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While foreign aid programs are largely based on the premise that the overseas effort will contribute to the development of and betterment of life in lesser developed countries, it has been found that many of these activities benefit the United States itself. Of some 200 projects reviewed, 76 were identified as having produced some benefit to the United States. The purpose, activity, and U.S. application of these projects are contained in this report. Indications are that the U.S. benefits tangibly in these ways: 1) technical findings abroad are applied to U.S. conditions; 2) developed methodologies are adopted domestically; 3) new insights on classes of problems are gained; 4) U.S. - LDC technological linkages are developed that lead to U.S. trade or preferences; and 5) participant training programs in the U.S. lead to joint ventures and export trade arrangements with industrialists in developing countries.

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BENEFITS TO
THE UNITED STATES
FROM
AMERICAN TECHNICAL
ASSISTANCE ACTIVITIES
ABROAD

Some Case Studies

AGENCY FOR INTERNATIONAL DEVELOPMENT
Bureau for Technical Assistance
Office of Special Technical Services

DECEMBER 1, 1972

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P R E F A C E

This report is the product of an effort to determine the extent and types of benefits that have accrued to the U. S. from technical assistance activities developed as a part of the foreign aid program. These activities are largely based on the premise that the overseas effort will contribute to the solution of a particular problem in a lesser developed country, contribute to the development of a particular sector in the host government's economy, or increase the capability of the host government to initiate and carry out development planning on its own--all designed to help the people of these countries fulfill their aspirations for justice, dignity and a better life. At the same time, many of these activities have been found to have produced benefits also to the United States itself.

Some 200 projects were reviewed and the project details discussed with the project managers and technical specialists. In those cases where there was evidence that the project contained potential benefits to the U. S., discussions were held also with the contractors' representative.

Of the projects reviewed, mostly those of the Technical Assistance Bureau, seventy-six have been identified so far as having produced some benefit to the U. S. Most of these relate to world-wide technical assistance or research activities. Some relate to AID's population research efforts, to geological and minerals survey activities completed with USGS assistance, and to bilateral participant training projects.

The cases included in this report indicate that direct tangible benefits to the United States may occur in several different ways or in a combination of them.

1. Application of technical findings abroad to U. S. domestic conditions. For example, research on wheat abroad has identified germ plasm which

when incorporated into the U. S. breeding program produces a variety having desirable qualities such as higher yields, increased resistance to disease and pests, and greater adaptability to varying climatic and soil conditions.

2. Application of methodologies developed overseas, e.g. nutrition survey methods developed for LDCs have now been applied in the U. S.

3. New insights on classes of problems. For example, skills developed in designing and administering foreign aid programs have been found useful in assisting state and local governments in the U. S.

4. Development of U.S.-LDC technological linkages. These have led to U. S. trade or technological preferences, e.g. U. S. assisted minerals surveys have led to U. S. joint investment, and to new minerals sources for imports into the U. S.

5. Participant training programs in the U. S. These have led to joint ventures and export trade arrangements with industrialists in developing countries.

Each case listed reflects one or more of these benefits or applications. While the economic or social benefits of an individual project to the U. S. are frequently open-ended and difficult to quantify, the collective impact and value of these projects to the U. S. is impressive.

Case write-ups are in the following sectors or groups: agriculture, health, nutrition, population, science and technology, section 211(d) grants, minerals development, and other participant training, multi-sectoral and partially reimbursable.) Cases are grouped and indexed accordingly. They are presented three to a page, with supplementary sheets in most cases. Also listed are contact points--from which further data can be obtained.

Report prepared by the Office of Special Technical Services
Technical Assistance Bureau

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

TABLE OF CONTENTS

| <u>AGRICULTURE</u> | Page |
|--|-------|
| International Agricultural Economic Seminar | A-1-a |
| International Maize and Wheat Improvement Center | A-1-b |
| International Crops Research Institute for Semi-Arid Tropics | A-1-c |
| International Potato Research Institute | A-2-a |
| Development and Utilization of Soybeans | A-2-b |
| Fish Production | A-2-c |
| Pest Management and Related Environmental Protection | A-3-a |
| Fertilizer Technical Assistance | A-3-b |
| Seed Program and Industry Development | A-3-c |
| Plant and Seed Materials | A-4-a |
| Food Grain Drying | A-4-b |
| Asian Agricultural College and University Seminar | A-4-c |
| CARIS Pilot Project | A-5-a |
| Agribusiness Planning and Development | A-5-b |
| Textbook on Natural Fibers | A-5-c |
| Manuals on Control of Plant and Animal Pests | A-6-a |
| Textbook on Neotropical Phytopathology | A-6-b |
| Agricultural Technical Support (Technical Literature) | A-6-c |
| Control of Weeds | A-7-a |
| Agricultural Equipment Development | A-7-b |
| Improved Grain Legumes | A-7-c |
| Improved Nutritional Quality of Wheat | A-8-a |
| Improved Protein Quality of Sorghum | A-8-b |
| Improved Protein Quality of Maize | A-8-c |

| | Page |
|--|--------|
| Agro-economic Research on Tropical Soils | A-9-a |
| Soil Fertility Requirements of Humid Tropics | A-9-b |
| Tailoring Fertilizers for Rice | A-9-c |
| Water Management Research - Latin America | A-10-a |
| Water Management Research - Asia | A-10-b |
| Control of Vertebrate Pests | A-10-c |
| Research on Hemoprotozoal Diseases | A-11-a |
| Tsetse Fly Control | A-11-b |
| Cattle Feeding Systems in the Tropics | A-11-c |

HEALTH

| | |
|---|-------|
| Health Center Manpower Planning | B-1-a |
| Development and Evaluation of Integrated Delivery Systems | B-1-b |
| Development of a Water Pump for LDCs | B-1-c |

NUTRITION

| | |
|--|-------|
| Effects of Malnutrition on Mental and Neurological Development | C-1-a |
| Classification of Various Types of Anemias | C-1-b |
| Vitamin Enrichment of Skimmed Milk | C-1-c |
| Effects of Extrusion Processing on Nutritional Quality | C-2-a |
| Improving the Nutritive Value of Cereal-based Foods | C-2-b |
| Clinical Evaluation of New Protein Sources | C-2-c |
| Marketing "Golden" (High Protein) Macaroni in LDCs | C-3-a |
| Importance of Zinc in Growth | C-3-b |
| Marketing Textured Vegetable Proteins in LDCs | C-3-c |
| Improvement of Metabolism by Chromium | C-4-a |
| Cotton Seed Meal as a Human Protein Resource | C-4-b |
| Cocunut Protein Products for Use in Foods | C-4-c |

| | Page |
|--|-------|
| <u>POPULATION</u> | |
| Dual Function, Prophylaxis - Contraceptive Agent | D-1-a |
| Releasing Factor Inhibitor as Contraceptive Agent | D-1-b |
| Intrauterine Device Development | D-1-c |
| Laboratories for Population Studies | D-2-a |
| Prostaglandin and Other Contraceptive Device Research | D-2-b |
| <u>SCIENCE AND TECHNOLOGY</u> | |
| Mosquito Genetic Control | E-1-a |
| Substitute Engineering Materials | E-1-b |
| Oceanography Training | E-1-c |
| Use of Computers | E-2-a |
| <u>SECTION 211(d)</u> | |
| Grants to U. S. Universities | F-1-a |
| Land Tenure and Related Institutional Development | F-1-b |
| Science of Tropical Soils | F-1-c |
| Utilization of Water Resources for Agriculture | F-2-a |
| <u>MINERALS DEVELOPMENT</u> | |
| Geological and Minerals Development Projects | G |
| Brazil Geological and Mining Surveys | G-1-a |
| Colombia Geological Mapping and Training | G-1-b |
| Indonesia Geological Mapping and Training | G-1-c |
| Liberia Minerals Assessment and Development | G-2-a |
| Pakistan Irrigation and Land Reclamation - Indus Basin | G-2-b |
| Philippines Geological Survey and Minerals Appraisal | G-2-c |

OTHER

| | |
|---|-------|
| Assisting State and Local Development Efforts in the U.S. | H-1-a |
| Korean Top Management Training Team - Case I | H-1-b |
| Korean Top Management Training Team - Case II | H-1-c |
| | |
| Korean Top Management Training Team - Case III | H-2-a |
| Korean Top Management Training Team - Case IV | H-2-b |
| | |
| Biocide Residues in Migratory Birds (Wildlife Preservation) | H-3-a |
| Earthquake Research Program in Taiwan | H-3-b |
| Aflatoxin Infestation of Pistachio Nuts | H-3-c |

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|---|
| <p>(a) INTERNATIONAL AGRICULTURAL ECONOMICS SEMINAR</p> <p>Project No. 140-88 Time Span: 1970-75 Contractor: Agric. Development Council, New York, csd-2813-Dr. Abraham Weisblat</p> <p>Proj. Mgr.: Dr. A. Coutu-TA/AG Proj. Spec.: Dr. F.L. Mann-TA/AG</p> | <p><u>Purpose:</u> (a) Identify agricultural development problems, explore opportunities for combined efforts in analyzing and determining implications of policy alternatives. (b) Use of such knowledge to improve training. (c) Provide a forum for the interchange of ideas and methodologies on the economics of agricultural development in the LDCs.</p> <p><u>Activity:</u> Plan activities for selected sectoral areas and research problems on marketing, production, employment and income; also sector analysis methodologies involving a cross section of U.S. and foreign agricultural economists.</p> | <p>The interchange between U.S. and foreign researchers and operations oriented personnel provided by this project is influencing changes in U.S. university curriculum and graduate training programs, bringing greater focus on problem specification, theoretical and methodological conceptualization, and informal exchanges concentrating on sector planning. Reports produced alert a broad range of U.S. institutions, both public and private, on trade and investment opportunities overseas. (No attachment)</p> |
| <p>(b) INTERNATIONAL MAIZE WHEAT IMPROVEMENT CENTER (CIMMYT)</p> <p>Project No. 110-840 Time Span: 1969-76 Contractor: CIMMYT, Londres, Mexico, csd-2973-Dr. H. Hanson</p> <p>Proj. Mgr.: Dr. S.C. Litzenberger-TA/AG Proj. Spec.: Dr. G.B. Baird-TA/AG</p> | <p><u>Purpose:</u> Increase CIMMYT's capacity as an intermediary assisting LDCs to increase production of corn and wheat.</p> <p><u>Activity:</u> Enables CIMMYT to expand its programs in international testing of wheat and maize, wheat and maize breeding; establishing a system for data retrieval, analysis and interpretation; and training of research and production agronomists.</p> | <p>CIMMYT is a source and exchange center for germ plasm serving the world. This material is made available to U.S. breeders and is currently being used in programs to increase yields, adaptability, resistance to insects and diseases, and improve nutritional value. The project has developed changes in breeding methods, cultural practices and a new approach toward attaining broader adaptation. U.S. seed companies work very closely with CIMMYT, obtaining from them potential parental material for broader adaptation, improved yield, insect resistance, and disease resistance. (See attachment #A-1-b)</p> |
| <p>(c) CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS (ICRISAT), Hyderabad, India</p> <p>Project No. 110-972 Time Span: 1972-76</p> <p>Contractor: ICRISAT - Dr. Ralph Cummings</p> <p>Proj. Mgr.: Dr. S.C. Litzenberger-TA/AG Proj. Spec.: Dr. G.B. Baird-TA/AG</p> | <p><u>Purpose:</u> Establish and develop a program of research at ICRISAT directed toward the development of improved varieties of sorghum, millets, chickpeas, pigeon peas, and other upland crops that can increase the agricultural productivity of the semi-arid tropics.</p> <p><u>Activity:</u> Supports research on upland crops to increase yields, fertilizer response, drought, disease and insect resistance; develops a system for the adaptive testing of experimental germ plasm; provides a center for the coordination of semi-arid crop research; and institutes a training program for semi-arid crop specialists.</p> | <p>Increased yields of high quality upland crops will improve economics in human and cattle feed production. ICRISAT will serve as a center for identification and evaluation of germ plasm collected from world-wide sources. These improved varieties will be available to U.S. breeders for including in their programs to improve quality and increase yields. (No attachment)</p> |

INTERNATIONAL MAIZE WHEAT IMPROVEMENT CENTER (CIMMYT) - Project No. 110-840
Contractor: CIMMYT, csd-2972

CIMMYT sends its experimental seed and related research findings, on request, to Government research stations, universities, and private seed companies all over the world, including those in the United States. CIMMYT maintains the leading corn germ plasm bank in the world (12,000 items) and supplies hundreds of requests each year from U.S. corn breeders seeking breeding materials to meet specific problems. When the U.S. corn crop was attacked in 1970 by the fungus disease Helminthosporium maydis, almost all U.S. hybrid varieties carried the Texas male sterile cytoplasm, which was vulnerable to the attack. CIMMYT was the seed source for El Salvador male sterile germ plasm which has been widely used by U.S. breeders and seed companies in 1971 and 1972, to provide resistance to the race of Helminthosporium which caused the attack. Altogether, CIMMYT has provided 28 different male sterile populations from the CIMMYT collection which are now being used by U.S. breeders in continuing the fight against the races of Helminthosporium. Diversifying the U.S. germ plasm resources from the CIMMYT world collection should help to avoid another disaster in the future.

CIMMYT's experimental wheat lines were grown at 490 locations in 61 countries in 1972. The best performing items are assembled at CIMMYT for distribution to all collaborators. CIMMYT's international wheat nurseries are presently grown by 55 institutions in the U.S., and those institutions are free to take from CIMMYT nurseries whatever items that will help in their own breeding programs. Mexican short wheats, developed at CIMMYT, are now widely grown in the U.S. These materials have been used in the breeding of new U.S. bread wheat varieties including Era, Fletcher, Bounty, Bonanza, and Red River.

CIMMYT solved the sterility problem in triticale, the man-made wide cross between wheat and rye, in 1968 and it is now rapidly approaching the stage at which it can enter the world cereal market as a major commercial grain. Triticale gives indication that it will have some advantages over both its wheat and rye parents: it has better protein content, is more drought resistant and more cold tolerant.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|---|---|
| <p>(a) INTERNATIONAL POTATO CENTER (PERU)</p> <p>Project No. 110-950 Time Span: 1972-76 Contractor: International Potato Center - Dr. R.L. Sawyer</p> <p>Proj. Mgr.: Dr. S.C. Litzenberger-TA/AG Proj. Spec.: Dr. G.B. Baird-TA/AG</p> | <p><u>Purpose:</u> Increase IPC's capacity as an intermediary assisting LDCs to increase production of potatoes.</p> <p><u>Activity:</u> Expands and enhances the capability of IPC to develop HYVs of potatoes with broad adaptability to tropical conditions and higher nutritional value; provides a center for coordination of world-wide potato research; and a facility for training potato research and production specialists.</p> | <p>The number of potato varieties available to U.S. breeders has been very limited and largely of types producing higher yields under cool climatic conditions. This activity will increase the variety of germ plasm available to U.S. breeders. This will permit the development of varieties having different flavors, improved keeping qualities, higher nutritional value, higher yields and broader adaptability to different climatic and soil conditions. (See Attachment #A-2-a)</p> |
| <p>(b) DEVELOPMENT AND FOOD UTILIZATION OF SOYBEANS</p> <p>Project No. 190-929 Time Span: 1971-76 Contractor: Univ. of Ill., csd-3292 - Dr. E.R. Leng/ Dr. H.C. Miner</p> <p>Proj. Mgr.: Dr. C.A. Breitenbach-TA/AG Proj. Spec.: Dr. S.C. Litzenberger-TA/AG</p> | <p><u>Purpose:</u> Reduce the world-wide protein gap by the utilization and development of improved varieties of soybeans suitable for use without complicated processing or fermentation.</p> <p><u>Activity:</u> Accelerates the production of new soybean varieties, utilizing new technology in plant breeding, cultural practices, and pest and disease control; and, in selected centers, adapting the Illinois method of processing soybeans for human food.</p> | <p>Under this project a number of quick, simple methods have been developed by which the housewife can make soybeans an acceptable nutritious food for home recipes. This activity has provided extra facilities at the University of Illinois, increasing the university's capacity to broaden its research approach to problems directly applicable to the U.S. by sampling world germ plasm, incorporating the best features (high yield, protein content, and disease and insect resistance) in varieties adapted to the U.S. (See Attachment #A-2-b)</p> |
| <p>(c) FISH PRODUCTION IN LDC's</p> <p>Project No. 180-787 Time Span: 1967-73 Contractor: Auburn Univ.csd-2270- Dr. Homer S. Dwingle</p> <p>Proj. Mgr.: C.E. Shuart-TA/AG Proj. Spec.: Dr. C.A. Breitenbach-TA/AG</p> | <p><u>Purpose:</u> Increase the production of fish by utilizing pond fish culture as a source of food and a means of increasing employment and income.</p> <p><u>Activity:</u> Identifies and assists priority project development by supplying technical consultation and backstopping in key problem areas and provides a center for the development, analysis, collection and dissemination of relevant data, reports and fisheries information.</p> | <p>Studies under this activity are identifying species of fish, crab, and shrimp for their economic potential under intensive cultivation. Some of these are types that would be acceptable to U.S. consumers and are potentially adaptable to intensive cultivation practices in the U.S. where fish farming is a rapidly growing industry. (See Attachment #A-2-c)</p> |

INTERNATIONAL POTATO RESEARCH INSTITUTE - Project #110-950

Contractor: International Potato Center, csd-3286

The International Potato Center is having immediate and direct effect on U.S. programs for potato improvement in general and specific U.S. institutions. In the development of modern-day varieties in the U.S., only a small fraction of the genetic variability of tuber bearing potato species has been utilized. The Center is providing a facility which is making available a large amount of previously unused genetic material for potato improvement.

The Center is taking advantage of U.S. institutional competence in potato improvement for some priority projects of the Center. These projects have a priority for developing countries as well as for the U.S. areas which the U.S. institutions concerned are servicing.

The Center, besides providing the U.S. institution programs with a flow of new genetic material for their state programs, is also providing some specific project help. For potato improvement, geneticists and breeders have determined that the quickest results can be obtained from the cultivated tetraploids, next the cultivated diploids and thirdly from the wild species. The Center has catalyzed projects undertaken by state institutions into an international dimension for the good of all concerned with potato improvement. Segregated populations from crosses made at specific universities are being tested at the Center and at other locations. Thus the universities are accumulating more thorough knowledge of the value of their crosses in a shorter period of time.

DEVELOPMENT AND FOOD UTILIZATION OF SOYBEANS - Project #190-929

Contractor: University of Illinois, csd-3292

Under this project a number of quick, simple methods have been developed by which the housewife can make soybeans an acceptable nutritious food for home recipes. These processes destroy the trypsin inhibitors existent in the crude bean which render whole beans poorly digestible when used in the human diet. They also eliminate the green or "paint-like" taste which makes the beans disagreeable to the occidental's palate. Although the Illinois research has been oriented to processes by which to render this legume, with up to 40% protein content, suitable for consumption in protein deficient nations, it also has the advantage of making them available for use as a meat substitute to low-income households in the U. S.

The University of Illinois has also developed a series of tasty recipes for the use of whole soybeans which allow these to be used as substitutes for the common bean in such popular dishes as baked beans, pork and beans and chile. It is entirely conceivable that this work can also render the dried soybean a popular item in the U. S. diet.

At each foreign location where the Illinois nursery of U. S. soybean varieties have been tested for adaptation to local conditions, the best local varieties have also been included as yield controls. In several instances one or more local varieties have been found to have greater yield potential or higher resistance to disease and insect damage than the U. S. types. These superior varieties have been brought back to Illinois and several of them are providing new germ plasm sources for resistance which can be used to improve U. S. varieties.

FISH PRODUCTION IN LDCs - Project No. 180-787

Contractor: Auburn University, csd-2270

Auburn University presently is involved in cooperative fisheries programs supported by the Agency for International Development in Brazil, El Salvador, Panama and the Philippines. Although relatively new, staff affiliated with three of the four country programs have been on post for a period of one year or less.

In Brazil, the Amazon River reportedly contains 1,800 fish species of which 400 are catfishes. Only a very limited number of these fish have been tested to assess their potential for intensive culture. Studies sponsored by this project have identified one catfish species (Maparate) to possess characters that make it particularly interesting: a) comparatively small size of head relative to total body size, thus resulting in high dress-out weight, b) absence of spines in fins which contributes to ease of handling, and c) it is a filter feeder and thus should be an extremely efficient species for pond culture. Experimental fish farming under conditions similar to those in the U.S. is expected to lead to the adaptation of this species for U.S. production.

A freshwater crab species, which locally is considered a delicacy and sells at a high price, currently is under investigation in El Salvador.

Effort is on developing methods of successfully reproducing this crab under hatchery conditions and subsequently testing its potential as a cash crop in farm ponds.

In Panama, freshwater shrimp species provides an exciting dimension to the aquaculture project in this country. Males of this shrimp attain a weight of one pound and are highly desired as a gourmet food item in Panama. When tested at Auburn University, this species was found to grow at a rapid rate in ponds although attempts to reproduce it were not successful. One of the programs at the new aquacultural station in Panama will be directed toward investigating the life history and biology of this freshwater shrimp species with special emphasis placed upon development of techniques for producing young for culture in fresh-water ponds.

Improved culture methods of marine fish and shrimp are to be developed at the new 100-acre brackish-water experimental station, which is presently under construction on Panay Island near Iloilo City in the Philippines.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|---|
| <p>(a) PEST MANAGEMENT & RELATED ENVIRONMENTAL PROTECTION</p> <p>Project No. 190-930 Time Span: 1971-76 Contractor: Univ. of Calif., csd-3296 - Dr. R.E. Smith</p> <p>Proj. Mgr: C.J. Fredrickson- TA/AG Proj. Spec.: W.H. Garman-TA/AG</p> | <p><u>Purpose:</u> Define key problems in pest management under various environmental conditions as related to crop development and determine the nature and scope of needed research, training and technical assistance aimed at their solution.</p> <p><u>Activity:</u> In selected countries, study teams in concert with mission/country will prepare reports defining parameters and scope of problems of pests affecting principal food crops and recommend set of priority problems with suggested U.S. role.</p> | <p>The research conducted on various pests and diseases in foreign areas under this activity may be expected to produce solutions to some of the pest and disease problems in the U.S. The project offers an opportunity to study pests and diseases under widely varied conditions and will enhance the U.S. capability to manage and control these conditions. Methods and agents employed will have direct application in the U.S. on the same and in some cases similar conditions. (See Attachment #A-3-a)</p> |
| <p>(b) FERTILIZERS - TECHNICAL ASSISTANCE</p> <p>Project No. 190-832 Time Span: 1966-77 Contractor: Natl. Fertilizer Dev. Center, TVA; PASA TA(QA) 6-69 Dr. D.T. McCune</p> <p>Proj. Mgr.: Dr. J.L. Malcolm- TA/AG Proj. Spec.: W.H. Garman - TA/AG</p> | <p><u>Purpose:</u> Solve problems from mining geology through process engineering, market research, product distribution and field use. Develop within selected LDCs institutionalized information and service capability.</p> <p><u>Activity:</u> The potential and effective demand for specific fertilizers and fertilizer materials is being related to capacities, existing supplies and patterns of trade. In selected countries, market studies are being undertaken to provide examples of organization, logistics and marketing cost as a guide to policy and operational decisions.</p> | <p>Current data on selected country fertilizer use, requirements, production, market structure and costs have proven useful in estimating future-world fertilizer requirements in relation to domestic production and local demand. This is used by U.S. industry in estimating potential exports, domestic production and identifying foreign investment opportunities, and by the USG and other lending agencies concerned with fertilizer loans and the financing of production facilities. (See Attachment #A-3-b)</p> |
| <p>(c) SEED PROGRAM & INDUSTRY DEVELOPMENT</p> <p>Project No. 130-203 Time Span: 1958-77 Contractor: Miss. State Univ., csd-2967 - Dr. J.C. Delouche</p> <p>Proj. Mgr.: T.V. Tibbutt-TA/AG</p> | <p><u>Purpose:</u> Increase the LDC's capability to supply farmers' needs for improved seeds.</p> <p><u>Activity:</u> Develops within LDCs a capability to design, construct and adapt specialized equipment for seed processing, testing, drying, storage and packing; design, construct, operate and maintain facilities, equipment and systems related to seed industry systems; and identifying and assessing agriculture - government - industry linkages and their respective roles in seed program and industry development.</p> | <p>The "Green Revolution" brought about wide dissemination of (high yielding variety) seeds for production and utilization. Seed laws in the countries of the world, including the U.S. had evolved from custom and usage and were not designed to facilitate movement or exchange. Under this activity, a Model Seed Law is being developed in collaboration with Seed Trade Associations in the U.S., Europe, and the LDCs. This will provide a basis for uniform seed law legislation in the LDCs which will be extremely advantageous to U.S. seed exporters by making the U.S. sources more competitive than at present. (No attachment)</p> |

PEST MANAGEMENT AND RELATED ENVIRONMENTAL PROTECTION - Project No. 190-930

Contractor: University of California, csd-3296

Modern transportation has greatly increased the possibility of introducing new pests and diseases into the U. S. This project affords an opportunity to study these pests in their foreign environment, and the controls developed will have direct application in the U. S. should the need arise.

The research conducted on pests and diseases in foreign areas under this activity will, in many cases, have a direct relation to the solution of similar problems in the U. S. since many of the conditions under which diseases and pests to be studied are identical or closely related to those existing in the U. S. The opportunity, provided by this project, to study pests and diseases under widely varied conditions will enhance U. S. capability to manage and control these pests.

This project will also provide an opportunity to locate, identify and evaluate beneficial insects such as parasites and predators of insects which could be introduced into the U. S. for pest control.

Improved crop protection in developing countries will result in better and more effective utilization of pesticides, increased demand for these products and increased U. S. exports.

FERTILIZERS TECHNICAL ASSISTANCE - Project No. 190-832
Contractor: Tennessee Valley Authority, PASA TA(QA) 6-69

The impact of this project lies in the transfer of fertilizer production, marketing, and utilization technology from the United States to the developing third world. The contribution of this assistance to the United States is summarized as follows:

By assisting developing country fertilizer programs this project has helped to identify new markets for U.S. materials, industrial plant and equipment facilities, new technology and concepts in manufacturing, distributing, and use of fertilizers. Evidence of this is that U.S. technology is being widely accepted throughout the world rather than European. Also, the developing countries have served as an experimental and proving ground for new fertilizer technology.

The statistical phase of this project has made it possible to obtain technical production data on more than 2,000 fertilizer plants around the world. The primary beneficiary of these data is the U.S. industry, universities, and public and private research institutions and foundations. Additionally, through automated data processing techniques world-

wide fertilizer consumption data by country inclusive of imports and exports is maintained and disseminated. Again, the principal beneficiaries are U.S. public and private institutions.

This project has enabled TVA to establish an international fertilizer library. This library has become a primary reference center for the U. S. fertilizer industry, university graduate studies, and related programs.

Work conducted within the scope of this project has enabled the U.S. government to realize millions of dollars in savings by helping to develop the technology for shipping hygroscopic fertilizer materials from the United States into the tropics.

U. S. scientists who have participated in this project have become more knowledgeable and skilled in agricultural and economic development techniques and application. This experience has enabled them to upgrade themselves and associates in industry and government.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|---|
| <p>(a) PLANT AND SEED MATERIALS</p> <p>Project No. 130-829 Time Span: 1955-76 Contractor: USDA, Agricultural Research Service, PASA TA(AJ) 2-69-Dr. H.L. Hyland</p> <p>Proj. Mgr.: T.V. Tibbutt-TA/AG Proj. Spec.: Dr. S.C. Litzenberger-TA/AG</p> | <p><u>Purpose:</u> Broaden the germ plasm base available to plant breeders in developing disease and insect-resistant high-yielding varieties with broad adaptation as needed to meet changing ecological balances.</p> <p><u>Activity:</u> The USDA/ARS has established and is evaluating and maintaining germ-plasm collections; and serves as a source for the supply of selected agricultural plant and seed materials</p> | <p>An agricultural station in Puerto Rico is serving as a tropical base for the receipt and distribution of plant and seed materials gathered from world-wide sources. Collections are evaluated and maintained as disease free stocks for use of plant scientists. This isolation and quarantine station has made it possible for U.S. breeders to have available superior germ plasm thereby expanding and enhancing the scope and potential of U.S. research for both LDCs and U.S. use. (No attachment)</p> |
| <p>(b) FOOD GRAIN DRYING, STORAGE, HANDLING AND TRANSPORTATION</p> <p>Project No. 190-788 Time Span: 1968-75 Contractor: Kans. State Univ., csd-1588 - Dr. W.J. Hoover</p> <p>Proj. Mgr.: James Urano - TA/AG Proj. Spec.: M. Galli - TA/AG</p> | <p><u>Purpose:</u> Solve problems involving the losses of food grains and food grain quality during post-harvest handling, drying and storage.</p> <p><u>Activity:</u> Identify grain storage and marketing problems, recommend solutions, evaluate remedial programs and design and conduct training programs to improve grain storage and marketing practices.</p> | <p>Identification of overseas investment opportunities in fabrication of storage facilities (joint ventures); provide opportunity for U.S. firms to participate in feasibility studies, develop tools and procedures for improved solutions to operational and managerial problems applicable to U.S. situations and improve the U.S. grain storage and marketing training programs. (See Attachment #A-4-b)</p> |
| <p>(c) ASIAN AGRICULTURE COLLEGE & UNIVERSITY SEMINAR</p> <p>Project No. 130-873 Time Span: 1969-71 Contractor: North Carolina State Univ., csd-2576-Dr. J.A. Rigney</p> <p>Proj. Mgr.: J.A. Urano - TA/AG Proj. Spec.: Dr. M. Broadnax - TA/AG</p> | <p><u>Purpose:</u> Provide an opportunity for the leaders of Asian agriculture colleges, universities, and related institutions to exchange ideas in personal contact and study at first hand the institution building experience of other nations in the region.</p> <p><u>Activity:</u> Organize and conduct seminars for Asian educators. Visit selected universities in the region and discuss instructional, training, research, and extension functions of agricultural universities; their role in agricultural development and the problems encountered in developing such institutions.</p> | <p>Advanced the concept of "systems of agricultural services" which is applicable to the U.S. Stimulated U.S. institutional participants to examine their own institutions to evaluate present program support to the agriculture sector. (See Attachment #A-4-c)</p> |

FOOD GRAIN DRYING, STORAGE, HANDLING AND TRANSPORTATION - Project No. 190-788

Contractor: Kansas State University, csd-1588

The initial assessments of storage and marketing conditions existing in the areas studied under this project have provided U.S. firms an opportunity to participate in large scale feasibility studies. These studies have identified foreign opportunities for U. S. investors. Improved storage, marketing and processing recommendations have resulted in a demand for U. S. equipment and supplies.

The development by Kansas State in Korea, Ethiopia and Panama of tools and procedures for the solution of operational and managerial problems has resulted in a master projection model for long range projects. This model is now being used in evaluating inland water transport of grain in the U.S.

Many of the storage structures and drying facilities developed for adverse, tropical conditions under this project will be applicable to areas in the U. S. where similar conditions exist. This will be especially true in the cases of storage of high moisture grains.

The training programs for foreign nationals have provided U. S. manufacturers opportunities to expand their area of service and increase sales opportunities. Training materials have been developed that also have a direct application to U. S. situations. These are utilized in the training of U. S. grain personnel.

ASIAN AGRICULTURE COLLEGE & UNIVERSITY SEMINAR - Project No. 140-887

Contractor: North Carolina State University, csd-2576

The first seminar explored and advanced the concept of "systems of agricultural services" which identified the relationship of various farm organizations and proposed broad guidelines for coordinating their various activities in the promotion of agricultural production and development of rural areas. This concept has been further studied and applied by USDA/ERS and several states as a means to improve farm services.

The second seminar focused on exposing Asian leaders to the theory and strategy of institution building that have come from recent U. S. studies and to provide a format within which their University and Ministry officials could discuss their joint responsibilities in serving the agricultural sector. In the process of these discussions, it became apparent that many institutions are formed and develop excellent staff and resources but do not fulfill the urgent needs for which they were originally designed. These discussions have focused attention of the U. S. participants back onto our own institutions, and initiated examinations of how and why they serve as they do.

Specifically the questions now being asked of the U. S. university's support to the agricultural sector are: (a) what are the important services that need to be provided from the public sector?, (b) which services would more efficiently be supplied from the private sector?, (c) how has this mix changed during the past fifty years?, (d) what are the major developments that influence the change?, (e) what are the optimum roles for the various types of public institutions today? and (f) how will these be likely to change in the next decade?

Obviously these are difficult questions to answer, and the indicated changes would be difficult to implement, but at least we will have tools to answer these questions. The USDA History Branch and several Universities are mounting a coordinated attack on them.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|---|---|
| <p>(a) COMPUTERIZED AGRICULTURE RESEARCH INFORMATION SERVICE (CARIS) - Pilot Project -</p> <p>Project No. 130-974 Time Span: 1972-73 Contractor: Food & Agric. Org. (FAO) - Dr. R. Aubrac</p> <p>Proj. Mgr.: C.F. Deyoe - TA/AG Proj. Spec.: G.B. Baird - TA/AG</p> | <p><u>Purpose:</u> Computerization of relevant data on agricultural research already performed or in progress in 14 African countries.</p> <p><u>Activity:</u> Determine the basic methodology; design systems and program procedures; establish classification and indexing standards; and develop a coding system and input forms. Collect and verify data from 14 African countries; and prepare, index, code, transcribe and process by computers.</p> | <p>The collected data, to be published in directories, will provide U.S. scientists with current detailed information on African research institutes, scientific personnel, and on-going research programs and activities. This information can facilitate contact by U.S. scientists with African scientists in areas of mutual interest. One area of important implication to tropical and sub-tropical agriculture of the U.S. will be greater access to germ plasm of various crops, particularly those indigenous to Africa. (No attachment)</p> |
| <p>(b) AGRIBUSINESS PLANNING & DEVELOPMENT (Talent Bank)</p> <p>Project No. Time Span: 1973-75 Contractor: Kans. State Univ. - Dr. W.J. Hoover</p> <p>Proj. Mgr.: D. Gaumer - TA/AG The concensus among experts</p> | <p><u>Purpose:</u> Identify AID contractor and private sector skills and inputs crucial for agribusiness systems development, mobilize and integrate these to produce an integrated capability to develop LDC agribusiness entities in the cereal-oil seeds sub-sector.</p> <p><u>Activity:</u> Utilizing the research, training and technical assistance skills of on-going AID contractors, identify private sector skills and contractor technical resources and capacity needed for identifying sub-sector agribusiness opportunities; and develop a system oriented technical assistance in support of LDC sector planning and programming effort to develop agribusiness entities within this sub-sector.</p> | <p>U.S. companies are generally highly specialized and are somewhat limited in their ability to provide a systems approach to agribusiness development. Under this activity the private sector, with Commerce Department assistance, will combine capabilities in developing a system of integrated expertise to support LDC agribusiness planning and programming that will compete with foreign agribusiness competitors. (See Attachment #A-5-b)</p> |
| <p>(c) TEXTBOOK ON NATURAL FIBER CROPS</p> <p>Project No. A-11 Time Span: 1970-71 Contractor: Univ. of Florida</p> | <p><u>Purpose:</u> Produce a textbook on the natural vegetable fibers.</p> <p><u>Activity:</u> A manuscript prepared by James Dempsey, a recognized authority on the subject, has been completed for publication by the Univ. of Florida Press.</p> | <p>The concensus among experts is that the manuscript is well-written and accurate, reflecting the author's extensive knowledge gained through many years of work and research on the subject. When published by the Univ. of Florida Press in its Tropical Agriculture Series, it is expected to become the definitive work on natural vegetable fibers and to have wide applicability among U.S. scholars, students, research institutions and private industry. (No attachment)</p> |

AGRIBUSINESS PLANNING & DEVELOPMENT - Project #

Contractor: Kansas State University, csd-

The Agribusiness Planning and Development project has the potential for U.S. utilization in many areas. During the past ten years, many changes in domestic and international agribusiness operations have had profound effects on the life cycles of various commodity industry systems as well as products. These, involving the development of new analytical tools and forms of vertical and contractual coordination that will allow management of U. S. agribusiness operations to anticipate and take advantage of developments within the agribusiness sector of the LDCs, are being evaluated by present AID contractors.

Inherent in this planning effort is the attitude of the U. S. government toward the involvement of U. S. firms in agribusiness development, both within the U.S. and international. The project provides for an evaluation of the risk factors involved in establishing viable agribusiness enterprises and an identification of means by which government can assist rural development through the creation of new agribusiness entities and related economic opportunities in rural America.

The analysis of various parts of a commodity system in developing LDC export operations has already resulted in modifications of agribusiness education form and content in various U. S. educational institutions. These new programs are more responsive to agribusiness management needs.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|---|
| <p>(a) MANUALS ON CONTROL OF PLANT AND ANIMAL PESTS</p> <p>Project No. D-32 Time Span: 1964-69 Contractor: National Academy of Sciences</p> | <p><u>Purpose:</u> Publish scientific information having global application on plant and animal pests.</p> <p><u>Activity:</u> Prepare a series of manuals dealing with various methods of pest control. The following subjects are treated: Plant Disease Development and Control; Weed Control; Insect-Pest Management and Control; Control of Plant-Parasitic Nematodes; Vertebrate Pests: Problems and Control; and Effects of Pesticides on Fruit and Vegetable Physiology.</p> | <p>AID, with the USDA and the Rockefeller Foundation, sponsored this six-volume series on the "Principles of Plant and Animal Pest Control". The entire series, developed by expert sub-committees on the subjects concerned, constitute an important reference work for U.S. scholars. It is available in U.S. universities, libraries and research institutions, and is also on sale by the National Academy of Sciences. (No attachment)</p> |
| <p>(b) TEXTBOOK ON NEOTROPICAL PHYTOPATHOLOGY</p> <p>Project No. D-33 Time Span: 1966-70 Contractor: North Carolina State University</p> | <p><u>Purpose:</u> Prepare a textbook-reference on neotropical plant diseases.</p> <p><u>Activity:</u> Dr. F.L. Wellman, who spent thirty years in the tropics and sub-tropics performing research in neotropical phytopathology has summarized available literature and combined it with his own extensive research findings to provide a comprehensive reference. The manuscript is to be published commercially by Scarecrow Press. The North Carolina State University is preparing an associated smaller volume in which known diseases of the American tropics are listed and indexed.</p> | <p>Scarecrow Press, Inc. of Metuchen, New Jersey, has published the 989 page volume under the title "Tropical American Plant Disease (Neotropical Phytopathology Problems)". The text discusses problems and progress in the science of plant pathology in the American tropics. For the first time American scientists, researchers and students will have in one book most of the available knowledge on the subject. It is expected to become the authoritative text on the subject. (No attachment)</p> |
| <p>(c) AGRICULTURAL TECHNICAL SUPPORT (TECHNICAL LITERATURE)</p> <p>Project No. L-54 Time Span: 1965- Contractor: Various</p> <p>Proj. Mgr.: Ruth Lancetti-TA/AG</p> | <p><u>Purpose:</u> Purchase, print or reprint research and technical assistance reports; develop and publish new publications and revise and reprint existing ones.</p> <p><u>Activity:</u> Provide a technical enquiries service, develop new materials, and sponsor translation programs. Serve as a technical backstop to AID overseas missions by the supply of technical information and materials.</p> | <p>Publications produced under this project have been made available to U.S. universities and government agencies. More than fifteen titles were funded by AID, at least in part. AID participated actively in the writing, editing, approving and/or printing processes. These are used as textbooks in U.S. universities and high schools; as reference works in U.S. libraries; and as training aids in OEO, VISTA, and State poverty programs, on Indian Reservations, and in responding to requests from private U.S. citizens. Some have been published commercially. (No attachment)</p> |

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|--|
| <p>(a) CONTROL OF WEEDS IN LDCs</p> <p>Project No. 130-463 Time Span: 1966-76 Contractor: Oregon State Univ., csd-1442 - Dr. L.F. Taylor</p> <p>Proj. Mgr.: C.J. Fredrickson- TA/AG Proj. Spec.: W.H. Garman - TA/AG</p> | <p><u>Purpose:</u> Develop simple, effective, and economical methods of controlling weeds, thereby increasing the production of food crops.</p> <p><u>Activity:</u> Develops information on mechanical, cultural and chemical methods for weed control and their relationship to production costs, yields and labor requirements; analyzes data relative to cost-benefits; develops optimum weed control programs; conducts training programs in effective methods of weed control research; and promotes sound and safe usage of herbicides in view of environmental relationships.</p> | <p>This research stimulates the demand for U.S. exports of agricultural production inputs, provides the U.S. public with unique technical information, and broadens project staff experiences that are shared with U.S. students and professionals. (See Attachment #A-7-a).</p> |
| <p>(b) AGRICULTURAL EQUIPMENT DEVELOPMENT</p> <p>Project No. 130-443 Time Span: 1965-75 Contractor: International Rice Research Institute (IRRI), Loa Banos, Philippines, csd-834 & 2541 - Dr. A. Khan</p> <p>Proj. Mgr.: Dr. J.L. Macolm - TA/AG Proj. Spec.: M. Galli - TA/AG</p> | <p><u>Purpose:</u> Develop farm equipment for manufacture and distribution through commercial channels for small rice farmers which will reduce the fluctuations in farm labor requirements during the growing season, will permit continuous or multiple cropping and will increase the use of high yielding varieties.</p> <p><u>Activity:</u> Develops new or improved field machines for 2-10 hectare farms and processing machines for farm and village use; provides manufactures with equipment designs and trains workers in manufacturing skills; and studies the economic impact of use on farms and on the rural community.</p> | <p>A 2-wheel garden tractor, developed under this activity and being manufactured commercially in the Philippines, requires 150 U.S. built Briggs & Stratton engines per month. Production could increase to 600 units per month. The immediate demand is estimated to be in excess of 5000 units. (See Attachment #A-7-b)</p> |
| <p>(c) IMPROVED GRAIN LEGUMES</p> <p>Project No. 130-039 Time Span: 1963-73 Contractor: Agricultural Research Service, USDA; PASA RA(AJ) 3-00 Dr. Martin Weiss</p> <p>Proj. Mgr.: T.V. Tibbutt-TA/AG Proj. Spec.: Dr.S.C. Litzenberger- TA/AG</p> | <p><u>Purpose:</u> Increase protein availability of grain legumes by increasing the yield and improving related cultural practices.</p> <p><u>Activity:</u> Tests, breeds, and selects introduced and indigenous varieties of beans and cowpeas in various ecological zones. Makes qualitative and comparative analyses to determine disease and insect resistance, yielding ability, and response to improved cultural practice. Increases yields and quality through breeding of disease and insect-resistant varieties with broad adaptation to soil and climate; develops appropriate pest control measures; and improves cultural and management practices.</p> | <p>Provides additions to the U.S. germ plasm bank which constitute a valuable source of new characteristics potentially useful to U.S. breeders for improving these food legume crops and increasing their production, especially beans and cowpeas. (No attachment)</p> |

CONTROL OF WEEDS IN LESS DEVELOPED COUNTRIES - Project No. 130-463
Contractor: Oregon State University, csd-1442

The project was conceived, funded, and operated expressly for improving weed control research in less developed countries, with the ultimate goal of reducing weed-caused agricultural production losses. However, incidental benefits of some magnitude are considered to have accrued to the United States as a result of the project.

The research conducted demonstrates that the advantages of higher efficiency crop production inevitably stimulates the use and demand of agricultural production inputs. Alert U.S. entrepreneurs are encountering an expanded LDC market for export of agrichemicals, seed, and equipment. Consequently, the U.S. balance of payments benefits from this increased export trade.

A direct and continuing exchange of technical information has occurred under project auspices with unique technical research information being made available to the U.S. public and data being supplied to all the various world research organizations which are heavily involved with introducing new high-yielding crop varieties and supported by multilateral, foundation and USAID funding.

The project has hosted innumerable visiting foreign researchers and administrators, often resulting in closer subsequent working relationships and improved cooperation. Exposure to international situations has helped create broadened project staff expertise that is often shared with domestic students and, at meetings, with other professional groups. The overseas operations of the project contribute yet another element that fosters the image of the United States as one of the world leaders in agricultural technology.

The less tangible areas of international relationships and U.S. image are also believed to have enjoyed positive support from project activities. All foreign-based project personnel have been multilingual and therefore able to establish close working relationships with counterpart researchers as well as travel relatively freely within large geographical areas, thereby acquiring a clearer knowledge of current social, economic, and political trends.

AGRICULTURAL EQUIPMENT DEVELOPMENT - Project No. 130-443

Contractor: International Rice Research Institute, csd 834&2541

Research under this activity has developed or adapted a number of types of agricultural equipment and machinery for use in rice fields. One of these, which requires a component part from the U.S., is a two-wheel garden tractor developed for small farmers as a substitute for carabao work animals. The design adapts a British made "land master" to Philippine conditions and utilizes locally available Jeep parts in the fabrication.

A local manufacture is presently fabricating and assembling about 150 units per month and is marketing them at approximately one-half the retail price of imported Japanese tractors. Demand projections indicate that production can easily be increased to 500 to 600 units per month.

Each of these tractors is equipped with a Briggs and Stratton engine costing \$55. each. This represents U. S. exports at \$8,250 per month at present, with the estimated production this would increase to \$33,000 per month or \$400,000 per year. It is feasible that a \$1,000,000 in annual sales of U. S. motors could stem directly from this project within the next three years.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

A-8

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|---|
| <p>(a) IMPROVEMENT OF THE NUTRITIONAL QUALITY OF WHEAT</p> <p>Project No. 130-471 Time Span: 1966-77 Contractor: Univ. of Nebr., csd-1208 - Dr. P.J. Mattern/ Dr. V. Johnson</p> <p>Proj. Mgr.: Dr. C.A. Breibenbach- TA/AG Proj. Spec.: Dr. S.C.Litzenberger- TA/AG</p> | <p><u>Purpose:</u> Improve the protein quantity and quality of high yielding winter wheat varieties.</p> <p><u>Activity:</u> Screens the world wheat collection to identify nutritionally superior wheat; evaluates superior germ plasms; identifies superior genotypes; and develops and distributes superior high protein commercial varieties.</p> | <p>A new technique for the identification of high protein genotypes in the seedling stage has been developed; and new and superior genotypes that increase the protein quality of wheat, permit the plant to have broader adaptation and increased resistance to diseases and insects have been made available to U.S. breeders. A Russian variety called "Bezostaia" has emerged as highly productive and broadly adaptive. Its special characteristics of short, very strong straw and large heads, make it a potentially valuable "parent" for new U.S. varieties requiring broad adaptation, irrigation and heavy fertilization.(See Attachment #A-8-a)</p> |
| <p>(b) IMPROVEMENT OF PROTEIN QUALITY OF SORGHUM</p> <p>Project No. 130-452 Time Span: 1966-76 Contractor: Purdue Univ., csd- 1175 - Dr. J.D. Axtell/ Dr. E. Mertz</p> <p>Proj. Mgr.: Dr. C.A. Breitenbach- TA/AG Proj. Spec.: Dr. S.C.Litzenberger- TA/AG</p> | <p><u>Purpose:</u> Improve the protein quantity and quality of high yielding sorghum varieties for animal feed.</p> <p><u>Activity:</u> Screens the world collection of sorghums; identifies nutritionally superior grain sorghums; evaluates superior germ plasms; identifies superior genotypes and develops and distributes superior high protein commercial varieties.</p> | <p>Studies supported by this activity have revealed that the protein in sorghum is not all available as a nutrient since tannin inhibits its absorption by the animal. The plant's resistance to birds and insects and other factors may account for some of these resistance properties. It is anticipated that superior genotypes will be identified that will have high commercial value in the U.S. The wide sampling of germ plasm has identified several lines, currently available to U.S. breeders, with 50-100% better biological value than the present commercial hybrids. (See Attachment #A-8-b)</p> |
| <p>(c) IMPROVEMENT OF PROTEIN QUALITY IN MAIZE</p> <p>Project No. 130-524 Time Span: 1971-75 Contractor: Purdue Univ., csd- 2809 - Dr. L.F. Bauman</p> <p>Proj. Mgr.:Dr. C.A. Breitenbach- TA/AG Proj. Spec.:Dr. S.C. Litzenberger- TA/AG</p> | <p><u>Purpose:</u> Improve the protein quantity and quality of high yielding maize varieties.</p> <p><u>Activity:</u> Identifies and evaluates nutritionally superior maize types; and develops and distributes varieties of maize with superior protein characteristics, high yield potential and good commercial qualities.</p> | <p>Research conducted under this activity has revealed where additional sources of more and better protein might be obtained within the plant, and ways to increase the protein quantity and quality. Varieties resulting from these breeding programs will help produce a maize with higher nutritional value. This will lower food costs by providing a more balanced ration in maize when utilized alone and by reducing the need for more expensive high protein supplements. (See Attachment #A-8-c)</p> |

IMPROVEMENT OF NUTRITIONAL QUALITY OF WHEAT - Project No. 130-471
Contractor: University of Nebraska, csd-1208

Wheat farmers in six high plains states are currently confronted with a problem of low protein content in the wheat they produce. In the past, the use of nitrogen fertilizer to maintain the protein content of wheat at an acceptable level has proven uneconomical. Advanced productive high protein experimental varieties developed at Nebraska as a result of the AID-supported project should effectively alleviate the problem. Research information from the project will be highly useful to high plains wheat farmers in developing the most economical and effective combinations of varieties and fertilizers to achieve the most acceptable levels of both yield and protein. The high protein varieties are currently undergoing final tests.

Seventeen thousand wheats maintained in the USDA World Collection have been systematically analyzed for protein and lysine differences. Previously unknown genetic sources of high protein and high lysine have been identified. Most wheat breeders in the United States are now using these newly identified genetic materials in breeding programs. U.S. varieties with much improved nutritional value should result from this work.

An international winter wheat performance nursery was initiated in 1968 by the Nebraska Wheat Team as a part of AID funded research to improve the nutritional value of wheat. A highly productive Russian variety, Bezostaia, already has been identified as having unusually broad world adaptation. It possesses short, very strong straw and large heads and represents exciting new germplasm for U.S. wheat improvement. Numerous breeders in the USA are already using it. It is likely that many future wheat varieties in the United States will have Bezostaia as a parent. Also, the international nursery affords an opportunity for U.S. wheat breeders and

agronomists to observe and evaluate new foreign varieties and experimental lines much sooner than has been possible in the past. This should accelerate wheat improvement progress in this country.

Several new laboratory procedures and techniques for rapidly measuring the nutritional quality of wheat have resulted from the AID supported research at the University of Nebraska. Among these was the identification, at the seedling stage, of wheat cultivars with above normal capacity for converting nitrogen to protein. This means that the plant breeder no longer has to test mature plants for protein fixation and then wait a generation to transfer their genes for improved nutritional value into productive wheat varieties. More important is the discovery of the process which utilizes live plant tissue as a rapid screening method for phytotoxins and surfactants. It explains the specific mechanism involved in the herbicidal process by which the largest majority of weedicides and defoliant achieve their kill. This discovery can be used to develop a rapid screening phytotoxicity test for presently known and newly synthesized or experimental chemicals.

Animal and human feeding trials on high protein wheat varieties will provide much needed information on the true nutritional value of these varieties. Correlation of the results of these feeding trials with in-vitro laboratory analyses will provide breeders with guidelines for the most rapid and efficient identity of superior nutritional value among large numbers of experimental lines of wheat.

IMPROVEMENT OF PROTEIN QUALITY OF SORGHUM - Project No. 130-452

Contractor: Purdue University, csd-1175

The major objective of the Purdue/USAID sorghum project is to identify and distribute sorghum lines in the world sorghum collection which have superior nutritive value in the human diet. Sorghum grain is a major source of protein and carbohydrates in many of the lesser developed countries of the world. A combination of chemical and biological assays are performed on grain samples to make their determination. Data collected on protein quantity, amino acid composition, oil content, carbohydrate digestibility and tannin content of the sorghum lines is available to U. S. sorghum breeders for utilization in their sorghum improvement programs. Several sorghum lines with 50 to 100 percent better biological value than present commercial sorghum hybrids have been identified and are currently available to U. S. sorghum breeders.

The high tannin content of "bird resistant" sorghum hybrids has been shown to substantially reduce the performance of monogastric animals (poultry, swine). Methods of supplementation which will help overcome the tannin effect are being investigated. Techniques have been developed for rapid evaluation of sorghum grain for tannin content.

IMPROVEMENT OF PROTEIN QUALITY OF MAIZE - Project No. 130-524
Contractor: Purdue University, csd-2809

The research supported by this project contributes to the search for new techniques, new materials and improved production of desirable quality food for meeting the increasing world requirements for maize. These endeavors have benefitted the U.S. farmer and producer. It now appears that some opaque-2 materials developed at Purdue have comparable yield levels to that of their normal counterparts and therefore it will be economically feasible for the American farmer to produce maize for feed. Information from feeding trials with cattle suggest that better gains are obtained with opaque-2 corn. Therefore, from the standpoint of feeding value of opaque-2 corn with swine and cattle coupled with the fact that comparable yield levels may be obtained, it is evident that this concerted research effort will have its impact in this country. The opaque-2 kernel types are being modified by genetic modifying factors to produce a much harder endosperm type with a vitreous appearance. These types will not only improve appearance and acceptance of the grain, but most likely improve grain quality for handling and storage in addition to reducing ear rots and insect damage.

Purdue is concerned with developing high quality protein, wide germplasm based temperate maize materials for the more temperate zones of the world in addition to the U.S. These materials decrease the specific vulnerability to disease and insect pests and increase the genetic base from

which further selection progress and improvement in protein quality may be made. Studies are in progress to examine the response of maize types to photoperiod and accumulated heat unit sensitivity. This research may eventually help to more easily integrate more tropic and sub-tropic varieties of maize into the temperate germplasm base and therefore improve the genetic base from which improved materials may be selected. Furthermore, dissemination of improved genetic materials may be obtained with wider adaptation.

Now that the opaque-2 endosperm is being altered by modifying genes to the extent that the high lysine grain cannot be visibly differentiated from normal flint-type endosperm, simple chemical tests for identifying the new opaque-2 kernels must become available if this new type of grain is to move easily in commercial channels. Such test will benefit the U.S. farmer, the grain elevator and the dry and wet miller.

At present the dry millers and wet millers cannot handle the soft kernel type of opaque-2 corn, and are awaiting the development of hard kernel types. Once these have developed, wide acceptance is expected. This will improve the protein quality of the many corn products consumed by the American public such as corn meal, snack foods made from corn, etc., since opaque-2 has twice the protein quality of ordinary corn.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|--|
| <p>(a) AGRONOMIC ECONOMIC RESEARCH ON TROPICAL SOILS</p> <p>Project No. 120-525 Time Span: 1970-75 Contractor: North Carolina State University, csd-2806 Dr. C.B. McCants</p> <p>Proj. Mgr.: Dr. J.L. Malcolm - TA/AG Proj. Spec.: Dr. S.C. Litzenberger - TA/AG</p> | <p><u>Purpose:</u> Develop a system for making fertilizer and crop management recommendations which will yield the best return from the available resources and is adapted to general use in the LDCs.</p> <p><u>Activity:</u> Collects and collates existing soil fertility and yield data in selected areas in Latin America; develops analytical models to express relationships among soil variables, crops and cost price data for inputs and outputs; and selects for wider use the system which yields best recommendations from available data.</p> | <p>The contractor has compiled an extensive bibliography on tropical soils that will serve as a basic reference and source. Increased knowledge of tropical soils and consequently their fertility requirements is useful to the U.S. fertilizer industry in formulation and sales promotion activities.</p> <p>Indications are that many of the practices worked out under the extreme conditions in the tropics will be applicable to the southeastern U.S. or will suggest useful techniques which are intermediate between those currently used in the U.S. and those worked out for the tropics. (See Attachment #A-9-a)</p> |
| <p>(b) SOIL FERTILITY IN HUMID TROPICS</p> <p>Project No. 120-505 Time Span: 1969-74 Contractor: Cornell Univ., csd-2490 - Dr. Matthew Drosdoff</p> <p>Proj. Mgr.: Dr. J.L. Malcolm - TA/AG Proj. Spec.: Dr. T.S. Gill - TA/AG</p> | <p><u>Purpose:</u> Determine factors limiting plant growth on well drained acid tropical soils and devise management systems which permit profitable utilization of these soils.</p> <p><u>Activity:</u> The acid soils from the humid tropics are being studied to determine their chemical, physical and biological reactions to various treatments. From these studies, rates of application of major, secondary, micronutrients and lime are being tested, usually in a range of combinations to determine their interaction with soil, crop and season.</p> | <p>The University of Puerto Rico research facilities were expanded and the concrete field results obtained have had a direct application to Puerto Rican conditions and the improvement of the islands agriculture.</p> <p>Initial results of research on plantain indicate that with proper soil management both the Puerto Rican need and that of the mainland U.S. can be grown in Puerto Rico instead of being imported. The collaborative work on pasture fertilizer on steep slopes indicates good management conserves the soils and good pastures will supply the much needed meat for the island. (See Attachment #A-9-b)</p> |
| <p>(c) TAILORING FERTILIZER FOR RICE</p> <p>Project No. 190-494 Time Span: 1969-73 Contractor: TVA PASA RA(QA)5-69 Dr. D.T. McCune</p> <p>Proj. Mgr.: Dr. J.L. Malcolm - TA/AG Proj. Spec.: W.H. Garman - TA/AG</p> | <p><u>Purpose:</u> Develop fertilizers which will increase production and economic return from land planted to rice.</p> <p><u>Activity:</u> Formulates and tests new compounds and new physical forms of commercial fertilizers for their utility as mineral nutrient sources for rice which are more efficient under certain conditions than those currently available.</p> | <p>New fertilizers and fertilizer forms are being developed that have export potential. One of these is a sulfur coated urea which increases the efficiency of nitrogen fertilizer for rice. Another is the discovery that North Carolina phosphate rock may be used for direct application to rice without chemical processing. Work is in progress on partial processing of phosphate rocks to supply the same amount of available phosphorus at lower cost than from conventional fertilizers. These activated phosphates might be used in large areas of the U.S. as well as being exported. (See Attachment #A-9-c)</p> |

AGRONOMIC ECONOMIC RESEARCH ON TROPICAL SOILS - Project No. 120-525

Contractor: North Carolina State University, csd-2806

The research conducted under this activity has contributed to improving soil science in the U. S. by providing:

1. More breadth and depth in the subject matter involved in the teaching of courses in soil science, particularly in the increased use of illustrative material.

2. By studying drastically different socio-economic environments, some of the current problems in the United States are placed in sharper perspective. For example, the concepts of shifting land use with population pressure are better understood by seeing the changes in low and high population density in shifting cultivation areas in tropical regions.

3. The relatively close morphological similarities between many soils of the tropics and those of southeastern United States has demonstrated that concepts of soil science of this region are more closely related to those of tropical areas than to those of the midwestern United States. This fact will bring about a shift in the frame of references more towards the tropical literature.

4. Experience in tropical soils research has led to proposed changes in the United States Soil Taxonomy System. Such changes will improve the acceptability by other countries of this system as the universal natural soil classification system. Most of the tropical criteria used by the Soil Taxonomy System relate to Hawaii and Puerto Rico, both of which are fairly atypical situations.

5. Soil management concepts recently developed or being developed in the tropics have direct potential for United States agriculture. For example, aluminum-tolerant varieties of corn and wheat have considerable potential for use on acid soils of the southeastern United States. Attention has also been focused on the interaction between plant type and nitrogen response when short-statured, non-lodging varieties of rice and corn are introduced.

6. Analytical studies of tropical soils have resulted in the development of improved techniques for thin-section analysis in soils in the United States.

TAILORING OF FERTILIZERS FOR RICE - Project No. 190-494
Contractor: Tennessee Valley Authority, PASA (QA) 5-69

In addition to adding to the general know-how of fertilizing rice, this project has identified vast areas where improved and new fertilizers have application. The technology and know-how of producing these new fertilizers lie solely in the United States (TVA). For example, the product sulfur-coated urea (SCU) has many advantages over conventional fertilizers. In addition to its controlled-release characteristics, it has the advantages of high nitrogen content, physical stability, resistance to hygroscopicity and caking, and ability, to withstand frequent and rough handling. In effect, it is an excellent product for international trade. As to its potential for export, TVA states:

SCU with modified coating also would have considerable advantage over uncoated materials, especially ammonium nitrate, in the export market. The United States has not been able to capture a very large portion of the world trade in nitrogen materials which in 1971 totaled some 6.6 million metric tons of nitrogen valued at some \$860 million. Should the United States capture 10% of the world trade in nitrogen through its export of SCU, which should be realistic, this would amount to 660,000 metric tons of N (790,000 short tons) or \$86 million based on export price.

Also, this project has identified that there are major differences in the potential of rock phosphates for direct application. It has further identified that U.S. sources from North Carolina and some areas of Florida are among the more reactive sources. The fact that this project has identified vast rice growing areas where rock phosphate is a potentially good source of phosphate fertilizers and that U. S. sources can well meet these requirements opens up a new potential for export.

The work under this project is also opening up new and relatively cheap methods of treating phosphates to make them even more effective than they are in their natural state. Again, the fact that this technology is being developed in the United States (TVA) opens up new opportunities for U.S. industry to adopt this technology and to capture sizable export markets.

In addition to SCU, a potential exists for the development of slow-release complex fertilizers (N-P-K) which will slow eutrophication and thus enhance pollution control due to reduced nitrogen and phosphorus runoff levels. Such technology has worldwide implications.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|---|
| <p>(a) WATER MANAGEMENT RESEARCH - LA</p> <p>Project No. 120-480 Time Span: 1968-78 Contractor: Utah State Univ. csd-2167 - Dr. B. Palmer</p> <p>Proj. Mgr.: James Urano - TA/AG Proj. Spec.: A.A. Bishop - TA/AG</p> | <p><u>Purpose:</u> Improve soil-water management practices and develop a competence to solve water management problems.</p> <p><u>Activity:</u> Develops data on the most efficient means of supplementing soil moisture by limited amounts of irrigation water; develops data that can be used for the on-farm design and construction of inexpensive conveyance, delivery, and drainage systems; and develops management systems to minimize salinity hazards in irrigation waters of different qualities on soils of varying physical and chemical characteristics.</p> | <p>Research findings on irrigation interactions with crop varieties, plant populations and fertilizers; evapotranspiration and water requirements; drainage salinity, water rights and water laws; land and water management techniques have a direct application to present or potential problems in the U.S. The simulation study in Columbia has improved U.S. understanding of its application to hydrologic economic problems and has directly contributed to a computer program used to model the Provo River Basin in Utah which has wide application wherever groundwater modeling is a component. (See attachment #A-10-a)</p> |
| <p>(b) WATER MANAGEMENT RESEARCH, ASIA</p> <p>Project No. 120-489 Time Span: 1968-74 Contractor: Colo. State Univ., csd-2162 - Jim Leo</p> <p>Proj. Mgr.: James Urano - TA/AG Proj. Spec.: A.A. Bishop - TA/AG</p> | <p><u>Purpose:</u> Improve water management practices and integrate these practices with other essential management and cultural practices basic to effective agricultural development.</p> <p><u>Activity:</u> Develops in West Pakistan a research capability to solve water management problems by conducting adaptive research of present knowledge and developing new knowledge to find solutions to on-farm water management problems.</p> | <p>The results of research being conducted under this project in Pakistan are useful in helping to solve current problems of mineral pollution of irrigation supplies in the U.S. where the problem of soil and water salinity is constantly increasing and is becoming more and more a source of concern since each year thousands of acres of productive land could become agriculturally worthless. (See Attachment #A-10-b)</p> |
| <p>(c) CONTROL OF VERTEBRATE PESTS</p> <p>Project No. 190-473 Time Span: 1967-76 Contractor: Bureau of Sport Fisheries and Wildlife, Dept. of Int.; PASA RA(ID) 1-67 - Dr. N. Kverno</p> <p>Proj. Mgr.: C.E. Shuart - TA/AG Proj. Spec.: Dr. N. Konnerup - TA/AG</p> | <p><u>Purpose:</u> Develop pest control methods that are safe, effective, economical and adaptable to the special and economic conditions of LDCs.</p> <p><u>Activity:</u> Measures losses due to vertebrate pests; studies ecology of pests and assesses their habits; tests new candidate pesticides, sterilants, attractants and hormones for control; and conducts training programs and workshops.</p> | <p>The reduction of livestock losses in Latin America due to vertebrate pests will encourage the production of better quality livestock. This will create a demand for improved breeding stock and U.S. exports of these animals may be expected to increase substantially. The development of effective rodent and bird control measures will have direct application to similar conditions in the U.S. and will reduce field and storage losses. (No attachment)</p> |

WATER MANAGEMENT RESEARCH - LA - Project No. 120-1480

Contractor: Utah State University, csd-2167

Research designed to improve the efficiency of interaction experiments with respect to size of field indicates as plot sizes are decreased to some optimum, the range of applicability of the new designs should be determined. These test will be useful in developing designs to increase efficiency in U. S. agriculture.

The Christiansen-Hargreaves method of determining crop water requirements is being proven to be much more realistic and reliable over a wide variety of climatic conditions than existing methods. The impact of this on system design, delivery programs, irrigation methods and other related activities will be very significant not only in the U. S. but world-wide.

New mold plows designed under this project are shaped to make a significant improvement in maintaining the mold drains open and minimizing power requirements.. These have application in the U. S. wherever suitable soils occur.

The salinity leaching studies in Columbia are providing U. S. soil scientists an understanding of how to control the effect of sodium in soils.

Water law designs for Andean Pact countries will provide some solutions to difficult problems such as trade water rights in order to more efficiently distribute water.

The simulation study in Columbia has improved U. S. understanding of its application to hydrologic-economic problems. This directly contributed to the development of the Atlantico-3 computer program used to model the Provo River Basin in Utah. This program will have wide application wherever groundwater modeling is a component.

WATER MANAGEMENT RESEARCH, ASIA - Project No. 120-489
Contractor: Colorado State University, csd-2162

As part of this activity, the Colorado State University has been actively engaged in researching the hydraulics of fresh-salt water aquifers. The primary thrust has been toward developing means by which fresh water can be recovered from thin layers which float on extensive bodies of saline water in Pakistan. This research, while oriented toward the mathematical formulation of the principles which govern the behavior of fresh-salt water aquifers and then toward the engineering application of these developments to Pakistan problems, with the possible exception of specific applications, would be useful in any part of the world where fresh-salt water aquifers are being developed from fresh water supplies.

The problems of developing fresh water supplies from fresh-salt water aquifers are encountered in a great many locations around the world. For example, in the U.S., salt water encroachment in the coastal aquifers is a problem in Connecticut, New York, New Jersey, Florida, Texas and California to name a few localities.

In each area where these problems exist, the hydraulics of the system is an important consideration and the primary constraint in the design of collection facilities such as tubewells. Since CSU research has concerned the description of the fundamental behavior of such aquifer systems in addition to the specific applications, it is certain that much of the research work will be directly useful in a wide variety of situations in the U.S.

Technology assessment and the methodology to accomplish it have become a major concern of public and private authorities in the U. S. The problem is to

devise a methodology for assessment of first, second, and third order impact of technology so as to be able to determine more fully the range of cost and benefits. Technology assessment methodologies are important to improvement of decision making in the U. S. just as in lesser developing nations. Although the social-cultural setting in Pakistan will yield data unique to that setting the methodological tools developed to accomplish technology assessment can be applied to other social-cultural regions including the U. S.

The research involves the application of principles developed largely in the U.S. to new and broader soil-water-climate situations than heretofore studied. As a consequence the research will provide additional supporting data for the verification of the principles which then can be further applied to U. S. agricultural problems. Pakistan is already confronted with a salinity problem in much of the irrigated lands of the Indus Valley. In certain areas of the U.S. the problem of soil and water salinity is constantly increasing and is becoming more and more a source of concern. If the U. S. is unable to halt increasing salinity concentration in these areas of America each year thousands of acres of productive land could eventually become agriculturally worthless. This is the situation which faces Pakistan right now. Consequently, research results in Pakistan are pertinent in helping to solve current problems of mineral pollution of irrigation supplies in the U. S. thus preventing, or at least retarding this type of pollution in the U. S.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(AGRICULTURE)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|--|
| <p>(a) RESEARCH ON HEMOPROTOZOA DISEASES</p> <p>Project No. 130-475 Time Span: 1968-79 Contractor: Texas A&M csd-1947 - Dr. Fred Maurer</p> <p>Proj. Mgr.: C.E. Shuart - TA/AG Proj. Spec.: Dr. N. Konnerup - TA/AG</p> | <p><u>Purpose:</u> Develop an economical, practical and effective immunizing agent against hemoprotozoa and/or develop means for controlling the infectious process before the onset of debility or death.</p> <p><u>Activity:</u> Develops methods for controlling hemoprotozoal disease by immunization and other preventive procedures; determines ecological factors which contribute to the perpetuation of vectors and hemoprotozoal organisms in nature; studies the interaction of pathogenecity and immunity; and studies species resistance to certain specific hemoprotozoal organisms.</p> | <p>The test and treatment approach currently under investigation for the elimination of anaplasma infections in carrier animals may be expected to form a basis for a U.S. eradication program. Control of these diseases will reduce risks in U.S. breeding stock to that area. (See Attachment #A-11-a)</p> |
| <p>(b) TSETSE FLY CONTROL</p> <p>Project No. 130-030 Time Span: 1963-76 Contractor: USDA, PASA RA(AJ) 1-00 - Dr. David Dames,USDA/ARS</p> <p>Proj. Mgr.: C.E. Shuart - TA/AG Proj. Spec.: Dr. N. Konnerup - TA/AG</p> | <p><u>Purpose:</u> Determine the feasibility of control and eradication of the tsetse fly.</p> <p><u>Activity:</u> Conducts research on mass rearing and releasing of sterile male tsetse flies.</p> | <p>This research would be of direct value to the U.S. if tsetse flies become established in the Western Hemisphere. Although currently found only in Africa, fossil tsetse flies have been found in Colorado. They could become re-established if accidentally introduced in favorable habitats in some sections of the U.S. In such an event the availability of effective and economical eradication techniques would be of great value. (No attachment)</p> |
| <p>(c) CATTLE FEEDING SYSTEMS IN THE TROPICS</p> <p>Project No. 130-514 Time Span: 1969-75 Contractor: Univ. of Fla., csd- 2498 - Dr. H. Popenoe/ Dr. J. Conrad</p> <p>Proj. Mgr.: C.E. Shuart - TA/AG Proj. Spec.: C.F. Sierk - TA/AG</p> | <p><u>Purpose:</u> Identify the nutritive value of a wide range of feeds and forages in order to establish a data base for improving animal nutrition through combination ration formulas and through improved range and crop management.</p> <p><u>Activity:</u> Develops source form for composition of feeds, instructions for compilation of data, and prepares a laboratory manual for field analysis.</p> | <p>An analysis of the nutritive value of feeds and forages in different areas of the world will be used by U.S. feed exporters to formulate concentrates that will best supplement locally available grains and forages. Improvement in the LA livestock industry will increase demand for related U.S. exports and increase availability of meat imports. (See Attachment #A-11-c)</p> |

RESEARCH ON HEMOPROTOZOA DISEASES - Project No. 130-475

Contractor: Texas A&M, csd-1947

Anaplasmosis, a hemoprotozoa disease, is a serious problem in the Americas. While the research under the AID/Texas A&M project is directed primarily toward problems of South America, it contains many features directly applicable to U. S. disease problems and those faced by the U. S. livestock industry.

Of greatest interest and benefit to the U. S. is the development of a therapeutic approach which will eliminate anaplasma infections in carrier animals. The test and treatment approach currently under investigation may be expected to form the basis for a U. S. eradication program.

The first published reports on the use of Gloxazone with oxytetracycline and Imidocarb (4 H55) for the elimination of the anaplasma carrier state resulted from AID sponsored studies at Texas A&M. Extensive field trials using Imidocarb for this purpose are currently being conducted by the USDA.

A second aspect of this research is the development of preimmunization techniques to prevent anaplasmosis and babesiosis. These same procedures would be useful and a necessary prerequisite for cattle being exported from the U. S. to any endemic area of South or Central America.

The importance of preimmunization is widely recognized by cattlemen interested in exporting cattle. Death losses as high as 70-80% are common in adult cattle shipped from the U. S. to some infected areas. Even though a keen demand is present for U. S. breeding stock, there is a reluctance among buyers and importers in these countries to buy U. S. cattle. The adequate preimmunization techniques expected to result from this research should overcome this problem and permit increases in U. S. exports.

CATTLE FEEDING SYSTEMS IN THE TROPICS - Project No. 130-514

Contractor: University of Florida, csd-2498

Chemical analyses of feedstuffs are being used to improve the quality of animal feeds produced, processed and manufactured in Latin America. This information serves to make the livestock industry more quality conscious and will increase demand for U. S. produced grains, protein supplements (soybean meal) which are needed to balance the poor amino acid quality of protein sources available in Latin America. As the quality and quantity of livestock diets improve there will be a need to obtain more vitamin, mineral and feed additives from the U. S. to properly balance these diets.

Many U. S. feed companies operate throughout Latin America and in many countries they are the leading producers of manufactured formula feeds. The chemical analyses of feedstuffs and other information gathered under this project is valuable in assisting these U. S. owned companies to formulate better feeds and to make the livestock producer more quality conscious.

As Latin America improves their animal feeding and nutrition programs, there will be increased demand for U. S. produced breeding stock (cattle and swine) to improve the quality of local herds.

U. S. currently does not have information on the effect of ecological life zones and environment (altitude, temperature, humidity, rainfall, light intensity, etc.) on the chemical analyses and nutritional value of feedstuffs produced. This project is being developed to get this kind of information and the system being developed and used in Latin America will serve as a guide for undertaking similar studies in the U. S.

Improvement in the Latin American livestock industry will provide a greater market for U.S. manufactured products used to support livestock production. These include livestock equipment, farm machinery and industrial equipment. Industrial equipment market is expanding for feed manufacturing and processing equipment, meat slaughtering and processing equipment and forage processing and dehydrating equipment.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(HEALTH)

B-1

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|--|
| <p>(a) HEALTH CENTER MANPOWER PLANNING</p> <p>Project No.: 946-11-590 Time Span: 1965-70 Contractor: Johns-Hopkins Univ., Baltimore, Md. Contacts: Dr. A. Reinke, Dr. Alter, Pilot City Health Serv., Cincinnati Health Dept.; Dr. Cunningham, Dept. of Community Med., Mt. Sinai Hosp., NYC</p> | <p><u>Purpose:</u> To develop a methodology for adapting available community resources for improving community health in developing countries.</p> <p><u>Activity:</u> Researchers studied the necessary functions which should be performed by health and family planning units, taking into consideration resources available--especially the optimum balance between highly trained vs. less trained personnel. Using new "functional analysis" methods, better ways of meeting community health needs were developed, and are now being applied in India, Turkey and Taiwan. See "Functional Analysis of Health Needs and Services," 1971, 493 pps.</p> | <p>After introducing the functional analysis approach into its own course work on health planning, Johns-Hopkins presented the method to the Tucson, Arizona, office of the Bureau of Indian Affairs for possible application on Indian reservations. Dr. Alter, a former Johns-Hopkins researcher, has used his India experience in Appalachia, and is now settling up a pilot project using the functional analysis method in Cincinnati. Dr. Cunningham, formerly in Lagos, is in Harlem--supervising another U.S. pilot project. (No attachment)</p> |
| <p>(b) DEVELOPMENT AND EVALUATION OF INTEGRATED DELIVERY SYSTEMS FOR HEALTH, FAMILY PLANNING, AND NUTRITION</p> <p>Project No.: 530-928 Year Project: First phase: June, 1972-February, 1973 Three-year contract: 1972-75 Possible extension: to 1982 Contract: American Public Health Association, Washington, D.C. Contacts: Dr. Malcolm Merrill, AHA</p> | <p><u>Purpose:</u> To make possible the establishment, in up to four countries, of pilot projects designed to develop improved, low-cost systems for delivering health services.</p> <p><u>Activity:</u> Now in the initial reconnaissance phase, the program will include: 1) establishment of a project site service area embodying a population base of up to one-half million; 2) analysis of existing resources and management practices; 3) analysis of feasible alternatives for reallocation of existing resources; and 4) testing and evaluation of a culture-based, simple delivery system.</p> | <p>Learning how to organize and deliver health services for deprived populations will benefit rural areas and urban-ghettos in the United States with problems of health care service. Some of the experience which will be learned in the next several years will be transferrable to programs for deprived peoples in this country. (No attachment)</p> |
| <p>(c) DEVELOPMENT OF A WATER PUMP FOR LDCs</p> <p>Project No.: 521-454 Time Span: 1966-1970 Contractor: Battelle Mem. Inst. Collaborators: UNICEF, CARE Contact: A. Dale Swisher, TA/HEALTH, AID</p> | <p><u>Purpose:</u> To develop and field test a low-cost hand-operated pump--high performance, easily maintained.</p> <p><u>Activity:</u> A pump was developed after field visits to five LDCs. With the help of UNICEF, 140,000 pumps will be produced in Bangladesh, beginning in January 1973. Trial production will take place in Nigeria and Thailand.</p> | <p>Likely candidates for the pumps are: Indian reservations, national and state parks. Discussions with appropriate officials are now underway.</p> <p>Also there are several million small farmers in the U.S. who still depend on wells for water supply. Some of these too represent a potential market. (See attachment #B-1-c)</p> |

DEVELOPMENT OF A WATER PUMP FOR DEVELOPING COUNTRIES - Project No. 521-454
Contractor: Battelle Memorial Institute

AID contracted with Battelle to develop and field test a low-cost, hand-operated pump--capable of long performance under severe conditions, and easily maintained with simple tools and unskilled labor. A well pump with a cylinder that can be used either above or below the level of water being pumped was designed and constructed following field visits to the Philippines, Thailand, Bangladesh, India, and Jordan. A cast iron and plastic pump is going into production in Bangladesh, where 140,000 pumps costing about \$10 equivalent each will be produced beginning in January, 1973, with the help of UNICEF. In Nigeria, a private manufacturer and CARE have purchased materials to produce 285. About 300 pumps per year will be manufactured in Thailand to meet the needs of the Thai Government's Advanced Rural Development Program. Thailand is also planning some initial production for the benefit of the USAID program in Laos.

Indian reservations, and national and state parks, are likely candidates for the pump, after the conclusion of efforts to work out arrangements with U.S. agencies dealing with rural development: i.e. USDA, the National Park Service, and the Bureau of Indian Affairs. Efforts are being made in this area which could conceivably bear fruit during FY 1974. Because U.S. parks have heavy seasonal needs for sturdy, non-breakable pumps, they will be potential customers. Indians would use them because their reservations are generally in remote areas without access to municipal water supplies and sometimes without funds to purchase more expensive pumps. Also, there are several million small farmers in the U.S. who still depend on wells for their water supply. Some of these too represent a potential market for this pump.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

C-1

(NUTRITION)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|--|
| <p>(a) EFFECT OF MALNUTRITION ON MENTAL AND NEUROLOGICAL DEVELOPMENT</p> <p>Year project: 1962 et seq. Contractor: Univ. of Calif. Contacts: Dr. C.O. Chichester, Nutrition Found. of U.S., N.Y.; Dr. Peter Chase, Univ. of Calif.; U.S. Pub. Health Serv.</p> | <p><u>Purpose:</u> To develop a low-cost food supplement to help Chile prevent brain damage and other irreversible damage due to malnutrition among preschool children.</p> <p><u>Activity:</u> Chile is using the food supplement in its AID-assisted preschool milk program, one of the largest preschool milk programs in the world. Under a related research program supported by the Univ. of California, a pediatrician and clinician at the Univ. of Chile has been studying the effects of malnutrition on the mother during pregnancy and the preschool child.</p> | <p>Findings from the Chilean projects have been applied in research and/or feeding programs benefiting U.S. migrant workers, Indian reservations, and other low income groups. Applying the results of the AID research effort in Chile, the U.S. Public Health Service provided grants to five Indian reservations to improve the nutrition of preschool children, and Dr. Peter Chase, of the Univ. of Colorado, initiated a further research project related to malnutrition problems among migrant workers in Colorado. (No attachment)</p> |
| <p>(b) POPULATION SURVEY TO CLASSIFY THE KINDS OF ANEMIA DUE TO IRON DEFICIENCY, FOLIC ACID DEFICIENCY, AND OTHER NUTRITIONAL DEFICIENCIES</p> <p>Year Project: 1965-67 Contract: Inter-Departmental Committee on Nutrition for National Defense (defunct) Collaborators: INCAP (Nutrition Inst. for Cen. Am.-Panama)</p> | <p><u>Purpose:</u> To document the major factors essential in maintaining good hemoglobin levels in preventing anemia.</p> <p><u>Activity:</u> Conducted by INCAP under AID financing, the random population samples in all six countries of Central America enabled the documentation of red blood cell counts on a mass scale for the first time in biomedical anemia due to nutritional deficiencies, the survey teams studied the food, health, and industrial resources that could be, brought to bear on the problem.</p> | <p>From the data collected, standards for determining the normal level of hemoglobin were established for worldwide application in refining the definition of anemia and how to correct it. (See attachment #C-1-b)</p> |
| <p>(c) VITAMIN A ENRICHMENT OF SKIMMED MILK POWDER</p> <p>Year Project: 1965 Contractor: Wash. Univ., St. Louis, Mo. Dr. Robert Shank Collaborators: UNICEF; Inter-Dept. Comm. on Nutri. for Nat'l. Defense (defunct)</p> | <p><u>Purpose:</u> To prove that vitamin A added to skimmed milk powder could be assimilated by children being fed powdered milk.</p> <p><u>Activity:</u> AID supported a study conducted by Dr. Shank in Northeast Brazil to determine if fat were essential to the assimilation of vitamin A in the human body. Prior to this study, it was believed that some fat was needed in the human diet for the proper absorption of vitamin A. The absence of this essential vitamin in the diets of children in the less developed countries is the cause of hundreds of thousands of cases of total blindness. Vitamin A deficiency also causes night blindness.</p> | <p>By proving that vitamin A could be effectively added to skimmed milk powder, the AID-financed study led to vitamin A and D fortification in 1965 of all AID shipments of powdered milk overseas and by the fall of 1965 to the similar fortification of all U.S. powdered milk supplies distributed within the U.S. under the U.S. commodity distribution program (as distinct from the Food Stamp program.) In addition to helping the U.S. milk industry set the guidelines for enriching skimmed milk powder with the two vitamins, AID subsidized the effort for the first year for overseas shipments, as an incentive to the manufacturers. (No attachment)</p> |

POPULATION SURVEY TO CLASSIFY THE KINDS OF ANEMIA DUE TO IRON DEFICIENCY, FOLIC ACID DEFICIENCY, AND OTHER NUTRITIONAL DEFICIENCIES

Evidence uncovered in the Central American survey showed that males as well as females are susceptible to anemia because of iron deficiency, particularly in the teenage years. Between 15 and 20 percent of the people studied also had inadequate tissue levels of folic acid. Together with a U.S. survey, conducted later as a spinoff and carried out in a 10-state area, the Central American study raised all kinds of questions for U.S. researchers about nutritional deficiencies related to anemia among low-income families and indicated some implied practical solutions through food fortification. The imbalance in iron metabolism is a key health problem in the United States, but new ways of attacking it have now been demonstrated. Very little is yet known about the degree to which folic acid is lost during food processing, but the project has suggested future lines of research in this area.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

C-2

(NUTRITION)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|---|
| <p>(a) EFFECTS OF EXTRUSION PROCESSING VARIABLES ON THE NUTRITIONAL QUALITY OF INEXPENSIVE HIGH PROTEIN FOOD MIXTURES</p> <p>Time Span: 1967-72 Contractors: Univ. of Calif. and Univ. of Rhode Island Contacts: Dr. C. Chichester, Nutr. Found., New York & Prof. U. of R.I.; R. Stalvey, Nutr. Found.</p> | <p><u>Purpose:</u> Determine the effects of varying pressure, temperature, and time via extruder processing upon the nutritional quality and acceptability of low cost protein foods.</p> <p><u>Activity:</u> Studies the nutritional quality of mixtures of grains after processed by the extruder method.</p> | <p>These studies indicate that sunflower seed meal and rapeseed meal were two products that could be used as additional low cost protein sources in the U. S. The processes developed eliminate the undesirable and toxic characteristics of these two meals. When the process is perfected, farmers in the northern U. S. may find the demand sufficiently increased that production on a profitable basis will be feasible. (No attachment)</p> |
| <p>(b) IMPROVING THE NUTRITIVE VALUE OF CEREAL-BASED FOODS</p> <p>Time Span: 1967-73 Contractor: Kansas State Univ. Dr. W. J. Hoover Contacts: Dr. Fred Senti - USDA P. Johnson - FFP/OD</p> | <p><u>Purpose:</u> Improve the nutritive quality of wheat-based breads and bread-like products by incorporating the protein flours derived from indigenous plant sources.</p> <p><u>Activity:</u> Finds ways of fortifying bread and other wheat-based products with low-cost protein concentrates derived from legumes or oilseeds without reducing the quality and acceptability of the staple foods. Develops various formulations using soy, chickpea, and broadbean flours.</p> | <p>Studies under this project led to the discovery that the addition of a dough conditioner (sodium-stearoyl-2-lactylate) allows the incorporation of significant levels of protein concentrates derived from legumes or oilseeds in wheat-based products. These products are used in U. S. school lunch programs for the improvement of child nutrition. (No attachment)</p> |
| <p>(c) CLINICAL EVALUATION OF NEW PROTEIN SOURCES FOR THE PREVENTION OF MALNUTRITION</p> <p>Time Span: 1966-76 Contractor: Inst. of Nutritional Research, Lima, Peru Contacts: Dr. G.C. Graham, Johns Hopkins Univ.; D. Rosenfield, USDA</p> | <p><u>Purpose:</u> Determine the relative biological value of new foodstuffs developed from non-traditional protein sources for feeding infants and pre-school children in protein-deficient countries.</p> <p><u>Activity:</u> Develops low-cost high-protein foods from cotton seed, soy beans, peanuts, fish, and mixtures of wheat, corn and soy for use in child feeding in the LDCs. The protein quality of the new foodstuffs compare well with the quality of cow's milk.</p> | <p>The products which prove to be of value nutritionally may be used as supplements in U. S. school lunch programs. Meat supplements, for example, were introduced into the school lunch program last year and have been accepted by many schools. (No attachment)</p> |

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(NUTRITION)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|---|---|
| <p>(a) MARKETING "GOLDEN" (HIGH PROTEIN) AMONG LOW-INCOME CONSUMERS</p> <p>Project No.: Grant Contract csd 2542</p> <p>Time Span: 1969</p> <p>Contract: General Foods Corp.</p> <p>Contacts: M. R. Bandle, TA/ Nutrition, AID; Dr. Maurice Fagan, Gen. Foods Corp., White Plains, N.Y.</p> | <p><u>Purpose:</u> To test the acceptance of high protein, corn-based pasta -- similar to macaroni -- by the malnourished in the developing countries.</p> <p><u>Activity:</u> A macaroni-like food developed by General Foods from corn, soy, and wheat was introduced to protein-deficient groups in Brazil under an AID market feasibility contract. The yellow noodles have a protein content of 21 percent or seven times the nutritional quality of conventional pasta. Golden macaroni is now being produced in Brazil for the school lunch program and U.S. voluntary agencies, as well as retail stores.</p> | <p>General Foods is now selling golden macaroni to many U.S. institutions feeding hundreds of thousands of people--hospitals, children's homes, and prisons. Though golden macaroni is not yet on the retail market in this country, due to definitional problems with the Food and Drug Admin., General Foods has asked its marketing staff to utilize market research for the nutritional factors that would promote sales in the U.S. (No attachment)</p> |
| <p>(b) IMPORTANCE OF ZINC IN GROWTH</p> <p>Project No.: FL 480 Local Currency Project</p> <p>Time Span: 1961-63</p> <p>Contract: Nat'l Inst. of Health</p> <p>Collaborators: Inter-Departmental Committee on Nutrition for National Defense</p> <p>Contacts: Dr. A. Prasad, Wayne Univ., Detroit; Dr. Sanstead, USDA, Grand Forks, N.D.; Dr. Halstead, Albany(N.Y.) Med.Ctr</p> | <p><u>Purpose:</u> To establish that zinc deficiency exists in man and that dwarfism due to zinc deficiency is completely reversible.</p> <p><u>Activity:</u> Forty-four Egyptian dwarfs with zinc deficiencies caused by dietary habits studied. Iron was administered to some of the dwarfs, zinc to others and still others received only a nutritious diet without added minerals. Those treated with zinc (between eight and 10 of the dwarfs) grew from five to six inches taller in one year. Later, in Iran, a similar study was conducted by Dr. J. Halstead.</p> | <p>An immediate result of the pioneer study was the establishment of two U.S. research centers on trace elements. Both are now investigating the special problem of dwarfism due to zinc deficiency in the U.S. Although the problem is considered only "marginal" in this country (not all dwarfism is due to zinc deficiency), several such cases have now been documented and treated. (No attachment)</p> |
| <p>(c) RESEARCH GRANTS FOR MARKETING TEXTURED VEGETABLE PROTEINS (TVP) IN LDC'S</p> <p>Project No.: Two projects</p> <p>Time Span: 1960; 1972-74</p> <p>Contracts: Swift & Co. Archer-Daniels-Midland Gen. Mills (also foreign companies)</p> <p>Contact: M. R. Bandle, TA/Nutrition, AID</p> | <p><u>Purpose:</u> To find ways of marketing textured vegetable protein (TVP) in forms acceptable to low-income families deficient in protein.</p> <p><u>Activity:</u> U.S. companies participating in this program are making instant foods (water soluble, in most cases) from a variety of local vegetable protein sources. From soy, corn, wheat, mung beans, and sunflower seeds, for example, a variety of instant foods are being market-tested in Thailand, India, and Brazil. In a separate project, AID is providing a series of grants (up to \$30,000 each) to market test various types of low cost, nutritious foods.</p> | <p>The market feasibility studies financed by AID have generated a worldwide interchange of information on textured vegetable proteins. The USDA is using a number of these products in the school lunch program benefiting underprivileged American children. Some of the companies listed above are selling similar products on the U.S. commercial market. If and when the knowledge gained overseas is applied to "infant" formulas in the U.S., TVP could become a big seller in this segment of the U.S. market. The primary source of textured vegetable protein in the U.S. is the soybean. (No attachment)</p> |

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(NUTRITION)

C-4

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|--|
| <p>(a) IMPROVEMENT OF METABOLISM BY CHROMIUM IN MALNOURISHED INFANTS</p> <p>Project No. PL 480 Local Currency Time Span: 1965-66 Contractor: Interdepartmental Committee on Nutrition for Nat'l. Defence - Dr. L. Hopkins, ARS/USDA; Dr. W. Mertz, ARS/USDA; Dr. A.E. Shaeffer, Pan Am Health Org.</p> | <p><u>Purpose:</u> To find out if there is a chromium deficiency in children with kwashiorkor (extreme protein malnutrition) in Jordan and Nigeria.</p> <p><u>Activity:</u> Dr. Hopkins (USDA) discovered and treated a marked impairment due to chromium deficiency in refugees from the Jerusalem area. Water supplies near Jerusalem area were found to be deficient in chromium. This was the first such study in the world showing chromium deficiency in humans. Another similar study was done later in Nigeria.</p> | <p>As a result of these studies, Dr. Mertz is testing diabetic patients in the U.S. to see if some might be helped with chromium. Hypoglycemia (impaired glucose tolerance) is part of diabetes. Under a VA contract, Dr. Mertz is looking at the possibility that chromium supplementation will prevent certain minor forms of diabetes. The work overseas provided impetus to the research with diabetes by indicating that there may be a "marginal" deficiency of chromium in the U.S. population. (No attachment)</p> |
| <p>(b). COTTON SEED MEAL AS A HUMAN PROTEIN RESOURCE</p> <p>Project No. Time Span: 1968 Contractor: Dorr-Oliver Co., Stamford, Conn. Collaborators: ARS/USDA/Southern Regional Lab. Dr. Fred Senti, USDA/Washington; M.R. Bandle, TA/N</p> | <p><u>Purpose:</u> To find an inexpensive way to remove the toxins (gossypol, a toxic saccharide) from cotton seed meal, so that it can be used as a nutritious, inexpensive food resource.</p> <p><u>Activity:</u> Up to now, procedures for removing the toxic saccharide have been very costly. With a \$60,000 grant to Dorr-Oliver, which manufactures food separation equipment, the firm established a pilot plant in India capable of producing three tons of high protein, gossypol-free cotton seed meal daily. The plant is testing various inexpensive processes for removing gossypol from cotton seed.</p> | <p>On a full-scale commercial basis, the same process will shortly be used by the Plains Cotton Coop Oil Mill Co., of Texas. The U.S. production, as it develops, will make cotton seed more available as a cheap source of protein for human and animal consumption in the U.S. and abroad. In this country, cotton seed approaches soy as an abundant source of concentrated protein. (No attachment)</p> |
| <p>(c) COCONUT PROTEIN PRODUCTS FOR USE IN FOODS</p> <p>Project No. Time Span: 1970-72 Contractor: Texas A & M Univ. Dr. Karl F. Mattil</p> | <p><u>Purpose:</u> Develop an inexpensive process for preparing food-grade coconut protein for use in blended foods.</p> <p><u>Activity:</u> Develops new processes for preparing protein concentrates from fresh coconuts.</p> | <p>The aqueous process developed under this project on a pilot basis makes coconut protein available for protein fortification of other foods. Applied to other oilseeds and legumes such as peanuts, the aqueous extraction process may provide a more desirable method of producing low cost proteins for public feeding programs and commercial food products in the U.S. (No attachment)</p> |

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(POPULATION AND FAMILY PLANNING)

D-1

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|---|
| <p>(a) DEVELOPMENT OF A DUAL FUNCTION, PROPHYLAXIS-CONTRACEPTIVE AGENT</p> <p>Project No.: 570-526 Time Span: 1970-1975 Contractor: Univ. of Pittsburgh</p> | <p><u>Purpose:</u> To develop an intravaginal agent for pre-coital use with the dual properties of contraception against unwanted pregnancy and prophylaxis against venereal disease.</p> <p><u>Activity:</u> Approximately 40 candidate products have been lab tested in preparation for field trials. Procedures have been established for selecting field trial candidates. Field trial design has been established and arrangements made for carrying out field trials with county authorities in the U.S.</p> | <p>The incidence of venereal diseases has increased sharply in the U.S. in the last few years despite the fact that the diseases can be treated effectively. An effective intravaginal contraceptive that is bacteriacidal as well as spermicidal may make it possible to effect a significant reduction in the prevalence of venereal diseases, by reducing the number of situations in which they are transmitted before they are detected and the number of situations in which they are transmitted because of neglect. (No attachment)</p> |
| <p>(b) DEVELOPMENT OF RELEASING FACTOR INHIBITOR AS CONTRACEPTIVE AGENTS</p> <p>Project No.: 931-17-570-518 Time Span: 1970-1975 Contractors: Salk Inst., and Univ. of Calif. at San Diego</p> | <p><u>Purpose:</u> To develop an orally-active, once-a-month contraceptive which acts by inhibiting the "luteinizing hormone releasing factor" (LRF) and hence ovulation, thereby preventing conception.</p> <p><u>Activity:</u> Establishment and implementation of method for synthesizing "luteinizing hormone releasing factor" (LRF) has been completed. Synthesis of derivatives of LRF for purposes of identifying analogues to LRF with anti-LRF activity has been accomplished. Background studies have been initiated for field efficacy trials.</p> | <p>The approach being investigated in this project may reduce serious side effects that sometimes (though rarely) occur with the approach currently in use. Additionally, there is a possibility that the research on this project may produce a means for achieving ovulation regularity making it possible for many to avoid the use of chemical and mechanical means that may conflict with religious or other views. (See attachment #D-1-b)</p> |
| <p>(c) INTRAUTERINE DEVICE (IUD) DEVELOPMENT</p> <p>Project No.: 570-527 Time Span: 1970-1975 Contractor: Battelle Mem. Inst.</p> | <p><u>Purpose:</u> To refine and clinically evaluate new and improved IUD's which overcome deficiencies and side effects of present devices.</p> <p><u>Activity:</u> A theoretical model was constructed and idealized IUDs designed. Measurement techniques incorporating ultrasonic imaging and uterine metrology were developed. Initial prototype IUDs have been designed and locations for initial trials identified.</p> | <p>IUDs are a relatively low cost contraceptive means. They are currently used by about 2,000,000 women in the U.S. Some side effects can accompany the use of IUDs which, though not serious, are annoying and lower acceptance. Success in this program may make available a more acceptable, low cost means of contraception that could benefit increasing numbers of people in the U.S. Successful models could be clinically tested and ready for production by the end of 1973. (No attachment)</p> |

Development of Releasing Factor Inhibitors as Releasing Agent

Project No. 931-17-580-518

U.S. Application

Contraceptive pills currently in use, steroidal in nature, are not totally free of side effects that can be undesirable. While not perfect, the pills represent a significant advance in terms of acceptability and effectiveness over contraceptive means hitherto available. Nevertheless, they have not been universally accepted, and research is underway to develop an approach that will meet such objections as exist to pills now available.

The approach being investigated in this project is non-steroidal, more pin-point, less broad in its method. There is good basis for expecting that side effects stemming from this approach would be fewer than those stemming from the approach currently in use. Side effects from the current approach are low but any diminution would be welcome and applicable in the U.S. as well as elsewhere. Additionally, it is possible that this investigation may result in the devising of non-contraceptive means for regulating the periodicity of ovulation. Such a development would be welcomed by those whose religious and other convictions restrain them from using mechanical or chemical contraceptive means.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(POPULATION)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|--|
| <p>(a) LABORATORIES FOR POPULATION STUDIES</p> <p>Project No. 570-861 Time Span: 1970-77 Contractor: Univ. of North Carolina</p> | <p><u>Purpose:</u> To develop in various areas of the world institutional capabilities and resources for improved demographic statistics gathering and analyses in order to enhance reliability of population data and their use in policy formation and socio-economic planning.</p> <p><u>Activity:</u> Population laboratories established in four developing countries. Methodological approaches for vital events surveillance being tested through dual report system and other methods for measuring population change.</p> | <p>The course of fertility in the U.S. is dramatically downward. However, our vital statistics system gives us little information about why the fertility trend is down. Good information, expeditiously secured, is important. Small changes in fertility have large subsequent effects on population size. As interest and concern about population size continues to develop, the need for better systems will become stronger. The methodologies developed in this project, carried out for LDCs whose interest in these matters antedates ours, will then stand us in good stead in developing our own new systems. (See attachment #D-2-a)</p> |
| <p>(b) PROSTAGLANDINS & OTHER CONTRACEPTIVE DEVELOPMENT RESEARCH</p> <p>Project No. 931-17-580-520 Time Span: 1970-73 Contractor: Worcester Foundation</p> | <p><u>Purpose:</u> Some major attributes of an "ideal" contraceptive would be that it would be administered once-a-month, that it would be self-administered, and that it would be post-coitally as well as pre-coitally effective. The purpose of the research is to determine whether prostaglandins (PGs) might be developed as a contraceptive agent that would incorporate some or all of the above-mentioned "ideal" attributes.</p> <p><u>Activity:</u> Supplies of PGs for experimentation developed. Central analytical lab established. Experimentation with PGs on rodents underway. Work with eight subcontractors underway.</p> | <p>Currently available family planning techniques are not perfect in terms of convenience, freedom from side effects and expense. Advances along these lines that are developed in response to requests received from outside of the U.S. will be of benefit to many persons in the U.S. who are looking for improved family planning techniques. (No attachment)</p> |
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Laboratories For Population Studies - Project # 570-861

In the U.S., government does not have a population growth policy with a quantitatively specific desirable growth rate, and there is no immediately apparent reason that it should at this point in time. However, a survey conducted by the Opinion Research Corporation in 1971 found that two-thirds of those interviewed felt that the growth of the U.S. population is a serious matter; and half or more expressed concern over the impact of population growth on natural resources and pollution.

The trends that are now taking place in the U.S. are fairly comforting. The birth rate has dropped from 25 (per 1000 of population per year) in the 1950s to 17, and the drop has been more rapid in the last several years than it was during the overall period. A birth rate of 17 corresponds roughly (given the population age structure and the conditions of mortality in the U.S.) to an average family size that includes 2.3 children. Allowing for modest improvement in mortality conditions and assuming no significant changes in U.S. immigration and emigration patterns, an average family size that would include slightly more than 2 children would stabilize the size of the population. We are thus not far removed from that condition now and declining birth rates are carrying us closer to it at a rather rapid rate. (Population growth in the U.S. would not cease immediately upon achievement of the "2 child family" situation, population in the U.S. would ultimately reach 300 million before it stabilized.)

Despite the current favorable course of events in the U.S., fertility trends have reversed themselves in the past, and so demographers and planners would like to know more about what is currently going on so that they will have answers - to a greater

extent - to the "why" questions. The current decline in fertility is almost unprecedentedly steep. If more were known about who is having children and who is not, from what socio-economic and age groups and from marriages of what age, the experts would have far better understanding and thus could provide more accurate predictions of what to expect. It might then be far easier to identify the conditions under which fertility conditions in the U.S. are apt to reverse themselves and the likelihood (if any) of such reversals. Such information is highly important, for future population size is a matter that is highly sensitive to rather slight changes in current birth rates - compound interest factors create a powerful, multiplier effect.

The question of future population growth has been a matter of concern to some LDCs for some time. AID has been assisting in finding ways to determine what is happening to their fertility rates, and why. Should interest in the U.S. in the future of U.S. population growth continue to increase, it will be necessary to devise ways to get "what" and "why" information quickly, easily and cheaply. Our current, vital statistical systems--set up originally to accomplish other objectives--are somewhat slow and costly when they are required to produce information of this type, and some of the information - especially of the "why" type - they cannot produce at all. The work being carried out under the population laboratories project will be of great help in devising quick and inexpensive ways of getting expanded information about fertility changes in the U.S.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

(Science and Technology)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|---|
| <p>(a) MOSQUITO GENETIC CONTROL AND TSETSE FLY CONTROL Projects # 995-535 and 995-983 Time Span: 1971-1978 Contractors: University of Notre Dame and others. Contact: Bill Long - TA/OST</p> | <p><u>Purpose:</u> Carry out field and other studies to determine the feasibility of eradicating mosquitoes and other insects by non-chemical--e.g., sterilization and other--means.</p> <p><u>Activity:</u> Administrative arrangements and necessary linkages established with the international center for this work in Nairobi, also with WHO and national research activities in East Africa. Investigation site selected, investigation underway.</p> | <p>Reductions in insecticide usage in the world have potential worldwide ecological benefits in that they tend to reduce pollution levels in neighboring oceans and the incidence of fish poisoning. In addition, it is possible that the developing methodology may significantly lower the cost of insect control in the U.S. (See attachment #E-1-a)</p> |
| <p>(b) SUBSTITUTE ENGINEERING MATERIALS AS A FOREIGN EXCHANGE SAVER Project No: None assigned yet. Contractor: MIT, Cambridge, Mass. Dr. Peter Griffith Proj. Mgr.: H. Arnold - TA/OST</p> | <p><u>Purpose:</u> Produce a basis for reducing LDC foreign exchange requirement through establishment of effective indigenous materials to substitute for materials (e.g. steel, polymers) that would otherwise be imported.</p> <p><u>Activity:</u> Initial investigation, now funded under a Sec. 211(d) grant, involves definition of technological opportunities and design of high payoff research program.</p> | <p>Programs of this type have the potential of identifying U.S. materials that will prove to be lower in cost than other U.S. materials currently being used. Such discoveries benefit U.S. foreign and domestic trade. The substitution of cast concrete for cast iron in many types of plant equipment--an example of investigations currently being carried out--has a large, potential U.S. application. (See attachment #E-1-b)</p> |
| <p>(c) OCEANOGRAPHY TRAINING - ACQUISITION AND USE OF DATA Project No: 931-11-995-897 Contractor: National Oceanic and Atmospheric Admin., U.S. Dept. of Commerce (In conjunction with the UNESCO International Oceanographic Comm.) Contact: W.H. Littlewood - TA/OST</p> | <p><u>Purpose:</u> To provide the initial impetus for increasing the capability of developing countries in oceanographic activities and potentials affecting their economic welfare.</p> <p><u>Activity:</u> A series of three six-months training programs have been developed in the U.S. at Woods Hole and at the National Oceanographic Data Center in Washington on acquiring, processing and effectively using information about ocean resources near the LDC coasts.</p> | <p>The economic importance of good worldwide oceanographic data is widely recognized. The U.S. is a major consumer of oceanographic data. Expansion and improvement of such data will particularly benefit U.S. programs. Other countries participating in the training exercise of this project are establishing their data collection and analysis systems either in the U.S. image or in ways which are compatible with the U.S. system. It is generally concluded that this will reduce the cost of U.S. development and management of its world wide oceanographic data materials. (See attachment #E-1-c)</p> |

MOSQUITO GENETIC CONTROL AND TSETSE FLY CONTROL - Projects Nos. 995-535 and 995-983

Contractors: University of Notre Dame and others

The methodology of insect control by sterilization--as contrasted with the use of chemical insecticides, is in the early research and application stage. (One past, non-AID, example of successful application was by elimination of the grub of a tropical fly that had been fatally attacking calves in the important Florida cattle industry.)

Based upon such past successes, there is good reason to believe that these long-range AID research projects will also be successful. Such success would have two benefits to the U.S.:

a. A significant reduction in the use of insecticides anywhere in the world will have ecological benefits, by tending (a) to reduce the level of pollution of our neighboring oceans, and (b) to reduce the incidence of fish poisoning.

b. Improved methodology in application of these new types of control systems may lead to economic savings--to the extent that the cost of control methods by sterilization become less than the cost of control by insecticide production, distribution and use.

SUBSTITUTE ENGINEERING MATERIALS AS FOREIGN EXCHANGE SAVERS

Contractor: Massachusetts Institute of Technology

The purpose of this project is to attempt to identify materials that are indigenous to developing countries that can be used as substitutes in engineering application for materials that a developing country would otherwise have to import. The possible substitution of concrete for cast iron would be a case in point. Sewerage, water supply and other activities involving the transportation of liquids frequently call for the extensive use of cast iron pipe. For many developing countries that have no iron and steel industry, the implementation of such projects requires the importation of the cast iron pipe. A research and development program may show that cast concrete can be used as a substitute for cast iron in many cases. This would be of benefit to developing countries for whom concrete is an indigenous product and cast iron pipe a product they would have to import, for the substitution of concrete for cast iron would enable such countries to conserve their (usually) scarce supplies of foreign exchange through the use of indigenous products instead of imported products.

Such research and development activities sometimes turn out to be of benefit to the U.S. Once again, the substitution of concrete for cast iron may be a case in point. In the U.S., cast iron is currently used as the material for the shell of a heat exchanger. The continuous expansion of the U. S.

economy and the advance of manufacturing processes has created demands for ever larger heat exchangers. The size of heat exchangers now in demand for many applications has gotten to the point where the substitution of concrete for cast iron as the material used for the heat exchanger shell would be economically very attractive if it could be made technically feasible. The research for substitute materials for developing countries may produce the technology that would make it possible to substitute lower cost concrete for higher cost cast iron in the manufacture of heat exchangers in the U.S. (especially large heat exchangers). The U. S. would benefit from the resulting increased productivity of its economy.

There are many additional places when the substitution of cast concrete for cast iron would be economically very beneficial to the U.S. if it can be made technically feasible. Some examples involve the substitution of cast concrete for cast iron in the manufacture of large condensers used in the generation of electric power, and in the substitution of cast concrete for cast iron in the manufacture of beds for large machine tools. The use of concrete as a replacement for cast iron in some of the parts of large pumps may represent another possibility.

OCEANOGRAPHY TRAINING - ACQUISITION AND USE OF DATA - Project No. 931-11-995-897

Contractor: National Oceanic and Atmospheric Administration, U. S. Dept. of Commerce

The economic importance of good world wide oceanographic data--as a world resource--is recognized in the U.S. Government and the U.S. is the leader in systems development and technology in the field. It has also been a leader, in conjunction with the UN, in encouraging the utilization of this data. Exchange of international data is an international exercise for international benefit. As the U.S. is a major consumer of the data, expansion and improvement of it will particularly benefit U.S. programs.

Other countries participating in the training exercise are establishing their data collection and analysis systems either in the U.S. image or in ways which are compatible with the U.S. system. It is generally concluded that this will reduce the cost of U.S. development and management of its world wide oceanographic data materials, as the U.S. will be a collateral, secondary beneficiary thereof.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(SCIENCE AND TECHNOLOGY)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|---|---|
| <p>(a) USE OF COMPUTERS IN ECONOMIC PLANNING</p> <p>Project No. 995-970 Time Span: 1972-73 Contractor: U. S. Dept. of Commerce</p> | <p><u>Purpose:</u> To determine the value of an extended AID capability to (1) assess problems and opportunities related to the effective implementation and use of computers in developing countries, and (2) respond to requests for assistance by LDCs regarding computer investment and applications.</p> <p><u>Activity:</u> Project has been activated, a Department of Commerce expert has been assigned, a survey of computer technology situation in LDCs is underway.</p> | <p>Computers are not extensively used around the world in economic development and other planning work. The state of the technical art of planning is considerably ahead of the level of application by practitioners. A major purpose of the project is to correct this deficiency, and to develop efficient use of computers as a planning tool. The U.S. has a strong comparative advantage in computer hardware and software. The success of this project may be of mutual benefit to the U.S. and LDCs, for the expansion of the use of computers will be supportive of demand in an area in which the U.S. is an important participant. (No attachment)</p> |
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APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

SECTION 211(d)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|---|--|
| <p>(a) SECTION 211(d) GRANTS to U.S. Universities</p> <p>(See attached sheet for list of U.S. universities receiving 211(d) grants)</p> | <p><u>Purpose:</u> Assist "research and educational institutions in the United States for the purpose of strengthening their capacity to develop and carry out programs concerned with the economic and social development of less developed countries." <u>Activity:</u> The Section 211(d) authority was implemented through a series of five year grants to establish centers of competence in specific subject areas. The purpose was not to build a center from scratch but rather to take advantage of the commitment of existing institutions and their permanent sources of funding in order to build into these U.S. centers more permanence, and competence, on international development problems.</p> | <p>The programs selected to serve as a basis for these grants build into these centers a degree of permanence and, while developing competence on international development problems, they have given the institutions' program an international dimension. In some cases, departments of international studies have been formed. In all cases, faculties have been strengthened, teaching and research programs have been given new and broader dimensions, and libraries expanded. These among other developments enrich the U.S. universities and furnish students and professionals unique information resources and consulting services. (Three specific examples are reported separately.) (See attachment #F-1-a)</p> |
| <p>(b) LAND TENURE AND RELATED INSTITUTIONAL DEVELOPMENT (211d)</p> <p>Grantee: Univ. of Wisc., csd-2263 - Dr. W. Thiesenhusen</p> <p>Liaison Officer: Dr. F.L. Mann - TA/AG</p> | <p><u>Purpose:</u> Strengthen the competency of the Univ. of Wisconsin Land Tenure Center for a world-wide program of technical assistance, research and training in land tenure, agrarian reform, and related institutional change in the less developed nations.</p> <p><u>Activity:</u> Provide additional key staff members to engage in original research, integrate findings of previous research, improve teaching and develop new curricula, provide support for graduate students and library acquisitions.</p> | <p>Over the course of this project the Wisconsin staff, largely of the human and social sciences of the university, which is foremost world-wide, has been involved. The Land Tenure center at Wisconsin has assembled the largest body of data to be found on land problems and tenure, particularly on Latin America. These materials, the enrichment of the staff on cultural, sociological, and tenure problems, and the experiences gained from the in-field research have been utilized in graduate and undergraduate training at Wisconsin. (See attachment #F-1-b)</p> |
| <p>(c) SCIENCE OF TROPICAL SOILS</p> <p>Grantees: Cornell Univ., csd- 2834 Univ. of Hawaii, csd- 2833 N.C. State Univ., csd- 2855 Prairie View A&M College csd-2336 Univ. of Puerto Rico csd-3857</p> <p>Liaison Officer: A. Ayers - TA/AG</p> | <p><u>Purpose:</u> Enhance the competencies of the recipient universities for teaching, research, and service in the subject matter of tropical soils.</p> <p><u>Activity:</u> The five institutions have joined in a cooperative program to strengthen and coordinate their competencies and resources in soil science for teaching, research, technical assistance, and consultation for increasing food and fiber production on soils of the tropics.</p> | <p>The grantee institutions have introduced new courses, developed new teaching techniques, increased the number of staff members, exchange professors and scientists, sponsored work-shops, initiated programs of library acquisitions, and expanded their research programs. The institutions' programs have been given an international dimension which has enlarged the perspectives of the faculty and students. (See attachment #F-1-c)</p> |

U. S. Universities Receiving Section 211(d) Grants,
with Fields of Technical Concentration

International Agricultural Economics Panel

Cornell University(1970)
Iowa State University(1970)
Michigan State University(1970)
University of Minnesota(1970)
Southern University(1972)
Virginia State College(1972)

Council of U. S. Universities for Rural
Development in India

University of Illinois(1968)
Kansas State University(1968)
University of Missouri(1968)
Ohio State University(1968)
Pennsylvania State University(1968)
University of Tennessee(1968)

Council of U. S. Universities for Soil and Water
Development in Arid and Sub-Humid Areas

University of Arizona(1969)
Colorado State University(1969)
Utah State University(1969)

Tropical Soils Science Group

Cornell University(1970)
University of Hawaii(1970)
North Carolina State University(1970)
Prairie View A & M College(1970)
University of Puerto Rico(1970)

Aquaculture and Marine Resources

Auburn University(1970)
University of Rhode Island(1969)

Land Tenure Center

University of Wisconsin(1969)

Health and Population Planning

The Johns Hopkins University(1968)
University of Michigan(1968)
University of North Carolina(1967)

Law, Development and Modernization

Stanford University(1971)
Yale University(1969)

Comparative Legislative Studies

Duke University(1971)
University of Hawaii(1971)
University of Iowa(1971)

Separate Grants in Economic, Social,
and Political Development and Modernization

Tufts University(1968, supplement 1970)
University of Michigan(1969)
Southern Illinois University(1969)
Midwest Universities Consortium for
International Activities, Inc.(1971)

Educational Development

University of California at Los Angeles(1970)
Florida State University(1971)

Science and Technology

Cornell University(1971)
Massachusetts Institute of Technology(1971)

LAND TENURE & RELATED INSTITUTIONAL DEVELOPMENT - (211-d)

Grantee: University of Wisconsin, csd-2263

The Land Tenure Center at the University of Wisconsin works on the hypothesis that in many less developed countries investment in agriculture will significantly increase rural employment and improve income distribution only if preceded or accompanied by basic structural reforms in institutions governing the organization, use and allocation of land. In conducting research and training on this type of rural institutional change and its consequences, efforts have been concentrated on Latin America but recently extended to Asia and Africa.

This grant has greatly assisted the University to develop a center of excellence in land tenure and related problems by supporting additional key professional staff appointments in various departments to give the research a multidisciplinary approach. It has enabled the Center to expand its instructional program with the addition of new courses and through the establishment of a Ph.D. in Development degree program. Special seminars are conducted and staff members and graduate students are afforded unique research opportunities.

The Center has acquired one of the nation's most complete libraries of materials relating to international agricultural development, agrarian reform, and the social, economic and political changes associated with rural development - over 20,000 titles. It also provides answering and consulting services.

Much of the data accumulated and the studies conducted have application to some areas and conditions in the U. S. However, to date, efforts have not been made to apply the results of this research to the U. S. situation.

SCIENCE OF TROPICAL SOILS - (211-d)

Each of the five cooperating institutions will utilize grant funds to concentrate efforts in emphasizing the following interrelated fields: Cornell University - Cultural Systems; University of Hawaii - Biology and Mineralogy; North Carolina State University - Soil fertility relating plant nutrition to the physical and chemical properties of soils; Prairie View A & M College - Soil fertility problems under savanna - prairie ecology; University of Puerto Rico - Conservation and protection.

Eight new courses on tropical soils have been initiated and five and one-half full-time professorial staff equivalents have been added to staffs of the five member institutions. Ten graduate assistants, two post-doctoral fellows, and one technician have been supported by 211(d) funds. One long-term and eleven short-term visiting professors and scientists have consulted and lectured at the institutions during 1970-71. By the end of the 1971-72 operational year, the cumulative numbers of new and revised courses and new participating personnel are expected to be: Fifteen new courses, twelve revised courses, eight full-time professorial staff equivalents, two post-doctoral fellows, twenty graduate assistants, three long-term and twenty-five short-term visiting professors and scientists, and one exchange professor. A "Work Shop on Teaching Basic Soils" with particular reference to the tropics was held for teachers of the Consortium institutions. These actions have affected instruction not only through the initiation of new courses and new teaching

techniques, but also through enlarged perspective of the teachers of established courses. These trends are expected to continue.

Funds of the 211(d) grants have been used to stimulate participation of staff and graduate students in research projects supported mainly by other funds. For the two institutions located in the tropics, 211(d) funds have been used to augment resources for their continuing research programs. North Carolina State University and Cornell have supported activities that contribute to their related programs under AID research contracts. At Prairie View A & M College, 211(d) funding has stimulated establishment of four research projects. At the University of Puerto Rico, additions of new staff have released other staff from teaching, permitting all staff to participate in research. These accomplishments are expected to be expanded.

Seven staff members of the Consortium have participated in one or more major consulting and service assignments as well as in many activities with foreign visitors and other scientists from the tropics. At least eight service and consulting assignments are projected for 1971-1972. Activities of the program have stimulated major inputs into the program by staff supported by other funds.

All of the cooperative institutions have developed programs of acquisitions to improve library resources for tropical soils.

Grantees: Cornell University - Dr. M. Kline
 University of Hawaii - Dr. Wallace G. Sanford
 North Carolina State University - Dr. C. B. McCants
 Prairie View A & M College - Dr. J. I. Kirkwood
 University of Puerto Rico - Dr. Salvador Alemany (Dean)

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

SECTION 211(d)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|---|
| <p>(a) UTILIZATION OF WATER RESOURCES FOR AGRICULTURE - (211d)</p> <p>Grantees: Univ. of Arizona, csd-2457 Colo. State Univ. csd-2460 Utah State Univ. csd-2459</p> <p>Liaison Officer: A. Ayres - TA/AG</p> | <p><u>Purpose:</u> Increase competencies of the participating U.S. Universities in applying water management principles and techniques to food production needs in arid and sub-humid areas.</p> <p><u>Activity:</u> The joint program emphasizes water management for agriculture and water use optimization, drainage, irrigation structures and practices, hydrologic systems analysis, as well as related social, economic and institutional factors governing technological introduction and use.</p> | <p>These grants have had a multiplier effect in stimulating the commitment of other resources to the program, in increased efficiency through pooling multi-university resources, and in capturing the interest of faculty, students and constituents in the extension of technical services. Related research programs, new courses, language training, library acquisitions and area studies and collections have reached a new high level because of AID interest and support through the Section 211(d) program.</p> <p>(See Attachment #F-2-a)</p> |
| | | |
| | | |

UTILIZATION OF WATER RESOURCES FOR AGRICULTURE - (211-d)

Each of the three cooperating institutions, in developing programs to improve their facilities and competence in the soil and water field as it relates to arid and sub-humid areas will emphasize a special area of competency in coordination with others: Arizona - watershed management with emphasis on systems analysis of water-related problems in LA and Asia; Colorado State - Water delivery and removal systems and related institutional development, worldwide, but especially Pakistan; Utah State - On farm water management for increasing food production, LA.

Increased teaching competence is shared by 17 departments in the three grantee universities. The teaching programs have been strengthened; eight new courses have been added; and eight new staff members of high distinction and competence have been added in part with 211(d) funding. Material progress has been made in increasing both the depth and utility of library collection partially with grant funds. Three technical reports have been issued and the preparation of many additional reports, textbooks, circulars, manuals and monographs are now underway. Thirty-two graduate

students were supported with grant funds. The competence of member universities in language fields has also advanced, and consideration is being given to offering several basic water development and management courses in at least two languages at Utah State. All member universities are prepared to counsel students from the developing countries in many of their own tongues, as the need arises.

New staff members are heavily engaged in research. Research programs in which 211(d) staff and students are participating include: water use optimization, drainage, irrigation structures, hydrological systems analysis, sociology, political science and public administration.

The consulting capability has been increased largely through direct consulting assignments and trips undertaken for other purposes.

Inter-university programs on publications, seminars, and student faculty interchange are being actively developed by the Council.

Grantees: University of Arizona - Dr. D. B. Thorud
Colorado State Univ. - Dr. Maurice Albertson
Utah State Univ. - Dr. H. B. Peterson

BENEFITS TO THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES

General Statement on
Geological and Minerals Development Projects of AID
on Conjunction with the U. S. Geological Survey

The United States currently imports about a third of its mineral requirements from other countries and it is likely that import requirements will rise to two-thirds or more within the next thirty years. Faced with increasingly stiff competition from other developed countries for supplies of minerals, the United States must have accurate information about foreign minerals resources and contacts in other countries that can help facilitate access to these resources. AID's exploratory technical assistance projects for the LDCs, with USGS participation, have provided large amounts of information about actual or potential sources of minerals in other countries, and also have helped to develop contacts and institutional linkages with other countries that will facilitate access to these sources of supply as they are developed by the LDCs.

Under the National Minerals Policy Act passed in 1971, the Secretary of Interior has been charged with the responsibility of keeping the Congress and the President informed on the United States position in the mineral field. This can be done only if the Department of Interior has adequate knowledge of world resources and resource potential as a "base line". Technical assistance projects sponsored by AID give U.S. mineral specialists the opportunity to collect and evaluate data on minerals in other countries--in other words the projects help to establish the "base line". Data so collected

also provides some measure of availability of supplies in other countries, some estimate of future competition for foreign sources of raw materials that may affect the domestic supply situation. Thus, almost without exception, AID-sponsored assistance projects in the minerals sub-sector contribute directly to the fulfillment of the National Minerals Policy Act.

AID assistance projects in the minerals field have also contributed valuable data which has led to exploration and development of foreign minerals in areas of particular significance to U.S. industry, as the attached cases indicate. A specific example is data developed by AID on the Andean region of South America. The Andes contain some of the richest minerals deposits in the world, of which only a small fraction has been exploited to date. Potential resources of copper, lead, and zinc are probably sufficient to cover hundreds of years of demand at the present rate of exploitation. As the resources of these metals and other metals are exhausted at home, the U.S. will become more and more dependent on foreign sources, of which the Andean countries are potentially the most important, for base metals.

Data follows on six bilateral projects of AID and its predecessor agencies, completed with the assistance of the U. S. Geological Survey.

BENEFITS TO THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(MINERALS)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|--|
| <p>(a) BRAZIL GEOLOGICAL AND MINING SURVEYS</p> <p>Project: Several survey projects</p> <p>Time Period: 1950's and early 1960's</p> <p>U.S. Agency: U.S. Geological Survey/ USAID Brazil</p> <p>Contact: J. Reinemund, USGS</p> | <p><u>Purpose:</u> To assist the Government of Brazil in making geological surveys and maps; and in minerals and ores appraisals.</p> <p><u>Activity:</u> A number of areas were examined including: (a) mapping and appraisals of iron resources with the State of Minas Gerais; (b) appraisal of Amapa's manganese potential; (c) survey of manganese potential in Urucum; (d) survey of bauxite at Pocas de Caldas.</p> | <p>Utilizing these studies, Hanna Mining Co. has invested \$250 million in iron ore production in Minas Gerais, and may invest much more. The U.S. will receive 20 million tons of iron ore per year from this source. U.S. firms (Bethlehem Steel and U.S. Steel) have made major investments in manganese at Amapa and Urucum, providing a major source of manganese for the U.S. Alcoa and Hanna are making large investments in Pocas de Caldas aluminum production. The development of Brazilian mines has also resulted in the purchase of millions of dollars of U.S. trucks, drills, earth-moving, and processing equipment. (See attachment #G-1-a)</p> |
| <p>(b) COLOMBIA GEOLOGICAL MAPPING AND TRAINING</p> <p>USAID Projects: Two Loan Projects</p> <p>Time Period: 1964 to present</p> <p>U.S. Agency: U.S. Geol. Survey/USAID</p> <p>Contact: J. Reinemund, USGS</p> | <p><u>Purpose:</u> To assist the Colombian Institute of Geology and Mines (INGEOMINAS) in geologic mapping and minerals evaluation, development of facilities, and training of personnel.</p> <p><u>Activity:</u> Analysis of geological structures (Colombia contains the northern section of the Andean range), and studies of ore deposits--especially phosphates. Several dozen Colombians, scientists and technicians, were also trained in the U.S. or locally.</p> | <p>USGS geologists have benefited through increased knowledge of important geological processes relevant to resource potentials of the Western Hemisphere. New data on crustal plates will contribute to studies of locations of ore deposits in relation to crustal movements. Data on phosphate deposition will be used to improve the search for similar deposits elsewhere. Geochemical exploration techniques under humid-tropic conditions have been improved, with a major belt of copper mineralization discovered in Colombia in the process. (See attachment #G-1-b)</p> |
| <p>(c) INDONESIA GEOLOGICAL MAPPING AND TRAINING</p> <p>Projects: Two USAID Projects</p> <p>Time Period: 1956 - 1965; 1969 to present</p> <p>U.S. Agency: U.S. Geol. Surv./USAID</p> <p>Contact: J. Reinemund, USGS</p> | <p><u>Purpose:</u> To provide geological survey technical and institutional development assistance; and to train key personnel of the Geological Survey of Indonesia (GSI).</p> <p><u>Activity:</u> Special attention was paid to the problem of improved GSI leadership. Dr. Soetjaro Sigit, who became GSI's Director, was given participant training in the U.S. and on-the-job assistance. By 1969, Sigit moved up to Chairman of the Minerals Investment Committee of the Ministry of Mines and Petroleum - serving as principal architect of Indonesia's new policy of encouraging private foreign investment.</p> | <p>A number of investment opportunities have developed as a result of these technical assistance relationships. Freeport Sulfur Corp. has been given a concession for copper development in West Irian involving an investment of more than \$50 million; Alcoa will develop a large bauxite reserve in Kalimantan (Borneo); and several other U.S. companies have been given mineral exploration licenses. (See attachment #G-1-c)</p> |

BRAZIL GEOLOGICAL AND MINING SURVEYS

Technical cooperation between the USGS and Brazilian agencies has been underway continuously since 1940 under the auspices of AID and a succession of predecessor or other sponsoring agencies. One of the major projects in Brazil during the 1950s and early 1960s involved the mapping and appraisal of iron resources in the State of Minas Gerais. This study helped justify the development of an iron mining industry, in which the Hanna Mining Company has an interest, with an investment that already totals about \$250 million and is likely to be increased another \$100 million. The United States will receive about 20 million tons per year from this source. Moreover the development of these mines has resulted in the purchase of millions of dollars worth of trucks, drills, earth-moving and mineral processing equipment.

Similar benefits have accrued from the development of several other major resources discovered or

appraised during the Brazil program, including the Amapa manganese involving an investment of about \$125 million, a major source of manganese for the United States, in which the Bethlehem Steel Corp. has an interest; the Urucum manganese in which U.S. Steel Corp. has an interest; and the Pocas de Caidas bauxite in which Aluminum Company of America and Hanna Mining Company have interests.

As a peripheral result of the Brazil program, USGS consultation with the Brazilians in applications of remote sensing to geological and resources problems has made it possible for USGS or other scientists to learn about the applicability of a number of remote sensing techniques to geological features in tropical and semi-tropical environments. Extensive applications of remote sensing technology developed in the United States are now being applied in Brazil with the help of United States private industry.

COLOMBIA GEOLOGICAL MAPPING AND TRAINING

Geological assistance to the Colombian Institute of Geology and Mines (INGEOMINAS) has been carried on under AID auspices since 1964 and has resulted in a substantial amount of geologic mapping, training of several dozen Colombian personnel and development of facilities and capacity in INGEOMINAS. As a result of this program, USGS geologists have benefited through increased knowledge of a number of geological processes that are significant to an understanding of the geologic history and resource potentials particularly in the Western Hemisphere.

One of the principal results of the project has been a better understanding of the geologic structures that have developed near the junction of the South American Pacific, and Caribbean crustal plates, including specific displacement on major faults, and their significance in relation to the formation of the Andes Mountains. New information

on these structural features will help in future studies of the relation between ore deposits and crustal movements.

In another phase of the project, considerable detailed information on phosphate accumulation has been obtained through studies of extensive, newly-discovered phosphate deposits. This information helps confirm concepts of phosphate deposition and can be used to strengthen the search for similar deposits elsewhere.

Another result of the program has been the acquisition of data about the distribution of geochemical anomalies in an area of extremely high rainfall and exceptionally deep weathering. It has been possible to assess the value of geochemical exploration techniques for copper under high-intensity humid-tropic weathering and in so doing a major belt of copper mineralization was discovered.

INDONESIA GEOLOGICAL MAPPING AND TRAINING

Technical assistance has been given by the USGS to the Geological Survey of Indonesia (GSI) from 1956 to 1965 and again from 1969 to the present. The first of the two projects was concerned primarily with organizing and activating the GSI, and primary attention was given to the development of a young geologist - Dr. Soetjaro Sigit - as its Director, through participant training in the United States and on-the-job guidance in Indonesia. By 1969 Sigit had moved up to Chairman of the Mineral Investment Committee of the Ministry of Mines and Petroleum - a position in which he has served as the principal architect of the new Indonesia policy encouraging private investment. Under this policy the Freeport Sulfur Corp. has been given a concession for copper development in West Irian which will involve an investment of more than \$50 million; the Aluminum Company of America has a concession to develop a large bauxite reserve in Kalimantan, and several other United States companies have been given mineral exploration licenses.

The Indonesia assistance is a good example of the intangible benefit arising from favorable relationships with the host country, for the resumption of USGS assistance was given top priority by the Indonesian Government after the revolution of 1967. This has enabled the USGS to have continuing influence on Indonesian resource development, through training courses in geophysics and geology for employees of several Indonesian agencies.

A recent (1970-72) phase of the Indonesian program has resulted in the compilation of a tectonic map of Indonesia and adjacent regions where the new global tectonic concepts of sea-floor spreading and continental drift are especially important for resource studies. The project has provided an opportunity to test and refine these concepts, to demonstrate United States' leadership in advancing these concepts, and to broaden the background of the USGS scientists involved.

BENEFITS TO THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(MINERALS)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|--|--|--|
| <p>(a) LIBERIA MINERALS ASSESSMENT AND DEVELOPMENT</p> <p>Project: Several-grant and loan</p> <p>Time Period: 1950's; 1963-72</p> <p>U.S. Agency: U.S. Geological Survey/USAID</p> <p>Contacts: W. Holzle; W. Coonrad, USGS</p> | <p><u>Purpose:</u> To assess and map minerals deposits, especially iron; and prepare systematic geological maps for the Geological Survey of Liberia and investors' uses.</p> <p><u>Activity:</u> Assessment of the Bomi Hill and Mano River iron ore proved the existence of huge resources in the two areas. The geological mapping program was probably the first large-scale application of new techniques in a humid-tropical environment. The geological studies also revealed the existence of offshore sedimentary basins favorable for oil.</p> | <p>Republic Steel Corp. invested hundreds of millions in Bomi Hill. Both activities have involved the purchase of millions of dollars in U.S. ore-moving equipment. Over 130 million tons of ore have been taken from the two locations. About 2 million tons were shipped in 1970 (latest figure available) to the U.S. at a value of \$18 million. Some European sales earn dollars, helping the U.S. trade balance. As to the offshore oil, several exploration licenses were granted to U.S. companies. Exploratory drilling is going on.</p> <p>(See attachment #G-2-a)</p> |
| <p>(b) PAKISTAN IRRIGATION AND LAND RECLAMATION--INDUS BASIN</p> <p>Projects: Several--grant and loan Last is 391-11-120-257</p> <p>Time Period: 1953-1967; 1968-1971</p> <p>U.S. Agency: U.S. Geol. Serv./USAID (Later IBRD participation)</p> <p>Contact: J. Reinemund, USGS</p> | <p><u>Purpose:</u> To advise on groundwater, soil desalination and irrigation problems in the Indus Basin area. 32,000,000 acres are now under cultivation.</p> <p><u>Activities:</u> (a) Development of a scientific and technical organization capable of collecting, interpreting and publishing data on soils and water resources; provision of technical support of field and laboratory investigations; and training of scores of Pakistani scientists. (b) In the later stage, USGS advised on monitoring and analysis of the effects of reclamation activities on the alluvial plain area.</p> | <p>The opportunity to study hydrologic conditions in one of the largest irrigated alluvial basins in the world has contributed greatly to the development of hydrologic science and hydrologists in the U.S. Confrontation with problems associated with soil salinity, water-logging, well yield, and institution building, and the challenge of scientific appraisal of the effects of reclamation activity provided experiences beyond the scope of most domestic assignments. (See attachment #G-2-b)</p> |
| <p>(c) PHILIPPINES GEOLOGICAL SURVEY AND MINERALS APPRAISAL</p> <p>Project: Various, to 1965</p> <p>U.S. Agency: U.S. Geol. Surv./USAID</p> <p>Contact: J. Reinemund, USGS</p> | <p><u>Purpose:</u> To assist in the development of the Philippine Bureau of Mines and its geologic and minerals appraisals activities.</p> <p><u>Activity:</u> USGS helped establish systematic procedures for compiling and publishing geological and resources information. Several dozen geologists and mining engineers were trained.</p> | <p>Detailed appraisal of the large chromite resources helped in the development of the Coto mining operation of Benguet Consolidated, Inc. which has reserves of more than a million tons of ore. It is the principal supplier of refractory grade chromite for the United States. As a separate outgrowth, a comprehensive program of exploration and appraisal of the Surigao laterite deposits is now being developed by the Marinduque Mining Co. This could provide a source of nickel, cobalt, and iron ores, for the U.S. and other countries, valued potentially at more than \$6 billion. (See attachment #G-2-c)</p> |

LIBERIA MINERALS ASSESSMENT AND DEVELOPMENT

Intermittent technical assistance to Liberia through AID predecessor agencies, beginning in the 1950's, resulted in the assessment of reserves and development of several major iron resources, including the Bomi Hill and Mano River mining operations. Bomi Hill, which includes railroad and dock facilities, is a Republic Steel Corp. activity and Mano River is an operation of the National Iron Ore Company of Liberia. Both involve hundreds of millions of dollars in investment and in sales of equipment from the United States. More than 130 million tons of ore have been shipped from Bomi Hill and from Mano River. In 1970, Bomi Hill produced 22 million tons of ore--2 million of which was shipped to the U.S. (valued at 18 million). Republic's ore sales to Europe have been a dollar earner.

From 1963 to 1972, USGS provided assistance under AID auspices to develop the Geological Survey of Liberia. A number of benefits resulted from this program. An airborne geophysical (magnetic and radiometric) survey was carried out under an AID loan by a United States company for the Liberian Government at a cost of about \$800,000. The data from this survey were interpreted and applied jointly by USGS and GSL personnel direct-

ly in support of the geologic mapping program in what was probably the first large-scale application of these techniques to systematic geologic mapping in a humid-tropical environment. As a result, it was possible to confirm the utility of these techniques, which had been developed and applied in the United States, to mapping in humid-tropical conditions. The base maps are widely used by U.S. firms. The survey findings will result in further benefits to Liberia.

The geophysical and geological studies also revealed the existence of offshore sedimentary basins favorable for petroleum for which exploration licenses were given to several United States companies. Exploration is now going on; four holes have been drilled and more are planned.

As an additional benefit of the recent Liberian project, USGS scientists were able to obtain much important information about the time and sequence of geologic events related to the formation of the ancient rocks in the West African Shield and also the mechanics of the separation of Africa and South America, which has improved our understanding of processes of continental evolution.

PAKISTAN IRRIGATION AND LAND RECLAMATION--INDUS BASIN

The USGS has provided continuous technical support to the water resources investigations in the vast irrigated alluvial plains of the Indus River in Pakistan since 1953. Under the auspices of AID, this assistance has been centered around the problems of waterlogging and soil salinization of the irrigated lands. It has involved assistance in developing a scientific and technical organization capable of collecting, interpreting, and publishing data on the soils and water resources of the Indus Plains, technical support of required field and laboratory investigations, and training of scores of Pakistani scientists.

The initial project ended in 1967. During 1968-71 the USGS assistance was oriented toward a new project involving the monitoring and analysis of the effects of reclamation activities in the alluvial plain. This provided a unique opportunity to study the hydrologic changes resulting from a massive program of drilling, pumping, and flushing.

Although the primary benefits were the development of a system of combatting waterlogging and salinity in the Indus Plain and a water investigations agency, a number of significant benefits also accrued to the United States.

1. United States engineering and hydrologic consultants were employed in Pakistan on the project. The opportunity to study hydrologic conditions in one of the largest irrigated alluvial basins

in the world has contributed greatly to the development of hydrologists and hydrologic sciences in the United States. Confrontation with problems associated with soil salinity, waterlogging, well yield, and institution building, and the challenge of the scientific appraisal of the effects of reclamation activity provide experiences beyond the scope of most domestic assignments. Skills developed under these circumstances add immeasurably to the future value and stature of the scientist and the USGS.

2. Direct purchase from the United States of modern drilling rigs, air compressors, welders, vehicles, road graders, earth movers, pumps, and hydrologic, meteorologic, geophysical, and scientific equipment represent a large dollar value.
3. Familiarity with American high quality products may lead Pakistani scientists and institutions to continue to purchase material from the United States. It is entirely possible that U.S. firms may operate sales and service outlets in Pakistan.

PHILIPPINES GEOLOGICAL SURVEY AND MINERALS APPRAISAL

USGS technical assistance to the Philippines was continuous from 1946 until 1965. During that time the project established the Philippine Bureau of Mines, helped with the training of several dozen geologists and mining engineers, and established systematic procedures for compiling and publishing geological and resources information.

Both tangible and intangible benefits to the United States resulted from this program. Detailed investigation and appraisal of the large chromite resources helped in the development of the Coto mining operation of Benguet Consolidated Inc. which has reserves of more than a million tons of ore and is the principal supplier of refractory grade chromite for the United States. A comprehensive program of exploration and appraisal of the Surigao laterite deposits now being developed by the Marinduque Mining Company could provide a source of nickel, cobalt, and iron ores valued potentially at more than \$6 billion. Information about most other mineral resources of the Philippines resulted from this program.

As a byproduct of this program and supplemented by non-AID funds, studies of an eruption of Taal volcano were carried out in which it was demonstrated that infra-red scanning techniques could be utilized successfully to predict the locus of an impending eruption. Considerable information was obtained on the blast effects and mechanisms.

BENEFITS TO THE U.S. OF AMERICAN FOREIGN AID ACTIVITIES

H-1

(OTHER)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|---|
| <p>(a) ASSISTING STATE AND LOCAL DEVELOPMENT EFFORTS IN THE U.S. (The Inter-governmental Personnel Program under the Intergovernmental Personnel Act of 1970)</p> <p>Contact: Mr. Sam Simpson, SER/PM/CRS</p> | <p><u>Purpose:</u> Assisting State and local governments in the strengthening of their personnel administration through the temporary assignment of experienced AID development officers whenever possible and when requested.</p> <p><u>Activity:</u> As of the fall of 1972, sixteen persons from AID have been assigned to different activities in about twelve different localities within the U.S. to assist State and local governments to develop new programming or administrative capabilities. Assignments are normally for a two year period.</p> | <p>Skills developed in designing and administering foreign aid programs have been found to be relevant and useful in designing, coordinating and administering development programs in the U. S. AID foreign service officers are assisting State and local government in the U. S. who have embarked on development programs in their regions. (See attachment # H-1 -a)</p> |
| <p>(b) KOREAN TOP MANAGEMENT TRAINING TEAM</p> <p><u>Case I:</u> Mr. Koo Choel Hoh, President - Lucky Chemical Company</p> <p>Project: PIO/P 489-606-1-89177</p> <p>Time Period: 1965-1969</p> | <p><u>Purpose:</u> To assist the growth of Korea's industrial sector by training managers of leading Korean companies.</p> <p><u>Activity:</u> Those managers thought to be the most innovative and willing to experiment were carefully selected to observe comparable U.S. industries. They returned to Korea with many ideas. Mr. Hoh was a member of the team.</p> | <p>This observation-type training and related contacts resulted in a joint venture between the Lucky Chemical Co. and CALTEX, an American petroleum firm. A new firm was created, the Ho Nam Refining Co. Ltd. All U.S. equipment was used to build this refining company, which has expanded into petro-chemicals and fertilizers. This refining company now has a network of gas stations throughout Korea. (No attachment)</p> |
| <p>(c) KOREAN TOP MANAGEMENT TRAINING TEAM</p> <p><u>Case II:</u> Yu Tuk Han, President, Yuyu Industrial Co. Ltd.</p> <p>Project: PIO/P 489-606-1-89177</p> <p>Time Span: 1965-1969</p> | <p>Mr. Han was also a member of the above Korean management team. While in the U.S. he developed ideas for a new manufacturing activity.</p> | <p>Upon Mr. Han's return to Korea, he entered into a joint venture with The Upjohn Co., creating Upjohn Korea, Ltd. Major equipment components, and raw materials were imported from the U.S. to establish the new manufacturing concern. (No attachment)</p> |

ASSISTING STATE AND LOCAL DEVELOPMENT EFFORTS IN THE U. S.

Despite the fact that the U.S. leads the rest of the world in economic development, economic progress is not uniform throughout the nation and many regions and localities are taking steps to quicken the pace of development in their areas. Even though incomes per capita in such localities far exceed those that are found in most LDCs, the problems encountered in speeding development are in many respects similar to those found in pursuing the same type of objectives overseas. The skills developed by AID development officers in their work in developing countries is extensively applicable, therefore, in solving many local development problems within the U. S. These skills are being applied now in assisting with the solution of such problems and in helping state and regional governments to incorporate such skills into their own staffs.

Examples of the application of AID-type skills to development activities here in the U.S. include the work that Mr. J. S. Ott is carrying on with the development authorities in Alexandria, Va., the work of Messrs. George Hawbaker and Jim Hickman with the Gateway Area Development District in eastern Kentucky, the work of Mr. Paul Foster in his association with the Waccamaw Council Development District in South Carolina, and the work

of Mrs. J.N. Zodun with the state government of Wyoming. Mr. Ott, in his work in Alexandria, is applying many of the same skills that he used in his extensive AID experiences as an urban and regional design consultant in Kingston, Jamaica and other areas in the Caribbean. Messrs. Hawbaker and Hickman are applying skills used at a variety of overseas posts to the problem of stimulating industrial activity and employment in eastern Kentucky and reducing somewhat the difficulties that might otherwise arise if applying his skills as an administrator and coordinator of aid and assistance in years of work in Africa and Latin America to the problem of planning a viable and appropriate development program for a region which has set more rapid development as one of its primary goals. Mrs. Zodun has been assisting the state government of Wyoming in establishing improved procedures and practices in the area of personnel administration.

AID people who are involved in assisting state and local governments and development authorities have been assigned to a variety of locations throughout the country including, for instance, California, Washington (State), Florida and Massachusetts, as well as those mentioned above.

APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(OTHER)

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|---|--|
| <p>(a) KOREAN TOP MANAGEMENT TRAINING TEAMS</p> <p><u>CASE III</u> - Other joint ventures or licensing Project: Same as below</p> | <p>See project outline below.</p> | <p>Other team members completed either joint ventures or licensing arrangements with Eastman-Kodak, Halston Purina, U.S. Pipe and Foundry, and Westinghouse. Other members of teams discussed arrangements with General Tire, Ford, General Electric, Peerless Pump, White Motors, Sears Roebuck, etc. Others contacted U.S. firms for technical knowledge in preference to that available from Japanese firms (No attachment)</p> |
| <p>(b) KOREAN TOP MANAGEMENT TRAINING TEAMS</p> <p><u>CASE IV</u>: Mr. Joon Yoon Chun, Pres., Sam Yang Foods Co., Ltd.</p> <p>Project: PID/P 489-606-1-80075 Time Span: 1965-69</p> | <p><u>Purpose</u>: To expose Korean entrepreneurs to U. S. management techniques, for adaptation to the Korean industrial sector.</p> <p><u>Activity</u>: The observation training provided executives the opportunity to meet and observe U. S. executives in day-to-day management planning and operations. Mr. Chun was a team member. On his return to Korea, he doubled his assembly lines, started producing two new products, and began construction of a new manufacturing plant.</p> | <p>Mr. Chun, as a result of his expansion plans, negotiated with U. S. suppliers to purchase approximately \$5.5 million in wheat and lard. Previously he had purchased all his raw materials from Japan. Large scale purchases of U. S. equipment were attributable to his exposure to U. S. production methods. (No attachment)</p> |
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APPLICATIONS IN THE U. S. OF AMERICAN FOREIGN AID ACTIVITIES
(OTHER)

H-3

| PROJECT | AID PURPOSE AND ACTIVITY | U. S. APPLICATION |
|---|--|---|
| <p>(a) STUDY OF BIOCIDES RESIDUES IN MIGRATORY BIRDS (Wildlife Preservation)</p> <p>Project: Financed by Venezuela Govt. and Dept. of Interior Time Span: 1972 Contractor: Bureau of Sport Fisheries and Wildlife, Dept. Of Interior, Determination under Sec. 597(a) FAA</p> <p>Contact: W. W. Rhodes, TA/STS</p> | <p><u>Purpose:</u> Determine appropriate types, concentrations and schedule of use of agricultural biocides.</p> <p><u>Activity:</u> Advise Venezuelan scientists on studies of ingestion of biocides by migratory birds.</p> | <p>A U. S. law directs the Bureau of Sport Fisheries and Wildlife to "provide for the conservation of ...migratory birds, that are threatened with extinction". The Bureau has determined that ingestion of agricultural biocides threatens the survival of some species. Data from the Venezuelan studies will be combined with data on the same species during their U.S. sojourn to provide the Bureau with an improved understanding of how to protect these species. (No attachment)</p> |
| <p>(b) ESTABLISHMENT OF EARTHQUAKE RESEARCH PROGRAM IN TAIWAN</p> <p>Project: Financed by Rep. of China Govt. and USGS Time Span: 1972 Contractor: Geological Survey, Dept. of Interior, Determination under Sec. 607(a), FAA</p> <p>Contact: W. W. Rhodes, TA/STS</p> | <p><u>Purpose:</u> Establish an earthquake research center and a network of seismograph stations in Taiwan.</p> <p><u>Activity:</u> Map geologic faults in Taiwan and make comparative studies with California fault.</p> | <p>Since Taiwan and the U.S. west coast are both in the Pacific earthquake belt, new information developed in Taiwan may be extremely useful in understanding the overall structure and faulting processes of the belt area, including portions in the U. S. (No attachment)</p> |
| <p>(c) AFLATOXIN INFESTATION OF PISTACHIO NUTS</p> <p>Project: Financed by Govts. of Iran, Turkey and the USDA and FDA Time Span: 1971-1972 Contractor: Food and Drug Adm., HEW, Determination under Sec. 607(a), FAA</p> <p>Contact: W. W. Rhodes, TA/STS</p> | <p><u>Purpose:</u> Assure that pistachio nuts exported from Iran and from Turkey are free from aflatoxin infestation and thereby improve net export income.</p> <p><u>Activity:</u> Train Iranian and Turkish chemists in detection and prevention of aflatoxin.</p> | <p>Improved inspection and quality control in Turkey and Iran will greatly reduce FDA's cost of assuring that pistachio imports are fit for human consumption. (No attachment)</p> |