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SUMMARY OF A.I.D. RESEARCH ACTIVITIES:
The Office of the Science Advisor
The Bureau for Science and Technology

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The Agency for International Development is sponsoring cutting-edge research with potential impact in both developing and developed countries. There are three major types of research sponsored by the Agency's central bureaus and offices: research grants programs sponsored through the Office of the Science Advisor (AID/SCI) and the Bureau for Science and Technology's Office of Research and University Relations (S&T/RUR); research funded through or undertaken by the technical offices in the S&T Bureau; and research and studies undertaken regularly by each regional bureau and various PPC offices. This is a brief overview of the major research efforts and programs sponsored by two of the Agency's central divisions: The Office of the Science Advisor, and The Bureau for Science and Technology. Some examples of research grants and projects are given; complete lists of projects and grants are always changing and can be obtained on request by contacting the office involved, or through the Center for Development Information and Evaluation (PPC/CDIE/DI).

This paper is organized by Office and Program; the following can be found on the cited pages:

Research Grants Programs 2

Program in Science and Technology Cooperation (PSTC) 2
US-Israel Cooperative Development Research Program (ICDR) 3
BOSTID Research Grants Program, National Acad. of Sciences 3
Historically Black Colleges and Universities (HBCU) Program 4

Examples of Recently Funded Grants 5

Research Funded Through The Bureau for Science and Technology 6

S&T/Agriculture 6
International Agricultural Research Centers 7
Collaborative Research Support Programs 8
Examples of S&T/AG Research Projects 9
S&T/Health 9
S&T/Population 11
S&T/Nutrition 12
S&T/Forestry, Environment and Natural Resources 12
S&T/Energy 12
S&T/Education 13
S&T/Rural and Institutional Development 13

RESEARCH GRANTS PROGRAMS

Research grants programs are administered by both the Office of the Science Advisor (AID/SCI) and the Bureau for Science and Technology. The Office of the Science Advisor (AID/SCI) funds research grants through three programs, the Program in Science and Technology Cooperation (PSTC), the U.S.-Israel Cooperative Development Research (ICDR) Program, and the National Academy of Science's Board on Science and Technology in Development (BOSTID) Research Grants Program. The Research and University Relations office of the Bureau for Science and Technology (S&T/RUR) funds the Historically Black Colleges and Universities (HBCU) Program.

The Program in Science and Technology Cooperation (PSTC) was begun in 1981 under mandate from Congress. It funds a system of competitive research grants available primarily to scientists in the developing countries where A.I.D. is active. Scientists in middle income countries are eligible if their research is innovative and directly applicable to the problems of developing countries; cooperation with U.S. scientists is encouraged. Grants are most often awarded for research involving the initial phases of investigation in the natural sciences or engineering. Forty to fifty projects with budgets of $1,000 - $150,000 and durations of 1 to 3 years are funded each year. In the first 5 years of the program, over 2300 proposals were submitted. This large number of proposals has necessitated the definition of six areas of emphasis:

Biotechnology/Immunology in human and/or animal systems includes genetic engineering, immunological techniques, vaccine development, and other related health applications;

Plant Biotechnology includes research into: tissue culture and microbiology to enhance food crops, the improvement of drought tolerance and resistance to disease, and insecticides and herbicides;

Chemistry for World Food Needs includes research in biochemical growth regulation, soil chemistry, agriculture and food chemistry, natural pesticides, and integrated ecosystems and aquaculture systems;

Biomass Resources and Conversion Technology encompasses research into uses of biomass for fuel, fodder and higher value chemicals;

Biological Control of human schistosomes (worms) and their vectors, and plant crop viruses and their vectors;

Diversity of Biological Resources entails the investigation of terrestrial and aquatic plant, animal and microbial species for economic promise, the restoration/optimization of the habitat for useful species, and the identification and development of new species.

Research grants are also considered in the two broader areas of:

Engineering Technology, namely structural and materials research, mechanical engineering, and electronic engineering including the development of low-cost computer and information technology;

Atmospheric, Marine, and Earth Sciences includes meteorology, hydrology, geology, seismology, remote sensing for natural resource analysis, and coastal zone utilization and preservation.

The U.S.-Israel Cooperative Development Research (ICDR) Program seeks to facilitate the access of developing countries to Israeli scientific and technological capabilities to help solve the problems confronting LDCs. Grants of up to $250,000 are awarded to scientists from LDCs where A.I.D. has a program to cooperate in joint research with Israeli scientists. Each project commonly lasts from 1 to 3 years. The program was begun in 1985 and concentrates on the initial, innovative phase of research in areas of Israeli expertise and comparable advantage. For example, research will be funded in arid lands agriculture, agroforestry, agricultural intensification (including water management and double cropping), plant biotechnology, human/animal health biotechnology, the innovative use of by-products, marine sciences and aquaculture, the biological control of insects, and energy research.

The BOSTID Research Grants Program through the National Academy of Sciences (Board on Science and Technology in Development) was begun in 1981. Grants ranging from $50,000 to $150,000 are awarded over a period of 2 to 4 years to scientists in LDCs or middle income countries (if the results are applicable to LDCs). There are six areas of focus for the program:

Grain Amaranth is a plant possessing seed with a high-quality protein content. Research is funded to select varieties appropriate to different environments, to improve the species quality, yield, production cost, and stress tolerance, and to investigate the possible contributions of amaranth to modern cropping systems. Research activities concentrate on germ plasm collection and evaluation. An amaranth research newsletter has been established to communicate grant project results.

Tropical Trees research focuses on multiple use species of importance to developing countries. For example, fast growing, nitrogen fixing species, and species useful for agro-silvo-pastoral systems, environmental rehabilitation, and fuelwood production are all investigated. Research activities focus on germ plasm collection and evaluation, seed and vegetative propagation, silviculture management, and fuelwood, fodder, and commodity production.

Biological Nitrogen Fixation research concentrates on nitrogen fixation to increase food and forage productivity, cropping systems with legumes, legume inoculation problems, the contribution of mycorrhizae to nitrogen fixation, the improvement of host plants through breeding and genetic manipulation, and the use of azolla.

Mosquito Vector Field Studies attempt to define the natural history of mosquito vector populations and identify vulnerable points in their life cycles in order to develop control strategies to reduce or eliminate mosquito-borne diseases.

Rapid Epidemiologic Assessment methods for health planning and decision making includes the development of diagnostic instruments, survey techniques, sampling methods, and data collection, presentation and analysis methods.

Diagnosis and Epidemiology of Acute Respiratory Infections in Children projects assess incidence, severity, and fatality rates, describe clinical and radiological features, treatment and outcome, and identify the risk factors for specific pathogens. They also develop rapid diagnostic tests, prepare manuals, and present workshops on the topic.

The Historically Black Colleges and Universities (HBCU) Program is funded through the Bureau of Science and Technology, Research and University Relations division (S&T/RUR). This program awards grants of up to $100,000 for discrete research purposes by scientists at historically black colleges and universities. The program was established in 1984 as part of an overall Agency effort to comply with executive order #12320, which has as its objective an increase in the participation of HBCUs in federal government programs. Approximately $2 million per year are awarded, half in the area of health, half in agriculture. Some suggested areas of research are: food and agriculture policy, soil and water management, protection of plants and animals, small animals and aquaculture, farm implements and simple tools, health, nutrition, natural resources and energy, and human resources.

EXAMPLES OF RECENTLY FUNDED GRANTS:

PSTC and ICDR grants:

* "Control of Malaria Growth by Antibodies Against Host Membrane Components,"

* "Sulfonamide Drugs as a Male Antifertility Agent,"

* "Floods in Ephemeral Streams: Evaluation Based on Geomorphology,"

* "Studies of Metallization and Passivation Techniques for Improvements in Solar Cell Performance,"

* "Genetic Improvement of Gracilaria Sp., an Agar-Producing Seaweed,"

* "Preparation of a Live Vaccine Against the Caprine Arthritis - Encephalitis Virus (CAEV),"

* "Ammonia Translocation in Cyanobacteria and Their Use as Biofertilizer,"

* "Strain Selection for Mass Cultures of Spirulina, a Novel Agrotechnology for Arid Lands,"

* "Ecology of a Virus and Mollicutes of Maize and of Their Dalbulus Vectors in Costa Rica and Mexico."

BOSTID Research Grants

* "Selection and Breeding for Enhanced Nitrogen Fixation in the Vulgaris Common Bean,"

* "Lot Quality Assurance Sampling for Monitoring Health Care,"

* "Plantation Establishment of Bonotan (Trichospermum discolor),"

* "Biology of Anopheles nuneztovari and Its Role in Malaria Transmission,"

* "A Case-Control Study of Vaccine Efficacy in the Field: Antityphoid Oral Vaccine."

HBCU Program Grants

* "Chemical Analysis of Amaranth Seeds and Related Celosia Species: Under-utilized Food Sources of West Africa,"

* "Model for the In-Vitro Generation of Human Epidemal Autographs for Potential use in the Treatment of Sickle Cell Leg Ulcers"

* "Studies on the Incidence and Field Management of Infertility in Cattle and Buffaloes in Rural Haryana (India)."

Complete lists of the PSTC, ICDR, BOSTID, and HBCU research grants are maintained by the offices which supervise the programs.

RESEARCH FUNDED THROUGH AID/S&T OFFICES

Roughly ninety percent of the research funded through the Agency's Bureau for Science and Technology (S&T) is handled by its offices of Agriculture, Health, and Population. Much of the research is in highly current, cutting-edge technology. In all three offices, research is funded through a variety of mechanisms: support of international research organizations, research funded through U.S. universities or research organizations, and "projectized" research where the management of the research effort is contracted out.

THE S&T OFFICE OF AGRICULTURE lists eight priority research areas:

> To increase crop and livestock resistance to pests and disease and to aid them in overcoming environmental stresses such as adverse climate and soil conditions. This is to be accomplished through biotechnology methods emphasizing tissue culture and biological nitrogen fixation;
>
> The conservation and improvement of natural resources through such methods as resource inventories and soil management;
>
> Production enhancement through wide crosses, biological nitrogen fixation, and development of true seed for tuber crops such as the potato;
>
> Funding of International Agricultural Research Centers (IARCs);
>
> Livestock health and production systems and the biological control of insect vectors;
>
> Small-scale fisheries and aquaculture;
>
> The efficient use of scarce water, in both irrigated and rainfall systems;
>
> Transfer of agro-technology regionally, using computer simulation and predictive technology.

There are four mechanisms used by the Office of Agriculture to accomplish these goals: funding of the International Agricultural Research Centers (IARCs), both those that are members of the Consultative Group on International Agricultural Research (CGIAR)* and those that are not; the Collaborative Research Support Programs (CRSP); its own programs of small research grants; and direct contracts and grants to U.S. Universities and agreements with U.S. Government Agencies.

The program through which A.I.D. funds the individual IARCs, both CGIAR members and non-members, is funded through the PPC and S&T bureaus. These centers are at the heart of the global agricultural research network; they perform research in the major food source crops, livestock, fish, and allied agricultural technologies.

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*The Consultative Group for International Agricultural Research (CGIAR) was established in 1971; A.I.D. was one of the establishing agencies. Its function is to provide funding and program guidance to 13 of the International Agricultural Research Centers; A.I.D funds 25% of its operating costs.

The IARCs that A.I.D. funds and some of the more notable A.I.D.- funded research contributions of each are:

CGIAR MEMBERS

International Potato Center (CIP), Apartado 5969, Lima, Peru, has made significant progress in the study and control of several potato viruses and the activity and movement of disease-free germplasm;

International Board for Plant Genetic Resources (IBPGR), Crop Ecology and Genetic Resources Unit, Plant Production and Protection Division, FAO, Via delle Terme di Caracalla, Rome 00100, Italy;

International Center for Agricultural Research in the Dry Areas (ICARDA), P.Ol Box 5466, Aleppo, Syria, is focusing on agronomy and soils research in cereals, legume and forage improvement programs;

International Center for Crops Research in the Semi-Arid Tropics (ICRISAT), Patancheru P.O., Andhra Pradesh 502-324, India, has discovered new sorghum and millet varieties for the Sahel region;

International Food Policy Research Institute (IFPRI), 1776 Massachusetts Avenue, NW, Washington, D.C. 20036, U.S.;

International Institute for Tropical Agriculture (IITA), P.O. Box 5320, Ibadan, Nigeria, has played a key role in research on alley cropping and maize streak virus resistance;

International Livestock Center for Africa (ILCA), P.O. Box 5689, Addis Ababa, Ethiopia;

International Laboratory for Research on Animal Diseases (ILRAD), P.O. Box 30709, Nairobi, Kenya, is researching Trypanosomiasis and East Coast Fever. A vaccine for East Coast Fever has been developed and is presently being tested;

International Rice Research Institute, P.O. Box 933, Manila, Philippines;

International Service for National Agricultural Research (ISNAR), Oranje Buitensingel 6, 2511 VE The Hague, Netherlands;

West Africa Rice Development Association (WARDA), P.O. Box 1019, Monrovia, Liberia;

OTHERS

Asian Vegetable Research and Development Center (AVRDC), P.O. Box 42, Shanhua, Taiwan 741, Taiwan, China, through direct funding from A.I.D., is modifying its home vegetable gardening activities for application in Africa to combat Vitamin A deficiency;

International Fertilizer Development Center (IFDC), P.O. Box 2040, Nuscle Shoals, Alabama 35662, U.S.;

International Irrigation Management Institute (IIMI), Digana Village Via Kandy, Sri Lanka;

International Center for Living Aquatic Resources Management (ICLARM), P.O. Box 1501, Makati, Metro Manila, Philippines;

International Board for Soils Research and Management (IBSRAM), P.O. Box 9-109, Bangkok 10900, Thailand;

International Center for Insect Physiology and Ecology (ICIPE), P.O. Box 30772, Nairobi, Kenya, is focusing its research on crop and livestock insect pests. A.I.D. funds research on ticks and plant resistance to insect attack.

The Collaborative Research Support Programs provide funding to U.S. Land Grant Colleges and Universities, U.S. agricultural research institutions, and the U.S. Department of Agriculture -- all in cooperation with scientists and institutions in the less developed countries. The programs focus on food crops where research and training can be performed at sites that will offer the greatest global impact; thus, they make use of different climates, soils, and production conditions. The programs are funded under Title XII of the Foreign Assistance Act (the Famine Prevention and Freedom from Hunger Act); the costs are shared by the U.S. Government (A.I.D.), U.S. colleges and universities, and host nations. Research is linked to nine of the IARCs. Eight key research priorities were selected in 1978. They are:

Small Ruminants -- increasing the meat, milk and fiber production from sheep, llamas, alpacas and goats. Among other advances, vaccines have been developed against contagious pneumonia in goats, a treatment involving selenium and vitamin E has been devised for lambs in Morocco, and a diet supplement has been developed for sheep and goats in Indonesia;

Sorghum and Millet -- increasing their production, marketing, and utilization. A high-yield sorghum variety that can tolerate Striga (a parasitic weed in Semi-Arid Africa), aluminum (acid) -tolerant sorghums and aluminum-tolerance screening techniques, and crop rotations involving sorghum and grain legumes to increase soil nitrogen levels have all been developed;

Beans and Cowpeas -- increasing their availability and utilization; key considerations are genetics and plant breeding, agronomics, economics, nutrition, and socio-cultural factors. Some efforts have undertaken the development of a high-yielding drought resistant cowpea variety, the study of cowpea pest lifecycles for future Integrated Pest Management systems, and the study of insect control during bean and cowpea storage;

Peanuts -- boosting their yields, lowering their cost, and expanding their usage. A simple process to remove aflatoxin (cancer-causing mold) from crude peanut oil has been developed, a previously unknown peanut virus has been discovered, and a method to test individual seeds for this virus has been created.

Tropical Soils -- better technological management of soils agronomically, economically, and ecologically in four major agro-ecological zones: semi-arid, acid-savanna, humid tropical, and steepland. Methods have been developed in: mulching to increase soil moisture and porosity to aid reforestation and protect millet from sandstorms in the Sahel; managing nitrogen in acid-savanna soils through use of common green manure; and continuous cropping in acid/infertile Amazon basin soils;

Nutrition -- the biological and behavioral significance of marginal food intake on human functional development in the areas of reproduction, lactation, resistance to disease, work performance, cognition, and social competancy;

Pond Dynamics -- increasing fish as a protein source and quantitatively determining how physical, chemical, and biological variables regulate pond productivity;

Fisheries Stock Assessment -- increasing the coastal fish harvest, improving management practices, and developing stock assessment techniques for tropical conditions.

EXAMPLES OF S&T/AG RESEARCH PROJECTS (full list available through CDIE/DI)

		project #
*	Biotechnology, Limiting Factors (Biological Nitrogen Fixation research)	931-0610
*	Soil Management Support Services	931-1229
*	Storage and Processing of Fruits and Vegetables	931-1323
*	Host Animal Resistance/Tick Control Project	936-4083
*	Soybean Utilization and Research Project	936-4132
*	Integrated Pest Management and Environmental Protection	936-4142
*	Postharvest Grain Systems R&D	931-4144
*	Biotechnology Projects: Improved Animal Vaccines (Rinderpest)	936-4178

THE S&T OFFICE OF HEALTH supports research primarily through funding international agencies (notably the World Health Organization (WHO) and the International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)), U.S. universities and research institutions, and other U.S. government agencies such as the National Institutes of Health (NIH). Funds are targeted for specific research; day-to-day management efforts are the responsibility of the organization concerned. Like the Office of

Agriculture, S&T/H also funds research by setting up projects where the contracted management acts as an intermediary between the A.I.D. funding function and the research. The major thrusts of S&T/H research are:

Malaria -- The ultimate goal is the development of a polyvalent vaccine focused on the anti-sporozoite and anti-red blood cell stages of the parasite; all four strains of the disease are under research. To date, A.I.D. research has: developed several prototype vaccines, one of which is being tested on humans; investigated techniques to detect drug resistance in malaria parasites; and applied biotechnology methods to identify malaria-carrying mosquitos;

Immunization -- Key efforts in this field have involved reducing the spread of infection due to unsterilized needles and syringes and increasing the heat stability of vaccines. A one-dose disposable needle in which vaccines remain potent without refrigeration for three weeks has been developed. Research is now focusing on an improved device to ensure nonreuseability;

Leprosy -- This effort includes support for field trials of new treatments for the control and prevention of leprosy;

Other Vaccine Development and Testing -- A.I.D. is funding research through the National Institutes of Health (NIH), the Centers for Disease Control (CDC), WHO, and ICDDR,B to improve vaccines for LDC Health Programs. Presently the following are being researched:

- Measles vaccine that can be administered at six months of age (the present vaccine can only be given at nine months);
- Whooping Cough vaccine without the dissuasive side effects;
- Genetically engineered oral and injectible polysaccharide vaccines for typhoid fever, which is now resistant to antibiotics in many LDCs;
- An oral vaccine for cholera;
- A vaccine for rotavirus;
- Vaccine for group B streptococcus infections, which affect infants in-utero;
- Vaccine for streptococcus pneumoniae, which affect infants and children;

Improved Diagnostics -- Improve the speed and accuracy of disease diagnosis in the field in LDCs, especially the diagnosis of: malaria, diarrheal diseases and typhoid fever, and acute respiratory diseases. So far a DNA probe to detect malaria parasite levels as low as 0.0001%, a non-radioactive method to detect plasmodium vivax in recurrent malaria, and a rapid field assay for choleratoxin and hepatitus B antigens have been developed;

Oral Rehydration Solutions -- Research through WHO and ICDDR,B to develop solutions to complement the WHO formula such as: solutions based on complex carbohydrates (rice and maize powder) to reduce the volume of fluid loss, and fluids commonly consumed in the home which have a potential for preventing dehydration;

Vitamin A -- Being researched not only for its effects in conjunction with xeropthalmia (nutritional blindness), but also for its effects on depressed immune functions, enhanced susceptablility to infection, and increased mortality;

Global AIDS Prevention and Control Program -- Funds granted to WHO's Global Program for the Prevention and Control of AIDS will be used to help establish a network of collaborating centers on AIDS, help coordinate the global surveillance of AIDS, and to assist the development of effective control strategies. Special emphasis will be placed on making blood transfusion and immunization procedures safe.

THE S&T OFFICE OF POPULATION provides technical assistance and program resources to LDCs for family planning assistance, education and training programs, and policy analysis. S&T/POP also funds, through "projectized" efforts such as those described above, four broad areas of research: demographic, social science, operational, and biomedical. Service delivery and its supporting research hold the highest priority for A.I.D. Research activities take up 24% of S&T/POP's budget. The major areas of research are:

Biomedical Research on safer, more acceptable, more effective, and more affordable methods of contraception, or fertility regulation technologies. So far S&T research has focused on: Copper T 380A IUDs; NORPLANE subdermal implants and vaginal rings; the 3-month microsphere morethindrone injectable; the Filshie Clip for female sterilization; nonsurgical or reversible sterilization; new hormonal methods for inhibiting ovulation and sperm production; methods to interrupt the transport of ova or sperm; methods to prevent fertilization; contraceptive vaccines against sperm, ova, or hormones; new barrier methods and spermicides; and kits to predict ovulation;

Operations Research to improve the management and operations of service delivery programs and family planning delivery systems. This research includes studies on contraceptive marketing and the design, implementation and evaluation of service delivery systems;

Social Science and Demographic Research to increase the knowledge of population dynamics and improve the collection and analysis of demographic data. Some areas of investigation are: contraceptive knowledge, availability and use -- demographic levels and trends; world fertility data sets; the determinants of fertility in LDCs (how and why changes in fertility occur); the acceptability of natural family planning; the impact of fertility control modalities and delivery systems; and epidemiologic safety studies.

The S&T Office of Nutrition is sponsoring research in four major areas: investigating the linkage between agricultural policy and food consumption; testing the effect of Vitamin A on morbidity and mortality rates in children; designing dietary regimens using indigenous foods in the management of acute diarrhea in young children; and determining the best modifications (if needed) of traditional and contemporary weaning practices to decrease child vulnerability to disease. Other S&T/N research efforts deal with the development of effective iron delivery systems to combat iron deficiency anemia on a national level, the development and improvement of food processing systems, the development of country nutrition surveillance systems, the development and evaluation of social marketing and nutrition education interventions, and the determination of the biological and behavioral effects associated with different levels of malnutrition. The Office of Nutrition also supports the Nutrition CRSP described on p. 7.

The S&T Office of Forestry, Environment, and Natural Resources provides technical backstopping to missions and LDCs with special emphasis on forestry research, training, and agriculture - forestry interrelationships. A major goal of S&T/FENR is to strengthen institutions in developing countries to help manage and conserve their renewable natural resources in the interest of sustainable development. S&T/FENR's major areas of research are:

Forestry and Fuelwood Research and Development to meet the basic needs of developing countries for fuelwood and other tree products through: improved formulation, planning and management of forestry/fuelwood and agroforestry research; and enabling LDCs to address the critical forestry/fuelwood needs through better use of forestry, on-farm forestry, and agriculture-related research information. This effort consists of three interrelated components: research planning and management; network development and research; and global research.

Genetic Improvement of Multipurpose Trees to be integrated into agroforestry systems.

The Development of Agroforestry Technologies for various land-use configurations to enhance agricultural production and conserve the natural resource base.

Coastal Resources Management to assist countries in the identification of research needs related to integrated management and conservation of coastal resources.

The S&T Office of Energy sponsors research and development on innovative power systems which use indigenous fuels such as coal or biomass (sugarcane, rice residues). Applications of gas turbine technology to the sugar industry is one area being researched at Princeton University; it is expected that technologies being developed in the aircraft and cogeneration industries in the U.S. could improve the economics of energy generation in developing countries.

The S&T Office of Education focuses on increasing access to and the performance of basic education systems in developing countries. S&T/ED supports a number of research and dissemination efforts designed to improve the effectiveness of educational efforts at the primary school level and to increase the efficiency with which scarce fiscal, material, and human resources are applied to this task. Empirical research is being conducted in over a dozen countries on issues where policy can have an important effect, such as: the determinants of school quality; access to schooling, especially for women; decentralization; system-level and school-level management; classroom organization; teacher performance; and resource generation. Prototype microcomputer-based models and methodologies for conducting system self-assessments are being developed to improve the planning and management capabilities of decision makers and planners. Research efforts also focus on demonstrating the efficacy of technology for low cost instructional purposes. Research on the use of telecommunications and other media has led to the design of instructional approaches which provide greater access to better education for more of the world's children.

The S&T Office of Rural and Institutional Development works with missions and bureaus to conceptualize approaches to specific development problems and devise strategies for development interventions. S&T/RD works to keep the Agency at the forefront of policy-oriented work in the developing world through an integration of research and field support activities structured around three priorities which reflect the purpose of the office's portfolio:

> Applied and basic research into methods to stimulate employment, generate income, and increase productivity while strengthening private enterprise;
>
> The study of the operative mechanisms and interrelationships of: financial, resource, and production systems; and targetted human populations as they express themselves in specific environmental, social, geopolitical, and regional contexts
>
> The investigation of the forms of organization, resource mobilization, and enterprise management that will best produce and sustain decentralized economic benefits in LDCs.

In implementing these research priorities, S&T/RD emphasizes: policy reforms and institution building efforts that increase productive employment, stimulate income, and improve access to food while maintaining the productive natural resource base; linkages between urban and rural economic sectors; relationships between the incomes of the poor and improved access to food; and small scale enterprise promotion programs that provide increased income for the poor.

The several recurrent themes in this paper highlight the direction technological and scientific approaches to development are taking within the Agency. Biotechnology is receiving a great deal of attention for its possible contributions to the human and animal health sciences, agricultural sciences, and environmental sciences. Social science research is looking at old problems and developing new types of interventions based on individual and group behavioral models. Finally, the major areas of emphasis that recur in most of the distinct programs and efforts reflect the Agency's continued concern with the Basic Human Needs goals of feeding more people more effectively, improving health levels and standards, and effectively using, developing, and perpetuating the natural resource bases of lesser developed countries.

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The following documents are sources of further information on the programs discussed in this paper:

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- ; "Congressional Presentation, Fiscal Year 1988," U.S. Agency for International Development, Washington, D.C., (1987).

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- ; "Directory: Office of Health, A.I.D.," U.S. Agency for International Development, Bureau for Science and Technology, Washington, D.C., (January 1987).

- ; "Field Support and Research Capabilities," U.S. Agency for International Development, Bureau for Science and Technology, Office of Rural and Institutional Development, Washington, D.C., (September 1, 1987).

- ; "Guidelines for Submitting Proposals under the A.I.D. Research Program for Historically Black Colleges and Universities," U.S. Agency for International Development, Bureau for Science and Technology, Office of Rural and Institutional Development, Washington, D.C., (February 5, 1986).

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