

**OFFICE OF RESEARCH
DIRECTORY**

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**Bureau for Research and Development
U.S. Agency for International Development**

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**Agency for International Development
Bureau of Research and Development
Office of Research
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936-5545 National Academy of Sciences
936-5552 External Technical Advice
936-5600 Innovative Scientific Research
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I. Innovative Scientific Research

Project No. 936-5600

Life-Project-Budget: 49 million

Buy-In Capacity: 13 million

Final Year Obligation: FY 97

PACD Date: FY 99

Geographic Area: Worldwide

Objectives:

To encourage the expansion of innovative scientific research on problems of importance to developing countries, and to strengthen research capabilities in LDCs.

Description:

This project is a continuation and expansion of 936-5542, which funded researchers from over 60 developing countries. It includes four sub-projects:

- ◆ PSTC Competitive Small Grants Program
- ◆ Support to the International Foundation for Science
- ◆ American Association for the Advancement of Science, Science, Engineering & Diplomacy Fellowship Program
- ◆ Program development and support activities such as a contract with METRICA and other consultancies

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SUPROJECT 1

PSTC Competitive Small Grants Program

The Program in Science and Technology Cooperation (PSTC) funds cutting-edge research relevant to A.I.D.'s long term objectives. It is implemented through what is probably the most competitive investigator-initiated, externally-peer-reviewed grants program in the government. This program has received over 6,800 applications for funding. Each year 40 to 50 grants are awarded--about 6 to 7 percent of applications. Grants must involve investigators from countries receiving AID development assistance, but may involve collaborators from the U.S. or advanced developing countries. PSTC has funded projects involving scientists from over 60 developing countries. Grants can be for no more than \$150,000, and are usually for three to five years.

The project encourages LDC and U.S. scientists to submit their most innovative ideas for funding. Proposals undergo internal and external scientific peer review. Four general criteria are applied to all projects: 1) Scientific Merit, 2) Relevance to Development, 3) Innovation, and 4) Contribution to the Research Capacity of the Host Country.

Seven research modules, or areas of emphasis have been identified:

- 1) Biotechnology/Immunology
- 2) Plant Biotechnology
- 3) Chemistry for World Food Needs
- 4) Biomass Conversion Technology
- 5) Integrated Pest Management
- 6) Diversity of Biological Resources
- 7) Engineering Technology

The project emphasizes research areas in which developing country institutions can participate on their own or together with scientists from U.S. institutions. The intent is to provide LDC researchers with the opportunity to explore new or alternative solutions to the problems they encounter at home. Major outputs of the program have included new methodologies, diagnostics, vaccines, expert systems, and alternative forms of pest and disease control. In many cases, PSTC research has been the basis upon which pilot studies and field trials have been designed.

Preproposals can be submitted to the PSTC program at any time. Those submitted before November 15th, will be considered for possible invitation of a full proposal the following year. Full proposals are submitted by August 15, and are reviewed by external peer review panels in October. Frequently investigators are asked

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to modify projects on the basis of external reviewer comments.
Grants are to be made as early in the following year as possible.

Attached is a listing of PSTC projects funded in the last 5 years.

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Cooperating National Academy of Sciences
Agency Board on Science and Technology

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PSTC PROJECTS FUNDED
1987-1992

- BANGLADESH. Michigan State University; STICKLEN, M. 1992. Development of Rice Resistant to Rice Stem Borer by Genetic Engineering (11.238).
- BANGLADESH. U. Maryland; JOSEPH, S. 1987. An Assessment of the Role of Enterotoxin and Other Virulence Associated Features in *Aeromonas* Human Infections (6.333).
- BANGLADESH. Colorado State University; KARIM, M. 1990. Preferential Degradation of Lignin in Water Hyacinth using White-Rot Fungi for Animal Feed Production (10.027).
- BANGLADESH. University of Alabama Medical School; KHALED, M.. 1990. Development of Methods to Assess Marginal Vitamin A Status in Human Children in Bangladesh (10.293).
- BARBADOS. U. West Indies; CARRINGTON, C. 1989. Post-Harvest Physiology of Some Under-Exploited Tropical Fruit (8.116).
- BARBADOS. U. West Indies; DALES, R. 1989. Development of Recombinant DNA Techniques for a Vesicular-Arbuscular Mycorrhizal(VAM) System (8.117).
- EELIZE. NY Botanical Garden; BALICK, M. 1992. The Ethno-directed Sampling Hypothesis and Its Role in the Identification and Conservation of Plant Biodiversity (12.685).
- BOLIVIA. The New York Botanical Garden; MORAES, M. 1992. Diversity, Conservation and Economic Potential of Bolivian Palms with Special Emphasis on Parajubaea torallyi (12.585).
- BOTSWANA. U. Botswana; WOOLLARD, J. 1989. Natural Anti-feedants for the Corn cricket, Hetrodes pupus (8.388).
- BRAZIL. Universidad Federal; MEZA-MONTALVO, M. 1989. Effects of Cultural Practices on Potential Soil and Water Losses from Deforested Land in Humid Tropic Regions (9.311).
- BRAZIL. Purdue University; BUTLER, L. 1990. Low Tannin Bird Resistance Sorghums (10.060).
- BRAZIL. NY Botanical Gardens; BALICK, M. 1988. Improving Management Practices for Biomass Production from Native Stands of Babassu Palm...Exploit...Resources (7.079).
- BRAZIL, PER. Instituto Boliviano de Biologia; DEDET. 1990. Computer Aided Identification of American Sandflies (10.135).

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CAMEROON. University of Yaounde; TITANJI, V. 1992. Molecular Cloning and Characterization of the Antigens of Onchocerca volvulus (10.080).

CAMEROON. U. Yaounde; TITANJI, V.. 1988. Mechanisms of Survival of Onchocerca volvulus in the Human Host (6.341).

CAMEROON. University of Yaounde; TITANJI, V. 1991. Molecular Cloning and Characterization of the Antigens of Onchocerca volvulus (10.080).

CAMEROON. North Carolina State University; ELKAN, G.H.. 1991. Determination of Factors Allowing Bradyrhizobium sp. NC92 to Increase Yield of Peanuts Field Grown in Cameroon (11.286).

CAMEROON. CUSS; LEKE, R. 1991. Immunological Profile of Pregnant Women with and Without P. falciparum in Cameroon (10.085).

CHILE. U. Chile; CARDEMIL, L. 1988. Gene Expression of Thermotolerance and Injury Resistance in Underused Trees of Chile, Prosopis chilensis...Araucaria ar (7.068).

CHILE. U. Catolica de Chile; AGUILERA, J. 1988. Bases for the Separation of Light and Dark Tissue from Pelagic Fish (7.334).

CHILE. U. Chile; NIEMEYER, H. 1988. Role of Hydroxamic Acids in Cereal-Aphid Interactions (7.404).

CHILE. U. Cat. de Chile; LEIGHTON, F. 1989. Genetic, Molecular & Immunological Study of Salmonella typhi Porins in Pathogenesis Diagnosis and Previous of Typhoid Fever (6.537).

CHILE. P. U. C. de Chile; JORDAN, M. 1989. In Vitro Propagation and Improvement of Fruit Species with Economic Potential for Semi-Arid Zones (8.007).

CHILE. Universidad de Conce; BAER, D. 1989. Evaluation of the Genetic Stability of and the Potentiality of a Low Alkaloid Strain of "Tarwi" (Lupinus mutabilis) (9.386).

CHILE. Universidad de Concepción; KLEMPAU, A. 1991. Immunologic Control of Bacterial Kidney Disease (BKD) in Salmonids (11.185).

CHILE. Universidad de Concepción; COLLAO, R.W. 1991. Axial-Flux Generators for Micro-Generating Stations (11.196).

CHILE. Universidad Catolica de Chile; AGUILERA, J.M. 1991. Thermoset Composite Gels as Structured Foods (11.373).

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- COLOMBIA. CIAT; VALLEJOS, C. E. 1987. Development of Molecular Genetic Markers in Phaseolus as Breeding Tools: Disease Resistance (7.393).
- COLOMBIA. University of Califo; GEFTS, P. 1989. Establishment of a "Core Collection" for Common Bean (Phaseolus vulgaris L.) Genetic Resources Conservation (9.241).
- COLOMBIA. University of Florida; HIEBERT, E. 1990. Development of Monoclonal Antibodies for Serological Differentiation of Bean Golden Mosaic Virus Isolates (9.303).
- COLOMBIA. Ohio State University; SAYRE, R. 1990. Development of Transgenic Cassava Haing Reduced Cyanide Toxicity (10.222).
- COSTA RICA. Penn State University; FRITZ, P. 1992. Theobroma cacao: DNA Analysis for Fungal Resistance (10.117).
- COSTA RICA. Oklahoma State University; MACAYA, G. 1992. Detection and Replication of Cucumber Mosaic Virus (CMV) (10.326).
- COSTA RICA. Universidad de Costa Rica; TERAMOND, F. 1992. Internet Project (Towards a Continental Internet) (12.061).
- COSTA RICA. Clemson University; LACHER, T. 1992. Gap Analysis Mapping of Diversity of Biological Resources (12.343).
- COSTA RICA. University of Missouri; MARQUIS, R. 1992. Herbivorous Insect Populations in Native Tree Plantations in the Atlantic Lowlands of Costa Rica (12.421).
- COSTA RICA. Penn State U. Hershey Medical Cent; FRITZ, P. 1987. Theobroma cacao DNA as Marker for Plant Breeding (7.095).
- COSTA RICA. U. NC State; DVORAK, W. 1988. Maintaining Biological Diversity of Threatened Multipurpose Species in Central America by Vegetable Propagation (8.106).
- COSTA RICA. Penn State University; FRITZ, P. 1992. Theobroma cacao: DNA Analysis for Fungal Resistance (10.117).
- COSTA RICA. U. Costa Rica; RADULOVICH, R. 1988. Water Optimization of Rainfed Tropical Cropping (8.337).
- COSTA RICA. U. Costa Rica; ALVAREZ, R. 1989. Survival of Plant Pathogenic Bacteria in Tropical Soils Traced with Monoclonal Antibodies (7.138).

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COSTA RICA. CATIE; CHAVES, C. 1989. Use of Poro (Erythrina sp.) and Madero Negro (Gliricidia sepium) as a Protein Source for Dairy Cattle (7.204).

COSTA RICA. University of Florida; FURDY, L. 1989. Heritability of Resistance to Witches' Broom in Progeny From Crosses of Selected Clones of Theobroma cacao (9.174).

COSTA RICA. Universidad de Costa Rica; RAMIREZ, P. 1989. Cloned DNA to Study Molecular Biology, Host-Vector Relations, Control of Maize Rayado Fino Virus (9.198).

COSTA RICA. University of Florida; PLOETZ, R. 1990. Identification of Resistance in Banana to Races of the Fusarial Wilt Fungus (9.093).

COSTA RICA. University of Illinois, Urbana-Champaign; IRWIN, M. 1990. Natural Systems as Reservoirs of Agriculturally Important Plant Viruses and Microplasmias (10.236).

COSTA RICA. Duke University; CLARK, D. 1991. Molecular Genetic Analysis of Valuable Native Timber Species (10.105).

COSTA RICA. University of Florida; GRAY, D. 1990. Somatic Embryos for Germplasm Storage and Clonal Propagation (10.278).

COSTA RICA. Cornell University; RADULOVICH, R.A. 1991. Fertilizer Losses by Bypass Flow in Well-Aggregated Humid Tropical Soils: Evaluation and Strategies for Prevention (11.243).

COSTA RICA. University of Wisconsin; AHLQUIST, P. 1989. Use of Cloned Viral cDNAs in Characterization, Epidemiology and Control of Bean Golden Mosaic Virus (9.175).

CZECHOSLOVAKIA. Michigan State University; TIEZ, N. 1992. Development of Lipid-Bilayer Based Electrochemical Biosensors for Diagnostics (12.039E).

CZECHOSLOVAKIA. University of Pennsylvania; MOTLIK, J. 1992. The Specific Role of Theca Cells in Resumption of Meiosis (12.061E).

CZECHOSLOVAKIA. Czechoslovak Academy of Sciences; VRKOC, J. 1991. Biochemical Control of Crop Pests with Reactive Hormones and Pheromones (12.099E).

CZECHOSLOVAKIA. Ohio State University; ZAKIN, J. 1991. Surfactant Drag Reducers for Reduced Energy Costs in District Heating Systems (12.074E).

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- DOMINICAN R. U. Florida; ANTONINI, G. 1989. Assessment of the Impact of Land Use Change on Tropical Steepland Hydrology (8.369).
- DOMINICAN R. U. Puerto Rico; SCHROEDER, E. 1988. Biocontrol of Bean Ashy Blight by Improved Rhizobium Biotechnology (8.158).
- ECUADOR. Cornell University; FRY, W. 1992. Combating A Genetically Distinct Migrating Population of Phytophthora infestans with Plant Resistance (12.141).
- ECUADOR. University of Delaware; KITTO, S. 1992. Virus Identification, Elimination and Micropropagation in Tropaeolum tuberosum and Arracacia xanthorrhiza (12.187).
- ECUADOR. U. SW Louisiana; TWILLEY, R. 1988. Importance of Mangrove in Sustaining Fisheries and Controlling Water Quality in Tropical Coastal Ecosystems (8.333).
- ECUADOR. ATA, S.A.; ROJAS, R. 1988. Regeneration of Babaco (Carica pentagona, Hielborn, Badillo) via Tissue Culture (7.340).
- ECUADOR. University of Montana; NIMLOS, T. 1990. Cangahua in Ecuador; Its Strength, Classification and Delineation (10.288).
- ECUADOR. University of Washington; GARA, Robert. 1990. Natural Compounds to Manage a Serious Forest Pest: The Mahogany Shoot Borer (10.302).
- ECUADOR. U.of DE, & USDA; T, EVANS. 1992. Virus Identification, Elimination, and Micropropagation in Tropaeolum tuberosum and Arracacia xanthorrhiza (12.187).
- EGYPT. U.S. NAMRU-3; HOOGSTRAAL, H. 1987. Hormones and Pheromones in the Control of Mating in Camel Ticks (5.065).
- EGYPT. University of Maryland; WILLIAMS, W.F. 1991. Use of Bovine cDNA Probes in the Study of Buffalo Embryo Mortality (11.222).
- GHANA. School of Mines, Tarkwa; APPIAH, H. 1990. Geology, Mining, Ecology and Potential of Small Scale Mining, Ghana (10.241).
- GHANA. Penn State University; FURTEK, D. 1990. Genetic Transformation of the Cocoa Tree, Theobroma cacao (10.139).
- GHANA. Forest Products Laboratory; JEFFRIES, T. 1990. Continuous fermentation of xylose by Pichia stipitis (10.299).

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GUATEMALA. University of California, Davis; BRICE, A. 1992. Enhanced Parrot Production in Guatemala: Alternative to Unregulated Harvesting (12.416).

GUATEMALA. U. del Valle de; LUJAN, R. 1987. Analysis of Immunogenic Proteins of Adult Onchocerca volvulus (6.225).

GUATEMALA. ICTA; MASSAYA, P. 1989. Construction and Application of Biologically-based Whole Farm Simulation Models in Guatemala (9.245).

GUATEMALA. Universidad del Valle; LUJAN, R. 1989. American Cutaneous Leishmaniasis: A Model for Vaccine Development Against Human Disease (9.378).

GUATEMALA. Amazonic Center Research Control Tropica; PETRALANDA, I. 1991. Isolation and Characterization of Onchocerca volvulus collagenase(s) Recombinant Proteins (9.085).

HAITI. U. Texas A&I; FELKER, P. 1989. Genetic Improvement of Cactus (Opuntia sp.) for Fruit, Vegetable and Fodder on Semi-Arid Lands (7.187).

HAITI. Tulane University; JAMES, M. 1991. Synthetic Peptide-Based Diagnosis of Plasmodium falciparum Infection in Haiti (10.485).

HONDURAS. University of Minnesota; ASCHER, P.D. 1992. Characterization of a Novel Germplasm for Drought Tolerance in Phaseolus (11.290).

HONDURAS. University of Florida; ROSALES, F. 1992. Evaluation and Selection of Banana Hybrids Resistant to Strains o Race 4 of Fusarium oxysporum f. sp. cubense (Panama) (12.162).

HONDURAS. Fundacion Hondureña; MOLINA, G. 1989. Utilization of a Host-Specific Phytotoxin in Black Sigatoka of Plantain and Banana (9.395).

HONDURAS. Fundacion Hondurena; TABORA, P. 1989. High Density Techniques in Palm Hearts Production (9.396).

HONDURAS. U. Wisconsin; BLISS, F. 1988. Control of Bruchid Seed Weevils of Common Bean Using Unique Seed Proteins Having Insecticidal Properties (8.166).

HONDURAS. Rutgers U.; DAIE, J. 1987. Regulation of Drought Tolerance in Bean (7.216).

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- HONDURAS. University of Wisconsin; HANDELSMAN, J. 1990. Optimizing the Rhizobium-Host Symbiosis for Increased Bean Production (10.189).
- HUNGARY. Oregon State University; BEDO, Z. 1992. Genetic Analysis of Cold Tolerance in Winter Barley (12.091).
- HUNGARY. University of Maryland; DUBE, S. 1992. Development of Recombinant Fowl POX and Vaccinia Virus Vectors for Use as Vaccines (12.103E).
- HUNGARY. Hungarian Academy of Sciences; RAJKAI, K. 1991. Optimal Resolution Mapping for Salt Affected Landscapes (12.058E).
- HUNGARY. Hungarian Academy of Sciences; BUZAS, I. 1991. Fate and Plant-Uptake of Toxic Trace Elements in Cropped Unsaturated Soil Profiles (12.056E).
- INDIA. Battelle Labs; FLEISCHMAN, D. 1987. Study of Nodulation of Aeschynomene by an Unusual Endophyte (6.300).
- INDIA. National Zoological Park; WEMMER, C. 1990. Population Biology and Genetics of the Asian Elephant (10.073).
- INDIA. U. Chicago; HASELKORN, R. 1988. Molecular Basis of Salt Tolerance in Nitrogen-fixing Cyanobacteria (7.082).
- INDONESIA. LHRI (Bandung); DURIAT, A.S. 1987. Biological Control of Cucumber Mosaic Virus (CMV), An Important Disease Causing Agent of Hort. Crops in Indonesia (5.254).
- INDONESIA. U. Michigan State; WHALON, M. 1988. Identification and Cloning of Esterase Gene Responsible for Insecticide Resistance in Brown Plantopper (8.395).
- INDONESIA. Tea Research Institute; TAHARDI, J.S. 1989. Commercialization of Clonal Micropropagation of Superior Tea Genotypes using Tissue Culture Technology (8.165).
- INDONESIA. Ohio State University; WRENSCH, D. 1990. Control of Scarlet Mite on Tea Using Massed Reared Predaceous Mites (10.594).
- INDONESIA. Bogor Agricultural University; LITZ, R. 1991. In Vitro Propagation of Important Dipterocarp Species for Tropical Rain Forest Regeneration (8.300).
- INDONESIA. Dartmouth College; PEART, D. 1991. Enrichment Planting with Native Species to Increase the Economic Value of Selectively Logged Tropical Rainforest (9.249).

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INDONESIA. University of Indonesia; PARTONO, F. 1991. ELISA Using Monoclonal Antibodies to Detect Infective Larvae of Brugia malayi in Vector Mosquitoes (9.436).

JAMAICA. Office/Disaster Prep; THORHAUG, A. 1987. The Toxicity of Oil Spill Clean-up Using Various Dispersants on Critical Tropical Habitat: Seagrasses, Mangroves, Corals (7.103).

JAMAICA. USDA; AMES, R. 1988. Selection of Compatible VA Mycorrhizal Fungi, Rhizobia and Inoculation Methods to Increase Cowpea Yields in Jamaica (8.052).

JAMAICA. Univ of the West Indies; BACON, P. 1989. Development of a Wetland Evaluation Model for the Caribbean (9.088).

JORDAN. University of Jordan; AMR, A. 1989. Development of a High-Phytase Bakers' Yeast (9.051).

KENYA. Ministry of Livestock; WAGHELA, S. 1992. A Two-Site Monoclonal Antibody Assay for Nairobi Sheep Disease Virus Infection (9.307).

KENYA. Wildlife Conservation Int'l New York Zoo; MCCLANAHAN, R. 1992. Fishing Impacts and Recovery of Kenyan Coral Reefs (12.108).

KENYA. Case Western Reserve University; BLANTON, R. 1992. Vaccine and Diagnostic Potential of a Recombinant Schistosoma haematobium Specific Antigen (12.439).

KENYA. U. Virginia State; HILU, K. 1987. Breeding of Finger Millet: Phase I Molecular Genetic Study (7.242).

KENYA. U. Washington State; MCGUIRE, T. 1987. Development of a Recombinant Subunit Vaccine for Heartwater in Domestic Ruminants. (7.240).

KENYA. Eastern Michigan Uni; DIRLIKOV, S. 1989. Reactive Diluents for High Solid Coatings Based on Vernonia Oil (9.035).

KENYA. U. of New Mexico; LOKER, E. 1989. Role of Abiotic and Biotic Factors in Controlling Disease-Transmitting Snails in Kenya: An Experimental Study (9.413).

KENYA. Eastern Virginia Medical School; ISAHAKIA, M. 1990. Development of an Immunocontraceptive Vaccine: Immunization of Female Baboons with Affinity Isolated Sperm Antigens. (8.136)

KENYA. U. Washington State; RURANGIRWA, F. 1990. Identification of a Recombinant Mycoplasma Protein that Protects Against Contagious Bovine Pleuropneumonia (8.326).

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- KENYA. University of Maryland; OKEYO-OWOUR, J. 1990. Management of Maize Stalk Borers in Kenya: The Interaction of Genotypic and Crop Species Diversity (9.239).
- KENYA. Kenya Trypanosomiasis Research Institute; NJOGU, A. 1991. Preclinical Evaluation of Combination Therapy for Trypanosoma brucei rhodesiense (10.410).
- KENYA. Tea Research Foundation; ONSANDO, J.M. 1991. A Biological Control Approach to Root Rot Fungus, Armillaria mellea (Vahl:Fr.) Using Tea as a Model (11.135).
- KENYA. ICIPE; OSIR, E.O. 1991. The Molecular Basis of Selective Toxicity in B. thuringiensis (11.409).
- KENYA. Washington State University; CRAWFORD, T. 1991. A Ruminant-Restricted General-Purpose Poxvirus Vaccine Vector (10.292).
- KENYA. KETRI; NJOGU, A.R. 1991. Characterization, Quantification, Regulation of Production and Cellular Origin of the Trypanotoxin Present in Serum from A (11.297).
- KENYA. Virginia Polytechnic Institute and State; HILU, K.W. 1991. Molecular Genetic Analysis of Semi-Arid Millets and their Related Wild Species (11.288).
- KENYA. University of Nairobi; KINOTI, G. 1991. Identification of Protective and/or Diagnostic Antigens of Schistosoma haematobium (9.398).
- LIBERIA. U. Johns Hopkins; SHIFF, C. 1989. Detection of Schistosome Carriers in Natural Waters (8.065).
- LIBERIA. LA State U.; PATRICK, W. 1991. Study of Adverse Soil Chemical Conditions in the Lowland Rice Area of West Africa. (7.203)
- MALAWI. Duke University Marine Lab; JOHNSON, T. 1992. Detection of Climatic Cycles in Lake Malawi Sediments (12.482).
- MALAWI. Pennsylvania State University; STAUFFER, J.R.. 1991. Methods to Determine Biodiversity in Complex Ecosystems Case Study: Fishes of Lake Malawi, Africa (11.204).
- MALAWI. University of Maryland; MCKAYE, K. 1990. Genetic Analysis and Stock Identification of Commercially Important Fishes from Lake Malawi (Lake Nyasa), Africa (10.069).

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MALAYSIA. U. Maryland; NEWELL, R. 1988. Contribution of Mangrove Detritus to the Production of Commercially Important Shrimp Species (8.054).

MALAYSIA. U. Harvard; TOMLINSON, P. 1988. Increasing the Exploitability of the Nypa Palm for Fuel and Wood (8.129)

MALAYSIA. Uniformed Services University of Health; LAL, R. 1990. Development of Monoclonal Antibodies to 'Filaria Specific' Antigen; Their Use in Immunodiagnosis of Lymphatic Filariasis (9.270).

MALI. Washington State University; HINES, S. 1992. Synthetic Peptide-based Immunodiagnostic Test for West African Isolates of Babesia bovis (12.251).

MALI. Inst. Rural Econ.; TRAORE, M. 1987. A Study of Physiological Mechanisms Associated with Drought Tolerance in Sorghum & Pearl Millet Grown in Sahel Regions of Mali (6.451).

MEXICO. Colegio de Postgraduados; ROJO, H.A. 1992. Development of Improved Erosion Prediction Technology in Mexico (11.453).

MEXICO. University of Maryland; SANCHEZ, F. 1992. Regulation of the Enzymes of Ureide Biosynthesis in Tropical Varieties of Legumes (12.367).

MEXICO. Colegio de Postgraduados; ROJO, H.A. 1992. Development of Improved Erosion Prediction Technology in Mexico (11.453).

MEXICO. U.N.A. Mexico; PALACIOS. 1989. Organization, Dynamics and Manipulation of Genetic Information in Rhizobium (8.600).

MEXICO. Colegio de Postgraduados; LAGUNES, A. 1989. Search of Powders and Water Extracts of Wild Plants with Insecticidal Activity to be Used in Small-scale Farming (9.125).

MEXICO. USDA; BETHLENFALVAY, G. 1988. Crop Enhancement Through Direct Transfer of Nutrients Between Legumes and Cereals by Mycorrhizal Fungi (8.055).

MEXICO. UNAM; XIMENEZ, G. 1990. Anti-E. histolytica Monoclonal IgA, Its Role in Protection Mechanism-In vitro and In vivo (9.130).

MEXICO. Colegio de Postgraduados; LAGUNES, A. 1990. Search of Powders and Water Extracts of Wild Plants with Insecticidal Activity to be Used in Small-scale Farming (9.125).

MEXICO. U. Washington; Allan, G. 1988. The Conversion of Lignaceous Biomass into Nonleaching Nitrogenous Fertilizer by Ammoxidation (8.108).

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- MOROCCO. Purdue University; OUAFAE, B. 1992. Use of Biotechnology for Improving Hessian Fly and Drought Resistance in Wheat (10.276).
- MOROCCO. Colgate University; SWEARINGEN, W. 1992. Is "Drought Following the Plow" in Lesser-Developed Countries? (12.382).
- MOROCCO. University of Minnesota; OLSZEWSKI, N. 1992. Development of a Universal PCR-Based System for the Detection of Plant Badnaviruses (12.430).
- MOROCCO. IAVH II; HOUSSINE, B. 1987. Investigation of Plastic Liners for Indigenous Underground Grain Storage Structures (7.336).
- MOROCCO. Institut Agronomique et Veterinaire Hass; BOUZOUBAA, K. 1991. Prevention of fowl typhoid with Salmonella gallinarum Outer Membrane Proteins (10.063).
- NEPAL. Tribhuvan University; SHARMA, M. 1992. Evolution of Annual Chayote (Sechium edule swartz.) Genotypes with Specific Characters for Specialized Vegetable Prod. (9.247).
- NEPAL. University of Hawaii; ALVAREZ, R. 1992. Survival of Plant Pathogenic Bacteria in Tropical Soils Traced with Monoclonal Antibodies (X ref. 7.138) (12.691).
- NEPAL. IAAS; ADHIKARI, T. 1987. Pathogenic Variability of and Bacteriocin Production by Xanthomonas campestris Pv. Oryzae in Nepal (7.093).
- NEPAL. Tribhuvan U.; AGRAWAL, V. 1987. Clonal Propagation of Pine Trees (P. roxburghii and P. wallichiana) by Methods of Tissue Culture (6.262).
- NEPAL. RONAST; JHA, J. 1988. Scientific Instrumentation Unit. A Unit for Repair, Maintenance & Innovation of Scientific Equipment (8.020).
- NEPAL. BioSystems Analysis, Inc.; JACKSON, R. 1990. Reducing Livestock Depredation Losses in the Nepalese Himalaya (9.256).
- NEPAL. Tribhuvan University; SHARMA, K. 1990. Exploitation of Genetic Yield Potentiality of Ua (Hordeum sp.) Germplasm in the High Altitude Himalayas (9.397).
- NEPAL. Tribhuvan University; RAJBHANDARI, B. 1990. Exploitation of Genetic Yield Potential of Common Buckwheat Ecotypes in Different Ecological Regions of Nepal (9.158).

DRAFT

- NEPAL. Tribhuvan University; CHAUDHARYM R,. 1990. Identification of Choerospondias axillaris Roxb. Seedlings with Fruiting Capacity (10.270).
- NEPAL. ICIMOD; VERMA, L.R. 1991. Exploration of Genetic Diversity in Himalayan Honeybees, Apis cerana F. (11.037).
- NEPAL. Royal Nepal Academy of Science and Tech.; SHRESTHA, T. K. 1991. Ranching Mahseer in the Himalayan Waters of Nepal (10.613).
- NIGERIA. Mississippi State University; RAMASWAMY, S. 1992. Oviposition Marker and Sex Pheromones of Callosobruchus Species (12.145).
- NIGERIA. U. Florida; SHANMUGAM, K. 1988. Genetically Altered Cyanobacteria (blue-green algae) as Nitrogen Fertilizer Supplier for Growth of Rice Plants (7.065).
- NIGERIA. Old Dominion University; MUSSELMAN, L. 1991. Biology of Striga aspera and Striga forbesii (10.033).
- PAKISTAN. PCSIR; SHAH, F.H. 1987. Regeneration of Pistacia vera and Phoenix dactylifera Female Plants by Tissue Cultures Technique. (5.075).
- PAKISTAN. Nuclear Institute for Ag and Biology; RAJOKA, M. 1988. Bioconversion of Lignocellulosic (LC) Biomass Produced on Saline Lands by Cellulomonas (6.163).
- PAKISTAN. Pakistan Agric.; JILANI, G. 1988. Studies On the Possible Use of Plants/Plant Products as Stored Grain Protectants. (6.322).
- PAKISTAN. Pakistan ARC; INAYATULLAH, C. 1988. Evaluation of Wheat, Barley and Sorghum Germplasm for Resistance to the Greenbug Schizaphis graminum (Rondani) (7.137).
- PAKISTAN. U. Punjab; RIAZUDDIN, S. 1988. Host Range Specificity of Agrobacterium tumefaciens Strains Isolated from Crown Gall Tumors on Fruit Trees in Pakistan (8.275).
- PAKISTAN. New Mexico State University; NI, JAMES. 1990. Seismotectonics of the Western Himalayas: Applications to Earthquake Prediction in Pakistan and Collisional Tectonics (9.038).
- PAKISTAN. USDA; LEWIS, G. 1988. Prostaglandin Metabolite in Blood and Milk of Water Buffaloes: Evaluation of a Possible Indicator of Uterine Infection (8.156).

DRAFT

- PERU. U. Peruana Cayetano Heredia; GUERRA, H. 1987. Proteolytic Enzymes: Evaluation as Purified Antigens in Diagnosis of Fascioliasis in Peru (7.075).
- PERU. Universidad Peruana; NARANJO, J. 1987. Studies in Transmission of Cryptosporidium: A Pathogen Associated with both Malnutrition and Infant Mortality (7.234).
- PERU. Johns Hopkins U.; GILMAN, R. 1987. Cysticercosis: New Opportunities for Targeting Detection and Treatment Using Elisa Technology (7.208).
- PERU. Int'l Potato Cent; DODDS, J. 1988. Conferring Resistance to Potato Viruses and Viroid by Molecular Interference Sequences Inc. into Potato by Agrobacteria (6.553).
- PERU. U. New Mexico; MORAIN, S. 1988. Analysis of Declining Traditional Crops Using Satellite Remote Sensing and GIS (7.258).
- PERU. University of Washington; HALL, B. 1991. Use of Highly Repeated, Taxon-Specific DNA Markers to Accelerate Transfer of Genes from Wild to Cultivated Potato (9.314).
- PERU. IMTAVH; BELLATIN, J. 1989. Cellular Immunity in Patients with Leishmaniasis in Peru (8.312).
- PERU. University of Alabama; ALVAREZ, J. 1989. Role of Nutritional Status in the Early Loss of Passive Immunity and Response to Measles Immunization (9.271).
- PERU. U. Michigan; GORCHOV, D. 1987. Seed Dispersal in a Tropical Forest Managed for Sustained Yield (7.228).
- PHILIPPINES. University of California, Berkeley; WEST, J. 1992. Enzyme and Phycocolloid Biotechnology for Marine Algal Product Improvement (12.389).
- PHILIPPINES. University of Hawaii; 1992. Studies on Utilization of Sesbania rostrata as Biofertilizer for Corn and Upland Rice (9.446).
- PHILIPPINES. University of North Carolina/Wilmington; TRONO, G. 1992. Philippine Algal Hydrocolloids: Chemical Characteristics as a Basis for Selection (10.157).
- PHILIPPINES. University of California, Berkeley; WEST, J. 1992. Enzyme and Phycocolloid Biotechnology for Marine Algal Product Improvement (12.389).

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PHILIPPINES. Michigan State University; DE BRUIJN, F. 1992. Induction of Nodules on Rice Roots by Rhizobium (12.644).

PHILIPPINES. IRRI; ZAPATA, F. 1987. Rice Somatic Embryogenesis: A Tool for the Production of Planting Materials for Hybrid Rice (7.032).

PHILIPPINES. UP at Los Banos; TRUNG, L. 1988. Improving Performance of Grazing Dairy Cattle Through Biological Control of Bovine Ticks Using Stylosanthes sp. (6.567).

PHILIPPINES. U. California; LAETSCH, W. 1988. Biotechnological Evaluation of Phycocolloid Quality for Marine Algal Product Improvement (8.236).

PHILIPPINES. U. S. Florida; DAWES, C. 1989. Branch and Tissue Culture of Philippine Species of the Red Seaweed, Eucheuma (7.150).

PHILIPPINES. University of Maryland; ANGLE, J. 1990. Influence of Soil Populations of Aspergillus flavus on Aflatoxin Contamination of Corn (10.402).

PHILIPPINES. University of Missouri; MORRIS, R.O. 1991. Lignification and Stem-Strength in Rice (11.438).

PHILIPPINES. U. Philippines; GARCIA, E. 1991. Development of a Vaccine Against Severe Hepatosplenic Disease in Schistosomiasis japonica (8.417).

PHILIPPINES. Leonard Wood Memorial; WALSH, G.P. 1991. Application and Evaluation of the Polymerase Chain Reaction in Leprosy (11.304).

PHILIPPINES. Leonard Wood Leprosy Research Center; CRUZ, E.. 1990. Rapid In Vitro Detection of Drug Resistant Mycobacterium leprae (10.099).

POLAND. University of Minnesota; SADOWSKY, M. 1992. Genetic Factors of Host and Microbe Affecting Soybean Nodulation Specificity (12.080E).

POLAND. Ohio State University; SZYJKOWSKI, A. 1992. Reclaiming Poland's Riverine Resources (12.100E).

POLAND. University of Iowa; KRAJEWSKI, W. 1992. Real-Time Estimation and Prediction of Radar Rainfall (12.115E). POLAND. University of Lodz; ZALEWSKI, M. 1991. Restoration Ecology of Two Percid Fishes in Poland and U.S.A. (12.031E).

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- PORTUGAL. U. NL; DA PONTE, M. 1987. Supercritical Fluid Extraction of Natural and Biological Products (7.143).
- PORTUGAL. Nat. Lab. for; VIGARIO, J. 1987. Immunological Study As a Basis for Differentiation of African Swine Fever Virus (ASFV) Types (6.150).
- PORTUGAL. Guibenkian IS; VAN UDEN, N. 1988. Roles of Acetic Acid & Lactic Acid in Yeast Fermentations; Biochemical and Biophysical Mechanisms (7.144).
- REPUBLIC OF CHINA. Washington State University; GABRIELSON, R.L. 1992. Development of a DNA Diagnostic Probe for Xanthomonas campestris p.v. Campestris (11.647).
- RWANDA. University of Wisconsin; MOERMOND, T. 1989. Animal Seed-Dispersers as Key Elements for Conservation of Tropical Forests (9.259).
- SENEGAL. Virginia Polytechnic Institute and State; GILES, R.H. 1992. The Influence of African Elephant Populations on Senegal Biodiversity (11.361).
- SINGAPORE. Plantek Int'l Ltd.; GAMBRIL, B. 1989. Cloning of Elite Cashew Trees by Generating Juvenility Through Micrografts Using Tissue Culture Technology (7.086).
- SOLOMON ISLANDS. University of Georgia; WIEBE, W. 1989. Mangrove Forests & Seagrass Meadows as Biological Water Quality Filters Along Tropical Coasts (9.393).
- SRI LANKA. Cornell University; GUNAWARDENA, N. 1992. Use of Natural Attractants of the Rice Pest, Leptocorisa acuta (Hemiptera: Coreidae), for Lowering Its Population Levels (12.147).
- SRI LANKA. U. Harvard; ASHTON, P. 1988. Understanding the Maintenance of Tree Species Richness for Silvicultural and Conservation Management (8.245).
- SRI LANKA. U. California; PLATZER, E. 1987. Molecular Diagnostics for Filarial Nematodes in Mosquito Vectors (6.309).
- SRI LANKA. U. Colombo; TILLEKERATNE, L. 1988. Studies on the Allelopathic Potential of Selected Plant Species and Characterization of Allelochemicals (8.254).
- SRI LANKA. Inst Fundamental Stu; ILEPERUMA, O. 1988. Photofixation of Dinitrogen on Semiconductor Catalysts (8.269).

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SRI LANKA. Oregon State University; MORRIS, R. 1990. Cycles of P and Other Nutrients in Alley Crops on Alfisols (10.229).

SUDAN. Old Dominion U.; DAY, F. 1987. Nitrogen Dynamics of the Acacia Senegal Agroforestry System in Sudan (7.136).

SUDAN. U. Khartoum; BAYOUMI, R. 1989. Is Resistance to Plasmodium falciparum Malaria in Sickle-Cell Trait Carr. Due to Acquisition of Enhanced Immune Response (7.036).

SWAZILAND. U. Swaziland; MAKHUBU, L. 1987. Testing the Potential Use of Plant Phytolaca dodecandra as a Molluscicide, Pesticide and Detergent (5.054).

SYRIA. ICARDA; ACEVEDO, E. 1989. Determination of Genetic Difference in Transpiration Efficiency of Field Grown Barley and Wheat Genotypes (9.385).

THAILAND. Energy Concepts; ERICKSON, D. 1988. Intermittent Solar Ammonia Absorption Cycle (ISAAC) Refrigeration for Lesser Developed Countries (6.454).

THAILAND. U. Georgia; JORDAN, C. 1988. Soil Phosphorus Mobilization and Increased Crop Productivity with Agro Forestry in Thailand (7.109).

THAILAND. Battelle Kettering; BAKER, D. 1987. Molecular Identification of Frankiae Using Cross Inoculation Group-Specific DNA Sequences (7.202).

THAILAND. Louisiana State Univ; PATRICK, W. 1989. Phosphorus Equilibria and Availability to Rice in Acid Sulfate Soils of Thailand (9.179).

THAILAND. Smithsonian Institution; WILDT, D. 1990. Enhancement of Cattle Productivity While Conserving Wild Cattle Species. (10.310).

THAILAND. BNF Resource Center, Dept. of Agriculture; BOONKERD, N. 1990. Ecologically Based Models for Prediction of Legume Inoculation Requirement (9.363).

THAILAND. Silpakorn University; CHAIMANEE, P. 1990. Enzyme-linked Immunoassay for the Determination of Bruceine and Related Quassinoid Compounds in Brucea javanica (L.). (9.234).

THAILAND. Kasetsart University; NOOMHORN, C. 1990. Preparation and Evaluation of Condensation Polymers for Membrane Application. (9.367).

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- THAILAND. Chulalongkorn Hspl; HANVANICH, M. 1989. Antigen Specific B Cell Frequency in Malarial Patients (8.191).
- THAILAND. Prince of Songkla University; WITITSUWANNAKUL, R. 1989. Molecular Mechanism of Yield Stimulant Ethylene on Rubber Production of Hevea brasiliensis (9.374).
- THAILAND. Chiang Mai U.; SITTISOMBUT, N. 1989. Correlation of Dengue Virus Virulence with the Ability to Stimulate Helper T Lymphocytes (9.322).
- THAILAND. Asian Institute of Technology; LITTLE, D. 1990. Use of Leguminous Tree Leaves as Fish Pond Inputs (10.461).
- THAILAND. King Mongkut's Institute of Technology; CHAIYANAN, S. 1990. Improvement of Bacterials Strains for the New Fish Sauce Fermentation Technique (10.462).
- THAILAND. U. Chiang Mai; SURIYANON, V. 1988. Sero-Epidemiology of Leprosy (8.700).
- THAILAND. USDA; DAVIS, R. 1989. Development of Monoclonal Antibodies for Rapid Accurate Indexing of Sweet Potato for Mycoplasma (8.359).
- TURKEY. Cukurova University; MENGI, Y. 1989. Improvement of the Earthquake Resistance of Low Strength Masonry by Means of Bamboo Reinforcement (9.089).
- TURKEY. Oregon State University; HAYES, P. 1989. Application of Doubled Haploid & Tissue Culture Techniques to Winter Barley Germplasm Enhancement (9.171).
- UGANDA. Harvard University, Peabody Museum; CHAPMAN, C. 1992. Maintaining Frugivore Populations: Implications for Conservation of Tropical Forests (12.308).
- UGANDA. Makerere University; SSENKONGA, G.S.Z. 1989. Rapid Diagnosis of Bovine Theileriosis in Uganda (9.229).
- UGANDA. Makerere University; KAGONYARAM G. 1989. Bovine Babesiosis Mass Screening and Diagnosis (9.312).
- VANUATA. U. of South Pacific; MANSCHARDT, R. 1988. Study of the Genetic Resources of the Plant Species Piper methysticum Forst or "Kava" (7.039).
- WESTERN SAMOA. U. Hawaii; HUE, N. 1990. Increasing Soil Productivity Through Organic Matter Management for South Pacific Countries (8.098).

DRAFT

WEST INDIES. FRESCA; MICHELINI, S. 1987. Forced Flower Expression of Barbados Cherry (6.609).

WESTERN SAMOA. U. South Pacific; ASGHAR, M. 1989. Increasing Nutrient Retention and Fertilizer Efficiency in Variable-Charge Soils by Using Locally-Available Liming (8.097).

ZAIRE. University of Wisconsin; MBAKULIRAMI, M. 1990. Study of the Factors Improving the Crycitoma Reproduction in Captivity--Towards a new Breed of Micro-Livestock (7.081).

ZAIRE. University of California, Berkeley; HARDER, D. 1991. The Plant Genetic Resources of the Zambesian Domain of Zaire (11.077).

ZIMBABWE. U. Florida; PALMER, G. 1987. Development of a Synthetic Peptide Vaccine for Protection Against Bovine Anaplasmosis (7.384).

ZIMBABWE. Johns Hopkins University; SHIFF, C. 1990. Prevention of Snail-Miracidium Interaction by Use of Controlled Release Copper to Reduce...Schistosomiasis (9.301).

ZIMBABWE. Frostburg State University; HOWARD, J. 1990. Identification and Conservation of Indigenous Tilapia Genetic Resources in Zimbabwe (10.197).

ZIMBABWE. Ministry of Agriculture; MUGWIRA, L. 1988. Mapping Crop and Soil and Plant Nutrient Status for Improved Fertilizer Recommendations (7.088).

ZIMBABWE. Washington State University; PALMER, G. 1991. Molecular-Based Diagnostics: Development of a Widely Applicable, Simplified Assay for Infectious Diseases of Cattle (10.106).

ZIMBABWE. DU TOIT, J. 1991. The Impact of Artificial Waterpoints on Nutrient Cycling in Semi-arid Savanna Regions of Zimbabwe. (11.649).

ZIMBABWE. Blair Research Laboratory, Harare; CHANDIWANA, S. 1991. Studies on Role of Cell Mediated Immunity in Relation to Infection with Schistosoma haematobium in Zimbabwe (9.111).

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SUPROJECT 2

AAAS Diplomacy Fellowship Program

The AAAS Diplomacy Fellowship Program was designed to provide A.I.D. with increasingly needed technical expertise and to provide postdoctoral social and natural scientists and engineers with an internationally-oriented public policy learning experience.

AAAS Science, Engineering and Diplomacy Fellows are placed in technical offices of regional bureaus or R&D to bring their scientific expertise to bear on the development problems of priority in the hosting office. The Fellowship is for a period of one year, with a negotiable option to renew for a second year. The Program's success is evident in its rapid expansion at AID/W from one Fellow in 1982 to 45 Fellows in 1992-93. To date over 130 AAAS Diplomacy Fellows have been placed in A.I.D. offices.

In 1990, the AAAS developed an overseas option within the Fellowship Program to allow current and former AAAS Diplomacy Fellows the opportunity for long-term assignment in the field. Overseas Fellows are placed as technical specialists in USAID Missions for one to two years. In 1992-93, there will be two AAAS Overseas Fellows; one assigned to Thailand and the other to Fiji.

AAAS Diplomacy Fellows in AID/W and overseas are involved in a wide range of activities, depending on hosting office priorities and needs. Diplomacy Fellows serve as technical advisors to their offices, assist with project management activities, draft issues and policy papers and conduct special projects and analyses.

A.I.D. Offices buy-in to R&D/R's grant with AAAS to host a Fellow in their office.

Manager Dr. Howard A. Minners, M.D.
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Cooperating Agency American Association for the
Advancement of Science

Contact Claudia Sturges
AAAS Program Director
1333 H St, NW
Washington DC 20005
(202) 289-4950

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1992-93 FIRST YEAR AAAS DIPLOMACY FELLOWS AT A.I.D.

<u>Fellow</u>	<u>Office Affiliation</u>
Felice Apter	R&D/POP/R
Ben Bergmann	R&D/R
Christine Bergmark	R&D/R
John Borrazzo	R&D/H/CD
Bruce Byers	R&D/ENR
Richard Cincotta	R&D/POP
Janelle Daane	PRE/CAP
Maxx Dilley	FHA/OFDA
Jeff Eppink	ASIA/DR
Eric Fajer	LAC/DR/E
Martin Ferguson	ASIA/TR
Gwen Griffith	R&D/R
Curt Grimm	AFR/DP/PSE
Gary Jahn	R&D/H/CD
James Valentine	R&D/UC
Jeannine Koshear	R&D/ENR
Susan Matthies	EUR/DR/HR
Kathleen Michels	R&D/R
Melinda Moree	R&D/H/AR
Pam Muick	ASIA/DR/TR
Linda Padgett	R&D/H/RSCU
Anne Patterson	NE/DR/ENR
Mark Powell	POL/SP
Traci Tanaka	R&D/UC
Richard Trostle	R&D/H/HSD
Stacey Tighe	R&D/ENR
William Wing	NIS/PAC

DRAFT

1992-93 SECOND YEAR AAAS DIPLOMACY FELLOWS AT A.I.D.

<u>Fellow</u>	<u>Office Affiliation</u>
Mark Barone	R&D/POP/R
Nancy Diamond	R&D/EID
Adrienne Ertl	R&D/H/CD
Larry Ford	R&D/ENR
Peter Frumhoff	R&D/EID
Bill Hausdorff	R&D/H/AR
Jim Holderbaum	NIS/TF/EET
Wendy Jackson	R&D/R
Dianne Janczewski	R&D/AGR/AP
Nancy Johnson	R&D/R
Thomas Johnson	ASIA/DR/TR
Mihira Karra	R&D/POP
Alex Moad	R&D/ENR
Karen Moore	R&D/ED/C
Jim Rieger	R&D/ENR
Helga Rippen	R&D/H/CD
Alex Segarra-Carmona	NE/DR/ENR
Alan Shroeder	AFR/ARTS/FARA
David Wagger	R&D/EI
Joy Wolf	AFR/ARTS/HHS

1992-93 AAAS OVERSEAS FELLOWS

<u>Fellow</u>	<u>U.S.A.I.D. Mission</u>
Rita Klees	USAID/Thailand
Caroly Shumway	USAID/Fiji

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SUBPROJECT 3

International Foundation for Science

The International Foundation for Science (IFS) is a non-governmental organization with a membership of 93 scientific academies and research councils in 79 countries. The Foundation supports young developing country scientists of merit by providing subgrants in the areas of aquatic resources, animal production, crop science, forestry/agroforestry, food science, and natural products. The researcher must carry out the research in his/her home country and institution is expected to provide salaries and basic research facilities. IFS grants are for up to \$12,000, and a single investigator may receive at most four such grants.

The total A.I.D. grant to the IFS is for US\$1.8 million for six years. AID funds about 8% of the core program. Currently Dr. Howard Minners is the President of the IFS.

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Cooperating Agency International Foundation for Science

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(8) 791-2900
FAX: (8) 660-26-18

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II. U.S.-Israel Cooperative Development Research Program

Project No. 936-5544

Life-Project-Budget: 19,000,000 Buy-In Capacity: N/A

Final Year Obligation: 9/30/95 PACD Date: 12/31/99

Geographic Area: Worldwide

Objectives:

To facilitate the application of Israeli experience and technical expertise in collaborative cutting-edge research activities designed to help solve problems that confront LDCs. The project provides AID funding for Israeli and LDC scientists to cooperate in research on significant LDC development problems, and thereby strengthen the capability of LDC scientists to do and continue such types of research.

Description:

The U.S.-Israel Cooperative Development Research (CDR) Program is closely modeled on the PSTC research grants program, and contributes to A.I.D.'s support of cutting edge research. CDR emphasizes areas in which Israeli technology and expertise could be particularly valuable to target countries; these areas include arid-lands and saline agriculture, irrigation and hydrology, and biological control of insects. This program has received over 2,000 applications for funding. Of these some 150 have been funded to date. Grants must involve investigators from countries receiving AID development assistance in collaboration with Israeli investigators. PSTC has funded projects involving scientists from over 60 developing countries.

The project encourages LDC and U.S. scientists to submit their most innovative ideas for funding. Proposals undergo internal and external scientific peer review. Four general criteria are applied to all projects: 1) Scientific Merit, 2) Relevance to Development, 3) Innovation, and 4) Strengthening the Research Capacity of Developing Countries.

There are two subprojects, one which funds collaboration with the Central Asian States of the former Soviet Union, and one which funds research in countries receiving AID development assistance, including the countries of Eastern Europe.

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All grants under the CDR program are currently made to the Israeli institution. The U.S. Science Attache, Mr. David Mulenex, serves as Project Officer, and the grants are made by the U.S. Embassy in Tel Aviv.

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SUPROJECT 1

CDR Central Asian Republic Small Grants Program

This is a special competition that was initiated in 1992, but which is expected to continue into the future. The first grants are to be made in FY 1993. The competition is based on full proposals, skipping the stage of preproposals involved in other Office of Research competitions.

Funding has been restricted to Agriculture. All project proposals are judged on four criteria:

- 1) Scientific Merit
- 2) Relevance to Development
- 3) Contribution to the Research Capacity in the C.A. republic
- 4) Collaboration between the Israeli and C.A.R. researchers.

Grants may be for two or three years. Maximum grant size is \$100,000 for two years, and \$150,000 for three years. Preference is given to proposals for the shorter period of time.

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SUPROJECT 2

CDR Regular Grants Competition

This is a general competition that was initiated in 1985.

The project encourages LDC and Israeli scientists to submit their most innovative ideas for funding. Proposals undergo internal and external scientific peer review. Four general criteria are applied to all projects:

- 1) Scientific Merit,
 - 2) Relevance to Development,
 - 3) Innovation,
- and 4) Contribution to the Research Capacity of the Host Country.

All project proposals are judged on four criteria:

- 1) Scientific Merit
- 2) Relevance to Development
- 3) Contribution to the Research Capacity in the C.A. republic
- 4) Collaboration between the Israeli and C.A.R. researchers.

Grants are generally for three to five years. Maximum grant size is \$200,000 for two years.

Preproposals can be submitted to the CDR program at any time. Those submitted before November 15th, will be considered for possible invitation of a full proposal the following year. Full proposals are submitted by August 15, and are reviewed by external peer review panels in October. Frequently investigators are asked to modify projects on the basis of external reviewer comments. Grants are to be made as early in the following year as possible.

Attached is a listing of CDR projects funded in the last five years. In order to be considered for 1994 funding, preproposals should be submitted to the Office of Research no later than November 15, 1992.

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CDR PROJECTS FUNDED
1987-1992

- BOTSWANA. Ben Gurion U.; KAGAN-ZUR, V. 1990. Cultivation of Terfezia pfeilii - The Kalahari Truffle (C9-124).
- CHILE. Ben Gurion U.; COHEN, Z. 1987. Spirulina as a Source of Biochemicals (C7-131).
- COSTA RICA. The Volcani Center; BEN-YEHOSHUA, S. 1992. Introduction of the New Technology of Modified Atmosphere Packaging in Plastic Film in Order to Reduce Spoilage and Exte (C11-076).
- COSTA RICA. Hebrew U.; SLATER, P. E. 1990. A Traffic Monitoring and Driver Behavior Modification System (C8-043).
- COSTA RICA. Tel Aviv University; OVADIA, M. 1991. Isolation, Characterization and Neutralization of Hemorrhagic Toxins from the Venom of the Snake Bothrops aspera (C11-004).
- COSTA RICA. CATIE; MULLER, L. 1988. In Vitro Germ Plasm Preservation of Musa sp. (C8-165).
- CZECHOSLOVAKIA. Czechoslovak Academy of Sciences; NERUD, F. 1992. Ligninolytic System of White-Rot Fungi (C12-047).
- CZECHOSLOVAKIA. Hebrew University of Jerusalem; SCHICK, A. 1992. The Response of Fluvial Systems to Large Scale Land-Use Changes (C12-090).
- CZECHOSLOVAKIA. The Hebrew University of Jerusalem; BALEK, V. 1992. Soils and Clays Contaminated by Organic Hazardous Pollutants (C12-219).
- CZECHOSLOVAKIA. The Hebrew University of Jerusalem; HAAS, Y. 1992. Studies of Atmospheric Chemistry and Air Pollution (C12-223).
- DOMINICAN REPUBLIC. Volcani Center; CHALUTZ, E. 1990. Biological Control of Postharvest Diseases of Fruits (C8-087).
- DOMINICAN REPUBLIC. Volcani Center; RACCAH, B. 1988. Characterization and Control of Cucurbit Viruses (C8-077).
- ECUADOR. Hebrew U. of Jerusalem; COHEN, D. 1990. Induction Gonad Maturation in Penaeus vannamei (C9-147).

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ECUADOR. Tel Aviv U.; FRIEDMAN, J. 1989. Application of a Novel Method for Selection and Domestication of Indigenous Plants, Among Food Gatherers in Ecuador (C8-159).

GAMBIA. Hebrew U. of Jerusalem; SOLLER, M. 1990. Mapping Genes for Trypanotolerance in N'Dama Cattle of West Africa (C9-018).

GHANA. Ben Gurion U.; TSOAR, H. 1987. Bimodal Eolian Desert Sand Sheets and Their Potential Significance for Development (C7-143).

GHANA. Hebrew University; CHET, ILAN. 1991. Upgrading of Lignocellulose Waste with White-Rot Fungi for Ruminant Animal Feed. (C9-184).

GUATEMALA. ICAITI; PORRES, C. 1989. Biological Upgrading of Pretreated Coffee Pulp (C8-108).

GUATEMALA. IPRG; RABINOWITZ, N. 1991. Development of Methodology and Procedures for Monitoring Seismic Data in Central America (C11-229).

HAITI. MIGAL-Galilee Tech.; MARCHAIM, U. 1989. An Integrated Macro-algae Cultivation Farm on Sand (C8-104).

INDIA. Weizmann Institute; JAFFE, C. 1989. Kala azar in Brazil: Immunological and Genotypic Characterization of Vicerotropic Leishmania (C7-103).

HUNGARY. Agricultural Research Organization; LURIE, S. 1992. Prevention of Pathogen Infection and Insect Infestation by a Postharvest Heat Treatment (C12-081).

INDIA. Israel Ocean & Limno; BEN-AMOTZ, A. 1989. Production of Beta-carotene and Other Carotenoids by the Alga dunaliella and their Use as a Source of Vitamin A (C8-011).

ISRAEL. Tel Aviv U.; WAHL, I. 1991. Utilization of Hordeum spontaneum Resistance for Barley Leaf Rust Control (C7-114).

KENYA. Hebrew University; GALUN, R. 1990. The Induction of Resistance to Lice by Immunization (C8-164).

KENYA. Kenya Medical Research Institute; KOECH, D. 1990. Bancroftian Filariasis: Development of Immunodiagnostic and Seroepidemiologic Methods and Use in Filariasis Surveys (C9-173).

KENYA. The Volcani Center; SHAINBERG, I. 1991. Infiltration, Runoff and Erosion in Semi-Arid Soils from Kenya (C11-255).

DRAFT

- KENYA. Hebrew U. of Jerusalem; KEYNAN, A. 1990. Increasing the Persistence of Bacillar Mosquito Larvicides: A Biological Approach. (C9-175).
- KENYA. Ben Gurion U.; MENDLINGER, S. 1988. The Germplasm Collecting, Evaluation and Breeding of Southern African Edible Cucurbits (C8-142).
- MEXICO. Ben Gurion U.; GOTTLIEB, M. 1988. Development of Novel Products from Guayule Rubber (C8-123).
- NAIROBI. Kimron Institute; LIPKIND, M. 1991. Antigenic and Functional Properties of Hemagglutinin-Neuraminidase Glycoprotein of Avian Paramyxoviruses (C8-026).
- NEPAL. U. Tel Aviv; GUTNICK, DAVID. 1991. Specific Inhibitors of Pectolytic Enzymes for Control of Post Harvest Diseases (C9-039).
- NIGERIA. Ben Gurion U.; DANON, A. 1987. Protein-Binding of Drugs in Malnutrition and Parasitic Disease (C7-128).
- NIGERIA. University of Delaware; CHENG, A. 1991. A Low-Cost Microcomputer Program for Modeling Multiaquifer Systems (C9-200).
- PERU. UPCH; MIRANDA, E. 1989. The Epidemiology and Biology of Crypto-sporidium Infection in Peru and Israel (C8-099).
- PHILIPPINES. The Hebrew University of Jerusalem; CHET, I. 1992. Crop Residue Decomposition with Trichoderma for Disease Management in Rice-Based Cropping Systems (C12-040).
- PHILIPPINES. Ben Gurion University of the Negev; LIPS, H. 1992. Salt Resistance of Rice (C12-157).
- PHILIPPINES. Volcani Center; NAVARRO, S.. 1990. Application of Modified Atmospheres Under Plastic Covers for Prevention of Losses in Stored Grain (C7-053).
- PHILIPPINES. Volcani Center; MINGELGRIN, U. 1990. Water Transport and Storage for Gravity Powered Irrigation (C5-049).
- PHILIPPINES. Volcani Center; SCHROEDER, G. 1989. The Role of Sulfate Ions in the Potential to Replace Refined Feeds with Agricultural Residues in Mariculture (C7-042).
- PHILIPPINES. Israel O&L Research; LUBZENS, E. 1989. Mass Culture of the Rotifer Barchionus, Plicatilis--Isolation of Clones and High Yield Production (C7-099).

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POLAND. Israel Institute of Technology; NARKIS, M. 1992. Electrically Conductive Structured Polymer Blends (C12-097).

POLAND. MIGAL Galilee Technological Center; DOSORETZ, C. 1992. Degradation of Recalcitrant Xenobiotics by Immobilized Cultures of the White Rot Fungus Phanerochaete chrysosporium (C12-182).

POLAND. Weizmann Institute of Science; GRESSEL, J. 1992. Reducing Herbicide Inputs to Reduce Costs, and Prevent and overcome Resistance (C12-217).

POLAND. The Hebrew University of Jerusalem; PINCHASOV, Y. 1992. The Control of Chicken Growth for Optimal Egg Production in Broiler Breeders (C12-224).

POLAND. The Volcani Center; ZILKAH, S. 1991. In Vitro Biological Indexing in Fruit Tree Quarantine System (C11-065).

PORTUGAL. Colegio de Postgraduados; FIGUEROA, B. 1989. Adaptation to Salt and Water Stress by Pulses Tolerant to Environmental Stress of the High Altitude Deserts (C7-039).

PORTUGAL. Ben Gurion U.; LIPS, H. 1989. Carob (Ceratonia sioqua L.) Productivity as Affected by Inorganic Nitrogen Fertilization (C8-134).

SRI LANKA. Kimron Veterinary Institute; BOGIN, E. 1987. Bacterial and Leucocytes Contents and Enzymes Levels in Milk as Methods for Deter...Quality...Detection of Mastitis. (C7-111)
Record No. 262

SRI LANKA. Volcani Center; PRUSKY, D. 1988. Prevention of Postharvest Disease by Modulation of Natural Antifungal Compound Concentration in Ripening Avocados (C8-089).

SWAZILAND. Volcani Center; BRESLER, E. 1990. A Methodology for Evaluation of New Irrigation Techniques Considering Application Uniformity (C9-156).

SWAZILAND. Volcani Center; ASHBELL, G. 1988. Dual Purpose Sorghum as Source for Food and Feed for the Semi-arid Tropics (C8-092).

TANZANIA. University of Dar-es-Salaam; MAJAJA, B. 1991. Developing Mechanical Harvesting and Handling Systems for Sisal (C11-027).

THAILAND. Chulalongkorn U.; WONGSIRI, S. 1989. Biological Control of the Varroa Bee Mite (Varroa jacobsoni) (C9-045).

DRAFT

THAILAND. Asian Institute of Technology; GUPTA, C. 1990. Engine Driven Potato Digger with Oscillating Blade for Small Farmers (C9-098).

THAILAND. Khon Kaen U.; PIMSAMARN, S. 1988. Use of Labiatae Plant Extracts for Insect Control (C8-198).

THAILAND. Khon Kaen U.; LEMYINGCHAROEN, S. 1988. Monitoring and Controlling the Salt Gradient in the Solar Pond (C8-200).

THAILAND. Volcani Center; SHAYA, E. 1989. The Use of Natural Products for the Control of Stored Product Insects (C5-077).

THAILAND. Ben Gurion U.; COHEN, Z. 1988. Production of Eicosapentaenoic Acid (EPA) by Microalgae (C8-136).

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III. Applying S&T to Development

Project No. 936-5545

Life-Project-Budget: 18.9 million **Buy-In Capacity:** 2.5 million

Final Year Obligation: FY 95 **PACD Date:** 12/31/95

Geographic Area: Worldwide

Objectives:

To provide technical support in the conduct of the PSTC and CDR programs. To support grants to bring scientists from the former Soviet Union to work in U.S. university-related laboratories. To provide other AID offices with buy-in access to the services of the NAS.

Description:

This project utilizes the National Academy of Sciences (NAS) to allow U.S. scientists to volunteer support for the Innovative Scientific Research grants program, to network with scientists from LDCs and the former Soviet Union, and to carry out and distribute selected studies on research topics of specific concern to A.I.D. target countries.

This project involves 2 subprojects:

- ◆ The NIS-CAST project funds scientific exchanges between the NIS and U.S. Universities, with all former Soviet scientists entering U.S. university laboratories. Funding for FY1992 and FY1993 is 2.25 million dollars.
- ◆ The NAS Cooperative Agreement provides research grants support and S&T information and is projected to continue at a rate of under \$2 million per year. Site visits, networking meetings, support activities, publications and reviews have been supported under this activity.

The project includes 4.9 million dollars in add-ons to the NAS Cooperative Agreement to provide scientific services to A.I.D. Offices.

Manager Dr. John A. Daly
 AID/R&D/R, Room 320, SA-18
 (703)-875-4444
 Fax: (703)-875-4157

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**Cooperating
Agency**

**National Academy of Sciences
Board on Science and Technology**

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Subproject 1

NIS-Cast Project

The Cooperation in Applied Science and Technology (CAST) program, administered by the National Academy of Sciences, supports visits of scientists and engineers from the NIS (Newly Independent States from the Former Soviet Union) to carry out joint research in U.S. universities and research institutions for one academic year (up to nine months). This program will help NIS scientists and engineers who have worked in defense related research in the NIS to apply their skills to civilian activities. Proposals are evaluated using the following criteria:

- ◆ benefits of the proposed research to the NIS and the U.S.
- ◆ contribution of the proposed research in improving scientific and technological linkages
- ◆ defense conversion aspect of the proposed research
- ◆ potential commercial applications stemming from the research and potential contribution to private sector development in the researcher's home country

To participate in the program, both the American host, and the NIS scientists must possess doctoral degrees or their equivalent. NIS scientists should plan to return to their country and apply the research experience they have gained.

Proposals for this new program have been invited in the following areas: 1) applied mathematics/statistics, 2) control theory, 3) computer science, 4) aeronautics, 5) applied physics, 6) materials science, 7) nuclear science, 8) electronics, 9) chemistry, 10) microbiology, 11) virology, and 12) engineering. So far, the CAST program has placed 70 scientists from the former republics of the Soviet Union in universities throughout the United States. It is expected to reach 150 placements by the end of the fiscal year.

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Collaborator National Academy of Sciences
 Office for Central Europe and Eurasia

Contact Dr. Gary Waxmonsky
 NAS/OCEE
 2101 Constitution Avenue
 Washington DC 20418
 (202) 334-2653

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SCIENTISTS FUNDED BY THE NIS-CAST PROJECT

Adamowicz, Ludwik
The University of Arizona
Foreign Specialist: Gutsev, Gennady
Institute of Chemical Physics - RAN
Chernogolovka, Russia
[REDACTED] [REDACTED]

Project: Theoretical studies of structures and properties of singly and doubly charged molecular anions

Aifantis, Elias
Michigan Technological Univ.
Foreign Specialist: Romanov, Alexey
A.F. Ioffe Physico-Technical Institute
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Physics and Mechanics of Defects and Plastic Deformation in Solids

Asher, Sanford
University of Pittsburgh
Foreign Specialist: Nabiev, Igor
Shemyakin Inst of Bioorganic Chemistry
Moscow, Russia
[REDACTED] [REDACTED]

Project: UV resonance Raman spectroscopy

Berliner, Lawrence
The Ohio State University
Foreign Specialist: Permyakov, Eugene
Inst. of Theoretical/Experimental Biophysics - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: α -Lactalbumin and Galactosyltransferase

Bird, Kimon T.
University of North Carolina
Foreign Specialist: Burdin, Konstantine
Moscow State University
Moscow, RUSSIA
[REDACTED] [REDACTED]

Project: Develop better methods of measuring heavy metals in algae.

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Brown, Larry
Cornell University
Foreign Specialist: Morozova, Elena
Institute of Physics of the Earth
Moscow, Russia
[REDACTED] [REDACTED]

Project: Deep Seismic Sounding

Bucher, Doris
New York Medical College
Foreign Specialist: Kharitonenkov, Igor
Ivanovsky Institute of Virology
Moscow, Russia
[REDACTED] [REDACTED]

Project: Dev't of rapid viral detection systems for
influenza and parainfluenza

Casasent, David Paul
Carnegie Mellon University
Foreign Specialist: Vasiliev, Anatoly
Lebedev Physical Institute
Moscow, RUSSIA
[REDACTED] [REDACTED]

Project: Use of Russian liquid crystal SLMs in 3 areas:
optical pattern recognition, morphological image processing,
and neural nets.

Caulton, Kenneth
Indiana University
Foreign Specialist: Gusev, Dimitry
Inst of Organic-Element Compounds
Moscow, RUSSIA
[REDACTED] [REDACTED]

Project: Mobilization and transformation of molecular
hydrogen to reduce multiple-bonded small molecules.

Cole, Julian
Rensselaer Polytechnic Inst
Foreign Specialist: Bogdanova-Ryzhova, Elena V.
Moscow Academy of Petroleum & Gas
Moscow, Russia
[REDACTED] [REDACTED]

Project: Mathematical problems of boundary layer theory

DRAFT

Conwell, Esther
University of Rochester
Foreign Specialist: Gartstein, Yuri
Dept of Thermophysics -- Uzbekistan Academy of Sciences
Tashkent, Uzbekistan
[REDACTED] [REDACTED]

Project: Conducting Polymers

Doane, J. William
Kent State University
Foreign Specialist: Pergamenshchick, Victor
Institute of Physics -- Ukrainian Academy of Sciences
Kiev, Ukraine
[REDACTED] [REDACTED]

Project: Structures in Large Surface-to-Volume Ratio Nematic Systems

Eastman, Lester
Cornell University
Foreign Specialist: Tager, Alexey
Institute of Radioengineering & Electronics
Moscow, Russia
[REDACTED] [REDACTED]

Project: Study of Noise in High Frequency Operation of Semiconductor Lasers

Emery, Ashley
University of Washington
Foreign Specialist: Nenarokomov, Alexey
Moscow Aviation Institute
Moscow, Russia
[REDACTED] [REDACTED]

Project: Heat transfer -- inverse methodology and sensitivity analysis

Evans, Dennis
University of Delaware
Foreign Specialist: Laikhter, Andrei
N.D. Zelinsky Inst. of Organic Chem. - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Chemistry of nitro compounds

DRAFT

Folk, William
University of Missouri
Foreign Specialist: Nosikov, Valery
Nat'l Research Inst. of Genetics
Moscow, Russia
[REDACTED] [REDACTED]

Project: Polymerase chain reaction technology

Freed, Karl
University of Chicago
Foreign Specialist: Brazhnik, O., Olga
Institute of Applied Physics - RAN
Nizhniy Novgoro, Russia
[REDACTED] [REDACTED]

Project: Lattice Cluster Theory of Polymer Systems

Freed, Karl
University of Chicago
Foreign Specialist: Brazhnik, P, Pavel
Institute of Applied Physics - RAN
Nizhniy Novgoro, Russia
[REDACTED] [REDACTED]

Project: Phase Separation and Ordering in Blends and Block Copolymer Systems

Freeman, Arthur
Northwestern University
Foreign Specialist: Mryasov, Oleg
Institute of Solid State Chemistry
Ekaterinburg, Russia
[REDACTED] [REDACTED]

Project: Computer Modelling of Crystalline and Amorphous Magnetic Materials

Futrell, Jean
University of Delaware
Foreign Specialist: Sukhov, Andrey M.
Moscow Inst of Physics & Technology
Dolgoprydny, Russia
[REDACTED] [REDACTED]

Project: Investigation of ion-molecule collisions

DRAFT

Garfunkel, Eric
Rutgers University

Foreign Specialist: Gusev, Evgeny
Moscow Engineering Physics Institute
Moscow, Russia
[REDACTED] [REDACTED]

Project: A joint proposal to study the basic science of
chemical vapor deposition

Goodman, Erik D.
Michigan State University

Foreign Specialist: Radzevich, Stepan P.
Dneprodzerzhinsk Indust. Institute
Dneprodzerzhinsk, Ukraine
[REDACTED] [REDACTED]

Project: Numerically controlled machining of complex
sculptured surface parts

Granatstein, Victor L.
University of Maryland

Foreign Specialist: Vlasov, Alexander N.
Moscow State University
Moscow, Russia
[REDACTED] [REDACTED]

Project: Coherent sources of electromagnetic radiation in
millimeter, submillimeter & shorter wave lengths

Gubbins, Keith
Cornell University

Foreign Specialist: Akhmanatskaya, Elena
Institute for Low Temperature Physics & Engineering
Kharkov, Ukraine
[REDACTED] [REDACTED]

Project: Molecular simulation study of transport phenomena
in fluids confined in narrow pores

Gurarie, David E.
Case Western Reserve University

Foreign Specialist: Turbiner, Alexander V.
Inst of Theoretical & Experimental Physics
Moscow, Russia
[REDACTED] [REDACTED]

Project: Quantum systems in strong magnetic fields

DRAFT

Gustafson, Karl
University of Colorado
Foreign Specialist: Kobelkov, George
Moscow State University
Moscow, RUSSIA
[REDACTED] [REDACTED]

Project: Computer simulations and numerical analysis in
fluid dynamics

Hamburger, Michael W.
Indiana University
Foreign Specialist: Khalturin, Vitaly I.
Institute of Physics of the Earth
Moscow, Russia
[REDACTED] [REDACTED]

Project: Earthquake seismology centered on the seismically
active areas of the Central Asian republics

Hamburger, Michael W.
Indiana University
Foreign Specialist: Rautian, Tatyana G.
Institute of Physics of the Earth
Moscow, Russia
[REDACTED] [REDACTED]

Project: Earthquake seismology centered on the seismically
active areas of the Central Asian republics

High, Michael
University of Tennessee
Foreign Specialist: Nashempa, Xenia
Environmental Consulting Center
Kiev, Ukraine
[REDACTED] [REDACTED]

Project: Dev't of hybrid neural network/expert system
prototype for nuclear power plant operational control

Jensen, Donald
Utah State University
Foreign Specialist: Privalski, Victor
Institute of Applied Astronomy - RAN
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Statistical studies of actual and simulated
climates at different scales of spatial averaging...

DRAFT

Kaup, David
Clarkson University
Foreign Specialist: Rupasov, Valery
Institute of Spectroscopy
Troitsk, Russia
[REDACTED] [REDACTED]

Project: Stimulated Raman Scattering -- Quantum nature and integrable models of classical theories

Kazemersky, Philip
University of Tennessee
Foreign Specialist: Morozov, Alex
Environmental Consulting Center
Kiev, Ukraine,
[REDACTED]: [REDACTED]

Project: Dev't of hybrid neural network/expert system prototype for nuclear power plant operational control

Knight, Larry
Brigham Young University
Foreign Specialist: Ivanov, Leonid
Inst of Spectroscopy
Troitsk, RUSSIA
[REDACTED] [REDACTED]

Project: Theoretical investigation of laser schemes in capillary discharge plasmas: to determine plasma conditions necessary for soft x-ray amplified spontaneous emission.

Knight, Larry
Brigham Young University
Foreign Specialist: Ivanova, Elena
Inst of Spectroscopy
Moscow, RUSSIA
[REDACTED] [REDACTED]

Project: Theoretical investigation of laser schemes in capillary discharge plasmas: to determine plasma conditions necessary for soft x-ray amplified spontaneous emission.

Larson, Daniel
University of Virginia
Foreign Specialist: Kiyan, Igor
General Physics Institute
Moscow, Russia
[REDACTED] [REDACTED]

Project: Photodetachment spectroscopy

DRAFT

Lipson, Edward
Syracuse University

Foreign Specialist: Sineshchekov, Alexey
K.A. Timiriazev Inst of Plant Physiology
, Russia

██████████ ██████████

Project: Study of fungus *Phycomyces* as a model system for sensory transduction processes

Lipton, Mark
Purdue University

Foreign Specialist: Arshinova, Rauza
Kazan State University
Kazan, Russia

██████████ ██████████

Project: Organic synthesis and computational studies

Lommel, Steven A.
North Carolina State Univ

Foreign Specialist: Zavriev, Sergei K.
Inst of Agricultural Biotechnology
Moscow, Russia

██████████ ██████████

Project: The mechanism of plant virus cell-to-cell movement

Lopez, Ramon
University of Maryland

Foreign Specialist: Taktakishvili, Alexander
Abastumani Astrophysical Observatory
Tbilisi, Georgia

████████████████████

Project: Studies of Magnetospheric Structure & Dynamics in the Nightside Ionosphere-Magnetotail Region

Mamantov, Gleb
University of Tennessee

Foreign Specialist: Sidorin, Gennadi
Moscow Steel & Alloys Institute
Moscow, Russia

██████████ ██████████

Project: Dev't of an R&D sensor program for aluminum electrolytic processes

DRAFT

Matyjaszewski, Krzysztof
Carnegie Mellon University
Foreign Specialist: Zaremsky, M. Yu.
Moscow State University
Moscow, Russia
[REDACTED] [REDACTED]

Project: Synthesis of polymers via living radical
polymerization using cyclic initiators/transfer agents

McClure, Donald
Princeton University
Foreign Specialist: Basun, Sergei
A.F. Ioffe Physico-Technical Institute
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Photoelectric Studies of One- and Two-step
Photoionization of 3d and 4f Ions in Insulators

McFadden, Bruce
Washington State University
Foreign Specialist: Romanova, Alla
Institute of Soil Science & Photosynthesis - RAN
Pushchino, Russia
[REDACTED] [REDACTED]

Project: Increased Plant Productivity via Genetic
Engineering of Rubisco

Miley, George H.
University of Illinois
Foreign Specialist: Batyrbekov, Erlan
Nuclear Physics Inst
Alma-Ata, KAZAKHSTAN
[REDACTED]

Project: Study the design of optimized energy extraction and
beam formation from large-volume gas lasers.

Miley, George
University of Illinois
Foreign Specialist: Grebyonkin, Konstantin F.
Institute of Technical Physics
Chelyabinsk-70, Russia
[REDACTED]

Project: Obtain basic understanding of radiation-induced
plasmas

DRAFT

Moynihan, Cornelius
Rensselaer Polytechnic Institute
Foreign Specialist: Mashkov, Vladimir
Inst of Optical Materials Science
St. Petersburg, RUSSIA
[REDACTED] [REDACTED]

Project: Light scattering in glasses/relevance to glass transition process.

O'Keefe, Thomas
University of Missouri-Rolla
Foreign Specialist: Kozlov, Alexander
Sov.-Dan.-Leichtenstein Joint Venture Chelek
Moscow, Russia
[REDACTED] [REDACTED]

Project: Spontaneous electrochemical removal of metal ions from organics

Pratt, David
University of Pittsburgh
Foreign Specialist: Medvedev, Emile
Institute of Chemical Physics - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Experimental/theoretical studies of Tl-SO phosphorescence excitation spectrum of an organic molecule

Prelas, Mark
The University of Missouri
Foreign Specialist: Magda, Eduard
Institute of Technical Physics
Chelyabinsk - 7, Russia
[REDACTED] [REDACTED]

Project: Alkali metal vapor lamps

Prelas, Mark
University of Missouri
Foreign Specialist: Spitsyn, Boris
Inst of Physical Chemistry
Moscow, Russia
[REDACTED] [REDACTED]

Project: Dev't of p-n junctions in polycrystalline film and diamond film purity.

DRAFT

Richardson, Martin
University of Central Florida
Foreign Specialist: Vasilev, Andrew
Vavilov State Optical Institute
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Technological applications of laser plasmas

Roecker, Steven
Rensselaer Polytechnic Inst.
Foreign Specialist: Makeyeva, Larissa
Institute of Physics of the Earth - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Investigation of SV diffracted waves: observations and interpretation

Roecker, Steven
Rensselaer Polytechnic Inst.
Foreign Specialist: Petersen, Natasha
Institute of Physics of the Earth - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Analyze broadband waveforms from digital and analog seismic stations of the NIS

Rossman, Michael
Purdue University
Foreign Specialist: Gorbalenya, Alexander
Institute of Poliomyelitis and Viral Encephalitides - RAMS
Moscow, Russia
[REDACTED] [REDACTED]

Project: Model proteases encoded by genomes of flavi- and related viruses

Rozgonyi, George
North Carolina State University
Foreign Specialist: Koveshnikov, Sergei
Inst of Microelectronics Technology &
Moscow, Russia
[REDACTED] [REDACTED]

Project: Processes influencing type, density, thermal stability, and electronic behavior of precess-induced defects in silicon materials. Application of analytical instrumentation for defect characterization in semiconductors.

DRAFT

Rubinstein, Michael
University of Rochester

Foreign Specialist: Dobrynin, Andrey
Institute of Mineralogy, Geochemistry, & Crystal Chemistry
Elements
Moscow, Russia
[REDACTED] [REDACTED]

Project: Reinforcement of Polymer Blends by Copolymers

Salama, Guy
University of Pittsburgh

Foreign Specialist: Efimov, Igor
Inst of Theoretical & Experimental Biophysics
Pushchino, Russia
[REDACTED] [REDACTED]

Project: Processes of activation and repolarization in the
heart muscle

Schetz, Joseph
Virginia Polytechnic Institute

Foreign Specialist: Marshakov, Alexei
Central Institute of Aviation Motors
Moscow, Russia
[REDACTED] [REDACTED]

Project: Skin friction measurements on the blades of
two-dimensional turbine blade cascades

Schick, Paul
Cardeza Foundation

Foreign Specialist: Pestina, Tamara
Institute of Biomedical Chemistry
Moscow, Russia
[REDACTED] [REDACTED]

Project: Megakaryocyte Protein Synthesis: Role in the
Genesis of Platelet Dysfunction

Schmidt, V. Hugo
Montana State University

Foreign Specialist: Sinitski, Alexey
Inst of General Physics
Moscow, Russia
[REDACTED] [REDACTED]

Project: Investigation of proton glass mixed crystals.

DRAFT

Schmidt, V. Hugo
Montana State University
Foreign Specialist: Siny, Igor G.
A.F. Ioffe Physical Technical Institute
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Study of proton glass crystals, piezoelectric polymers, and liquid crystals

Schwarz, James A.
Syracuse University
Foreign Specialist: Dyakonov, Alexander J.
A.V. Topchiev Inst of Petrochem Synthesis
Moscow, Russia
[REDACTED] [REDACTED]

Project: Catalysis studies involving nickel

Shur, Michael
University of Virginia
Foreign Specialist: Bykhovski, Alexei
AF Ioffe Institute of Physics and Technology
St. Petersburg, Russia
[REDACTED] [REDACTED]

Project: Developing new approaches to epitaxial growth of wide band nitrides

Stewart, Clayton
George Mason University
Foreign Specialist: Gurevitch, Igor
Scientific Council Cybernetics - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Genetic Algorithms and Neural Networks for Image Analysis and Classification

Strom, Peter F.
Cook College/Rutgers University
Foreign Specialist: Ksenofontov, Victor
Volgograd Civil Engineering Inst
Volgograd, RUSSIA
[REDACTED] [REDACTED]

Project: Optimization of traditional activated sludge and newer rotating biological contactor wastewater treatment systems; application of biological waste treatment to contaminated soil; anaerobic treatment of wastes.

DRAFT

Thompson, David
OR Graduate Institute of S&T
Foreign Specialist: Gerasimov, Oleg
Institute of Catalysis
Novosibirsk, Russia
[REDACTED] [REDACTED]

Project: Characterization of Immobilized Oxidation and
Reduction Catalysts on Stabilized Membrane Supports

Trupin, Joel
Meharry Medical College
Foreign Specialist: Kozlov, Evgenii
Institute of Biological & Medical Chemistry
Moscow, Russia
[REDACTED] [REDACTED]

Project: Keloid and Normal Fibroblasts

Umstadter, Donald
University of Michigan
Foreign Specialist: Maksimchuk, Anatoly
P.N. Lebedev Physical Institute - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Physics & applications of novel compact
ultra-short-pulse x-ray sources

Umstadter, Donald
University of Michigan
Foreign Specialist: Shlyaptsev, Vyachelslav
. Lebedev Physical Institute - RAN
ow, Russia
[REDACTED]

Project: Ultrafast optical science

Urish, Daniel
University of Rhode Island
Foreign Specialist: Prilepin, Vladimir
Moscow University
Moscow, Russia
[REDACTED] [REDACTED]

Project: Environmental assessment of the Davisville-Quonset
Point land and contiguous coastal waters

DRAFT

Venanzi, Carol
New Jersey Institute of Tech.
Foreign Specialist: Luzkhov, Victor
Institute of Chemical Physics
Chernogolovka, Russia
[REDACTED] [REDACTED]

Project: Solvation studies of artificial enzymes

Waber, James
Michigan Technological Univ.
Foreign Specialist: Uinin, Yuri
Institute for Solid State Physics - RAN
Chernogolovka, Russia
[REDACTED] [REDACTED]

Project: Effects of Structural Modification on the
Properties of Semiconductors

Waldrop, William
Tennessee Valley Authority
Foreign Specialist: Nazarov, Nick
Water Problems Institute - RAN
Moscow, Russia
[REDACTED] [REDACTED]

Project: Develop improved computerized methods for
multi-objective operation of reservoirs ...

Wehry, Earl
University of Tennessee
Foreign Specialist: Zuzin, Alexander
Institute for Nuclear Research/Moscow State University
Moscow, Russia
[REDACTED] [REDACTED]

Project: Chemical Interactions of Polycyclic Aromatic
Hydrocarbons with Coal Fly Ash...

Welch, Ronald M.
S.D. School of Mines & Technology
Foreign Specialist: Vasilyev, Oleg
Leningrad State University
St. Petersburg, RUSSIA
[REDACTED]

Project: Use of hyperspectral image spectrometry in remote
sensing.

DRAFT

Widholm, Jack Milton
University of Illinois
Foreign Specialist: Lozovaya, Vera
Kazan Institute of Biology
Kazan, RUSSIA
[REDACTED] [REDACTED]

Project: Study composition, synthesis and turnover of cell wall components and starch in photoautotrophic plant cell suspension cultures.

Winefordner, James D.
University of Florida
Foreign Specialist: Bolshov, Mikhail A.
Institute of Spectroscopy
Troitsk, Russia
[REDACTED] [REDACTED]

Project: Attogram detection with graphite furnace atomization and laser enhanced ionization detection

Yeager, Ernest
Case Western Reserve Univ.
Foreign Specialist: Groza, Ivan
International University
Kishinev, Moldova
[REDACTED] [REDACTED]

Project: Metal Oxide Composite Coats as Anodes for Oxygen Evolution

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Subproject 2

NAS Cooperative Agreement

The Office of Research has had a relationship with the National Academy of Sciences since 1981, when the previous project (#936-5538), Applying Science and Technology to Development, was initiated. Under that project a grant was made to the NAS Board on Science and Technology for International Development (BOSTID), which funded six research grant areas, and developed a series of science policy papers and technical monographs relating to development. In 1988 Project 936-5545 replaced the functions of 936-5538.

The NAS Cooperative Agreement was put in place in August 1988 with the purpose of organizing and operating a program that would assist researchers in applying advanced scientific techniques and innovative technology to important problems of A.I.D. target countries, and to strengthen the institutional capacity of those countries. Scientific support includes direct support for the program such as peer review and advice on specific projects and groups of projects. It also provides support for the networking of scientists through meetings, scientific exchanges and other mechanisms, as well as S&T information support activities.

AID offices and missions have bought in to this project. For example, NAS/BOSTID panels provided the Office of Agriculture with advice on the development of programs in Sustainable Agriculture, Soil and Water Management, and Integrated Pest Management. It is providing the Center for University Relations in Development with external peer review for the University Linkages and Historically Black Colleges and University Competitive grants programs.

Scientific studies, study distribution and information services are also provided under the provisions of the agreement. A list of NAS/BOSTID Reports currently in print follows. Copies are available without charge to USAID Missions, and to developing country professionals. For copies, inquire from Ms. Wendy White at the address given below.

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Collaborator National Academy of Sciences
 Office for Central Europe and Eurasia

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NAS/BOSTID
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Washington DC 20418
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NAS/BOSTID REPORTS FUNDED BY THE AID OFFICE OF RESEARCH

Agroforestry in the West African Sahel. 1984. 86pp. Provides development planners with information regarding traditional agroforestry systems - their relevance to the modern Sahel, their design, social and institutional considerations, problems encountered in the practice of agroforestry, and criteria for the selection for appropriate plant species to be used. ISBN 0-309-04174-0.

Alcohol Fuels: Options for Developing Countries. 1983. 128pp. Examines the potential for the production and utilization of alcohol fuels in developing countries. Includes information on various tropical crops and their conversion to alcohols through both traditional and novel processes. ISBN 0-309-04160-0.

Amaranth: Modern Prospects for an Ancient Crop. 1983. 81pp. before the time of Cortez grain amaranths were staple foods of the Aztec and Inca. Today this extremely nutritious food has a bright future. The report discusses vegetable amaranths also. ISBN 0-309-04171-6.

Applications of Biotechnology to Traditional Fermented Foods. 1992. 207pp. Microbial fermentations have been used to produce or preserve foods and beverages for thousands of years. New techniques in biotechnology allow better understanding of these transformations so that safer, more nutritious products can be obtained. This report examines new developments in traditional fermented foods. ISBN 0-309-04685-8.

Butterfly Farming in Papua New Guinea. 1983. 36pp. Indigenous butterflies are being reared in Papua New Guinea villages in a formal government program that both provides a cash income in remote rural areas and contributes to the conservation of wildlife and tropical forests. ISBN 0-309-04168-6.

Calliandra: A Versatile Small Tree for the Humid Tropics. 1983. 56pp. This Latin American Shrub is being widely planted by villagers and government agencies in Indonesia to provide firewood, prevent erosion, provide honey and feed livestock. ISBN 0-309-04166-X.

Casuarinas: Nitrogen-Fixing Trees for Adverse Sites. 1983. 118pp. These robust nitrogen-fixing Australasian trees could become valuable resources for plating on harsh eroding land to provide fuel and other products. Eighteen species for tropical lowlands and highlands, temperate zones, and semiarid regions are highlighted. ISBN 0-309-04167-8.

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Conserving Biodiversity: A Research Agenda for Development Agencies. 1992. 127 pp. Reviews the threat of loss of biodiversity and its context within the development process and suggests an agenda for development agencies. ISBN 0-309-04683-1.

Crocodiles as a Resource for the Tropics. 1983. 60pp. In most parts of the tropics crocodilian populations are being decimated but programs in Papua New Guinea and a few other countries demonstrate that, with care, the animals can be raised for profit while protecting the wild populations. ISBN 0-309-04169-4.

Cutting Edge Technologies and Microcomputer Applications for Developing Countries. 1988. 489pp. Microcomputers play a special role in development, facilitating access to and implementation of new technologies. For those countries with experience in microcomputer use, applications need not be limited to the more traditional areas of record-keeping, accounting, and education. In this report, advanced computer concepts - such as artificial intelligence, computer-aided design and manufacturing, applied expert systems, and geographic information systems -- are described and assessed. ISBN 0-8133-7645-9.

Environmental Change in the West African Sahel. 1984. 96pp. Identifies measures to help restore critical ecological processes and thereby increase sustainable production in dryland farming, irrigated agriculture, forestry, and fuelwood, and animal husbandry. Provides baseline information for the formulation of environmentally sound projects. ISBN 0-309-04173-2.

Fisheries Technologies for Developing Countries. 1987. 167pp. Identifies newer technologies in boat building, fishing gear and methods, coastal mariculture, artificial reefs and fish aggregating devices, and processing and preservation of the catch. The emphasis is on practices suitable for artisanal fisheries. ISBN 0-309-04260-7.

Jojoba: New Crop for Arid Lands. 1985. 102pp. In the last 10 years the domestication of jojoba, a little-known North American desert shrub, has been all but completed. This report describes the plant and its promise to provide a unique vegetable oil and many likely industrial uses. ISBN 0-309-04251-8.

Leucaena: Promising Forage and Tree Crops for the Tropics (Second Edition). 1984. 100pp. Describes a multi-purpose tree crops of potential value for much of the humid lowland tropics. Leucaena is one of the fastest growing and most useful trees for the tropics. ISBN 0-309-04250-X.

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Little-Known Asian Animals with a Promising Economic Future. 1983. 133pp. Describes banteng, madura, mithan, yak, kouprey, babirusa, javan warty pig and other obscure but possibly globally useful wild and domesticated animals that are indigenous to Asia. ISBN 0-309-04170-8.

Lost Crops of the Incas. 1989. 415pp. The Andes is one of the seven major centers of plant domestication but the world is largely unfamiliar with its native food crops. When the Conquistadores brought the potato to Europe, they ignored the other domesticated Andean crops—fruits, legumes, tubers, and grains that had been cultivated for centuries by the Incas. This book focuses on 30 of the 'forgotten' Incan crops that show promise not only for the Andes but for warm-temperate, subtropical, and upland tropical regions in many parts of the world. ISBN 0-309-94264-X.

Making Aquatic Weeds Useful: Some Perspectives for Developing Countries. 1976. 175pp. Describes ways to exploit aquatic weeds for grazing, and by harvesting and processing for use as compost, animal feed, pulp, paper, and fuel. Also describes use for sewage and industrial wastewater. ISBN 0-309-04153-X.

Mangium and Other Fast-Growing Acacias for the Humid Tropics. 1983. 63pp. Highlights ten acacia species that are native to the tropical rain forest of Australasia. That they could become valuable forestry resources elsewhere is suggested by exceptional performance of Acacia mangium in Malaysia. ISBN 0-309-04165-1.

Manpower Needs and Career Opportunities in the Field Aspects of Vector Biology. 1983. 53pp. Recommends ways to develop and train the manpower necessary to ensure that experts will be available to understand the complex ecological relationships of vectors with human hosts and pathogens that cause such diseases as malaria, dengue fever, filariasis, and schistosomiasis. ISBN 0-309-04252-6.

Microcomputers and Their Applications for Developing Countries. 1986. 236pp. An overview of microcomputer applications in developing countries and the issues associated with their rational dissemination. The first section of the book is an assessment of the need for microcomputers in the development field and for the other interested computer-literate individuals, while the second part is divided into applications in agriculture, health, energy, and municipal management. Policy concerns are addressed in the final section as well as the problems of technology transfer as countries try to establish national computer policies that meet local needs while encouraging creative and useful applications. ISBN 0-8133-7252-6.

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Microcomputer Applications in Education and Training. 1987. 309pp. Recommends ways for the training of teachers and the applications of microcomputers in their curriculums, including the implications of integrating microcomputers into the classroom as well as various classroom uses for microcomputers in mathematical and analytical problem solving. ISBN 0-8133-7488-X.

Microlivestock: Little-Known Small Animals with a Promising Economic Future. 1990. 449pp. Discusses the promise of small breeds and species of livestock for Third World villages. Identifies more than 40 species, including miniature breeds of cattle, sheep, goats, and pigs; eight types of poultry; rabbits; guinea pigs and other rodents; dwarf deer and antelope; iguanas; and bees. ISBN 0-309-04265-8.

More Water for Arid Lands: Promising Technologies and Research Opportunities. 1974. 153pp. Outlines little-known but promising technologies to supply and conserve water in arid areas. ISBN 0-309-04151-1.

Neem: A Tree for Solving Global Problems. 1992, 148pp. The Neem tree offers great potential for agricultural, industrial, and commercial exploitation, and is potentially one of the most valuable of all arid-zone trees. It shows promise for pest control, reforestation, and improving human health. Safe and effective pesticides can be produced from seeds at the village level with simple technology. Neem can grow in arid and nutrient-deficient soils and is a fast-growing source of fuelwood. ISBN 0-309-04686-6.

Opportunities for Control of Dracunculiasis. 1983. 65pp. Dracunculiasis is a parasitic disease that temporarily disables many people in remote, rural areas in Africa, India, and the Middle East. Contains the findings and recommendations of scientists who were brought together to discuss dracunculiasis as an international health problem. ISBN 0-309-04172-4.

Priorities in Biotechnology Research for International Development: Proceedings of a Workshop. 1982. 261pp. Report of a 1982 workshop organized to examine opportunities for biotechnology research in developing countries. ISBN 0-309-04256-9.

Producer Gas: Another Fuel for Motor Transport. 1983. 101pp. During World War II Europe and Asia used wood, charcoal, and coal to fuel over a million gasoline and diesel vehicles. However, the technology has since been virtually forgotten. This report reviews producer gas and its modern potential. ISBN 0-309-04161-9.

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Quality-Protein Maize. 1988. 130pp. Identifies the promise of a nutritious new form of the planet's third largest food crop. Includes information on the importance of maize, malnutrition and protein quality, experiences with quality-protein maize (QPM), QPM's potential uses in feed and food, nutritional qualities, genetics, research needs, and limitations. ISBN 0-309-04262-3.

Saline Agriculture: Salt-Tolerant Plants for Developing Countries. 1989, 150pp. The purpose of this report is to create greater awareness of salt-tolerant plants and the special needs they may fill in developing countries. Examples of the production of food, fodder, fuel, and other products are included. Salt-tolerant plants can use land and water unsuitable for conventional crops and can harness saline resources that are generally neglected or considered as impediments to, rather than opportunities for development. ISBN 0-309-04266-6.

Sowing Forests from the Air. 1981. 64pp. Describes experiences with establishing forests by sowing tree seed from aircraft. Suggests testing and development of the techniques for possible use where forest destruction now outpaces reforestation. ISBN 0-309-04257-7.

The Diffusion of Biomass Energy Technologies in Developing Countries. 1984. 120 pp. This report examines economic, cultural and political factors that affect the introduction of biomass-based energy technologies in developing countries. It includes information on the opportunities for these technologies as well as conclusions and recommendations for their application. ISBN 0-309-04253-4.

The Improvement of Tropical and Subtropical Rangelands. 1989. 380pp. This report characterizes tropical and subtropical rangelands, describes social adaptation to these rangelands, discusses the impact of socioeconomic and political change upon the management of range resources, and explores culturally and ecologically sound approaches to rangeland rehabilitation. Selected case studies are included. ISBN-0-309-04261-5.

The Water Buffalo: New Prospects for an Underutilized Animal. 1981. 118pp. The water buffalo is performing notably well in recent trials in such unexpected places as the United States, Australia, and Brazil. Report discusses the animal's promise, particularly emphasizing its potential for use outside Asia. ISBN 0-309-04159-7.

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Triticale: A Promising Addition to the World's Cereal Grains. 1988. 105pp. Outlines the recent transformation of triticale, a hybrid between wheat and rye, into a food crop with much potential for many marginal lands. The report discusses triticale's history, nutritional quality, breeding, agronomy, food and feed uses, research needs, and limitations. ISBN 0-309-04263-1.

U.S. Capacity to Address Tropical Infectious Diseases. 1987. 225pp. Addresses U.S. manpower and institutional capabilities in both the public and private sectors to address tropical infectious disease problems. ISBN 0-309-04259-3.

Vetiver Grass for Soil and Water Conservation. 1992. Vetiver is a little-known grass that seems to offer a practical solution for controlling soil loss. Hedges of this deeply rooted species catch and hold back sediments. The stiff foliage acts as a filter that also slows runoff and keeps moisture on the hillsides, allowing crops to thrive when neighboring ones are dessicated. In numerous tropical locations, vetiver hedges have restrained erodible soils for decades and the grass-which is pantropical-has shown little evidence of weediness.