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OFFICE OF THE FOREIGN SECRETARY

STATUS REPORT TO THE USAID MISSION IN BRAZIL U.S.-BRAZIL JOINT STUDY GROUP ACTIVITIES

Period: July through December 1970

I. Introduction

This report summarizes major activities for the study group projects under the National Academy of Sciences (NAS) - Conselho Nacional de Pesquisas (CNPq) program for the period July through December 1970. A separate report for the chemistry program will be submitted.

II. Agricultural Research

The Second Brazilian Seminar on Administration of Agricultural Research was held in Campinas during the period July 27-31, 1970 at the Training Center for Coordination of Technical Assistance of the Secretariat of Agriculture in the state of São Paulo. The Seminar was organized and financed by the CNPq, the Brazilian Ministry of Agriculture through its Office for Research, and by the São Paulo State Secretariat of Agriculture. U.S. participation was made possible through the NAS-AID contract.

The program focused upon topics recommended by administrators of state and federal agricultural teaching and research institutions in Brazil. Among the subjects of concern were coordination of agricultural research for federal and state teaching and research agencies, applications of the computer to agricultural research, exchange of information on tropical agriculture, improvement of graduate training in agriculture, methodology for the assessment of agricultural research priorities for Brazil, the role of agricultural economics in research, relationship between teaching institutions and research institutions, increased financing for Brazilian agricultural research and dissemination of research results to farm users. Thirty-four papers were presented, ten by members of the NAS Agricultural Research Study Group and two by the NAS Agricultural Economics Study Group

Approximately 150 persons representing nearly all of the leading state, federal and private teaching and research institutions in Brazil registered for the Seminar.

The Seminar was successful in providing an additional opportunity for exchange of information and discussion among a broad cross-section of agricultural research administrators and educators in Brazil.

Because of the nature of the Brazilian federal system, coordination of federal and state programs has been weak. Ideally, greater communication must occur at the planning stage so that reinforcement of federal and state programs becomes the rule rather than the exception. Based upon experience in the United States, the Joint Study Group recognized that a considerable amount of time is required for workable mechanisms of information exchange to evolve. However, a good beginning has been made at the first seminar held in Rio de Janeiro in February 1969 and the follow-up meeting in Campinas in July 1970. At the 4th Brazil-U.S. Workshop, now scheduled for September 1971, the Joint Study Group will recommend to CNPq that seminars for agricultural research administrators occur at regular 12-18 month intervals in Brazil.

Prior to the Seminar, the U.S. Group travelled with Dr. Ady Raul da Silva to a number of federal and state agricultural teaching and research institutions in the south of Brazil. A list of the institutions visited and the U.S. participants in the Workshop are included in Appendix 1. The visits were carefully prepared by Dr. Ady so that the Group could observe the research in progress and discuss the programs with the agricultural scientists. The U.S. Group compared the institutions visited in 1970 to those visited in 1968 in the north of Brazil. In general, the Group observed that the stronger state and federal agricultural research institutions are located in the southern states. However, common problems exist throughout the country such as the lack of funds, shortage of well-trained senior research personnel, difficult administrative arrangements between research institutions and their parent organizations in state or federal ministries, difficulties in communication, etc. In spite of these obstacles, notable work is being conducted which is vital to the present status and future development of the agricultural sector.

III. Agricultural Economics

Brazil is making considerable progress in developing advanced training in agricultural economics. Three institutions - Piracicaba, Viçosa and Porto Alegre - offer the master's degree; the School of Agronomy of the Federal University of Ceara plans to offer a degree program beginning in March 1971. At the undergraduate level, both Viçosa and Piracicaba offer a specialization in agricultural economics, a Ph.D program is planned to begin at Viçosa in 1971.

In addition to the growing strength in educational programs, a number of specialized institutions have developed strong agricultural economics teams. These include the Institute of Agricultural Economics in Sao Paulo,

the Bank of the Northeast, the Department of Rural Studies of the Secretariat of Agriculture in Minas Gerais and the Institute of Applied Economic Research of the Ministry of Planning in Rio de Janeiro.

A notable deficiency in Brazil is the lack of research on farm level production problems. Few efforts are made to evaluate production technology at the agricultural research stations, or to synthesize packages or systems of new technologies which could be used on individual farms. Expressed in somewhat different terms, there is a significant lack of integration between agricultural economics and agricultural research.

The Joint Study Group has considered this problem on two occasions in 1970 - first at its May meeting in Washington and again in July at Campinas. On the latter occasion, the group agreed upon a preliminary proposal for presentation to the CNPq and the NAS at the time of the 4th Workshop. The proposal, in draft form, is being circulated to the individual study group members for comments and suggestions. Basically, the plan suggests that a nucleus of two or three agricultural economists be integrated into the research programs of eight federal and state research stations. Initially, some of the economists might be U.S. pre-doctoral candidates who would spend two years in Brazil at an experiment station working on a Brazilian agricultural problem acceptable as a Ph.D dissertation topic in their home university. The agricultural economists would be supervised by a group of senior Brazilian and U.S. professors in a program similar in concept, but not in detail, to the Brazil-U.S. Chemistry Program.

If adopted, such a program would provide a core of well-trained agricultural economists working on problems in Brazil and a natural linkage between research stations and training institutions. The Joint Study Group feels that over a five-year period the usefulness of agricultural economic research on farm level production problems would be demonstrated.

IV. Transportation Research

A preliminary meeting was held between two members of the Brazilian panel of the Transportation Research Study Group (Professor Roberto Leuzinger and Professor Jacques de Medina) and two members of the U.S. panel (Dr. Joseph Grunwald and Dr. Adolph May) in early July. The group was primarily concerned with a better definition of the scope of transportation research problems in Brazil and consideration of various approaches toward their solution. One view is that there is no significant transportation research in Brazil, that research should be carried out in various modes of transport (air, water and land) and that the identification of projects for funding by CNPq would serve as a powerful stimulus to a more rational Brazilian transportation development program.

Another view is that transportation development in Brazil should be examined in the context of the country's economic development plan. With an understanding of transportation needs and present plans recommended in a Brazilian - World Bank comprehensive transportation study, research priorities could be more directly identified. Strong consideration should also be given to the needs for graduate education in transportation engineering and economics. Although a formal meeting of the Joint Transportation Research Study Group could not subsequently be organized, an understanding of the two points of view was considered useful by the panels. The Brazilian panel agreed to hold a series of local meetings and communicate their results through the CNPq to the NAS.

Because of the change in leadership in the CNPq and the subsequent internal program review, it is not now known if a renewed joint effort in transportation research will be planned.

V. Earth Sciences

After the visit of Dr. Leon Silver to Brazil in October 1969, the NAS-CNPq agreed that a meeting of the Brazil-U.S. Study Group on Earth Sciences should be held June 29 - July 3, 1970 in Rio de Janeiro. The U.S. panel consisted of Dr. Clarence Allen, Director of the Seismological Laboratory and Professor of Geophysics, California Institute of Technology; Dr. Richard H. Jahns, Director of the School of Earth Sciences and Professor of Geology, Stanford University and Dr. George A. Parks, Professor of Minerals Engineering also of Stanford University. Of particular importance were the meetings with Dr. Paulo de Paula Leite of the Faculty of Engineering, Federal University of Rio de Janeiro who also serves as a special assistant to the Minister of Mines and Energy. The CNPq and the Ministry began a program in 1970 for in-service training of earth scientists and other professional personnel of the Ministry. The U.S. panel also visited geology-earth sciences teaching and research programs at the Universities of Rio de Janeiro, São Paulo, Bahia, Minas Gerais and Brasilia. As a result of these discussions and visits, the U.S. panel noted that:

1. The curricula of the basic four-year programs in geology in Brazilian universities exhibit an excessive rigidity in course requirements. Most U.S. geologists engaged in teaching and research now feel that a highly structured sequence of courses is not desirable and does not promote the training of geoscientists for the diverse needs of the profession.
2. The largest Brazilian employer of graduates in geology in Brazil is the Ministry of Mines and Energy. Field geology problems encountered by these graduates are complex and suggest the need for more highly skilled geoscientists than the present four-year programs can produce.

3. A priority need for the geosciences in Brazil is the strengthening and/or establishment of a few high quality programs at the M.S. and Ph.D. level in geology, geochemistry and geophysics.

4. A cooperative program for strengthening graduate training in the geosciences between Brazil and U.S.A. offers a number of opportunities for fruitful collaboration. The Joint Study Group agreed to present to the 4th Brazil-U.S. Workshop a plan for discussion which would outline opportunities, suggest resources required, estimate the time period for program development and provide a cost estimate.

5. The specific needs of the Ministry of Mines and Energy for in-service training in the geosciences are to be considered at greater length if a request from the Ministry is received.

VI. Computer Science

During the period August 10-14, 1970, the Joint Brazil-U.S. Computer Science Study Group met in Brazil to examine the role of computers as related to national development planning, to recommend an overall plan, and to outline manpower training needs. The U.S. panel members were Dr. Harry D. Huskey, Director of the Computer Science Center, University of California at Santa Cruz; Dr. Barry Boehm, Rand Corporation, Santa Monica; Dr. Bruce Gilchrist, Executive Director, American Federation of Information Processing Societies, Montvale, N.J.; and Dr. Michel A. Melkanoff, Chairman, Department of Computer Science, University of California at Los Angeles.

The panel visited the University of São Paulo main campus and the new branch at Campinas, the Aeronautical Technical Center and the Brazilian space agency at San José dos Campos, the Graduate Engineering Center of the Federal University of Rio de Janeiro and the Catholic University in Rio de Janeiro. While the group found a number of activities of considerable interest, a major deficiency noted was the lack of manpower supply-demand information in computer science. Furthermore, each university seemed to be developing a program for training research and computer utilization in isolation from other universities and possible computer users outside the academic area.

The Computer Science Study Group urges a study of data processing manpower requirements including business, science, engineering, government planning and commercial users be made together with a study of education and training institutions that can supply the demand. The study is of particular importance because of the need to utilize, to the maximum extent, the computers presently available in Brazil. Time-sharing needs to be considered in Brazil.

A report with these and other recommendations is to be presented by the Study Group at the time of the 4th Brazil-U.S. Workshop.

VII. Miscellaneous

A. Industrial Research

Representatives of the CNPq have reported to the NAS that as a direct result of the CNPq-NAS Industrial Research Study Group, Brazilian authorities have formed two local committees to consider specific areas of industrial research; the first, in food technology, completed its work during 1970 and presented a report. Four centers of excellence were selected to work with local industry for the improvement of research and development programs. The centers are a) Rio de Janeiro where a study is underway to determine means for the improvement of protein content of manioc, b) Rio Grande do Sul (Porto Alegre) for the study of fisheries, c) Recife for the study of better utilization of tropical fruits, and d) Campinas which will be a training center in food technology.

A second committee is devoted to chemical engineering. During 1971 the CNPq plans to support technical meetings to examine programs of research and development which will be directed specifically toward priority problems identified by Brazilian industrialists in the broad area of chemical engineering.

Because of the interest of the new chairman of the CNPq, renewed emphasis in applied and industrial research will be considered by the 4th Brazil-U.S. Workshop.

B. Paleontology Symposium

An international symposium on paleontology was held in Rio de Janeiro during the week of September 20-25, 1971. At the request of the AID Mission, the NAS made arrangements for the participation of four U.S. scientists, identified by the Brazilian organizing committee. The scientists were Dr. Arthur J. Boucot, Department of Geology, Oregon State University; Dr. Fritz H. Cramer, Associate Professor of Geology, Florida State University; Dr. George Gaylord Simpson, Professor of Geology, University of Arizona; and Dr. Wendell P. Woodring, Smithsonian Institution.

VIII. Summary

During calendar year 1970 there were formal meetings of joint study groups in the areas of Agricultural Research, Agricultural Economics, Earth Sciences and Computer Science. In addition, the Brazilian panel of the Agricultural Economics Study Group and of the Computer Science Study Group visited

the U.S.A. to consult with U.S. leaders in those disciplines. Although the 4th Brazil-U.S. Workshop on Science and Technology in Development was postponed from October 1970 to 1971, a major conference on agricultural research administration was held in Campinas, Brazil in July 1970.

The major objective of the NAS-CNPq Science Program continues to be one of cooperation in the area of planning as it applies to science policy, to scientific and technical education and to broader national development goals.

APPENDIX 1

A. Institutions Visited in Brazil by the Agricultural Research Study Group

1. College of Agriculture and Veterinary Medicine, Federal University of Rio Grande do Sul, Porto Alegre, Rio Grande do Sul.
2. Department of Plant Production and Animal Husbandry, State Secretariat of Agriculture, Rio Grande do Sul.
3. Agricultural Research Institute for the South, Pelotas, Rio Grande do Sul.
4. College of Agriculture and Home Economics, Federal University of Pelotas, Rio Grande do Sul.
5. Meridional Agricultural Research Institute of the Federal Ministry of Agriculture, Curitiba, Paraná.
6. Division of Research, Department of Plant Sciences, Paraná State Secretariat of Agriculture, Curitiba, Paraná.
7. Biological and Technological Institute, Paraná State Secretariat of Agriculture, Curitiba, Paraná.
8. College of Agriculture, Veterinary Medicine and Forestry, Federal University of Paraná, Curitiba, Paraná.
9. Division of Agricultural Engineering, Institute of Agronomy of Campinas, Jundiai, São Paulo.

B. U.S. Participants in the Agricultural Research Seminar, Campinas, São Paulo State, July 27-31, 1970

1. U.S. Panel, Agricultural Research Study Group

- a) Dr. H. Rex Thomas, Deputy Administrator for Plant Science & Entomology, Agricultural Research Service, U.S. Department of Agriculture. (Acting Chairman).
- b) Dr. R. K. Frevert, Director, Agricultural Experiment Station, College of Agriculture, University of Arizona.
- c) Mr. James Turnbull, Assistant Administrator, Cooperative State Research Service, U.S. Department of Agriculture

2. U.S. Panel, Agricultural Economics Study Group

- a) Dr. G. Edward Schuh, Chairman, Department of Agricultural Economics, Purdue University. For 1970-71 on leave with the Ford Foundation as Latin American consultant in Agricultural Economics, Rio de Janeiro, Brazil.
- b) Dr. D. Woods Thomas, Director, International Programs in Agriculture, School of Agriculture, Purdue University.
- c) Dr. Lawrence W. Witt, Department of Agricultural Economics, Michigan State University.