order not to retard progress. He therefore suggested that the committee should:

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i) Comment first on budget proposals for the four existing Institutes which

- ii) See which other matters might be supported firmly for early financing, e.g. water management, CARIS, animal health and production in Africa, etc;
- iii) Examine what further action (feasibility studies, etc.) was required in
- respect of other items which might be appropriate for later financing;
- iv) Consider what national efforts, if appropriately strengthened, could contribute significantly to the world scene.

To enable all this to be undertaken adequately (including mounting field missions where needed) additional funds might have to be requested from the sponsors or other members of the Consultative Group. The \$ 150,000 allocated for the TAC's first annual budget could provide for little more than its operating expenses. Assurance of sufficient support to permit flexibility in the work of TAC was essential. This would be sought as required, and should not be allowed unduly to constrain members' decisions on the items now up for discussion.

9.05 K) Programmes of FIRT, CIAT, IIITA and CDMYT and that tast a settime of of provide information on particular stations, the nature of whose work progra abam agam viraluaitus The committee felt it to be highly desirable for members to become better stab acquainted with the programmes and problems of the four existing international Institutes, in order to assess requests for additional financial support in 1972, to see how this work complemented other ongoing research, and to recommend any further steps which might be required to improve current work or to cover new problems over the longer term.

The representatives of the Ford and Rockefeller Foundations indicated that they nolaya nolia would welcome this, and it was therefore agreed that, as convenient, members of the committee would visit individual Institutes for discussions with research management and boards of trustees; it would also be represented at the International Centres Week in New York when programmes and budgets of all four Institutes were considered. This did not, however, imply in any way permanent representation of the TAC on the boards of the Institutes, although some of its members were in fact on these boards in an individual protect, and recently workers would be able to draw out from its durantery canacity. where would eachie then to economicate with other would are arrested stations

The following schedule of visits by committee members was agreed:

August - CIAT: Drs. Marcano and Hopper (or other IDRC observer) September (date to and the block and the sector sec be notified) - Chairman to visit IRRI

ity of stations and 13-15 September

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laup air foir hofanggue cole and fi la in house honolauph of 21-22 September - CIMMYT: Drs. Elgueta and El Tobgy me SIMAN Resource and go univers and terrolar and at herealbar has researce of - IITA: Drs. Pereira and Swaminathan (possibly also Secretary of TAC) membations for fur

5-8 October

6-8 August

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Mr. Oram to attend International Centres Week (Representatives of IBRD, UNDP, and IDRC would also attend)

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The Secretariat should prepare guidelines to members for such visits, in order to ensure that reports submitted to the October TAC meeting were as uniform as possible. ton to bajas I saw decorres 240

The committee expressed its gratitude to the Institute representatives for their invitation, and the Chairman asked that as a courtesy to the Foundations any members of TAC intending to visit an Institute should inform Dr. Hill of Ford "bundation of the proposed timing well in advance. Will at privace hariuper w marts Sec. 14: 15 4 B73

o. c) Nork of French Centres in Africa

The Chairman emphasised the need for TAC to be better informed on research in francophone Africa, and to study how best advantage could be taken of this work. (...

The committee welcomed steps already taken in this direction referred to by members, e.g. Ford Foundation Seminars, FAO ecological zone meetings, and considered that its own work could also contribute further to this cross-fertilisation of ideas. It was agreed that the committee should endeavour over time to look at all major internationally supported institutes. In particular, early steps should be taken to establish contact with those institutes for both French and English speaking African countries in ways parallel to those proposed in respect of the foundation-sponsored institutes. A similar approach should be adopted elsewhere, e.g. Turrialba. Tot en you

The aim should be to establish a general and continuing relationship, irrespective of whether there was a specific task of appraisal; but initial contacts would have to be made through the correct channels, and the Chairman requested members to 1 consider how this should be done in respect of areas or institutes of which they had special knowledge and to inform the TAC as soon as possible. As representative of IRAT in Sénégal, Dr. Sauger extended an open invitation to members to visit his Institution. 古四些ANIO10 This was gratefully accepted by the committee. s detiliates of (11) mainimum the formeast of decomposed

Upland or Rainfed Crops 9. d)

The committee expressed its appreciation of the considerable study already undertaken of this problem and embodied in Dr. Grey's report, and emphasised its anxiety to maintain this momentum. A strong plea was made, however, for a change in title; "upland" crops had a specific connotation in monsoon Asia, which was ambiguous and even misleading when applied elsewhere. The difficulty of finding a suitably clear definition was nevertheless recognised and "rainfed semi-arid crops" was suggested.

e to investigate basis reasons requirements for soil

The committee considered this to be a problem of the highest importance and urgency, and agreed that an attempt should be made to mount a Mission to prepare a study in depth for consideration at its next meeting, with a view to early transmission to the Consultative Group. It welcomed the initiative of the Rockefeller Foundation in appointing Dr. Ralph Cummings to undertake such work, and it was suggested that a team be formed under his leadership, including TAC representation, for field study and preparation of the report. It was agreed that Dr. Hugh Doggett of IDRC would be a member of the team, and Dr. Sauger would also join it as his commitments permitted. 1/

In considering how the problem should be approached it was recommended that the terms of reference proposed for Dr. Cummings should be widened to examine whether and where a major effort to develop new technology was needed, particularly in respect of sorghum and millet, and where a breakthrough was feasible without such an effort, by adjusting farming systems accompanied by appropriate socio-economic action (farm management research, credit, marketing studies, etc.). This would help to determine how far any Institute should concentrate largely on varietal improvements, e.g. of sorghum and millet, and how far it should extend its activities to general rainfed farming systems, including food legumes and other suitable crops. There might be a need to establish two new major centres, one in India, and a second in Africa; this question should also be evaluated carefully by the Task Force. and a member of ant

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Food Legumes 9.

The committee considered that Dr. Robert's report represented a useful starting point, but expressed a wish for a further review of his proposals, both in respect of the species cover d, the objectives of research to be undertaken, and the procedure recommended for strengthening research, i.e. to allocate work on one or two species to several different Institutes. Opinions differed on whether one Institute could cover all requirements, and the committee noted Dr. Marcano's proposal for integration of work of international and national programmes on Phaseolus in Latin America, with links in other regions. It was decided that the suggestions contained in the report of Dr. Roberts be discussed with him by Drs. M.S. Swaminathan, M. Elgueta and P.A. Oram as soon as convenient.

services of a remover as to whether one centre, however well equipped .actril to enalding dilated lastas rojan ils to' yletaupers ' atai

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should be setorated; whether

1/ It was arranged that Messrs. Cummings and Doggett would undertake preparatory work in India and East Africa in August, prior to visiting West Africa. From Sénégal they would return via East Africa to India with Dr. Sauger for a two-week study tour in early September:s rento has WMU mort ecceteres in a terrer or prach and indiantia also have to be thice date consideration. It night be necessary to work out an entropriste division of effort between centres in Africa according to an agreed master

The aim should be to cutablish a general and continuing relationship, irrespective of whether there was a specific task of apprecial; but initial contacts would have to be made through the correct channels, and the Chairman reconsider how this rhould be done in respect of areas or institutes of which they had specie

The committee noted that the approach proposed was twofold: (i) to hold a travelling seminar (mainly for managers of irrigation projects) in humid Asia, sconsored by the International Development Research Centre (IDRC) and the Asian Development Bank (ADB) to examine problems in the field and to identify sites for application of additional resources to research and training; (ii) to establish a very small highly experienced task force to investigate basic research requirements for soil/crop/water relationships, including groundwater development, and reasons for and consequences of mismanagement of water resources. If this approach proved promising it would be repeated, with appropriate modifications for arid areas of Asia and the Near East, and, according to needs and resources, to other regions.

The committee recognised that in view of the complexity of the problem careful examination of alternatives was essential before approaching the Consultative Group with proposals for institutionalising research on water use and management. It strongly supported the approach proposed as a means of seeking a solution to a key research problem which did not necessarily involve establishing a new Institute, and urged that a detailed proposal be submitted to its next meeting.

There were some differences of opinion as to the need for further data collection and survey of existing research literature. The committee noted that such a survey had in fact been undertaken in humid Asia, and that UNDP had just approved a Latin American Recional Project. FAO had seminars scheduled for the Near East and Latin America, and had been undertaking a literature survey. The Chairman invited the Organisation to make all possible information available to Dr. Hopper and the TAC for its next meeting.

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9. c) Rice development in West Africa

This was also recognized as an interesting and novel approach, and the committee indicated its willingness to examine suitable requests for financing related to this programme, if funds were being sought from the Consultative Group.

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9. h) Animal health and livestock production in Tropical Africa

The Chairman stressed the need to examine this proposal most carefully. It seemed necessary to define the degree to which the two subjects of health and production could or should be separated; whether existing facilities could be built up to achieve the desired objectives before indulging in major financial investments in any new centre(s); and whother alternative sites might be selected which would in any way be preferable to those already being considered.

Members with expert knowledge supported the priorities recommended by the Rockefeller Foundation for research on animal health. The committee also recognised the merits of the case for giving support to the potentially strong research complex in Kenya as a centre of excellence. It emphasised, however, that to function effectively any internationally supported station should have an independent charter and board of movemors, and its director should not be expected to serve three masters. Doubts were again expressed by some members as to whether one centre, however well equipped, could cate adequately for all major animal health problems of Africa.

The need to take account of existing centres, and for any new thrust to all in the complement rather than duplicate their activities was reiterated, and the committee's attention was drawn to requests for assistance from UNDP and other sources which would also have to be taken into consideration. It might be necessary to work out an appropriate division of effort between centres in Africa according to an agreed master

plan and perhaps with one co-ordinating mechanism. Matters on which existing research in the livestock centres was notably weak were the mechanism of heat resistance and the adaptation of exotic breeds to the tropics; the assessment and preservation of genetic resources; trypano-tolerance; and how to bring nomadic people into the market economy.

The Chairman hoped that these matters would be brought to the notice of the task force, and asked the observer from the Rockefeller Foundation whether the terms of reference tabled before the meeting were still valid, and if the team would make recommendations both in respect of animal production and health.

The committee were informed that the terms as tabled and outlined earlier in the meeting were still valid, but the Rockefeller Foundation welcomed guidance from the TAC and would take note of the discussion and the aide-memoire submitted by the IBRD observers on terms of reference. Consideration of animal health problems was certainly further advanced than work on husbandry, but the proposed health laboratory was essentially envisaged as part of one centrally directed animal research effort, the headquarters of which would probably be in a different location from the health centre.

The Chairman emphasised that he welcomed the task force and wished to encourage the speedy completion of its work. However, its report should go finally to the TAC if finance was to be sought from the Consultative Group, and it therefore seemed undesirable to set a precedent by continuing to present reports to potential donors in the future, ahead of TAC consideration. He hoped that it would be possible to deal with both health and production at the October meeting. The questions and requests for clarification from committee members should be regarded not as hostility to any action taken so far, but to be able to defend it better to the Consultative Group, given the fact that TAC was coming into a dynamic situation arising from the Bellagio and other meetings.

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- i) endorsed the establishment of the Task Force and asked it to proceed as rapidly as possible under its existing terms of reference, taking into account the
- comments of the TAC, with a view to reporting to the October TAC meeting. ii) Requested that its report should consider the relationship of the health
- problem to the overall problem of livestock improvement. iii) Stressed the need for a clear assessment of all existing facilities and a
- statement of the relations proposed between any new animal production or health centres and those facilities. Due consideration should be given in making such an assessment to new proposals for financing animal work now under consideration by UNDP or other agencies and whether and how these would be needed or would fit in to the overall research network proposed.
- iv) Asked Messrs. Muriithi and Pagot to comment specifically to the October TAC meeting, with particular reference to the animal health aspects of the report of the expert committee, and any proposals for siting new centres.

.9. i) Potato improvement in Latin America

The committee hoped that an early opportunity could be taken to discuss this proposal further with Dr. Sawyer, who has been in charge of the study so far. The Chairman hoped that he might be able to meet Dr. Sawyer when next in the United States; but it was also agreed that Messrs. Elgueta and Marcano would consider the report, if possible discuss it with Dr. Sawyer, and prepare a briefing paper for the TAC. Inter alia this should define the wider international role proposed for the Institute outside Latin America.

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9. "j) Consideration of Agenda Item 7 . methadioan gaitanibro-oo and drive stafted Bas asia

The committee noted that a number of the proposals discussed in the Secretariat paper were in relatively embryonic form, but the Chairman emphasised that the TAC had a very full programme in its formative phase and deferment of an item to a future meeting did not mean its abandonment. For example, he himself would probably raise again the subject of livestock development in South-East Asia.

Improving systems of agriculture in semi-arid areas of the Near East and Morth Africa

The Secretariat informed the committee that in addition to the ongoing review of research establishments and organisation in this area referred to earlier, FAO were hoping to field an evaluation mission to study research problems, define priorities, assess the adequacy of existing capacity, and to consider whether a new regional institute was required or what alternative means of reinforcing existing effort was needed. It was envisaged that this study (which would also look at staff requirements and training in relation to estimated future needs), would be mounted in early 1972. SIDA had expressed an interest in supporting it.

The committee strongly endorsed the proposal for a detailed study of research needs and priorities in this region. This should include consideration of the livestock sector, and cross-linkages between natural grazing, crops, and livestock. It housed that supporting finance for such a study could be mobilised; if current negotiations did not come to fruition it was prepared to examine the proposal itself at a later date.

Grassland and livestock improvement in Latin America

The committee was informed that this subject was considered a very high research priority in Latin America. Reference was made to work in progress in the region, e.g. at CIAT, IADB programmes, and the co-operative Andean country effort started by the Inter-American Centre (IICA) at Turrialba. The latter was small, but was working well, and could be extended with more funds.

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The committee expressed interest in following up such matters, but stressed the need for project identification supported by a clear definition of what needed to be done and how. There would have to be an adequate number of well prpeared projects in the pipeline to further its future work, and the Secretariat should inform potential donors of this.

The Secretariat would also have to assist in drawing together existing studies and other data to aid in project preparation. In the case of grassland and livestock development in Latin America it was requested to consider steps for preparation of a more clearly defined research programme and to report to the next meeting of the TAC.

Conservation of genetic resources

FAO was requested to prepare, for the October meeting of TAC, a paper showing what was needed, with specific reference to preservation of, and dissemination of information on, existing collections scattered around the world. It should define the minimum number of centres required, their location in relation to ecological origin of genetic material, the kind of management system proposed, the arrangements for co-ordination and central control. This report should concentrate initially on genetic resources preserved as seed rather than in the vegetative form and should attempt to define the probable costs of the proposed system. The committee was informed that the Rockefeller Foundation had a group of experts working on evaluation of gene pools for rice, wheat, maize, and sorghum. It was hoped that a report on this work could also be provided to the October meeting.

9. k) Consideration of Agenda Item 8: Computerised Agricultural Research Information System (CARIS)

The committee expressed strong support for this proposal, but some members expressed a wish for expert review, e.g. by computer specialists, of certain aspects of the proposal before it. It was agreed that any comments arising from reviews which members offered to undertake would be communicated to the Secretariat. These would be incorporated as necessary in an amended document to be re-submitted by FAO to the October meeting of TAC.

10. Matters of Procedure

10. a) Minutes

On the proposal of the Chairman it was agreed that minutes of the first meeting should record principal points made in discussion, without attribution to speakers, in addition to decisions taken. This procedure could then be tested on submission of the record of the first meeting.

10. b) Press Statements

It was agreed that no press statement or release should be made.

10. c) Status of Observers

Recognising the valuable contribution made by observers from the principal sponsoring organisations and several major donors, it was agreed that the attendance at meetings of the TAC of a limited number of observers should be continued.

10. d) Translation of Documents

The difficulties involved in the translation of lengthy documents into three languages, particularly when received only shortly before meetings, was clearly recognised. It was agreed that the annotated working agenda, short working papers, and summaries of feasibility studies, not exceeding 5 pages, meeting reports and essential administrative documentation related to meetings would be translated. Simultaneous interpretation into French and Spanish would be provided for all meetings.

11. Date of the next Meeting of the TAC

Following discussion of alternative dates it was agreed that the most appropriate time for the next meeting would be from 19 to 22 October 1971. This would allow sufficient time for the completion of required visits and studies for the TAC, and yet would enable preparation of its report and recommendations for the December meeting of the Consultative Group. The meeting would again be for four days.

12. Any Other Business

Members expressed a wish to receive working documents further in advance of the next meeting, and this was agreed to by the Secretariat to the extent that materials were available in time.

Dr. H.C. Fereire, T.F.M.V.T. East Malling Research Station, FIRST MEETING OF THE TECHNICAL ADVISORY COMMITTEE ON INTERNATIONAL AGRICULTURAL RESEARCH sonerfi

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REVISED AGENDA FOR THE FIRST MEETING OF

stating or a statistic the TECHNICAL ADVISORY COMMITTEE - AS ADOPTED of a

- 2. Opening statement by Director General, FAO.
- 3. Report on current status of Consultative Group on International Agricultural Research (to be presented by IBRD) .
- A. Discussion of the role and procedures envisaged for TAC and related technical working groups (introduction by Chairman).
- 5. a) Programmes and prospective requirements of CIAT, CIMMYT, IITA and IRRI (Oral presentation by representatives of Ford and Rockefeller Foundations);
 - b) Reports on other existing international agricultural research programes (Oral presentation by selected speakers).
- 6. Status of work related to specific identified gaps in agricultural research in developing countries;
 - a) Upland or rainfed crops, including millet and sorghum;
 - b) Food legumes;
 - c) Nater use and management;
 - d) Rice development in West Africa;
 - e) Potato improvement in Latin America;
 - f) Vegetable production in Asia and the Far East;
 - g) Animal health and livestock production in tropical Africa.
- 7. Discussion of problems of agricultural research in developing countries not adequately covered under items 5 and 6, e.g.
 - Improving systems of agriculture, including livestock, in semi-aria and arid areas (Near East and Africa)
 - Grassland and range management (International Grazing Lands Programme)
 - Developing livestock production in S.E. Asia
 - Rodent Control
 - Multiple cropping
 - Socio-economic or environmental implications of new agricultural technology, etc.

the fact this effected is correlated before next meeting

8. Development of an appropriate agricultural research information system for developing countries. Proposal to be presented by FAO.

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a) Restatement by the Chairman on role of TAC in relation to December meeting of 9. the Consultative Group

Required:

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- i. To comment on matters referred by Group for early decision, appropriate to 1972 budgeting by Group (e.g. work of existing institutes);
- To submit matters on which work of TAC incomplete but financial support ii. is necessary (e.g. feasibility studies);

iii. Report on other matters on which TAC is able to report from views on the basis of decisions reached at the first and second meetings; and appear of oth incourd

iv. Report on procedural and policy matters on which Group decision or Nisconsion of the released procedures guidance may be necessary. b) Programmes of IRRI, CIMMYT, CIAT and IITA

i. Review on established work, planned or desirable additions, link with related regional and national centres, training programmes

To formulate views on what material TAC may need further to Question: existing papers ? allocate assignments to members to talk with Centre Directors, attend appropriate Board or Programme - traser istarla in developing countries; Committee meetings -

Hater ure and management;

- Trens is a live took module to see a

Hice development in West

Should TAC be represented at International Centres Week? Question: :semmol hody

- c) Work of French Centres in Africa
 - i. Scope for more direct links with related non-French centres?
 - Scope for increased participation of French scientists (from African and ii. other overseas centres) on Boards of non-French international or regional to are from the relat centres?

Could two members of TAC meet with leaders of institutes in Question: Africa and discuss these matters, possibilities of supporting research and training programmes of wide importance and, most important, improve the TAC's direct knowledge of current research in French speaking countries? 3 Freezen rel

d) Upland or Rainfed Crops

- i. Mission of three to visit India and Africa to report on scope for one or more institutes; icitic" -
- ii. Can this mission be completed before next meeting of TAC? - Socia-compare or environmental implication

iii. Draft terms of reference? Development of an appropriate sympoultors) reference information events for Aevaloning constrict. Fromosal to be pricented by Edd.

e) Food Legumes

A task force to take stock of present research position and to advise on needs?

f) Water Management

Adopt Dr. Hopper's proposals and recommend to Consultative Group for funding?

g) Rice Development in West Africa

Note encouraging form of co-operation ? indicate willingness to examine programmes calling for support by Consultative Group?

- h) Animal Health and Livestock Production in Tropical Africa
 - i. Offer comment on Kenya proposal ... e.g. related to site, composition of Board of Management, and links with the rest of Africa
 - ii. Encourage Rockefeller Foundation to proceed rapidly with task force but:
 - 1. Consider terms of reference, and
 - 2. Make report by next meeting of TAC to enable possible funding (if deemed necessary) by Consultative Group in 1972
- i) Potato Improvement

Ask two members (and perhaps Chairman) to confer with Prof. Savyer and report, especially with reference to participation of Latin American scientists in work of institutes?

j) From Agenda Item 7

Arid and semi-arid zone problems; livestock in South East Asia, (consider questions arising in discussion)

- k) Consider next step (if any) in respect of Agenda Item 8. FAO project
- 10. Matters of procedure.
 - Minutes
 - Press statement, if any
 - Status of observers
 - Translation
- 11. Date of next meeting
 - Find of September?
 - Early October?
 - Late October?
- 12. Any Other Business

- 3 -

ANNEX III

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