

**International Development Cooperation Agency**



Agency for International Development

**Fiscal Year 1981**

**Congressional Presentation**

**Annex**

**United States Institute for Scientific And Technological Cooperation**

# **EXECUTIVE SUMMARY**

**Institute for Scientific and Technological Cooperation (ISTC)**

**Agency for International Development**

A Component of the  
International Development Cooperation Agency

**Annex**

**Fiscal Year 1981**

**Congressional Presentation**

**The complete FY 1981 Congressional Presentation on ISTC  
will be delivered to Congress on February 15, 1980**

## INSTITUTE FOR SCIENTIFIC AND TECHNOLOGICAL COOPERATION

### I. INTRODUCTION

"It has never been more clear that the state of the union depends on the state of the world. . . ." These words, introducing the 1980 State of the Union Message of the President mirror the rapidly growing realization of Americans that the well-being of the United States depends to a large extent on the world that lies beyond our borders.

Hence, in our own interest we must be prepared to participate more actively in the solution of development problems that affect the larger part of the world's population. However, traditional approaches for participation in the solution of development problems needs to be redirected.

The developing nations have increasingly expressed interest in obtaining assistance which would permit them to build their own capacities to solve problems of development. In major world conferences such as the World Food Conference in Rome and the Conference on Science and Technology for Development in Vienna, they have pointed out the need for expertise and capacity to develop select and adapt technologies most relevant to their own needs.

U.S. capabilities in science and technology are unparalleled and it is to the U.S. that the developing countries look as a principal source of assistance. Rapid progress has been made in many parts of the world in recent decades but the U.S. still has more than a third of the world's biomedical and agricultural research capacity. In many other areas, such as in the use of satellites for communication and remote sensing, the U.S. is preeminent.

### THE NEED FOR NEW KNOWLEDGE, TECHNOLOGY AND SCIENTIFIC COOPERATION

We have learned from experience that the direct transfer of modern technology to developing countries may have unintended adverse economic and social consequences. New, improved, and more appropriately applied technology is needed to reduce poverty and disease in the Third World. Often the scientific knowledge on which to base technology development is lacking.

In the agricultural and health sciences our knowledge of temperate zone plants and diseases is far greater than our scientific knowledge of these problems in tropical and semi-arid zones. We know comparatively little, for example, about the staple crops of many of the poor, such as cassava, lentils, millets, winged-beans and yams, or the scourges of the tropics such as schistosomiasis and river blindness. Also unfortunate is the fact that U.S. methods of farming and controlling diseases often prove too costly or ineffective in the Third World.

Scientific breakthroughs and technological leaps, like the past discoveries of DDT, the dwarfed wheat and rice plants, and the gasoline engine, may occur in the future to the benefit of millions of people, but, as noted below, they should not be relied upon to the extent that research on alternative technologies is neglected.

The DDT-based malaria eradication campaign is an example of the need for continuing research while combating a problem in the field. The campaign succeeded in some areas, but in most tropical countries, malaria has had a resurgence to levels rivaling the worst experiences of the past. As a result of over-reliance on "miracle" pesticides, research on alternative methodologies was neglected and two decades of malaria research were lost. The discovery of an effective vaccine would play an important role in controlling the disease, but even when available, there will still be a need for the design and application of other measures.

Similarly as the price of petroleum rises, local ingenuity will be required to harness energy from a variety of sources depending on geographical opportunities. Research and practical experimentation on the possibilities of energy production from renewable sources were neglected during the era of cheap petroleum. Every country will need the capability to exploit its natural sources of energy.

The development of the dwarfed wheat and rice plants has made a dramatic contribution in increasing food resources. However, many crops which form the staple of the diets of the poor in developing countries can be grown only in relatively narrow agro-climatic zones. The capacities of most developing countries for conducting research on crops of largely local importance, and for adapting and applying research results on the crops studied elsewhere, are limited at present. The management of the food resources of the sea, now that fishery zones have been extended, will also require new scientific and technological capacities in many countries and regions if productivity is to be increased.

New knowledge and technologies adapted to local conditions will be required to deal with the worst aspects of poverty. The industrial world could not undertake all the scientific research and technological adaptation needed, even if it was disposed to do so.

The task for the future is to find the means for attacking persistent problems of developing countries by enhancing their scientific and technological capacities while, at the same time, bringing more of the competence of the industrial world, particularly the U.S., to bear on these problems.

More of the research and development capacity of U.S. public and private institutions could be applied to developing country needs if a better mechanism existed for relating these efforts to the problems of the developing countries. To this end the UN conference on Science and Technology for Development held last August in Vienna, recommended that each country have a focal point for technological cooperation on development problems through which developing countries and international agencies could gain access to specialized competencies.

#### U.S. RESPONDS -- ISTC AS KEY ELEMENT

To meet this development challenge, the U.S. Government has reviewed and reorganized its Foreign Assistance Program. Out of this process came the determination that we must more actively and effectively participate with developing nations in building their own indigenous scientific and technological capacity.

To this end the President, on March 29, 1978, announced in a speech to the Venezuelan Congress that the United States intended to establish a new organization to improve technological cooperation with the developing countries. At the August

1979 United Nations Conference on Science and Technology for Development in Vienna, the United States delegation underscored the contribution the Institute could make to improving, on a cooperative basis, the application of science and technology to development problems.

## II. DESCRIPTION AND FUNCTIONS OF ISTC

### PROGRAM STATUS -- AUTHORIZATION AND APPROPRIATIONS

The ISTC was authorized by Congress in 1979 to serve as a mechanism for strengthening the application of science and technology to the most important problems of developing countries. The Institute is designed to assist developing countries to strengthen their own capabilities for problem-solving research and applications, to foster additional research on development problems, and to facilitate scientific and technological cooperation with developing countries.

The inauguration of the Institute's program awaits final action by Congress on the Foreign Assistance Appropriations Act of 1980. It is hoped that the Congress will act favorably on the appropriation for ISTC and that the Institute will launch its proposed FY 1980 programs in March, 1980.

#### Fiscal Year 1981 Programs

In FY 1981, approximately two-thirds of the \$95 million ISTC program budget request will support research projects transferred from AID. These projects were selected on the criteria of relevance to ISTC program objectives and their long-term character. The projects include support for international agricultural and medical research programs, the Cooperative Research Support Program developed under Title XII of the Foreign Assistance Act and other projects which have been scrutinized by the Research Advisory Committee of AID.

The balance of the program budget will be devoted to new initiatives which have been formulated in consultation with scientists and relevant research institutions in the U.S. and the developing countries. In the coming years, the entire ISTC program will be developed through a programming process which will incorporate the active involvement of developing country experts. The private sector will also actively participate in both program development and implementation. Once formulated the entire program and proposed projects will be subjected to peer review, through procedures similar to those of the National Science Foundation and the National Institutes of Health.

The ISTC intends to allocate the major proportion of its program funds for work in the developing countries. Many activities will be pursued on a regional basis where such cooperation is possible.

### ISTC IN RELATION TO OTHER AGENCIES

The ISTC will operate as a small, semi-autonomous agency within the framework of the basic policies and overall budget established by the International Development Cooperation Agency (IDCA), and in parallel with the Agency for International Development (AID).

AID and ISTC will have a complementary relationship with AID as well as other U.S. and international agencies helping in the identification of problems requiring research. AID will benefit directly from ISTC sponsored research, as will developing countries and other national and international development agencies.

The Institute will serve to facilitate and coordinate scientific and technological activities conducted by all government agencies related to development

problems within the foreign policy guidelines of the Department of State. It will be a principal contact point between international, regional, and national institutions engaged in development-related research and the U.S. science and technology community.

### STRUCTURE OF ISTC

The chief executive officer of the Institute will be the Director who, along with the Deputy Director, will be appointed by the President with the advice and consent of the Senate.

A Council on International Scientific and Technological Cooperation will be appointed by the President to advise the Director with respect to the policies, programs, planning and procedures of the Institute.

The Council will consist of up to 25 members, up to eight of whom will be experts from developing countries, and up to five of whom will be officials of the U.S. Government.

The Institute's staff is expected to number not more than 100 professionals by the end of FY 1981. The staff will be principally organized along the lines of development problems selected for the attention of the Institute. Under a fellowship program, the ISTC will obtain the services of individuals who have demonstrated exceptional competence and ability in the fields of scientific, technological, economic, or social endeavor. Annually up to 20 Fellows, half of whom will be from developing countries, will be appointed for periods of up to two years.

### FUNCTIONS OF THE ISTC

In order to serve the ISTC purposes of strengthening the capacity of the people of developing countries to solve their development problems, fostering research on problems of development, and facilitating scientific and technological cooperation with developing countries, the ISTC will function in the following ways:

1. Enhance the problem-solving capabilities of selected regional and national institutions in the Third World.

Working at the frontier of world-wide scientific efforts to deal with priority needs, chosen for attention in consultation with developing countries, the ISTC will concentrate on strengthening the capacity of regional and selected national problem-solving institutions in the Third World. The Institute will become a focal point of information related to priority problems, stimulating collaborative research and the sharing of experience among developing countries and with U.S. and international institutions. The Institute will also use grant funds for training research workers and providing support to institutions with unusual potential.

2. Promote problem-oriented research and its technological application to the problems of the poor.

The ISTC will assume a principal responsibility for U.S. financial contributions to such international development research programs as those in

agriculture and health, and will foster additional U.S. and international efforts with development implications. In addition, the ISTC will support the application of private R&D resources, including U.S. universities, to development problems through grants and contracts for joint research programs and training.

3. Increase the benefits to developing countries of U.S. publicly supported research on domestic problems.

One of the Institute's first tasks will be to scan the domestic research programs of U.S. agencies for activities that might be directly applied, or adapted, to development purposes. The ISTC will then be able to harmonize planning and coordination among various U.S. public and private agencies whose research activities bear on development needs.

4. Serve as a principal contact point for LDC and international institutions seeking access to U.S. scientific and technological resources.

The Institute will help locate appropriate U.S. sources of needed technical expertise. It will also facilitate U.S. training of scientific and technical personnel from developing countries.

5. Improve relationships with middle-income countries.

With the contraction of AID from middle-income, or "graduate," countries a gap was left in the pattern of U.S. interactions with these important Third World nations. Although commercial, military and industrial cooperation of a scientific and technological nature continued or increased, there has been little U.S. involvement in matters relating to the concerns of the poorer segments of their populations, such as in health, food production and small-scale technologies. The ISTC will enable U.S. institutions to collaborate with their counterparts in these countries on a shared-cost basis on topics of mutual interest such as health, population, environment and energy production.

## INSTITUTE FOR SCIENTIFIC AND TECHNOLOGICAL COOPERATION

Consolidated Budget Summary  
(\$000)

	<u>1980</u> <u>(Estimate)</u>	<u>1981</u> <u>(Proposal)</u>
<u>World Hunger</u>	<u>52,600</u>	<u>61,400</u>
Commodity Productivity	33,450	35,510
Efficiency of Production Inputs	3,350	4,795
Farming Production Systems	13,250	16,950
Knowledge: Applications and Use	800	2,500
Human Nutritional Status	1,750	1,645
<u>Health and Popultion</u>	<u>14,576</u>	<u>18,600</u>
Major Tropical Diseases	10,976	12,200
Control of Diarrheal Diseases	2,400	2,900
Prevention of Diseases through Immunization	500	2,500
Population Research	700	1,000
<u>Development and Use of Energy</u>	<u>500</u>	<u>3,000</u>
<u>Forestry Conservation and Development</u>	<u>500</u>	<u>1,500</u>
<u>Information and Communication Systems:</u>		
<u>Capital Saving Technology</u>	<u>400</u>	<u>2,000</u>
<u>Program Planning and Evaluation</u>	<u>2,185</u>	<u>2,810</u>
<u>Operating Costs</u>	<u>1,115</u>	<u>5,690</u>
TOTAL PROGRAM	71,876	95,000
Budget authority	23,750 <sup>a/</sup>	95,000

a/ At the time this document was prepared, congressional action on funding for the Institute for FY 1980 had been delayed for four months and the level of funding ultimately to be provided was uncertain. During this period, planning for the Institute's program was suspended. Because of these delays, it will not be possible for the Institute to fully program in 1980 the amount contained in the House Appropriations bill. Consequently, the presentation to the Congress for FY 1981 is based on the assumption that \$15 million will be programmed in FY 1980.

This presentation consolidates certain activities currently administered by AID with activities to be financed from funds appropriated directly to the Institute. It is anticipated that administrative responsibility for the transferred activities will be assumed by the Institute toward the end of fiscal year 1980. In most instances, FY 1980 obligations will have been made by AID prior to transfer of administrative responsibility and consolidation with the ISTC program.

### III. FY 1981 PROGRAM AND BUDGET SUMMARY

#### A. OVERCOMING WORLD HUNGER -- \$61.4 Million

The Institute will support research programs with the long-term goal of increasing agricultural productivity and nutrition. Particular emphasis is placed on the major caloric and protein sources of food for the poor. Included are U.S. contributions to the International Agricultural Research Centers, support to long-term collaborative research authorized under Title XII of the Foreign Assistance Act and increased support to LDC research institutions.

1. Commodity Productivity -- \$35.5 Million. The program will include work on major cereal grains, legumes, roots, tubers, vegetables, livestock, fisheries and on pest control and management systems.

- Cereal grains. Will fund efforts to increase the productivity of basic cereal grains--rice, sorghum, wheat, millet, maize and barley, including support to IRRI, CIMMYT and other international research organizations.

- Grain legumes. Will develop varieties and cultural practices to increase productivity of such legumes as beans, lentils, cow peas, and soybeans for the one-half billion people in semi-arid tropical countries that depend on these crops.

- New crops. Will support research on underutilized plants and crops which may have significant market and/or nutrition potential--leucana, winged bean, plaintains, jojoba, and guayule.

- Roots and tubers. Will improve productivity on this understudied but highly nutritious crop category on which 400 million people--usually the poorest--live. It will also support work on storage, marketing and processing systems to reduce the current 25 to 35 percent post-harvest food loss.

- Livestock health and productivity. Will foster programs focused on diet, disease control and the development of sturdier stock to provide improved employment opportunities for small farmers and to satisfy the increasing demand for livestock products which currently constitute an important source of protein in developing countries. Special emphasis will be placed on small animals such as goats and sheep, which are particularly important to many of the poorest populations.

- Fisheries and aquaculture. Will concentrate on improving the technology of fish farming and will seek to find methods to reduce the current 30 percent wastage following harvests.

- Crop and food protection. Will fund research programs designed to develop better processing and storage and environmentally sound pest control systems to reduce crop and food losses which range from 10 to 30 percent of potential yield.

- Agricultural Production Policy. To support the incorporation of production-oriented policy considerations in the work of the international agricultural research centers and similar organizations.

2. Production Inputs Efficiency -- \$4.8 Million. The program is designed to improve plant ability to better use the natural resources of the environment or those applied by farmers in order to increase productivity and lower input costs--particularly fertilizer which depends on availability of high cost petroleum.

- ° Soils and soil management. Will focus on ways of conserving and increasing the productivity of tropical soils.

- ° Water management. To support the development of improved techniques for the conservation and use of rainfall and irrigation water, and for drainage.

- ° Plant nutrients. Will explore biological nitrogen fixation and alternative types of more efficient fertilizers.

- ° Plant stress. Will develop plant strains with increased tolerance to hostile environments and ways of minimizing environmental effects on plants.

3. Farming Production Systems -- \$16.9 Million. The program will develop unifying concepts of farming systems that help in analysis of small farms and farmer organization. Much of this work will be carried out through the International Agricultural Research Studies. Studies will include work on farming systems, concepts, methodologies and studies of root zone ecology.

4. Application and Use of Knowledge -- \$2.5 Million. The program is designed to ensure that research results are available at the grass roots to give poor farmers access to and control over choices of technology.

- ° Improving research information utilization. Will facilitate communication between farmers, scientists, and policy makers.

- ° Policies for increased equity. To support international networks in the development of policies which provide small farmers with improved access to farm production inputs such as land, water, credit knowledge, and the like.

5. Improving Nutritional Status -- \$1.6 Million. This program is intended to examine the effects of alternative national nutrition policies and to explore mechanisms for improving nutritional status.

- ° Impact of marginal nutritional deficiencies. Will support research programs which provide information on the relationship between marginal dietary deficiencies and performance capabilities, such as behavior, resistance to disease, and productivity.

- ° Consumer knowledge and purchasing power. Will analyze alternative technologies to help the poor improve their understanding of nutrition and use of this information effectively in the marketplace.

## B. HEALTH AND POPULATION -- \$18.6 MILLION

The Institute's program will focus on disease priorities established by the World Health Organization in concert with U.S. scientists and those from other countries--the major tropical infections, diarrheal illnesses, and diseases

preventable by immunization. Population funds will support the development of research capacities in the developing countries.

1. Major tropical diseases -- \$12.2 Million. The program will concentrate on the development of vaccines and drugs, techniques for control of insect carriers, and development and practical application of methods for disease control to field conditions.

- Malaria. Long-term efforts will concentrate on the development of an effective vaccine. Medium-term programs will focus on the development of new, and the adaptation of known, control techniques to LDCs conditions.

- Other tropical diseases. Programs will emphasize development of vaccines and therapeutic agents as well as improvements in control techniques to deal with such diseases as river blindness, elephantiasis, sleeping sickness and snail fever. Included are funds to support the WHO/UNDP Special Program for Research and Training in Tropical Diseases.

2. Control of diarrheal diseases -- \$2.9 Million. The program is aimed at one of the major killers of children and a significant cause of death in the general population.

- Support to the International Center for Diarrheal Disease Research, Bangladesh.

- Research on vaccine protection, rehydration therapy, and improved water supply use.

3. Prevention of disease through immunization -- \$2.5 Million. The program will focus on research on those factors which inhibit the application or effectiveness of vaccines for diseases which are or potentially can be controlled through immunization.

- Development of more effective and heat stable vaccines, for such diseases as pertussis, tetanus, and poliomyelitis.

- Development of improved devices for the storage and transport of vaccines and better devices for administering vaccines.

4. Population -- \$1 Million. The Institute program will focus on the strengthening of capacity in research for the advancement of contraceptive technology.

#### C. DEVELOPMENT AND USE OF ENERGY -- \$3.0 MILLION

The Institute program will focus on promising renewable energy technologies appropriate to LDC environments. Support will be provided through regional centers in developing countries for development and testing of energy technologies that have a reasonable probability of technical success and a good possibility of replication in a variety of LDC locations. For example:

- Anaerobic digestion of human, animal and agricultural wastes. Will fund research programs aimed at the energy (burnable gas) potential of human,

animal and agricultural wastes, and the potential of such wastes as fertilizers and as a source of protein for animal feed.

- Alcohol production as a substitute for imported petroleum. Will support research on technologies for producing and using alcohol from tropical agricultural products to meet rural energy needs.

- Generation of small amounts of electricity from direct solar radiation. Will support development of solar thermally operated electric generators.

#### D. FORESTRY CONSERVATION AND DEVELOPMENT -- \$1.5 MILLION

The Institute program will focus on the problems of deforestation and the attendant impact on hydrological systems, flooding, soil and erosion and lack of fuel. Research priorities will include adaptation of fast growing woody plants to tropical conditions, cultural and social factors related to forest management and utilization, and the optimal mix of different uses of the same land.

#### E. INFORMATION SYSTEMS AND CAPITAL SAVING TECHNOLOGY -- \$2.0 MILLION

The program will concentrate on methods for delivery of practical information on useful technologies to rural small farmers, artisans and laborers in an easily understood and usable form. Emphasis will be placed on technologies that have been successful with other rural people and that respond to rather than prescribe grass roots initiative.

- Strengthening village level innovation. The program will evaluate mechanisms for stimulating scientific innovation at the grass roots level.

- Development and evaluation of appropriate technology manuals. Research will indicate what content and methods of presentation are most effective for communicating with illiterate and semi-literate people.

- Broadening participation in research design. The program will test ways to involve the rural poor in the choice and adaptation of technology.

#### F. PROGRAM DESIGN AND EVALUATION -- \$2.8 MILLION

This category includes funds for:

- Planning and program design and development for programs to be initiated in FY 1982 or later years.

- Program evaluations and dissemination of information.

- Scientific and technological cooperation, including studies of the development process as it relates to technological choice, and support to linkages between U.S. and LDC scientific institutions that improve problem-solving capability.

G. ADMINISTRATIVE EXPENSES -- \$5.7 MILLION

Funds provide salaries, benefits, travel, office overhead and support costs for permanent employees, persons serving under the Intergovernmental Personnel Act and Institute Fellows.