

ORGANIZATIONAL ISSUES IN IMPLEMENTING BASIC HUMAN
NEEDS POLICY AND TECHNOLOGICAL COOPERATION THROUGH
U.S. BILATERAL DEVELOPMENT ASSISTANCE

by

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ABSTRACT

The issues discussed in this paper are those related to the introduction of program and policy change in the U.S. bilateral development assistance system. The creation of the Institute for Scientific and Technological Cooperation has focused attention on transferring science and technology and satisfying basic human needs -- two related but sometimes conflicting U.S. foreign assistance policies. Because scientific and technological cooperation has in the past been directed primarily toward industrialized economies and because basic human needs satisfaction is directed to the elimination of poverty but its means and ends are not clearly defined, the plan proposed for ISTC suffers from contradictions and omissions that will make it difficult to implement.

In addition, managing the implementation of the change within the assistance system itself, while attending the aforementioned goal conflicts, poses problems for the administrators of the new institute. The implementation of change in the U.S. bilateral assistance system consonant with cooperation and human needs goals requires an educational intervention strategy. A matrix management system is also recommended to address the complex management problems raised by the ISTC proposal.

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Title: Associate Professor of Urban Studies and Planning

To my wife, Paula Diebold, in appreciation
for her love and encouragement.

FCV
Cambridge, 1980

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...It must be considered that there is nothing more difficult to carry out, nor more doubtful of success, nor more dangerous to handle, than to initiate a new order of things.

Niccolo Machiavelli
The Prince
Translated by Luigi Ricci,
Revised by E.R.P. Vincent
(1935)

1.0 INTRODUCTION

Focus of Paper

This paper describes the organizational issues that are likely to arise from the proposed creation of the Institute for Scientific and Technological Cooperation (ISTC).

The issues are described in terms of the presumed behavioral dynamics and processes accompanying change in large organizational systems. The change results from a major reorganization of the United States bilateral development assistance system currently being implemented. The reorganization directly affects the relationships of ISTC with the Agency for International Development (AID) and its sub-unit, the Development Support Bureau (DSB). Moreover, a new coordinating agency, the International Development Cooperation Agency (IDCA), has been created by the same reorganizational stroke.

The policy implications of meeting the basic human needs of the poor in developing countries, and the desire to share North American technological expertise in the pursuit of development objectives provide the background for this discussion. The theoretical framework upon which the projection of likely scenarios is made is derived from the issues surrounding technological cooperation with LDCs, the basic needs approach and the management of organizational change.

Background

The 96th U.S. Congress, 1st Session, 1979, adopted the legislative goal of strengthening the scientific and technological capacity of developing countries' research and development (R&D) institutions. This effort is considered a supplement to existing foreign assistance programs conducted by AID, the multilateral banks and other institutions receiving Federal funding. The vehicle for meeting the goal is the new ISTC.

*

The Institute is a unit of the International Development Cooperation Agency. IDCA has the authority to coordinate the entire U.S. foreign

* The name, "Institute for Scientific and Technological Cooperation, has been changed twice, once by the Administration from "Foundation for International Technological Cooperation" to "Institute for Technological Cooperation" and once by the House Foreign Affairs Committee which added the word "scientific" to rename it the "Institute for Scientific and Technological Cooperation." An Administration -prepared set of questions and answers for the House Appropriations Debate maintains that neither change in name represents a change in concept nor purpose. Given that science, or basic research, is the assumed undergrid of technology, the assertion may be correct. However, in that basic research and technological research are two distinct activities, the range of Institute activities has been expanded by the addition of the word "scientific." For further discussion of this distinction and the implications for ISTC, see Section 3.0.

assistance program heretofore managed through several federal agencies and committees. In response to Congressional initiative spearheaded by the late Senator Hubert Humphrey, President Jimmy Carter created IDCA -- a single agency with primary responsibility for coordinating all activities related to U.S. sponsored international development programs. This decision was made with the expectation that IDCA would improve development assistance by making more coherent economic policies and programs.¹

U.S. scientific and technological expertise has been considered a key component in meeting the basic human needs of the poor in developing countries. The underlying belief is that appropriate applications of technology can contribute towards increasing the productive capacity of LDC economies and therefore raise the standard of living of the poorest sectors. ISTC is considered an important step in this direction by planners in the Administration.

The concern for growth with equity has been on the agenda of the Administration's foreign aid policy, at least on paper. During the hearings on the fiscal year 1980 foreign aid budget before the House Foreign Operations Subcommittee of the House Appropriations Committee, Secretary of State Cyrus Vance stated that the first objective of foreign assistance programs is "to help nations achieve self-sustaining, equitable growth, primarily through a strategy of meeting basic human needs... Also important," Mr. Vance continued, "is our support of technological progress and improvement of basic infrastructure in developing countries."²

The Problem

The Institute is a new agency within a new structure. Nearly half of

the proposed 141 ISTC staff positions will transfer from AID. These shifts tend to create tensions and conflicts among the coalitions affected by the change process. ISTC managers will need skills that enable them to resolve the organizational issues created by (a) the reorganization itself; (b) the requirements of basic human needs policy directives; and (c) the constraints involved in seeking technological cooperation with developing countries.

Scope of the Paper

Management science provides the theoretical framework for understanding the effects of change on a large, complex system. (Beckhard, 1977; Weisbord, 1976; Tichy, 1977.) The ISTC mission is considered in terms of its stated goals. Etzioni (1975) defines goals as "desired future states of affairs." The organizational issues are described from inferences made about the outcomes of proposed strategies ISTC is expected to follow. All the information used in this paper about the IDCA system is derived from public documents, official statements of Administration planners, interviews with AID officials and members of the ISTC Planning Office. Also consulted on the issues addressed were staff members of Congressional Committees, private consultants and researchers from the Library of Congress. The Congressional Research Service prepared a report³ on the issues of coordinating foreign aid which is used in this paper.

The principal objective of this paper is to present the issues raised by the aforementioned constraints and policy directives. Understanding the dynamics and processes may help planners implement the

policy and program goals more effectively and efficiently. Recognizing that no single approach can adequately resolve such a complex set of problems, an intervention strategy is recommended as a means of dealing with the human resistance that often accompanies organizational change.

Format

The issues paper format is designed to present the reasearch findings to the reader with a holistic understanding of the problems encountered in organizing anew from established conditions. Its purpose is to identify the most important organizational problems, clarify the proposed basic objectives of ISTC and suggest the application of matrix management techniques and team building as a strategy that is consonant with the basic human needs approach to development.

The paper is organized into five sections. Section 1.0 contains introductory remarks. Section 2.0 provides the framework for understanding the implications of basic human needs policy on organizational change. Section 3.0 describes the components that operate in seeking technological cooperation with developing countries and the issues raised. Section 4.0 describes the organizational issues which must be managed by ISTC leaders in the implementation of its mission. Section 5.0 concludes the discussion and recommends a proposal for an intervention strategy aimed at improving the implementation process.

NOTES

SECTION 1.0

1. Statement of Hon. John J. Gilligan, AID Administrator before the Subcommittee on Foreign Operations of the House Appropriations Committee (March 6, 1979), p.30.
2. House Committee on Appropriations, Hearings, Part IV.
3. See "Issue and Options In the Coordination of U.S. Foreign Policy" prepared by the Foreign Affairs and National Defense Division, Congressional Research Service (May 1979).

No equation can divine the quality of life,
no instrument record,
no computer conceive it.
Only bit by bit can feeling men
lovingly retrieve it.

Jerome B. Wiesner

2.0 BASIC HUMAN NEEDS POLICY

Introduction

The United States Congress mandated through the International Development Cooperation Act of 1978 that bilateral development assistance and U.S. contributions to multilateral organizations "emphasize programs in support of countries which pursue development strategies designed to meet basic human needs and achieve self-sustaining growth with equity."¹ The 1979 amendments to the Act require that IDCA and ISTC pursue similar objectives in implementing their respective programs.

The purpose of the Institute is to focus "increased scientific and technological research attention" on ways to meet basic human needs (BHN) as well as "approach global problems" in developing countries. The BHN policy mandate and ISTC's purpose become a potential source of conflict in programming and implementing the Act's policy. One reason is that BHN goals are poorly or variously defined in terms of consistent operational applications within the complex climate of development. Another factor is that technological

cooperation with the developing world has not been a proven vehicle for meeting the basic needs of the poor. Traditionally, technology transfers have served the interest of the more developed sectors in the LDC economies. This section will refer to U.S. funded development programs affecting countries in the low and middle income category, but excludes the applications to capital surplus oil exporting nations and centrally planned economies which are un-affected by U.S. aid programs or basic needs initiatives.

The following discussion is centered on the economic and social implications of basic human needs policy as it affects the organization for technological and scientific cooperation with developing nations. The setting is the U.S. bilateral development assistance system and specifically ISTC. Congressional decisions on appropriations affecting ISTC plans after January 31, 1980 are not considered in this discussion, i.e., appropriating sufficient funds to enable ISTC to begin its programs.

The role of institutions in developing countries in determining what basic needs will be met first and how is a critical issue in planning the direction of ISTC programs. No less important are the interrelationships of a basic human needs policy strategem, the content of the scientific and technological cooperation program and each participating country's development agenda. These interrelationships pose organizational problems for IDCA and ISTC and

create peculiar organizational issues. These issues are the subject matter described in this and subsequent sections of the paper.

Purpose and Scope

This section suggests an operational definition of the Basic Human Needs approach and describes the impact of this approach on conventional foreign aid policies.* Some BHN approaches to development are more inclusive than others. They mesh better with conventional economic development strategies, but are not likely to achieve more equitable income distribution over the long term. Some approaches are more sensitive to the cultural concerns of developing countries. The operational definition proposed is a combination of the best aspects of a number of approaches and is one which seems most feasible to implement under the ISTC program guidelines.

The current interpretations of the BHN approach offered by development institutions and IDCA in particular are described in

* Accepted terminology is helpful in constructing an operational definition. The second edition of Webster's New World Dictionary defines policy as a "principle, plan, or course of action, as pursued by government, organization or individual, etc. . . ." A strategy refers to "a stratagem--i.e., a trick or scheme for achieving some purpose, or artful means to an end." An approach is "an approximation or similarity . . . a drawing nearer" to something.

An appropriate term and the one that more closely reflects usage among international institutions is "basic needs approach." This paper will refer to the "basic needs approach" when plans or programs for achieving the goals of meeting basic human needs are discussed. It will refer to "BHN policy" when the subject of discussion is the Congressional mandate or goal of U.S. foreign assistance.

subsection 2.1. This description is followed by subsection 2.2, which examines the relationships between BHN policy and economic development strategies, both those of the international development agencies and those of developing country governments as ascertained from collective development statements at international fora. The final section, 2.3, summarizes the recommended approach for ISTC, given the Institute's emphasis on technology and science as tools for carrying out the BHN policy goals.

2.1 INTERPRETING THE BASIC HUMAN NEEDS APPROACH

The meaning behind the goal of meeting the "basic human needs" of a population often gives rise to confusion among development practitioners. The term lends itself to various interpretations. Strictly speaking, the term "basic human need" refers to the essential, fundamental or elementary lack of something useful, required or expressly desired by the populace. Common use among the professional development community has expanded the meaning of the term to include both physical and psychological requirements. The basic needs generally considered as lacking in poor communities are a minimum protein-calorie adequate diet (food); health maintenance of the less advantaged population (health); basic education comprised of functional literacy (education); and adequate shelter (housing). The absence of adequate levels of these basic requirements significantly jeopardizes human welfare.

From these four general categories several ramifications are possible. For example, marketing agricultural products to feed the population requires secondary roads into inaccessible rural areas. Hence, road construction can be considered as a basic need because access to markets make it possible for the poor living in a remote village to sell more of their crops. Yet, by conventional criteria, providing infrastructure such as roads is not directly benefiting the poor. As can be appreciated, this ambiguity can create policy conflicts and operational problems in deciding the kinds of programs that should be funded under the BHN guidelines.

The priority of basic human needs in approaches to development has been conceptually arrived at by both Western and Eastern values. United Nations statements on the content of the core basket of basic needs reflects a universal view embraced by many nations and peoples. The distinction between U.S. funded programs guided by BHN concepts and other donor nations would likely reflect the situational imperative and conceivably reflect different values and political considerations.

2.11 The International View of BHN

International organizations have included the basic needs concept in several declarations of intent. The most notable in this respect is the Cocoyoc Declaration (1974) inspired by the

United Nations Conference on Trade and Development (UNCTAD) and United Nations Environmental Program (UNEP). The Declaration addresses the effects of international development patterns on the environment and natural resources. With respect to basic human needs, the Declaration calls for a redefinition of the "whole purpose of development,"² stressing that people have certain essential needs for food, shelter, clothing, health and education which must be satisfied by public investment. Any growth process that does not lead to the fulfillment of these needs is "a travesty of the idea of development."³ Development, however, is not seen as limited to meeting the physical basic needs.

Psychological needs can be regarded as freedom of expression, freedom of the press and the fundamental right to receive and give stimulus to ideas. From these notions emerges the Administration's stand on supporting basic human rights.

Encouraging popular participation in the decision affecting the functions of society is another component of BHN. Included in this idea is the right to gainful employment, which takes on the characteristic of an inviolate right. Without providing employment opportunities, national cohesion cannot be achieved, since the gap between a full employment economy and a resource poor economy will tend to widen. According to the Declaration, a person enjoys the right not to be alienated by the production process while pursuing personal welfare that in essence narrows the gap. The Declaration

further supports an international system which endorses the concept of self-reliance of a people in their economic, social and political development.

The World Employment Conference (1976), sponsored by the International Labor Office, placed basic needs as the dominant theme of development programs. The fundamental principle expressed at the Conference was that "strategies and national development plans should include as a priority objective the promotion of employment and the satisfaction of the basic needs of each country's population."⁴

Developing countries have sought to achieve independence from the industrialized economies by using arguments consistent with the basic needs approach. These arguments call for an "autonomous self-sustained growth"⁵ that is presently ruled out by economic dependence.

A parallel to the BHN approach is the New International Economic Order (NIEO), which recommends a restructuring of the world economy in ways that LDC human and material resources are used to further the growth potential of poorer nations. The implications of NIEO on the transfer of technology, structure and terms of trade, transnational enterprises and development assistance has a direct relevance to U.S. assistance programs.⁶

On the occasion of the Seventh Special Session of the United Nations General Assembly, the Dag Hammorskjold Foundation commissioned a report entitled "What Now - Another Development" (1975). The report argues that satisfying the basic needs of the poor should be the "core of the development process."⁷ The report criticizes past development policies as lacking in basic needs direction, adding that "self-reliant growth" at the local level is the building block of development. The existence of an "international power structure" that has as its basis the "market economy" of the industrialized nations mitigates against transferring resources to the poor. This structure is linked in most developing countries to local power structures that control directly their patterns of growth. By way of remedy, the recommendation is to transform the structures at the international as well as local level, in order to balance the existing inequality of economic relations and allow self-reliant growth.

The report underscores that basic needs should be defined "according to a normative scale" and in terms of prevailing social values. Timing and sequencing the delivery of basic goods and services is a practical requirement, since the scarcity of resources makes unavoidable a redistribution policy in the short run. Identifying the disadvantaged groups must receive "priority action," so that resources can be targeted.

Major international organizations have responded to the basic needs theme and proposed similar policy statements. The World Bank

and the Organization for Economic Development Cooperation (OECD) have adopted the BHN approach in their respective programs and policies. The Bank has been an articulate proponent as evidenced by the requirement that Official Development Assistance (ODA) meet basic needs criteria. The Bank has directed attention towards determining the composition of the core bundle of basic needs, as well as specifying the benefits of a BHN policy in concessionary lending.⁸

In 1977, the Development Assistance Committee (DAC) of the OECD held a high level meeting which endorsed the BHN approach by announcing that "progressively larger efforts to programmes meeting basic human needs" would be supported.⁹

2.12 The IDCA View

Prior to 1979, the Agency for International Development was the figurehead of American foreign assistance. U.S. foreign aid policies were often referred to as "AID policies." With the advent of IDCA, these attributions rightfully belong to IDCA.

The background paper prepared for the Development Coordination Committee (DCC) on basic human needs was first drafted in the summer of 1977, a year after the ILO World Employment Conference and four years after the "New Directions" legislation came into being.

The New Directions policy directs economic assistance to reflect "new realities" in its relationships with less developed countries. The criteria to be followed should emphasize "the following:

(1) Bilateral development aid should concentrate increasingly on sharing American technical expertise, farm commodities and industrial goods to meet critical development problems, and less on large scale capital transfers, which when made should be in association with contributions from other industrialized countries working together in a multilateral framework."¹⁰

"(2) Future U.S. bilateral support for development should focus on critical problems in those functional sectors which affect the lives of the majority of the people in the developing countries; food production; rural development and nutrition; population planning and health; and education, public administration, and human resource development."¹¹

The Act further states that "assistance under this chapter should be used not simply for the purpose of transferring financial resources to LDCs, "but to help countries solve development problems in accordance with a strategy that aims to increase substantially the participation of the poor."¹²

The DCC document spells out the "strategy for U.S. bilateral development assistance." The fundamental thrust reiterated is that

"sustained and equitable economic growth" as well as "the basic human needs" of developing country populations will be effectively supported.¹³ It goes on to state that the BHN strategy does not imply a departure from the "new directions approach" but is a "further evolution of that approach."

The principal components of IDCA's strategy include:

- (1) Assisting the poor to increase their incomes -- through raising their productivity and access to productive resources as well as expanding their opportunities for productive employment;
- (2) increasing the availability of and access to goods and services required to meet basic human needs.

In response to movements within the American polity, the strategy specifies the inclusion of women as participants in the decision-making process of a nation so that their "needs, desires, capacities and indigenous institutions are recognized" along with those of men. This is a distinction that is usually assumed in the pre-1977^{*} statements of non-U.S. institutions. Another significant focus of this policy is that basic needs are seen as a "strategy to enhance political and civil human rights as well as economic rights."

IDCA policy reflects vital U.S. interests in the developing countries. Its chief concern is to ensure that the security, political, economic and humanitarian assistance be channeled in

* The United Nations General Assembly designated 1977 as the Year of the Woman. This event focused international attention on the role of women in development, and may explain the attention given to the role of women in official publications.

such a way as to protect those interests abroad, however they may be defined over time. Any deviation from this objective would run counter to major U.S. foreign policy. As tensions between developed and developing nations wax and wane, cooperative assistance permits recognition of the changes in the relationships with other countries.

U.S. assistance has emphasized the use of science and technology for resolving problems in agriculture, education, health and major engineering works. Not enough has been done, however, in linking existing underutilized technologies to specific applications in pursuit of basic needs. Scientific research has played an important part in creating high yield rice crops, improving methods of agro-technical production, animal husbandry and human birth control. Technology has been used to build hydroelectric dams, airports and highways. Building an essential infrastructure for modernization has been the observable emphasis of AID sponsored technology assistance in the past. In this respect, for example, satellite imagery techniques have been used to "improve reliability of socio-economic statistics for rural regions"¹⁴ and assess damage caused by natural disasters. Satellites have also been used to transmit educational programs into hard-to-reach rural areas. These projects are considered within the basic needs guidelines, though they are undoubtedly beneficial to some LDC groups more than others. The emphasis has not been on appropriate techniques that have a more direct impact on the problems faced by poorer families. The new thrust in technology transfer is aimed at counteracting past deficiencies.

2.2 THE RELATIONSHIP BETWEEN BHN AND ECONOMIC DEVELOPMENT STRATEGIES

Recurring concepts have dominated the practice of AID development planning. However, NIEO or BHN guidelines have been difficult to follow in a consistent manner. Rural development, population control, health and nutrition, and human resource development are some of the concepts mentioned. These rubrics are all far too encompassing and general to have an impact on development problems, even though they include some BN components. Yet, programs have been implemented under these general themes. Their contribution to progress cannot be ignored, especially since these development themes, rather than purely fiscal and monetary policies, have had the most direct impact with basic needs satisfaction in the past and probably continue to in the future.

The BHN policy represents a departure from conventional development strategies primarily because of its specific focus on a target group of the society . . . the poor. The major shift in emphasis as Streeten (1977) points out in a BHN strategy of development is towards social services and transfer payments to the poor.¹⁵ The BHN approach is considered to be a supplementary and complementary strategy for existing development programs. The conventional emphasis on economic growth, employment and reduction of poverty remains valid, since these are components that determine development gains.

The main characteristics are described by Lisk (1977) in terms of personal consumption and basic public services.

The BHN concept has economic dimensions, since it affects the supply and demand of scarce goods and services. Its justification is not dependent on economic models, but on elemental value judgments about the preference of consuming a basket of goods and services described as "basic." Since it is value judgments that determine the concept of "basic," BHN cannot be defined in an absolute or normative sense. The determination of what is basic will depend upon the perceptions and judgments of consumers and suppliers, as they establish the effective demand for basic goods and services. The local environment together with the artificial inducements created by a public decision making process will specify which items of the market basket will be sought.¹⁶

Planners have argued that the arbitrariness of the concept does not in any way invalidate the BHN approach. What is suggested, however, is that recognition be given to problems of application and that no absolute determinants be imposed when considering the alternatives and trade-offs in the package of public and private consumption of goods and services deemed desirable.

In fact, the critical point of controversy among development planners, politicians and investors is how to resolve the problems

encountered in orchestrating public and private resources to achieve both balanced growth and BHN objectives. Technology is a significant input in the equation for balanced growth and contributes to filling the basic needs basket.

An important assumption underlying the BHN approach is that the poor are basic needs optimizers. In other words, given the availability of income and products, the poor as a group would make the best possible use of their resources to purchase food, clothing and shelter before purchasing non-basic goods. In this respect, the poor have to be considered as rational, though imperfect consumers in the same vein as higher income groups are. Applying this assumption means that the treatment of the poor in public programming must be upgraded. Respect for individuals of all income groups cancels the odious paternalism which marks most public programs, and enables the creative application of programs that complement existing programs. For example, consumerism, protection of the environment, energy alternatives, appropriate technology applications to solve the basic problems could all improve the quality of life for the poor.

A valid observation made by Streeten (1977) about the role of the BHN approach is that it supplements and complements existing development strategies. An opposing view held by AID planners is that it is an evolution in development thought culminating nearly thirty years of experience.¹⁷ The pragmatic view is of an approach

which makes up for deficiencies in existing development strategies and mutually reinforces strengths. This view has political appeal because it allows for shifts in policy so that resources can be redirected without invalidating past actions. BHN also calls for serious analysis and experimentation of new ideas about how to reach the poor more effectively -- an area of investigation in need of attention.

AID programs have stressed economic growth, generation of employment and reduction of poverty levels as independent program objectives. The BHN strategy attempts to combine these objectives in a holistic manner so that the right emphasis is given to situational conditions. In effect, what the BHN approach requires is an interdisciplinary commitment that has been given little importance in past AID programs. Consequently, a different organizational mind set and structure is required which is supportive of the basic needs approach.

There is some disillusionment with the past performance of U.S. development efforts. This is in part due to the paucity of information available to link causes of programs with effects. The magnitude of the global poverty problem, together with the meager financial commitment by all countries to attack its causes are another reason for discouragement. Financial resources alone cannot be considered the reason for past failures, however. Each nation's willingness to direct attention to development issues contributes to the success or failure of any strategy. Allocation

of limited resources to achieve the highest social benefits requires finely tuned planning and management. Development cooperation institutions have attempted to resolve the BHN/balanced growth dilemma by refocusing their policies in support of egalitarian strategies which itself is a cause for hope.¹⁸

LDC Efforts

Contrary to income strategies which emphasize raising per capita income levels, the BHN approach stresses the nature of what is provided as an end result. This interpretation is less abstract than eliminating poverty or reducing unemployment (Streeten, 1977).

Several strategies have been implemented by public agencies in LDCs that in one way or another address this problem. At the country level, for example, progressive tax policies, subsidies to propulsive industries and monetary policies have encouraged investment and provided some controls over inflation. Embodied in these strategies is the belief that capital accumulation is the principal ingredient for economic growth; that foreign exchange should be available free of encumbrances for trade to flourish; that developing countries should industrialize quickly. What has been lacking is an approach to development that targets resources to groups facing special problems and programs designed to resolve those problems.

A strategy which embraces the BN philosophy comes close to meeting these requirements, but lacks the organizational wherewithal to assure operational capability.

2.3 A RECOMMENDED BHN APPROACH FOR ISTC

The principal reasons for adopting a basic needs approach to development plans are generally accepted by the international community. If disagreement exists, it is in specific actions. No public official can deny that the reduction of the worst manifestations of poverty is a worthwhile policy. Channeling specific resources to groups identified as deficient in these resources is a responsibility of development institutions. The political aspects of a policy that shifts resources to the poor, however, can serve to thwart the aims of international donors.

Prioritizing satisfaction of basic needs implies ordering program priorities. Since not all demands for basic goods can possibly be met at a given time, government at the local level is faced with decisions of which needs to meet first. A determination of minimum acceptable levels for all basic needs goods in a given setting is an essential first step in assessing priorities. This is usually done by arriving at a core bundle of goods which can then be priced and quantified. Another BHN feature closely related to ordering priorities is targeting assistance.

Targeting development resources is an ancillary concept of the BHN approach. First, groups with special needs are identified, then programs are designed to satisfy those needs. In this way, fewer resources are used to combat the incidence of poverty and consequently attain greater efficiency of available resources. Targets are not limited to the reduction of absolute poverty only, but extend to the satisfaction of needs above a subsistence level as a means of eliminating relative poverty (Lisk, 1977) and raising living standards.¹⁹

One question that remains unanswered is whether or not the BHN approach leads to different country focus as well as a different focus within the country. The implications for ISTC are that, since BHN policy does signify a change in program content, a change in organizational structure and behavior is imminent. Implementation of BHN policy can be successful only if it is conducted through an appropriate organizational environment that supports the basic human needs approach.

Basic human needs policy is a source of conflict in programming because it is variously defined. There are no absolutes which can insure that a given institution will pursue similar strategies with the same concerns. Developing country governments, in operational terms, are not as enlightened as one would hope

they might be in implementing the BHN approach. Conflicts exist between local coalitions which do not share the same view about the abilities of the poor to achieve self-reliance. Attitudinal factors operating in many LDC governments prevent affirmative actions to be taken along the guidelines of the BHN approach. ISTC planners must take into account the susceptibility of LDC technological institutions to adopt a BHN strategy as part of the substance of their ongoing programs. In addition, some countries most responsive to the BHN approach are likely to have lower priority in U.S. foreign policy decisions affecting scientific and technological cooperation.

Consequently, a BHN approach which ISTC could implement would be one which takes into consideration each country's definition of its priority needs as well as considers the general "shopping list" in ISTC's present plans. The effective approach should also consider programs supported by local government allocations for funding and require the specific identification of groups whose needs are to be met. A final element in a BHN approach fitting ISTC's thrust as a scientific and technological institute would be to include organized participation in the development of programs calling for modern technological industrialization of micro-industry.

The long term effects of industrial technology must be carefully analysed to insure that traditional technologies, which are generally labor absorptive, are not displaced by modern technology. Or that the need for resources does not result in the substitution of equipment and materials for excess labor. Economic growth, spurred by

technological innovation is insufficient as a means of meeting basic needs in the next twenty years. Growth must be accompanied by the generation of sufficient and adequately compensated jobs.

This is the basic human needs area to which ISTC must ultimately address itself.

NOTES

SECTION 2.0

1. Hansen (1979), p. 48.
2. Ghai, et. al. (1977), p. 6.
3. Ibid.
4. In Ghai, et. al., p. ii.
5. Ghai, p. 4.
6. See Jan Tinbergen, "Reshaping the International Order" (1976), Club of Rome publication. Also Bariloche Foundation "Catas-trophe or New Society? A Latin American World Model" (1976).
7. In Ghai, p. 7.
8. See Churchill, Lycette.
9. DCC Policy Paper (1977).
10. Section 102, Chapter 1, Part 1, Foreign Assistance Act of 1961, as amended.
11. Ibid.
12. Ibid.
13. For other interpretations of BHN characteristics see Franklyn Lisk (1977); Paul Streeten (1977). The most detailed BHN discussion and its practical applications in African countries can be found in the reports produced by ILO/Jobs and Skills Programme for Africa.
14. Congressional Presentation.
15. Streeten, p. 11.
16. Churchill, Anthona A., Lycette, Margaret, "BN in Shelters" A Discussion Paper, Urban Projects Department, World Bank (March 1979).
17. AID Policy, p. 1.

18. In testimony justifying the new ISTC, the interim Director of ISTC submitted the following: "Less than one percent of the world's R&D expenditures are devoted directly to the problems that affect one billion people of the world in deepest poverty." p. 699, U.S. Congressional Hearings, Part 4 (March 22, 1979).
19. Ibid., p. 186.

"Societies will, of course, wish to exercise prudence in deciding which technologies... that is, which applications of science, are to be pursued and which not. But without funding basic research, without supporting the acquisition of knowledge for its own sake, our options become dangerously limited."

Carl Sagan
The Dragons of Eden: Speculations
On the Evolution Of Human Intelligence

3.0 SCIENTIFIC AND TECHNOLOGICAL COOPERATION

Introduction

This section describes the issues of cooperation in transferring scientific and technological know-how to institutions in developing countries through the organizational structure of the Institute for Scientific and Technological Cooperation.

The distinction between science and technology is central to the discussion of the issues of technology cooperation and transfer. How science and technology are considered determines the functions to be performed by each in order to achieve a particular development objective. This is the cleavage which differentiates the types of programs and the strategy that ISTC will need to implement.

Scientific and technological cooperation suggests three concurrent processes: (1) Enlisting the association of developing country institutions in enterprises that yield mutual benefits.

(2) Conveying scientific research skills and technical know-how to public and private groups in developing countries.

(3) Obtaining resources and managing programs with the assistance of appropriate organizations.

In order to put these three processes into action, ISTC must manage the points of controversy which impede their realization. The purpose of this section is to offer a description of the issues surrounding these processes.

The Problem

The operational success of the Institute depends on enlisting the cooperation of developing country institutions and on effectively managing the process of appropriate technology transfers.

The Constraints

The crucial factors which impinge on these processes are the economics of research activity, the costs of transferring technology, the political constraints and the role of patents. These factors are examined as part of the transfer process. "Transfer" refers to the processes by which both science and technology can effectively be conveyed to others for the resolution of specific development problems.

Empirical studies, referred to in Section 3.2, suggest that certain organizational designs are more effective than others for transferring scientific and technological information and skills. The optimal

organizational structure is also determined by the nature and purpose of the transfer. The Institute's proposed mechanisms for transfer and cooperation are examined in the context of these factors.

Distinction Between Science and Technology

Science and technology are not the same, although the latter is dependent upon the former. Science is a human learning process based on systematized knowledge derived from observation, study and experiment of things and events. Its purpose is to ascertain the principles of what is being studied. It is also a method for conducting research based on a theoretical explanation of the meaning of the observations in terms of practical applications. The knowledge people have of their immediate environment is advanced by scientific discovery, which is the quality that makes science a powerful tool for acquiring deeper insights into the world around us.¹ Science provides the basic knowledge necessary to create the technology for the production of new goods and services, although science, per se, is not immediately marketable.

Technology is a process for applying scientific knowledge to useful purposes. From its applications, societies derive those products which are needed or desired. It is a technical art based on applied science. Technology embraces a wide range of man's creations from the very simple levers to the extremely complex utilization of machines, materials and concepts. Using appropriate technological advances expands the possibilities nations have to create more employment options for the

benefit of their people; thus contributing to the improvement of living standards. Technology has its dark side: it can work against human welfare when uncontrolled by-products destroy the natural habitat. Patents and copyrights are the legal mechanisms which limit the commercialization and control the methods of manufacturing products dependent upon certain technologies.

The social function of science is to advance human knowledge about the world around us, whereas the function of technology is to turn that knowledge into means of controlling the world around us. Science is mostly involved with basic research, while technology is associated with the application of basic research. The importance of the differences between science and technology can best be appreciated in the way each contributes to development. Science provides understanding about how principles operate under specific conditions. Its basic product is information about people, things and events. Technology transforms scientific knowledge into detailed engineering services or methods which contribute to the rate of production and output.

Because ISTC purports to offer developing countries cooperation in both areas, the issues affecting both science and technology must be addressed. The transfer of science implies a set of activities involving university research facilities, academic personnel and modes of knowledge transfer. The transfer of technology implies activities and involvement with another type of research institutions, personnel and modes of skill transfers. Although there is interchange and sometimes overlap between the two areas, one has been traditionally considered public domain while

the other is primarily private sector. ISTC's activities must reflect these differences which directly affect the type of cooperation sought.

The description of the issues surrounding cooperation and transfer is meant to help clarify thinking about the possible alternatives for making the Institute operational and consonant with the basic human needs mandate of the legislation.

3.1 ISSUES AND FACTORS IN ACHIEVING COOPERATION

Achievement of the kind of cooperation which is feasible and desirable in the context of the Institute's programs will ultimately depend on the resolution of the issues related to enlisting cooperation, conveying skills and know-how, and obtaining the necessary resources to manage the programs.

An issue common to all three of these processes is that of the relationship between the technology transferred and the problem to be solved. United States foreign assistance agencies, as well as other industrialized nations' development organizations, have encountered similar difficulty in getting the creators of technology to focus on problems of grass-roots development in developing countries at any significant scale. The capital-intensive and often complex technology which is the mainstay of industrialized nations is often not suited for resolving the production problems faced by the poor in developing countries. Another drawback of industrial technologies is that they tend to produce goods that are priced above the ability of the poor to

afford and in addition tend to displace human resources from the production process. Any technology which relies on capital intensive methods generally ignores the need to incorporate the abundant labor supply. Somehow, however, labor must be absorbed if developing countries are to achieve balanced growth.

What is needed is to reinforce the validity of appropriate
*
technologies -- a technology that fits the circumstances and, in particular, uses available human labor. Such a technology is an intermediate one which offers prospects of continuous development in the future (Schumacher, 1973.)² Appropriate applications of technology also mitigate the oppressive social distortions which affect employment demand and commodity prices.

Cooperation in the areas of scientific and technological activity is a plausible way to narrow the gaps between developing and developed countries; especially with respect to the utilization of appropriate technology.

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Appropriate technology is a term gaining acceptance and used to describe an intermediate application of technology, usually referring to the level of sophistication of the hardware employed in the production of a good. For example, foot-powered irrigation pumps as opposed to engine-driven pumps are appropriate technology in areas where human labor is more plentiful and cheaper than electricity or petroleum fuel. The term and concept were first introduced by E.F. Schumacher, Ca. 1965. See Dunn, P.D. Appropriate Technology, Technology With A Human Face, New York: Schochen Books, 1979.

3.11 Enlisting Cooperation

U.S. Foreign assistance programs have traditionally sought the cooperation of participating governments in most development programs. Clearly, without a minimum level of participation, little can be accomplished by way of cooperation. At the initiative of the Institute, however, groups and institutions in LDCs are being asked to enter into a new form of cooperation agreement in joint enterprises for mutual benefit based on the sharing of specialized skills.

Cooperation, on the other hand, is becoming increasingly difficult to obtain as a result of changes in the power relations among many developing nations. Further, energy scarcity and the potential depletion of natural resources are affecting the accustomed fast-paced industrial growth of developed countries. Finally, the call for a New International Economic Order (NIEO), discussed in Section 2.0, points to still other reasons for changes in the relationships between developing and developed nations. Whatever long term cooperative arrangements are entered into will necessarily reflect the LDC's insistence on more equitable allocation of non-replenishable resources. In particular, interdependence will require that more LDCs negotiate restrictions on flows of resources originating in developing countries. It is becoming evident that, for these reasons, industrialized nations will have to seek "new types of cooperation efforts"³ to deal with the resource constraints to rapid growth both in their own economies and those of the LDCs with whom cooperation is essential.

In addition to the economic and technical factors complicating the pursuit of cooperation, international geopolitics impress stiff constraints on ISTC's approach toward the developing nations. The issue of national dependence on foreign technology has evoked mixed reactions among leaders in developing countries. Cooperation, according to ISTC's mandate, is to be sought not only with LDC institutions but among various U.S. public and private agencies doing research on development problems of common interest. Strengthening the technological capabilities of developing countries will require some institution building based on educational exchanges in order to provide the needed manpower. The prevailing mood, among nationalist governments in particular, however, is to lessen dependence on U.S. technology for the solution of local problems. The literature on development economics, in fact, contains supporting evidence that cooperative ties have not always been beneficial to LDCs. Reasons cited are the role of outside experts who in the past have failed to enlist truly cooperative ties with LDC scientists and engineers and the effect of culture and language barriers on a program's goals. In pursuit of the objective to enlist cooperation, ISTC will face its greatest challenge -- forging quid pro quo cooperative agreements that serve the long term interests of both LDC and U.S. institutions. Finally, the terms of cooperation through ISTC must face the structure of LDCs' demands for economic parity. The promise of strengthening scientific

* ISTC plans call for building up LDCs "research and development capacities." Capacity implies aptitude, qualifications, functions, competency. Capability is more the practical ability to do something or to develop the features not yet utilized. The difference is important.

and technological capabilities is but a meager gesture toward correcting the imbalance between the industrialized and non-industrialized countries. Therefore, the structure of cooperation which ISTC employs must help equalize wealth distributions in the world.

Cooperation in the transfer of technology development among developing nations became an agenda topic at the Group of 77 countries meeting in February 6-10, 1979 in Arusha, Tanzania. A group of high level government experts met in Quito, Ecuador in March of 1979 under the auspices of the Economic Commission for Latin America (CEPAL), calling for the reaffirmation of a "code of conduct for the transfer of technology" ^{*} that would be universally applicable under the conditions agreed to in the Arusha conference earlier that year.

The objectives of the code are:

- (1) To abolish the restrictive and unfair practices which affect the transfer of technology.
- (2) To strengthen the technological capacity of the developing countries.
- (3) To increase the international flow of the different forms of technology in conditions favourable to the developing countries.

ISTC's plans are directed toward meeting the second objective, but objectives one and three are either ignored in the planning documents or the bias is toward "mutual benefits" without tipping the balance in favor of the developing country.

* The U.N. Conference on Trade and Development (UNCTAD) has recommended cooperative links as a response to the New International Economic Order guideline to resolve the problems of science and technology transfer. See E/CEPAL/1073 (March 12-16, 1979), pp. 38-39.

3.12 Conveying Skills and Know-How

How can scientific and technological cooperation mutually benefit U.S. and developing country interests? This issue can be appreciated in terms of the two client groups involved: the public and private sectors. The major assumption underlying cooperation is that LDC institutions have a demand for the kind of programs and resources ISTC will offer.

Conveying scientific research and development capacity to a widely different population and institutional system requires identifying what kinds of skills and at what level of competence these skills will be delivered. Private and public sector programs not only will have need for a different capacity-building structure but will also pursue different development objectives.

Long term objectives in the public domain may involve primary and secondary science education programs as supplements to the existing curricula. Higher education, already considered highly irrelevant and costly in many LDCs, is nevertheless a likely candidate for some of ISTC's programs. The diversion of public resources toward elite educational investment will be a difficult policy choice to make under circumstances of fiscal austerity. Education for the majority population spreads the economic benefits of education more equitably than concentrating too much resources for the benefit of a few. If raising the level of professional competence becomes the mutual interest pursued, the immediate consequences will have to be weighed against long term goals.

Alternative choices and their consequences will also have to be considered. The introduction of a change in basic policy, curriculum or staffing in an educational institution results in major changes in structure and management. Changes in educational structures are reputed to be the most intractable of problems among LDC institutions.

The private sector is faced with similar dilemmas: either slow the rate of growth by lessening dependence on technical labor or import technical skills and fall into the dependence trap. For expansion to take place, private sector industries must choose between labor intensive or capital intensive means of production. In the technical ranks the demand for qualified professionals will increase regardless of production method or rate of growth scenario. Transferring the necessary skills will require, then, that the training system consistently prepare competent technicians, engineers and scientists. This area of cooperation has not been fully investigated, as the poor performance of current arrangements demonstrates. The only exceptions can be found among the middle tier countries where mid-level technicians perform at a par with those in developed industrialized economies.

Two categories of capacity building are mentioned in the ISTC proposal: Skill development in practical problem solving and cooperation in joint research problems affecting the lives of the majority of people in the developing countries. This specificity, if carried to conclusion, has direct implications for the types of training programs and techniques which can be adopted and adapted. At what level will technical skills be developed and for whom? U.S. technicians will benefit from the training efforts, either as instructors or as trainees. Among the LDCs, those most likely to receive benefits

will be a few educated elites. The transfer of the necessary education to meet the future demands of balanced growth and the more immediate program objectives of helping the poor will determine the kind of cooperation that must be negotiated. Practical problem-solving skills are expected to be developed through fellowships in U.S. institutions or through special programs. However well intentioned a U.S. institution may be, it will nevertheless not be able to adequately prepare foreign scientists and engineers unless its own educational curricula are changed to address appropriate technology methods.

Conveying technical skills will require an adaptation of teaching methods as well as technologies in ways that take into account the impact of change on the socio-political structures of LDCs.⁷ Traditional technical aid has for the most part centered on theoretical economic problems and less on the relationships between cultural change and economic growth (Herskovits, 1972). Equally ignored has been the impact of technology on the socio-cultural underpinnings of developing nations. The controversial relationship between technical imperatives and long term development is an issue begging attention in the ISTC plan.

3.13 Obtaining Resources and Managing Programs

A third set of factors hinders the concurrent process of seeking cooperation: (1) The efforts made to procure the appropriate staff, commodities and support from U.S. and developing country sources, and (2) The management of these resources with the participation of a like-

mind network of LDC organizations within the sphere of ISTC's influence.

Before any positive results can be expected, the circumstances and conditions that foster cooperative agreements must be spelled out.

These are:

- (a) selection of qualified social planners, scientists, engineers, etc., by criteria of the BHN approach. Basic human needs criteria can help identify compatible characteristics in individuals and offer a common ground for work both for U.S. and LDC participants.
- (b) planning for the participation of LDC counterparts as an example of the Institute's style. An organizational environment supportive of ISTC's philosophy can help overcome resistance to change in a more provident manner than by artificial mechanisms or cooption.
- (c) timely procurement of the necessary offices and equipment will serve to verify intentions and counteract the cynicism surrounding many AID projects.
- (d) securing funds for payment of factor costs will encourage broader participation and cooperation.

Securing mutual support for ISTC may prove to be a major problem from both the U.S. and LDC point of view. The battle currently being waged in a House-Senate Conference Committee over the appropriations for ISTC may be read by LDCs as a sign that the Institute does not have serious Congressional support and is likely to discourage cooperation from LDC groups. Management of the proposed programs necessarily involves operating agreements yet to be negotiated, many of a long term nature. Bargaining positions are unduly biased in favor of the

giver, possibly because the ISTC proposal was generated by AID and follows its patterns.

Institutions in many LDCs have always been at a disadvantage when negotiating private and public mutual assistance pacts with U.S. officials or transnational corporations. Bargaining power differentials, however, can be substantially altered over time by improving the capability of LDC negotiators, thereby shifting the power balance from U.S. dominance to LDC parity, a goal more consonant with ideals of cooperation. This type of assistance constitutes a first step toward the attack on broader development problems. Training local scientists, engineers, social planners, economists, and folklore experts in designing, implementing, and evaluating participatory projects/policies represents a primary responsibility of ISTC, but one which is not made explicit in the planning documents.

Identification of appropriate research and development (R&D) institutions that pursue goals similar to ISTC's will not be easy. Most LDC institutions operate through conventional structures⁸ and according to values distinct from U.S. norms. Many pursue policies that are neither inspired by a basic needs approach, nor liberational in purpose. ISTC prefers to manage its programs through existing LDC organizations. The imposition of new policies and purposes on these institutions would require more time, negotiation, and financial incentive than ISTC can muster. Creation of a new delivery structure for research could quickly deplete ISTC's resources. ISTC's probable

solution would be to rely on U.S. institutions and disregard the problems of interfacing with counterparts because the Institute reflects the interest of U.S. universities that are in a position to benefit most from research initiatives.

The relationship with private sector industry faces similar problems. Can a new foreign aid structure be compelling enough, in a period of waning confidence in federal programs, to attract private sector R&D involvement in programs directed primarily to meeting basic human needs? What incentive will attract private sector institutions? On what criteria will cooperating institutions be selected? How will mutual benefit be determined? AID's cumulative experience has been with public, not private sector institutions. The new ISTC must be able to interface with both, but these questions are unanswered in the ISTC proposal.

3.2 THE TRANSFER PROCESS

Experts have observed that technology transfer is a fine phrase to describe broad generalities, but consider it a "dangerous reference when the time comes for implementation and measuring results against ...assumed objectives."⁹ The goals ISTC will be pursuing are mandated by legislation: better ways to meet basic human needs and attain equitable growth through strategies which strengthen LDC capacities in the areas of science and technology.¹⁰

The objectives of the transfer process are to convey needed and requested scientific and technological expertise in an appropriate manner to developing country institutions and groups. This objective calls for collaborative work relationships with "private sector business, labor and private enterprise organizations"¹¹ in order to improve the environment and process of technology transfer.

The Institute's proposed mechanisms for transfer include work with U.S. scientific and technical institutions to improve the training of students from developing countries as well as develop joint research opportunities.

As a "central research and new technology development agency" ISTC will interface with R&D centers in the U.S. and in developing countries. The principal support is directed at "institution-to-institution contracts."¹²

Programs will concentrate on current concerns of U.S. assistance. The mechanism proposed is to work through the Problem Area Offices with links to LDC institutions. Grants and contractual support arrangements will focus on broad problem areas. Close to 80 percent of program funds are expected to support research and capacity building. The remaining 20 percent is destined to pay for policy studies, encourage the process of technological cooperation and "provide immediate support for new and creative unprogrammed opportunities."¹³

In summary, the mechanisms are institutional in nature. A combination of techniques are suggested, such as workshops, long term training via fellowships, and institution building. What emerges is a variation of a scientific, technological brokerage operation with a narrowly defined mandate and specific functions.

3.21 Components of the Transfer Process

The diffusion of technology has been traced in a number of studies conducted over the past forty years. These findings indicate that the rate of transfer from basic research to applied research is remarkably slow. (Allen, 1978) But once the applications of science and technology are commercialized, the transfers are much more rapid.¹⁴

Transfer of technological information takes two directions: horizontal and vertical. Vertical transfer converts a scientific idea or technical information into a specific device or production process.¹⁵ Horizontal transfer refers to conveying technical information from one project to another. Spin-offs of innovation from one firm to another are known as horizontal transfers.¹⁶ For example, today's computer technology was born in the first computing devices (electro-mechanical) created for the assembly of the first atomic bomb funded by the Manhattan Project.

ISTC's proposal will involve both vertical and horizontal transfers. Management of the transfer process covers three principal

functions: materials transfer, design transfer and capacity transfer. Each is considered as a separate stage in the transfer process requiring an appropriate management structure. The first stage begins with the importation of materials with no adaptation to the local environment.¹⁷ A manufacturer simply brings into the plant all the materials needed for the manufacture of the product. The second stage involves the introduction of the capability, technical staff and equipment necessary to manufacture the product. The third and final stage engages external expertise for longer periods of time and includes the capacity to modify existing technology to create indigenous technology. This last stage is the focus of ISTC.

Even the seemingly easy adoption of a more efficient process within a firm, no matter how experienced or successful, requires complex managerial initiatives to implement the necessary changes. This also holds true for a firm that has developed an operational environment and stability prior to adopting the technology in question.¹⁸ The case becomes even more complicated when a developing country is involved in the technology transfer process, which is the immediate case for the Institute.

3.22 Information Sharing

Technological adaptations are controlled by those with access to sources of information about technology. A study of Irish manufacturing firms (Allen, 1973)¹⁹ suggests that the scientist's

ability to maintain contacts and keep abreast of new technological developments is determined by the amount of personal contact an individual has with the sources of information. Technological information can be imported by personal contact more effectively than through an institutional format. If developing nations are inclined to foster technical information sharing, it would seem that the best conduits for this purpose are the informal channels.

The implication is that domestically educated researchers should do some work outside their own countries. Foreign sabbaticals would be supported by local governments. Although this practice has been criticized for its high cost and individual focus, its positive results must be weighed against the relative ineffectiveness of other modes of transfer. Potential problems for ISTC revolve around a seemingly universal tendency of government bureaucracies to reward political favors rather than meritorious achievement with trips abroad. The fear that the best performers will be lured away from work in the home country is another unspoken factor influencing the selection of fellows for foreign study. The benefits of exchange must be made evident to cooperating countries in order to balance the perceived risks.

3.23 Empirical Findings

Empirical evidence has produced insights about the process of technology transfer. Works by Allen, Teece, Mansfield, and Cooney

have shown that the process is generally complex but little is known about its nuances. What works in one situation may not work in another. One general trend which is important from a planner's perspective is the emergence of the technological gatekeeper²⁰ as a go-between in international commercial technology transfers. The "gatekeeper" is an intermediary among firms, governments and nations. The value of the gatekeeper is determined by the personal ability to emulate the characteristics of the technologist or scientist who has initiated the new idea. To be a gatekeeper, then, requires that the individual be more competent, productive, and qualified than his or her colleagues.²¹ Technological gatekeepers must be keenly aware of what constitutes the current advances in the field of dominance or line of work. In fact, the studies mentioned above suggest that the gatekeeper's role in international technology transfer can become more sophisticated as the volume of transfers increases and the country becomes actively engaged in the expansion of its industrial sector. For ISTC to accomplish its mandate to foster cooperation, it clearly must be able to serve this gatekeeper function for the projects it originates and fosters.

The most significant empirical discovery related to the gate-keeping function is that interpersonal contact among scientists can be effectively managed. Technology transfer policy has thus far tended to overemphasize the value of documentation as a means of diffusion of technical information. The reason given is that at least "the problem of dealing with documentation . . . appears to be

manageable."²² Managing human resources is more complicated and subject to uncertainty which may account for the reliance on reports, studies, and printed matter that often is regarded as technology transfer. This trend can, however, be reversed if, during the transfer process, the emphasis of the transfer is redirected to focus on collaborative management of informational/educational linkages by carefully designing the process of interpersonal contact among scientists.

3.24 Technology Transfer Constraints

The fact that some applications of technology are in demand does not ease the acquisition of utilitarian innovations. There are constraints that affect the free flow of technological innovation. Industrialized nations have the major technology and to a great extent control its diffusion. Complex interactions among international factors, markets, and organizations restrict the kinds of innovations that can be made available to developing countries. A one-of-a-kind idea is closely guarded. In addition, the unpredictable changes brought on by social revolt affect the relationships with multi-nationals and impact local political stability and policy direction. These changes impose serious constraints on the cooperation and exchange for mutual benefit goals of the ISTC proposal.

The usual list of constraints impeding technology exchange is replete with reference to the incapacity of LDC institutions to

absorb new technology at a steady rate and the lack of sufficiently prepared personnel who can implement socio-economic projects. These constraints reflect more the symptoms than the causes of interference in technological cooperation. First order issues are those that directly affect causes, for example: the economic viability of the transfer, the costs involved, the political ramifications of the transfer, and the role of patents and copyrights.

The problems posed by each of these categories of constraint are examined in the following sub-sections.

3.241 Economic Implications of Technology Transfer

The fundamental reason for ISTC's support of intermediate and long term research on the critical problems of development is that from these transfers a major contribution to economic growth is expected. By making accessible appropriate technology to LDCs, the overall process of development is accelerated. Another belief behind ISTC's creation as a vehicle for the support of local research and capacity development is that practical solutions to the more intractable problems of poverty will most likely be solved by local technical talent.

In many industrialized democracies, government sponsored institutions together with private sector contributions support the development of new industrial technologies. For example, many of

the advances made by the Japanese manufacturing firms are acknowledged to be a direct result of collaborative efforts between public and private research and development organizations.

A publicly funded institute cannot survive for long if the canons of market utility of its products are overlooked. When funding public research, the criteria that its products must meet effective market demand whenever possible cannot be ignored. In fact, success in creating a new profitable problem solving device increases the likelihood of obtaining support for basic research by local governments. The global picture of investment in science and technology programs involving research can be put into perspective by looking at the amounts allocated to research by different countries. The U.S. does not contribute more than two percent of GNP towards research investment and developing countries as a group allocate less than one percent.²³ It remains to be seen if the technologies developed through ISTC's intervention will generate profits for ISTC and the associated LDC institutions and if those profits will be reinvested in further research.

Adopting technological innovations can change the ratio of technical to non-technical inputs in the production process and thus becomes a significant component of the employment/growth process of an economy. It affects directly the ratios of labor to capital in the process of production, thereby impacting the labor absorption objectives of balanced growth strategies. These effects operate

independently of fixed factors, such as geographic location, population, and infrastructure which also contribute to the feasibility of adopting an innovation without displacing labor.

The exact measurement of the impact of a technological package on the labor demand in one firm or industry can be misleading when projected to the macro-economic level. Impact analyses are more meaningful when the effects on labor demand of specialized technologies are disaggregated by firm, region and sector.

In the agricultural sector, for example, it is extremely difficult to predict with any significant accuracy what the effects of technological adoption are on the economic growth of either the sector or the region.* As John Mellor points out, technological change in agriculture is highly erratic; it is also cumbersome and often futile to try to determine which crops or which regions will benefit from the opportunities of technological advance at a given time.²⁴

Whenever technology affects employment levels, public policy makers, employers and labor unions are the first to react. The

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The economic unit that lends itself to analysis is the region. Impact assessments of public policy can be better appreciated at this level. National aggregates tend to distort the true impact of a strategy, thereby making comparisons meaningless, particularly when only one industry introduces a technological innovation. The problem with the regional approach is in defining the region. However, for purpose of this discussion, the regional boundaries are those defined by local usage.

reaction may involve the justified protection of jobs, and if need be, pressure on policy makers to reject technologies that shift production in ways that devalue labor. Developing country governments are for the most part in agreement with the notion that public policies must control production methods in order to insure that labor intensive investments are given priority.²⁵ Common belief holds that technology is another word for job displacement and should therefore be resisted. ISTC has thus far argued that technology can help increase the employment rate in a developing region by creating opportunities for labor. It will be critical for ISTC to demonstrate through its projects that increasing appropriate technology can, in fact, stimulate employment.

3.242 Transfer Costs

Transfer costs are the prices paid for the transmission and adoption by a given firm or organization for the necessary knowledge, skills, equipment and related maintenance of the new technology to be acquired.²⁶

The effective transfer of marketable processes, materials, equipment or ideas has associated with it implementation bottlenecks, some of which are directly related to the magnitude and distribution of costs. In a strictly economic sense, if the benefits to be derived are less than the costs incurred in obtaining

the benefits, then the acquisition of the technology has a negative utility to the recipient institution. This holds true, however, only if the recipient pays all the costs and reaps all the benefits. Otherwise, the society and the specific institutions may receive very disparate costs and benefits from a particular project.

If we look upon the transfer process as an activity involving three sets of participants, i.e., donors, intermediaries, and recipients, each component of cost and benefit can be factored out among the three participants. Assume a private firm as the donor. Its costs would include the opportunity foregone when key people are taken from their duties and temporarily engaged in the transfer activity. From the recipient's perspective, these are the costs paid for consultant fees and services.

Intermediaries play a special function in the transfer process. Their costs are directly attributable to the transfer. For example, one Problem Area defined in the ISTC proposal calls for the assessment of natural resources. (see Section 4.2) In this case, satellite technology will be used for mapping inaccessible resource rich areas. Accurate survey of these areas is made possible by a combination of remote sensing techniques, satellite imagery, field study, local investigation and advanced data analysis---a specialized technology dominated by a few firms.²⁷ Brokerage of these services relies on an intermediary who will act as a go-between for the

different agencies at the onset of the assessment. The fee constitutes part of the overall cost to the recipient firm of the technology transfer.

Foreign exchange needed to pay for consultant services represents a cost passed to the central government, negligible as it may be at the onset. The greater the dependency on external services, the more likely imbalances of foreign exchange earnings will be. Radical political economists view this dependency as heightening the economic, political and cultural subordination of the LDCs to U.S. interests.²⁸

Depending on the manufacturing process in question, the cost of patent rights and recurrent outlays for service fees or equipment resulting from a new technology are typically accrued to the final user, or the recipient. Production start-up costs can be enormous if the transfer includes the retraining of employees or the acquisition of more advanced machinery. In some cases, the recipient absorbs a very expensive retooling investment that requires training of labor beyond its initial commitment or capacity. Establishing specialized schools and developing didactic methods appropriate for the cultural setting can escalate acquisition costs further.

Costs of science and technology can be staggering, as can be appreciated. Among those countries whose national budgets are already strained, allocating sufficient amounts of funds to science and technology policy pursuits may entail great political risk. More precise, comprehensive information upon which to make these decisions

is needed, including knowledge of the cultural and psycho-dynamic processes of political behavior. This type of information helps explain the practical problems encountered in an attempt to divert funds from programs offering private interests direct benefits to programs with longer time frames having unclear distributional results. Present cost outlays cannot be easily justified without consideration of the benefits that science and technology will bring to the poor and without public negotiation of the interests of the widest spectrum of the population.

3.243 Political Constraints

Bilateral foreign development assistance frequently becomes the carrot in U.S. foreign policy decisions. Nationalization of U.S. owned industries, seizures of American fishing vessels, non-democratic election procedures that abridge human rights or any of a variety of political acts can cut off a developing country's U.S. aid.

Beyond these obvious political expressions' domain are the issues which affect national security and world environmental balances.

Perhaps the major political issue of technology transfer centers around the security concerns of the U.S. and its allies. The energy (fuel) shortage is by any measure a worldwide crisis

that affects every person directly or indirectly. Much of the present research on alternative sources of energy supplies has been made on the basis of high-end technology adoptions. Nuclear power has met public resistance as an alternative supplement to fuel energy needs in developed countries; it cannot safely be considered a source in developing countries. Global security can be threatened by irresponsible uses of technology that fabricates harmful by-products, as is the case with nuclear waste.

Armaments transfer, long a part of U.S. assistance programs, has had the unfortunate consequence of strengthening the political role of the military in developing countries. Because of their training as highly specialized technicians in the operation of weapons and support systems, intelligence operations, zero-based budgeting, financial management and civilian crowd control, the military is usually perceived as better organized to undertake civilian responsibilities for governance. This type of assistance, growing out of American concern for the security interests of the U.S., has made it possible for a disproportionate number of the military to be placed in charge of civilian public agencies as the most highly trained personnel available. This military preponderance could have a number of problem consequences for ISTC programs: expansion of the number of trained LDC civilian personnel may be more difficult, introduction of BHN goals may be contrary to prevalent military goals and, of most consequence, the continued impact of military aid may completely overshadow any influence of ISTC sponsored programs.

3.244 The Role of Patents

In countries where trade protection is a national policy, the role of patents will figure prominently in the technology transfer process. For this reason a patent restriction may pose a constraint to certain kinds of technology adoptions since they award "exclusive rights to produce" something others may wish to produce.

The transfers most affected by patent restrictions are those that protect new processes not yet widely diffused. In fact, one of the functions of the patent process is to reduce the rate of diffusion of a new idea throughout the market. When a new idea or manufacturing process is absorbed at too fast a rate in its respective industry, the rate of return to the innovating firm of the firm's research investment is diminished accordingly. This condition has prompted a U.S. government official to remark that "the patent system institutionalizes the relationship between technology generation and diffusion."³⁰

The international system for protecting industrial property is reflected in the Paris Convention for the Protection of Industrial Property (1975). This agreement provides for the "national treatment and right of priority for owners of patents and trademarks."³¹ Developing country signatories to the Convention have sought to revise the rules in order to gain easier access to

patented technology. Many LDCs view patent protections as closely linked to trade opportunities since new manufactured products may depend on patent rights for export. Unless the rights to a process are secured without incumbrances, the product could be effectively barred from international markets.

Protection of patents overseas has been a matter of official concern. The authority granted the Commerce Department in Section 337 of the 1974 Trade Act, permits the U.S. government to exclude imports of manufactures produced under infringed or stolen technology. Sanctions on violators of the code are authorized in Section 301 of the Act. Prosecution under the existing codes is difficult to pursue; when infringements are discovered, each is decided on a case-by-case basis . . . provided a private party initiates a complaint.

ISTC's function in providing access to patented technology is not fully discussed in the proposal. Should issues associated with negotiation over patents become a constraint to the transfer process, they will have to be resolved at that time considering prevailing circumstances. Suffice it to say that patents and trademarks will play a restrictive role in future bilateral agreements on technology cooperation.

3.3 SUMMARY

From a description of the issues surrounding cooperation in transferring scientific and technological information and know-how, targeting decisions can be made for conveying the right skills, techniques and ideas, based on informed judgments.

The distinction drawn between science and technology permits practical applications to be pursued by ISTC management. It also enables the planner to design an organizational structure that is responsive to the people and the tasks involved. Appropriate technology that employs more labor and less capital is preferred from a developmental point of view, but may not be politically pertinent.

Cooperative links have suffered from neglect. ISTC management and staff have a responsibility to address this issue by fostering cooperative and collaborative grass-roots ties with the scientific and technological communities in developing countries. The need to establish a more equitable and stable relationship among developing and developed countries can be met by strengthening the lagging capacity in fields of basic and applied research, especially in the social sciences.

The optimal organizational structure for enhancing the technology transfer process is one that features a supportive environment for cooperation. A place for the critical role of "technology

gatekeepers" must be found in such structures. Sensitivity to the psychodynamics of the processes that encourage cooperative ties will insure harmonious planning and improved coordination among the public and private agencies involved in the ISTC program. Management of the issues which surround enlisting cooperation, transferring skills and obtaining resources can be done well or poorly. It is possible to have competent people in technical positions conducting transfer programs who are unaware of their inadequacies.

Developing societies have to exercise prudence in selecting which technology policies will be followed. Several factors are involved, not the least of which is the cost of change. Available resources are insufficient in quantity and kind to support adequately the immediate basic research required to develop technical capacity in a relatively short time. If time is of the essence, the patterns of acculturation affected by change need to be understood by the transferors---ISTC and associated organizations--- in order that innovations will not be buried in the furrows of resistance. Funding the appropriate technologies and programs must include various disciplines, for without these investments, the options for meeting basic human needs and approaching global problems through scientific and technological research will become dangerously limited.

NOTES

SECTION 3.0

1. This paraphrase is borrowed from Victor Weisskopf, M.I.T. Professor Emeritus of Physics, in "The Frontiers and Limits of Science," American Scientists, Vol. 65, July-August, 1977, pp.405-411.
2. Schumacher, E.F., (1973) is credited with introducing the term. See also Austin Robinson, ed., Appropriate Technologies For Third World Development, Proceedings of A Conference, International Economic Association, Teheran, Iran, New York: St Martins Press, 1979.
3. C.P., p. 19.
4. C.P., p.24.
5. See Arrighi, Giovanni, "International Corporations, Labor Aristocracies and Economic Development in Tropical Africa," in P. Rhodes, (ed.), Imperialism and Underdevelopment, New York: Monthly Review Press, 1970. The optimal choice of techniques and country of origin of equipment tends to extend the dependency of the poor on the rich.
6. For a cultural anthropological account of the problems experienced by societies in adapting to new tasks, see Melville J. Herskovitz (1973), pp 122-144. Also, ISTC's presentation to the Congress. The subject of dependence and nationalism as it affects cooperation is treated in Theotonio Dos Santos, "The Structure of Dependence," American Economic Review, Vol. 60, No.2 (May 1970),pp 231-236.
7. Herskovitz (1972), p.122.
8. Explain difference between institution and structure. as established practice and an organization of interrelated parts.
9. See "Some Thoughts on Technology Transfer," by Dr. Herbert I. Fusfeld, in the Report to the Deputy Secretary of State, "Technology and Foreign Affairs" October 20, 1976. Authored by Dr. Keneth Glennan, Bureau of Oceans and Interntional Environmental and Scientific Affairs, Department of State, Washington, D.C., Appendix H.
10. See Congressional Presentation, Institute for Technological Cooperation, February 23, 1979, Washington, D.C., p. 23.
11. C.P., p. 22.
12. Ibid., p.25.

13. Ibid., p. 30.
14. See for example, "Proceedings of A Conference on Technology Transfer and Innovation, under the auspices of the National Planning Association and National Science Foundation (NSF 67-5), May 15-17, 1966, Washington, D.C. U.S. Government Printing Office. And Raymond S. Isenson, "Technological Forecasting Lessons From Project Hindsight," in Technological Forecasting For Industry and Government Methods and Applications, ed. J. R. Bright, Englewood Cliffs, N.J.: Prentice Hall, 1968, p. 36.
15. Kinter, Sickerman, 1975, p. 27.
16. Teece, (1976).
17. Ibid., p. 7.
18. See Allen, 1973 and Kinter, et. al. for in depth discussion. Also Donald Schon, Technology and Change, 1967.
19. Allen, 1973, p. 51.
20. Allen and Cohen, 1969. First introduced the term "technological gatekeepers."
21. Allen, 1978; Whitley and Frost, 1973; Tushman, 1977; Frost and Whitley, 1971; Taylor and Utterback, 1975.
22. Allen, (1973) p. 51.
23. Hufbauer, Gary C., Deputy Assistant Secretary of the Treasury For Trade and Investment Policy, testimony before the Subcommittee on Domestic and International Scientific Planning, Analysis and Cooperation of the Committee on Science and Technology, U.S. House of Representatives, September 6, 1978, p. 30 ff.
24. Mellor, p. 283 ff.
25. CEPAL, "Report of the Fourth Session of the Committee of High Level Government Experts," Quito, Ecuador, 12-16 March, 1979 E/CEPAL/1073. Also see Technology Policy and Economic Development, A summary report on studies undertaken by the Board of the Cartagena Agreement for the Andean Pact Integration Process, IDRC-061e, International Development Research Centre, Ottawa, Canada, 1976.
26. Teece, 1976, p. 34 ff. The treatment of cost data by Teece uses mathematical models to determine costs of technology

transfer. Regression analysis is employed to determine costs incurred in implementing a sample of projects around the world. The basic model tested is

$$C_i = f(U_i, G_i, E_i, R_i, S_i, N_i, O_{1i}, O_{2i}, P_i, Z_i)$$

Where C_i is the transfer cost divided by the total project cost for the i th transfer. U_i is the number of previous manufacturing start-up that the technology of the i th transfer has undergone by the transferring firm. G_i is the age of technology in years. E_i is the number of years of manufacturing experience that the recipient of the i th transfer has accumulated. R_i is the ratio of research and development to value of sales for the recipient of the i th transfer. N_i is the number of firms possessing a technology that is 'similar or competitive' to the technology underlying the i th transfer. O_{1i} is a dummy variable, 1 if the recipient of the i th transfer is an affiliate of the transferor and 0 otherwise. O_{2i} is another dummy variable that takes value of 1 if the recipient is a government controlled enterprise and 0 otherwise. P_i is level of GNP per capita of the host country. Z_i is the random error term for the i th transfer. p. 58.

27. C. P., p. 115.
28. Weiskopf, Thomas, "Capitalism, Underdevelopment and the Future of Poor Countries," in Jagdish Bhagwati, ed., Economics and World Order, New York, McMillan Co., 1979.
29. See for example, the programs offered by the Inter-American Defense College, Washington, D.C.
30. In Hufbauer, p. 32.
31. Ibid., p. 39.

"You can imagine, Watson, with what eagerness I listened to this extraordinary sequence of events, and endeavored to piece them together, and to devise some common thread upon which they might all hang."

The Musgrave Ritual

4.0 MANAGING ORGANIZATIONAL ISSUES

The extraordinary sequence of events in the evolution of the U.S. foreign assistance system has made devising a common thread by which to organize them the continuing problem of Presidential administrations and Congressional committees. This section does not review the history of U.S. foreign aid, but focuses instead on the management of the organizational issues raised by the latest reorganization of the system. The first subsection presents the purpose and structure of IDCA and provides an overview of the ISTC proposal. The second subsection describes the organizational issues which must be managed in introducing any large system change. These subsections provide a basis for subsection three, which discusses the issues peculiar to ISTC, and for subsection four, which presents the implications of ISTC's special problems. The fifth and final subsection summarizes the key issues facing the managers of the proposed reorganization.

Statement of the Problem

The International Development Cooperation Act of 1979* has introduced a major change in the structure of the U.S. bilateral development assistance system. Under the provisions of this Act, two new agencies have been authorized: The International Development Cooperation Agency (IDCA) and the Institute for Scientific and Technological Cooperation (ISTC). Also contained in the Act is the intent of the U.S. Congress to alleviate the worst manifestations of poverty in developing countries by contributing to their economic and social progress. Basic human needs policy is made the focus for designing programs that are to be supported by this Act.

Changes in an institution's policies and programs create organizational issues which must be managed if the institution's programs are to be efficiently and effectively¹ implemented. The Act mandates the creation of new organizations and a focus on basic human needs, linking the two by direct goal statements. Central to the discussion of organizational issues is the impact basic human needs policy and scientific and technological cooperation/transfer issues might have on the organizational structure of ISTC and visa versa. For example, one of the most significant issues may be the resistance to change experienced by the people working in the system.

Using ISTC as a focus, then, this section looks at its

* Public Law 96-53, 22 USC 2151.

proposed purposes, goals, and structure to identify the possible issues that could affect the implementation of the ISTC plan. The expectation that the new Institute will take a leadership role in promoting technology both on a world-wide basis and within the U.S. development assistance system makes it even more important that the implications of these changes be understood.

In an attempt to trace the common thread upon which problems of implementation may hang, this section describes the proposed reorganization and the organizational issues which are likely to be involved. The issues are described in terms of the following characteristics and variables: the organization's dynamics and processes; the inferred change process for ISTC; the need for managing the transitional phase of ISTC and the reasons for using a planned change strategy as a means to overcome resistance to the introduction of new policies, programs, and structures.

4.1 REORGANIZATION OF THE FOREIGN ASSISTANCE SYSTEM

Reorganization Plan No. 2 transmitted to the Congress in April 1979 by President Jimmy Carter, is the Executive response specifying the structure of IDCA. The purpose of IDCA is to coordinate U.S. economic policies and programs affecting developing nations. Under this plan, policy-making authority will be more directly a Presidential responsibility than a task diffused throughout the various Cabinet Departments,² thereby improving

the efficiency of decisions about foreign development. Similarly, ISTC was created to complement the activities of IDCA. Since both IDCA and ISTC represent major changes in the present organization of U.S. bilateral development assistance, they become the focus for the study of planned change in this area. A description of the organizational plans follows.

Purpose and Structure of IDCA

IDCA has the primary responsibility for coordination of activities related to international development and funded by the U.S. government. Its purposes are to "provide stronger direction of U.S. policies toward the developing world, ensure a more coherent development strategy, promote the more effective use of the various bilateral instruments by which the U.S. can encourage economic and social progress in developing countries, and ensure that U.S. bilateral programs and the multinational programs to which we contribute better complement each other."³

The IDCA Director is designated as the principal international development advisor to the President and the Secretary of State. The Director chairs the Development Coordination Committee (DCC), recommends the appointment and tenure of senior officials of IDCA components, and controls budgets and policies of AID, ISTC, the Overseas Private Investment Corporation (OPIC), and

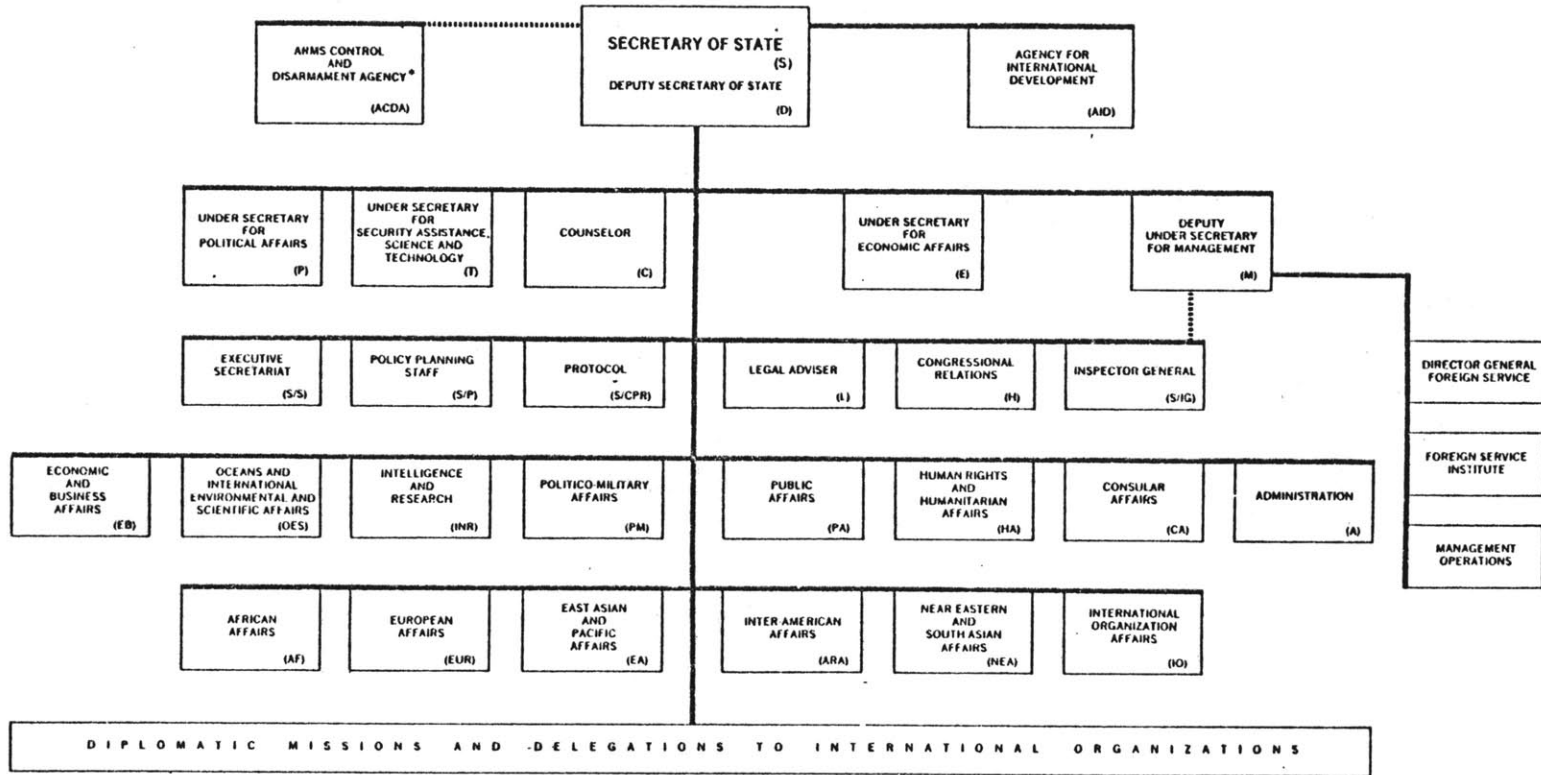
the PL 480 Program. The Director is also responsible for the achievement of consistency and balance among the policies, major programs, and budgets of component agencies.

The Carter message further delineates the following responsibilities for the IDCA Director:

The IDCA Director would be responsible for ensuring that development goals are taken fully into account in all executive branch decision-making on trade, technology and other economic policy issues affecting the less developed nations, and would submit an annual development policy statement to the Congress. The Director would also prepare a comprehensive foreign assistance budget, which he would submit to the Office of Management and Budget after consulting with the Secretary of State, and would lead the Administration's presentation of that budget to the Congress.⁴

In general, many functions formerly served by the AID Administrator are now assumed by the IDCA Director. For example, the AID Administrator is now a level III position, the IDCA Director is level II. This shift in responsibilities is illustrated in the following organization charts. Chart 4.1 diagrams the structure of the Department of State (1978) prior to the reorganization. Chart 4.2 provides a detail of AID's structure (February 1979) prior to the reorganization. Chart 4.3 emphasizes IDCA's linkages to the entire foreign assistance network.

DEPARTMENT OF STATE



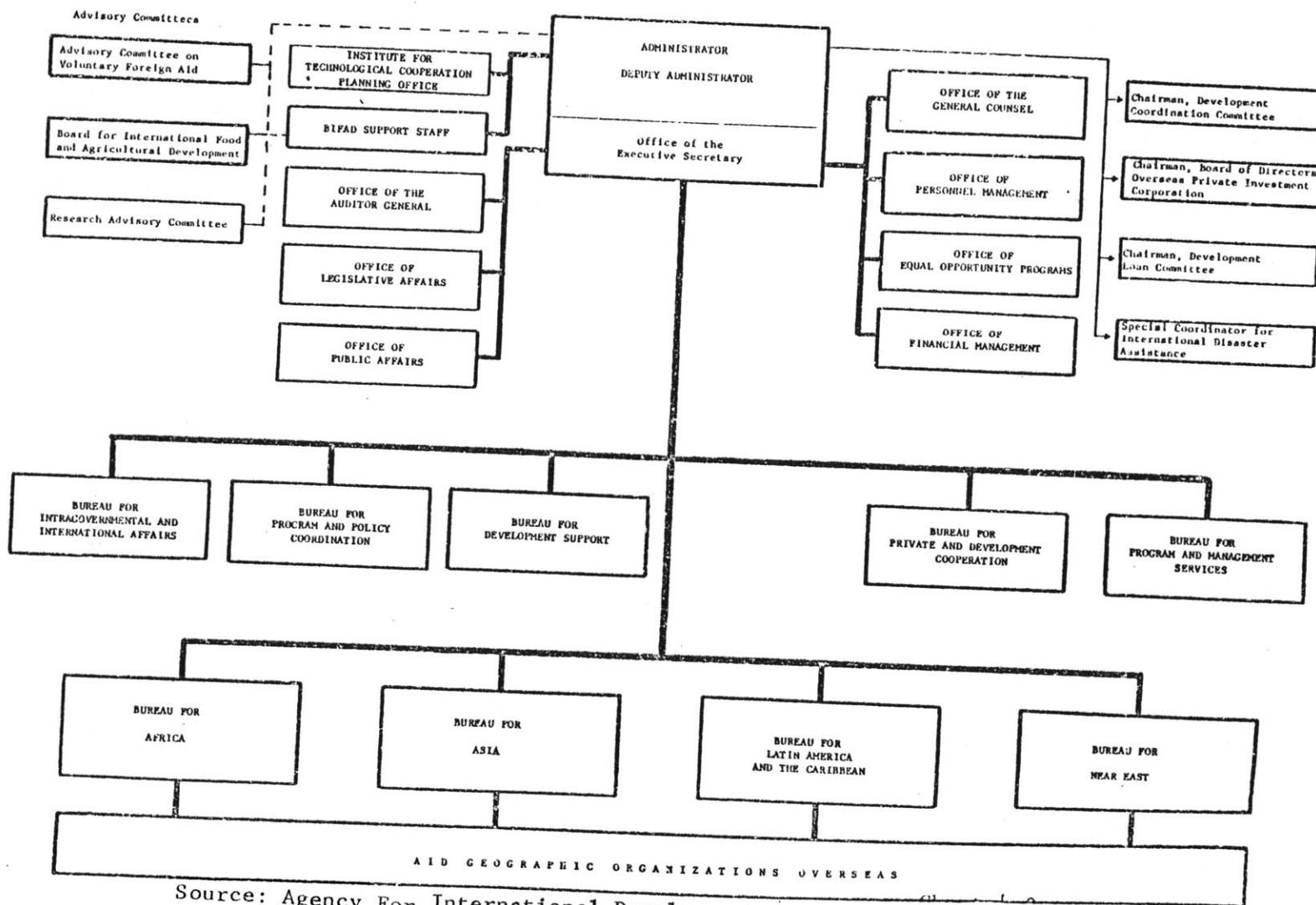
* A separate agency with the director reporting directly to the Secretary and serving as principal adviser to the Secretary and the President on Arms Control and Disarmament

Source: Department of State

Chart 4.1

MAY 1, 1978

Agency for International Development

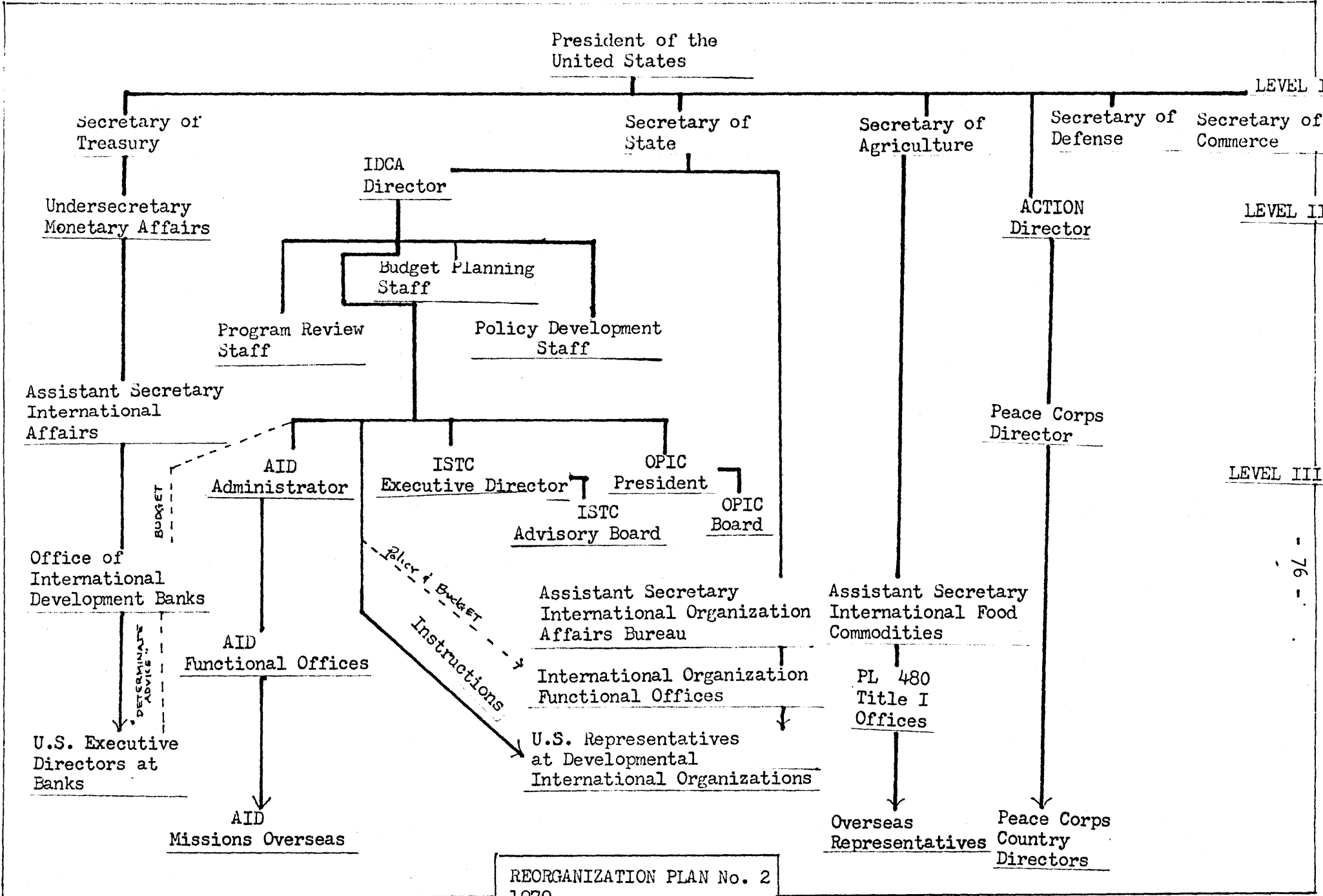


Source: Agency For International Development

Chart 4.2

Effective Date: 7/26/76

Chart 4.3



Source: Congressional Research Service. JESanford, FAND

The ISTC Proposal: overview

In addition to the shifts in responsibility resulting from IDCA's creation, the ISTC would cause further changes in the foreign assistance structure, particularly in the AID. As described in the February 23, 1979 Congressional Presentation, the Institute has a dual purpose: "(1) To strengthen capacities of developing countries seeking to apply science and technology to meet their needs; (2) To focus increased scientific and technological research attention on the search for better ways to meet basic human needs and approach global problems."⁵

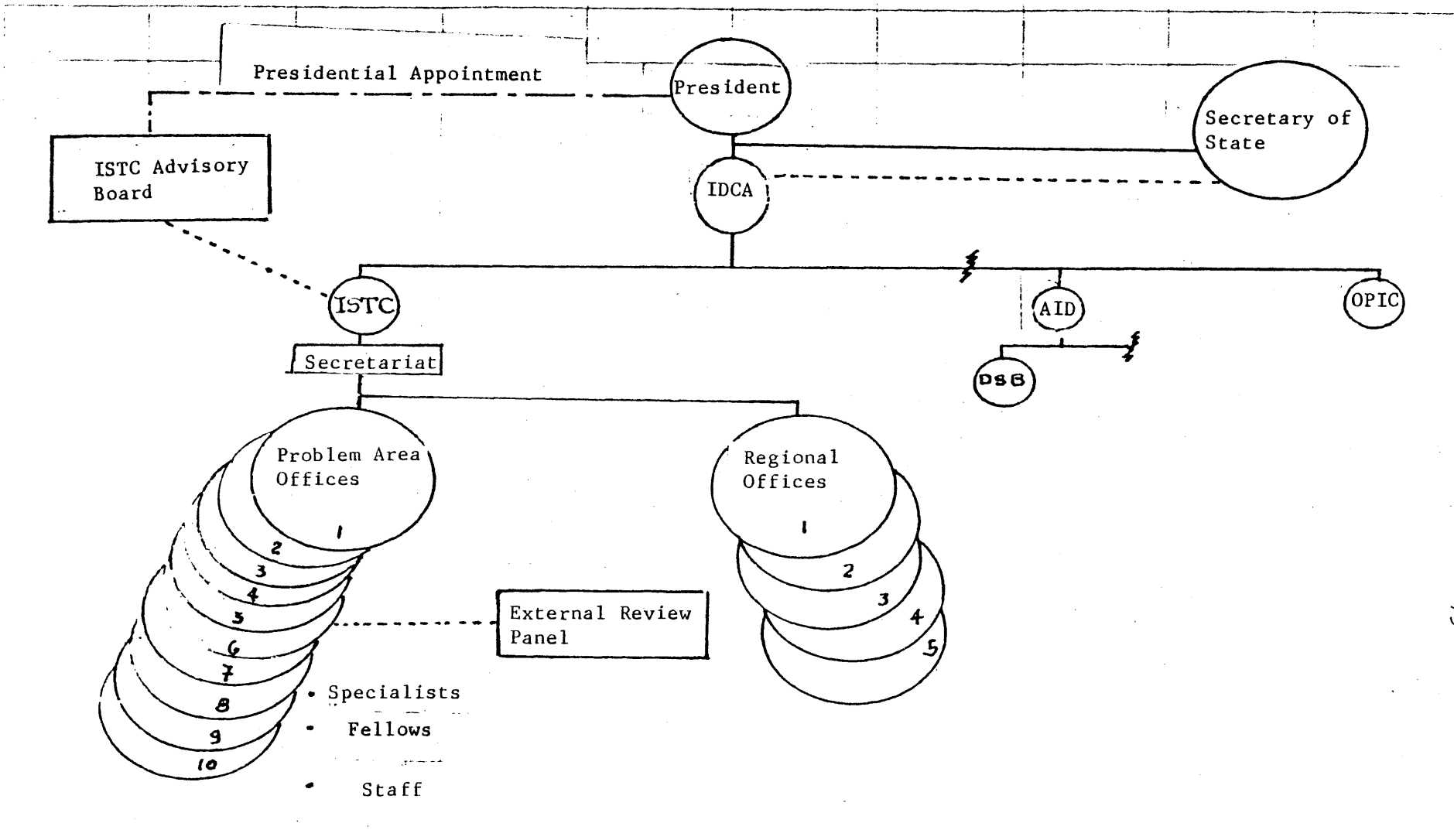
In specific, ISTC would be directed toward the following activities:

- (1) Increasing agricultural productivity and income.
- (2) Improving health conditions in developing areas.
- (3) Improving population programs.
- (4) Improving nutritional levels in developing countries.
- (5) Strengthening indigenous science and technology capacity.
- (6) Improving processes of technological cooperation.
- (7) Providing communications and information systems.
- (8) Encouraging energy planning and finding new energy supplies.
- (9) Promoting environmental protection and supporting natural resource management.

(10) Creating non-agricultural employment.

The structure proposed for carrying out these and other functions of the Institute calls for a centralized Director and a number of decentralized offices. The Director, appointed by the President, heads ten Problem Area Offices (corresponding to the program initiatives listed above) led by coordinators who are supported by small staffs and a variable number of scientific and technical specialists. Each Problem Area Office administers grants and contracts in support of its share of Institute programs. In addition, the Institute maintains regional field offices overseas staffed by an ISTC representative, a deputy, local support staff, and specialists assigned on long or short term basis depending on specific project activities. (See Chart 4.4).

Both its activities and its structure give the Institute characteristics which distinguish it sharply from other U.S. development cooperation programs. In particular, it is unique in the following regards: its focus on the research and development function; direct involvement of experts from developing countries; sustained attention to development problems by the science and technology community; its focus on problems rather than on countries, including cooperative work with the "middle tier countries"; and its attention to programs which attack poverty and to newer elements of developmental concern which



PROPOSED ISTC ORGANIZATIONAL STRUCTURE

basic operating units

SOURCE: FCV JAN 80

impinge upon U.S. economic and social interest; and finally, its operating style supportive of direct institute-to-institute contacts and collaboration.

Personnel

Chart 4.4, derived from the written description of the Institute's personnel and functional requirements, describes the likely personnel structure of ISTC. The personnel system will be managed internally and patterned after the career service of the bilateral aid program. Thus, scientific and technological personnel will be non-career specialists designated as Institute Fellows, with one-fourth to one-third from developing countries. Specialists will be assigned to problem areas and also function from time to time as a multi-disciplinary body of experts.

In addition, an advisory council of up to twenty-five persons appointed by the President (one third from developing countries) will advise the Director and senior staff (Program Coordinators) at least four times a year on matters involving broad policy or program change. Review panels will be drawn from lists of qualified scientists and technologists who are knowledgeable about the specific problem areas or requirements of developing countries. They will conduct periodic external reviews of the technical aspects of research and program proposals. The Institute's

relationships with other agencies will be maintained through an as yet undefined subcommittee structure.

Special Concerns

The Congressional Presentation singles out special concerns involved in separating ISTC from AID. Some of these concerns are related to the issues of organizational change addressed in this paper: "To be done well, the IFCT (ISTC) assignment calls for a different personnel, a larger time frame, a different programming process, and an alternate system of evaluation, and a set of relationships quite different from those of AID."⁶

These special concerns are offered as justification for an institute separate from AID. Immediate problems, it is argued, absorb the time of AID technical experts and limit the number of qualified personnel available to carry out the "New Directions." Also the number of technical experts in AID is declining.⁷ Therefore, it is necessary to draw ISTC's personnel from the scientific and technological communities. Though research and development calls for long term efforts and flexibility, AID's programming cycle is short term and considered by ISTC planners as cumbersome to change. Hence, there is a need for ISTC to use a multi-year time frame for programming and to be flexible enough to change direction rapidly.

The proposal also suggests that ISTC fill the need for more appropriate evaluation systems and for relationships or linkages abroad which are conducted more with individuals and private and public institutions and less with governments. The presentation also stresses that the Institute should work particularly actively with institutions devoted to meeting basic human needs.

In general, the Institute is said to offer a "productive balance of relevance and independence . . . broadened applications beyond the confines of AID . . . , involvement of science and technology communities . . . a new collaborative approach (especially with middle tier countries) . . . an emphasis on both basic human needs and problems of global maintenance . . . , an appropriate operating style (i.e., evaluation and operating procedures specific to its mission) . . . private sector involvement . . . a response to the U.N. Conference on Science and Technology for Development . . . an added dimension to domestic R&D . . . and an added perspective on foreign policy."⁸

The foregoing discussion centered on the set of variables affecting the mission and structure of ISTC -- basic human need policy, technology cooperation and Reorganization Plan No. 2. The above list of possible advantages to be gained from the creation of ISTC offers some insight into the organizational design problems AID or the new Institute would face in introducing the accompanying changes. In the next sections, issues in

organizational design are summarized and ISTC is seen in light of these concerns.

4.2 ORGANIZATIONAL ISSUES: THEORETICAL PREMISES

Organizations undergoing change face problems common to many large social systems where change alters ongoing behavioral patterns. ISTC clearly falls in this category. Change problems have been empirically studied to determine the components that are most affected (e.g., Kelman, 1978). Those components of a social program which are likely to face conflict when organizational change is attempted typically include the following:

- (1) The goals to which the change activities are directed.
- (2) The target groups of change.
- (3) The strategies used to implement the intervention.
- (4) The evaluation of the consequences of the intervention.

Deliberate social interventions in an organization are likely to create tensions within the groups affected by the factors outlined above. Conflict can arise, for example, when non-affected top management (Congressional planners, consultants and other agents not directly affected by the change) prescribe the reorganization of tasks and social arrangements.⁹ Individuals and groups can resist the change effort no matter how well conceived the plan may be, and resistance becomes a signal

that something is wrong in the process.

Trying to overcome resistance directly does little to alter the conditions which produced it in the first place.¹⁰ Social arrangements which remain unattended within the organization can work against the mission. These conditions and arrangements must be understood and their impact on the tasks assessed before attempting to implement the reorganization plan.

Thus, knowing where the potential areas of trouble are and whose values are affected aids in preparing a strategy to deal with objections to the change. Lawrence (1954) has suggested that resistance is often needless. What is necessary is to better understand the "true nature of the resistance" being observed. What values are being breached and what ethical questions are being challenged by the change effort? The unconscious behavioral and motivational responses to environmental influences, i.e., the psychodynamics, play a key role in affecting a group's ability to work toward a desired goal.

The conflicts arising from goal changes affecting personnel groups and the concomitant conflicts over implementation strategies and the evaluation of the consequences of change in an organization are most often manifest in an organization's operational considerations. Some of the variables and characteristics that we can expect to be affected are as follows:

- (1) The clarity with which roles are established.
- (2) The decision making process.
- (3) The information and communication flow.
- (4) The operational procedures and norms.
- (5) The problem solving process.

Although the organizational issues raised by the proposed structure and mission of ISTC affect the dynamics and processes of the primary organization, in this case the IDCA system, the Institute plan is the focus of discussion in the hope of identifying the areas where implementation may be difficult. In specific, the next subsection discusses the clarity of goals and consequent effect on the operational consideration of role definition, decision-making processes, information and communication flow, operational procedures and problem-solving within the ISTC.

4.3 ISSUES PECULIAR TO ISTC

Clarity of Goals

The goals toward which the ISTC activities are directed grow from the assumptions which accompanied the recommendations to reorganize the AID system and create ISTC as a separate entity.^{10a}
The underlying assumptions are:

(1) That basic human needs policy would be the principal focus of interest in the Congress for the next 3-5 years. (1980-1984).

(2) That basic human needs will continue to be an area of special competence for the AID - ISTC programs on a world-wide basis.

(3) That AID would not be the source of high-end technology in the future and therefore a new agency (ISTC) would have to provide the framework for channeling technological resources to the developing world.

(4) That the conflict between the generalists and the specialists in AID detracts from pursuing New Directions approaches, which include BHN policy. Basic needs programming is considered the specialization of AID's staff.

(5) That ISTC is considered a likely agency which can assume the technological leadership for future foreign aid programs.

(6) That, despite the demand for scientific and technological expertise focused on development problems, no increase in staff is contemplated for AID despite an increase in funding levels by a factor of two.^{10b}

One conclusion that may be drawn is that a failure to recognize the importance of these assumptions which undergird the goals of ISTC could result in failure to meet the desired goals. This point is raised because the current delay in obtaining an

appropriation may hinge on the assumptions that some Congressional leaders may have about ISTC. For example, they may have strong conceptions about its future role in foreign affairs, or in the focus of U.S. development assistance. Since the goals are based on these assumptions, the intervention strategy must be designed so as to recognize these implicit and explicit assumptions.

The principal goals ISTC will pursue in its change strategies are as follows:¹¹

-- Maintain a program distinguished from that of AID and the Development Support Bureau characterized by a 'distinct method of operations basic to its (ISTC's) purpose.'

-- Bring together multi-disciplinary attention to bear on complex development problems so as to broaden the view of the development task.

-- Involve the view and talents of developing country experts in the quest for solutions and alternative methods with which to address development bottlenecks.

-- Create a working environment that is attractive, stimulating and able to retain the necessary scientific and technological talent critical to ISTC's programs.

-- Focus the staff attention directly on problem solving activities, thereby reinforcing the orientation toward the mission and tasks on ISTC's agenda.

The goals expressed in official public documents, paraphrased above, are not specifically responsive to the special requirements of either basic human needs policies or to the issues raised by technology transfer, discussed in Sections 2.0 and 3.0 of this paper. Moreover, the official (formal) description does not propose an organizational format for implementing these goals. The only hint is contained in the recommendation which suggests that ISTC rely on the "bilateral aid program" for its career service and internal management system.¹² Though the plan suggests that "structure and processes" will reflect these goals, no mention is made of how it will be done.¹³

The general tenor of the goal statement lends itself to varying interpretations. There is some ambiguity about the steps needed to achieve, through organizational protocols, an efficient Institute, making prudent use of its resources. With respect to BHN objectives, such as participation of those affected by the change, the goal of involving the views of LDC experts can be interpreted as an effort at broad-based participation in making decisions within ISTC. However, in federal bureaucracies, whatever is not specified can be easily overlooked. More importantly, lack of specificity about implementing and measuring results makes these steps unreliable at best.

Clarity of Roles

A factor which contributes to the effectiveness of an organization is that those who perform the different tasks understand their roles -- what their assignment is, both in terms of their interests and in terms of the expectations of Congressional leaders, the Administration and developing country institutions.

Organizational theories hold that roles are considered key determinants in evaluating functions performed by persons and sub-units. Roles are shaped by expectations based on performance of tasks. (Beckhard, 1972; Kotter et. al. Ch. 7). In ISTC's case, for example, the expectations of problem area offices will vary, depending on the disciplines of specialists and fellows working on a problem. Whenever roles are not clearly defined, the likelihood of conflicts arising is greater, and role conflicts are certain to develop into issues, especially in the multi-disciplinary environment proposed, where expectations from the larger universe of ISTC's clients are at play, there is a ripe medium for problems to develop. Individuals and offices will be faced with time constraints that limit the number of tasks that can be performed with care. The priorities selected reflect the focus of policy thrusts which, in turn, determine the kinds of roles needed.

Conflicts can be reduced when expectations are in line with commitments and are based on established criteria for selecting task priorities. Attention should center on how personnel perform their work, despite conflicts that may emerge as a result of LDC national development agendas and U.S. foreign policy expectations. Since implementation will be dependent upon the abilities and competences of individuals selected to manage programs, the roles for each position need to be agreed upon. The classification should allow enough flexibility to accommodate program uncertainty.

Yet, there is no mention of how to address organizational issue in the planning documents. The significance of maintaining clarity about roles is that without resolution it affects the efficiency of operations. Role clarification is further complicated by uncertain job assignments which cannot be worked out until ISTC becomes operational and problems are identified. It is also true that technicians and administrators responsible for introducing and maintaining organizational changes are usually not skilled or knowledgeable about managing the special roles involved in a multicultural, multi-disciplinary work environment.*

* There is little verifiable data to support the assumption that expertise in managing change exists within the IDCA system; one can infer from discussions, interviews and official documents that the special skills and knowledge needed to manage the change, as framed in the context of this paper, are not appropriately placed. Some of the people more sensitive to development problems and capable of understanding change process are in offices with lesser influence on the overall system. The staff in the Office of Personnel Management (PM/TD) have a critical responsibility for setting standards, criteria for developing the kind of staff skills necessary. The spillover effect is negligible at the present.

Clearly it would be ideal if ISTC could produce role descriptions which reflect practical work situations; they contribute to job enrichment and job enlargement. Jobs that are defined in this way and openly structured attract the kind of professional talent ISTC hopes to retain. Thus, they would tend to make the total organizational effort more consonant with development requirements.

Decision Making Process

Closely related to the issue of role clarity is the issue of how well ISTC's decision making apparatus works. In complex organizations, the trend is to locate decision making authority as close to the source of the problem as possible. The optimal condition would be to place the power to influence decisions on the people having the most appropriate information on the problem, irrespective of their role or status within the ISTC operations and management level.

A question that needs to be answered is where does the information for decisions lie? In programmatic cases, ISTC will need to rely on the documentation retained in DSB about past enterprises undertaken by AID. Crossing organizational boundaries in search of vital information, however, may cause a loss of ISTC's effectiveness in becoming the source of technology leadership. Decisions based on borrowed information run the risk of

being incomplete. For this reason, the decision making process, especially on the operational level, has to be developed so that decisions made in the new agency and its "parents" are based on mutual trust and freely exchanged.

In addition to being based on better information, decisions affecting the types of programs and the levels of support for LDC institutions can be more complete when the process for arriving at decisions includes those people closer to the problem. (Usually these are the same people who can contribute the relevant information). Management studies have shown that people are likely to support those decisions they have helped to make. A feeling of "ownership" for the decisions is critical in achieving an effective implementation of the contemplated change.¹⁴ By inference, then, AID officials and ISTC staff at different levels of the hierarchy have to be involved in the change process.

Unfortunately, this level of full participation is not possible in the organization as currently designed. First, LDC counterparts have no discernible role in the current decision making process. Second, it is not clear whether or not ISTC will have the choice in selecting countries served or problems addressed. It is reasonable to expect Congressional pressure favoring certain countries over others or in pursuing a research proposal suggested by the Administration. But it is only with an enlightened, open decision making process that these conflicts can be satisfactorily resolved and inconsistencies accepted.

Information Flow and Communication

Effectiveness in ISTC will depend upon the kind of information it has available and the quality of communication transmitted. Distrust among working groups can be aggravated when pertinent data is truncated by a process of clearances and approvals. These procedures tend to limit the rate of information flow reaching decision centers.

In ISTC, problem area offices (see Chart 4.4) are charged with coordinating the problem selection cycle^{*} among several groups in a community setting by a problem area team. Confidence building in a team, however, requires pertinent, complete information in order to counteract client distrust that may arise as an outcome of the change. More generally, it becomes a matter of critical importance for the success of the implementation of ISTC's policies and programs to have access to sound information about what and why some members do what they do. Frequent communication, together with more information on strategies, data, intended results, and constraints are needed to set the collaborative style in motion. Ways are needed to increase trust and openness in a system traditionally known for clustering critical policy information on only a few staffers. What is important is that those who have access to

* The problem selection cycle would include the manner in which problems are identified, by whom, under what criteria and for what purpose are they accepted for attention and possible funding. Also the evaluation of programs becomes part of the cycle.

policy information, but are not close to the problems, not be given all the power over decisions. (e.g., As is often the case, the U.S. staff has the dominant position in a bilateral program).

The expectation of the Planning Office is that a multi-disciplinary, cross cultural approach will evolve under ISTC's guidance. The collaborative style of operation calls for communicating different value systems, norms and desires, together with the program content. ISTC coordinators must have in-depth knowledge about the effects of BHN policy on development strategies and the reasons behind the New International Economic Order.

Examining the social aspects of organizational issues and institutional organization patterns is an effective approach towards satisfying communication and information needs.^{14a} Management information systems, evaluation research and applied behavioral sciences can complement the existing knowledge that could be pressed into service to assure broader and more complete information sharing in ISTC. Communications technology can also be employed to augment the quantity and frequency of information and possibly help to counteract client distrust over the intentions of the change effort underway. It should be pointed out, however, that these technologies are not enough to overcome all the impediments that established or inherited norms and procedures pose for ISTC. Bureaucratic intrangency dampen efforts at improving communication in the IDCA setting, irrespective of technological marvels.

Operational Procedures and Norms

Operational procedures are those steps or requirements for task accomplishment which are specified in writing. Most large organizations have manuals specifying the procedures for various aspects of the organization's operation. AID is no exception. Indeed, its many procedural manuals are sometimes regarded as one of the chief reasons for project delay. Norms, on the other hand, are those unwritten practices that control the behavior and interactions of daily operations. Operational norms can range from the subtleties of who sends and who receives memos and in what order to reward and promote systems based on old-boy relationships.

ISTC has been structured, a priori to depend on the organization of AID for program support overseas. AID administrative procedures are to be adopted in areas of personnel management and budget control.¹⁵ Under these conditions, it is reasonable to expect that many norms and the general operating style of AID will also carry over into ISTC. Also, ISTC will not have control over the AID field staff when implementing its own policies. Thus, until a new division of labor is accepted among the AID work groups, ISTC will have to risk losing program control to the AID.

A particular concern expressed by ISTC planners¹⁶ is the desirability to maintain control over the contracting process for goods and services. The Contracts Office of AID has been described as overburdened with legalistic procedures imposed by federal guidelines -- in addition to the fact that its norms and demands are peculiar to AID. A separate contracting function for ISTC could be a practical solution to the alternative of depending on AID for this task. The issues raised by general adherence to the procedures, however, remain, and there is danger that such close linkage to AID may vitiate ISTC's collaborative, quick-to-act style.

Problem Solving Process

How will ISTC resolve problems within its institutional boundary and who will solve them? Whenever people with different professional backgrounds and nationalities are brought together as peers in a common work environment, tensions are certain to appear.¹⁷ Unsatisfactory solutions to such task related problems can erode confidence in management's ability to conduct a collaborative style of operations.

Processes must be devised, then, for managing new interfaces, such as non-U.S. scientists interfacing with the DSB divisional chiefs who previously controlled AID's research resources. The

traditional practice has been to minimize or discount the role of LDC technicians in a problem situation dominated by U.S. staff. The reasons given for this disparate treatment of views among nationalities are that security and classification regulations purposely restrict the input of non-citizens in policy decisions. Problem solving approaches will have to disregard administrative constraints such as these or risk losing the active participation of non-U.S. staff.

Managing the Transition

The preceding description of organizational issues in ISTC, based on the experience of AID, described some of ISTC's probable internal dynamics and processes. In addition to concerns about ISTC's organizational design, issues about the change process itself are important to its success. How does ISTC's management implement the legislated changes in structure, policy and program focus? What are the steps that can be taken? For a model against which to weigh alternatives, one might look at the experience of similar institutions in similar circumstances. Applied behavioral scientists who examine organizational behavior in large, complex systems provide empirical results of observations from which projections can be made. Recent studies of the North American health organizations by Beckhard (1977, 1972), Tichy (1976), and others, as well as research in the private sector, by Lorsch (1976),

Weisbord (1974), Seeger, J., Lorsch, J. Gibson, C., (1979), and Kotter (1979), suggest the types of variables usually operating in a major change effort.

Contingency theories of organizational design attempt to define components and processes which contribute to finding a proper fit among people, technology and structure.¹⁸ Seen in this perspective, ISTC's effectiveness depends on how well the structures of sub-units, their leadership style, and planning and control systems are matched to its mission. Thus, getting started means planning for the transition that occurs between the present situation and the desired end state four years hence. The transition is an unique condition, limited by time and bound by the special circumstances affecting the dynamics and processes described above.

In addition, the transition stage is characterized by a high degree of uncertainty and instability in the organization. Members perceive inconsistencies which, if unchecked, can produce high levels of emotional stress. Control over the situation becomes paramount since principal leaders become especially visible to the constituency. Consequently, expectations are raised about the trust, respect and competency of these leaders.

Thus, management must demonstrate confidence in the change plans since members of ISTC and its constituents need to perceive

the strategies employed as consistent with ISTC's goals.¹⁹ An effective transition management can also serve the function of providing feedback for evaluating performance against goals and make the necessary readjustments as the process develops. In general, the level of commitment from key supporters during the transition stage plays a significant part in determining the achievement of the future desired state.

Though a plan for managing the transition is an essential tool for implementing the contemplated changes, the transition plan for ISTC is unclear -- at least as judged from the presentation to the Congressional committees. The plan should identify who makes up the transition management team of ISTC and identify the tasks in clear, specific terms. Members of ISTC's basic operating units will be looking for consistency with the change goals in the priorities selected by management. In theory, all discreet activities should be integrated with explicit time sequences spelled out in the plan. Contingency plans for meeting the uncertainty of future conditions should be agreed to by IDCA. As a final step, the plan should show the cost effectiveness of all investment activities in terms of time, resources and people. A special structure will be necessary for ISTC to manage day-to-day operations during the transition period. This structure will need to include chief managers, representatives from various constituencies, relevant sub-systems, the IDCA hierarchy and all problem area coordinators.

4.4 Implications of Special Problems

The organizational issues described above represent the key situational variables involved in ISTC's change effort -- its creation. In determining the best way to approach the reorganization task, management will make implicit and explicit choices regarding the time allotted for the change to take place, the kind of preplanning needed, the involvement of others and the attention focused on alternatives. Depending on the speed with which change is desired, the tactics employed will vary from slow, initially unplanned activities involving many members to rapid, clearly planned, non-participatory approaches primarily aimed at overcoming resistance.

The choice of strategy for implementing the ISTC will depend on the level and type of resistance anticipated. Overcoming resistance can prove a difficult task if the level is found to be high. The recommended approach is one in which change is slowly introduced, so as to allow more members to participate, and an attempt is made to minimize resistance. The choice seems desirable for two reasons. First, a major reason that people resist organizational change is that they believe they will lose something of personal value as a result. Their responses are then directed more toward protecting their personal agendas than the organization's best interests.²⁰

Second, overcoming the fear change generally produces also implies using a strategy that can deal with personal stress, loss of self esteem and sense of worth. After all, some staff members will stand to gain a desired position, while others will, in fact, lose. This is especially difficult because, as Peter Drucker has argued, the greatest impediment to organization growth is the "manager's inability to change" employees' attitude and behavior.²¹

Another aspect to consider in thinking about the implementation of ISTC is the status of the Planning Office with respect to the rest of the IDCA system. It was noted earlier that ISTC's budget and staff is much smaller than the institutions it is trying to impact. Furthermore, ISTC depends on DSB for program information. Obtaining the cooperation and commitment of DSB and other units in AID to implement the change requires time and broader participation. These factors present problems because, if those responsible for initiating and implementing the change in ISTC have little or no power to control actions, the change will proceed slowly.

Finally, there is the matter of risk. Will organizational performance be risked by the choice of change strategy selected? If long term results are preferred over short run accomplishments, then one can expect a slower change effort, since a collaborative style absorbs more time at the onset. It may well be a few years

before ISTC becomes a viable entity, but the necessity for a viable transition strategy is clear. Already AID managers are expressing doubts about the feasibility of ever making the new organization operational, questioning the functions of newly created staff positions, and in general evidencing the resistance to change described above.

Organizational Structure

In Section 3.0, the organizational structure for ISTC was described, based on the special characteristics of technology transfer. The functions of the technological gatekeeper, however, require an environment radically different from the conventional institutional forms proposed. A plausible alternative is to adopt the matrix form of management* together with a team approach, given the kinds of tasks and interfaces expected of ISTC.

* The identifying feature of a matrix organization is that some managers report to two rather than one boss -- there is a dual rather than a single chain of command.

Firms adopt a matrix form when it is absolutely essential that they be responsible to two sectors, such as basic research and technology, when they face uncertainties that generate very high information processing requirements; and when they must deal with strong constraints on financial and/or human resources. The matrix form can help provide flexibility and balanced decision making, but at the price of complexity. Matrix organization is more than structure, it must be reinforced by matrix systems such as dual control and evaluation systems, by matrix leadership behavior that operates comfortably with lateral decision making and by a matrix culture that fosters open conflict management and a balance of power.

Every matrix organization contains three unique and critical roles: the top manager who heads up and balances the dual chains of command; the matrix bosses (functional, product or area) who share subordinates; and the two boss managers who report to two different matrix bosses. Each of these roles has its own unique requirements.

A matrix management form will require, in addition to other changes in procedure, a reward system distinct from the conventional AID system. Since the organizational values involved in a matrix form of organization are different from a more conventional form, the prevailing practices will need to be reconsidered.

An important issue arises from the Administration's and Congress's commitment to LDCs and ISTC's emphasis on both basic human needs and problems of global maintenance. Problems of global maintenance face developed as well as less-developed countries, but there are no clear guidelines for selecting problems. Definition of the specific BHN problems to be addressed will require selection of geographical problem areas and recognition of culture's role in development problems will require country or culture-specific selection of problems. The regional area concept proposed in ISTC documents suggests a much broader attack on problem solving, permitting selection of general problems of global maintenance, but making consideration of country-specific problems more difficult.

In addition, budget cuts in federal spending are already part of the new set of uncertain conditions affecting ISTC's implementation, and will restrict the number of new endeavors pursued. For reasons of efficiency, a few well-planned showcase projects could better serve as a demonstration of the usefulness of the basic needs approach to development problems. Staff

morale and ISTC's credibility among clients can be improved by successful and limited projects, assuming ISTC is not previously committed to a large number of requests politically inspired.

4.5 SUMMARY

This section presented the assumptions behind the goals of the proposed reorganization of the U.S. bilateral development assistance system and the reasons for creating the Institute for Scientific and Technological Cooperation. The necessary changes in goal, policy and program content impose unique demands on the Institute. Internally, ISTC must wedge into an environment hostile to the new Institute. Outwardly, the Institute must respond to development agendas which may or may not be consistent with ISTC programs and philosophy. Cooperation under circumstances of uncertainty and waning credibility for U.S. assistance may come difficult to obtain, despite the need for technology.

Basic human needs policies and technology cooperation also pose unique organizational demands on ISTC. The creation of ISTC in the wake of a major reorganization of a large, complex system of which ISTC is a sub-unit, compounds the issues which affect its implementation. Over the past year, international events in developing countries accentuated the need for a broader understanding of the effects rapid technological change can produce in traditional

societies. Perceptions among development technicians about their mission and the manner in which change impacts social systems must be broadened.

Specifically, organizational issues in ISTC have been described in terms of the social dynamics and processes that have characterized the AID system. Particular problems are the way decisions are made and by whom; the clarity of individual tasks and roles; the style of communication, either open or closed; the information flow within the system; and the way problems are identified and solved. In addition, managing the transition -- more appropriately, ISTC's metamorphosis -- is perhaps the single most important task for ISTC. Getting from the present state to the desired end condition requires an interim management structure able to deal with resistance and ambiguity.

The Administration's effectiveness in conducting foreign policy changes may well be judged by the success of this seemingly innocuous event. Indeed, the style of conducting cooperative enterprises for mutual benefit is a reflection of the depth of understanding an Administration has about the dynamics and processes that impede or accelerate change. The microcosm of ISTC may measure a government's sincerity and appreciation of human systems and the spirit in which change is introduced.

The process of managing organizational change is, of course, complex and replete with pitfalls. First, in implementing the

necessary changes, management may fail to break from traditional operational orientation. Second, ISTC cannot rush through the planning process in order to reach the implementation stage without first considering the tensions produced by Congressional demands for realizable solutions in the short run. Long term programs often end in failure, too, as a result of not understanding what the "process of intervention change involves"²² in a large, complex system. Recognition of the developmental and inter-dependent nature of change helps management understand and appreciate the difficulties of organizational interventions.

Whatever intervention strategy ISTC chooses to follow, a fresh look at the options available for creative applications of managerial tools is in its advantage. A matrix form of managing could well serve the special needs of ISTC and an educational intervention could help leaders relearn the new techniques required of their new tasks. Those involved in managing change in the IDCA network, particularly top management and policy makers whose responsibilities extend into future generations, will need to examine the concepts presented in this paper. Their contribution in making ISTC operational depends on understanding the organizational issues involved and the conditions required for organizational effectiveness as well as efficiency.

NOTES

SECTION 4.0

1. Efficiency refers to the economic productivity of conducting organizational operations. Effective refers to the capable, competent and adequate manner of producing a decisive effect.
2. This is the aim contained in the Congressional Research Service Report and interpreted to be the outcome of the new coordination scheme. See "Issues and Options in the Coordination of the U.S. Foreign Policy," May 1979, p. 6.
3. President Carter, Message to Congress, April 10, 1979.
4. Ibid.
5. Congressional Presentation, February 23, 1979, p. 4.
6. Ibid., p. 137.
7. Brookings Report (1977), p. 24.
8. Congressional Presentation, Feb. 23, 1979, p. 4.
9. Weisbord, Marvin R., Notes on teaching large system change, a workshop conducted at MIT Endicott House, Dedham, Mass., Aug. 1-14, 1977. Unpublished syllabus.
10. In discussion with senior level staff of DSB and Policy Planning and Coordination (PPC) ISTC is viewed as another intrusion by the academic community in the operational work of AID supported by the influence the academics have on Congress.
- 10a. Princeton Lyman, II, p. 2.
- 10b. See C. P. comments by Ralph Smuckler.
11. C. P., p. 26.
12. US, Part IV, p. 713.
13. Ibid., p. 712.
14. Beckhard, 1972, p. 306.
- 14.a See Beckhard (1972, Weisbord.

15. U.S. Congressional Hearings, Part IV, P. 711.
16. Skolnikoff seminar. MIT, October, 1979.
17. Beckhard, 1972, p. 311.
18. Galbraith, 1971.
19. See class notes, Nevis, Beckhard.
20. Lorsch (1976).
21. In Kotter, p. 383.
22. Managing Change, p. 80.

5.0 CONCLUSION AND RECOMMENDATIONS

The Administration's emphasis on an Institute capable of fulfilling Congressional mandates and the expectations raised when President Carter announced the creation of ISTC in Caracas in February 1978, indicate that the time is ripe for initiating a significant departure from traditional approaches in U.S. relations with the developing nations.

What this paper has tried to address is the problem of implementing change in the form and content of development assistance programs. It was necessary to understand first the parameters defined by the basic human needs policy and technology transfer mandates. Second, it was necessary to examine the management strategy which can ultimately address the new development problems surrounding U.S. bilateral development assistance.

Understanding the types of changes required for the effective sharing of scientific and technological expertise involves a prior assessment of perceptions among the ISTC constituency, the behavior patterns of the staff, the meaning of policies and procedures which guide the implementation process.

Implementing policy and program changes in the U.S. bilateral development assistance system is a complex process. There are many polarized positions that must be overcome or dealt with before a successful change effort can take root. For example, what is the the operating perception of the staff with respect to basic human

needs programming? Is it regarded as merely another Congressional gimmick devoid of practical substance? An assessment of this perception is indispensable. Such an assessment should include a consensus about the definition of the problems faced in implementing BHN projects. A pertinent question is what is going to change -- the relationships with AID and DSB: the program content, or the relationships with institutions in developing countries? And finally, what will be the desired end-state when ISTC becomes operational?

The willingness of key individuals within the IDCA system, particularly AID, to allow the changes to take effect and to help the ISTC management through the initial as well as transitional stages so as to make the necessary changes happen is a critical factor. Further, the capability to initiate the desired change is dependent upon adequate funding levels, human resources and commitment. Unless there exists a critical mass of top people within the Administration, IDCA and cooperating country institutions supportive of the ISTC concept, there is little hope that the organizational issues herein described can be adequately resolved.

A strategy to help key members evaluate the problems -- i.e., distinguish between the substantive changes in policy direction from the organizational issues of marshalling needed resources, must be made part of the implementation strategy. Enabling managers (decision makers) to relearn organizational behavior in order to deal with low levels of trust, organizational games and unilaterally made decisions is part of the educational strategy recommended. The reasoning behind

this recommendation is that a cleavage exists between the knowledge of development problems raised by diffusion of technology and the competence within the IDCA system to produce a workable solution within the context of the international development environment.

Acceptance that conflicts exist, not only with respect to basic needs policy and technological cooperation issues and constraints, but in terms of existing coalitions that resist change and recognition that this resistance must be managed is a determinant first step toward implementation. As Chrys Argyris (1980) notes, quasi resolutions to conflict are reinforced by intergroup warfare. The foreign assistance organization is reputed to be a closed system where issues of human frailty are undiscussable. ISTC, cut from the same branch, cannot be expected to be an exception. The final organizational design mirrors the "theories-in-use" of its members.

A matrix form of management as proposed in Section 4.4 has merit for the types of programs ISTC is designed to pursue. The advantage is twofold -- Congressional supporters can be assured that an effective new agency is at least structurally in the making and second, the flexibility and accountability for efficiency is made possible. By adopting an organizational system that is a departure from traditional forms, which are suspect of bureaucratic dry rot, enhances the chances for continued support.

In addition, the flexibility allows for greater participation of scientists and technologists from developing countries in any of several projects at different levels of expertise without invoking the intimidation of rank and status characteristic of existing institutional forms.

One way to introduce the new management format is through an intervention strategy (Beckhard, 1977). Initiating a new order of things is the most dangerous, laborious and threatening exercise for members of the management staff of ISTC. But if properly conducted, the intervention could produce excellent results. The resources exist within IDCA to carry out many of the initial stages for structuring the new Institute. The use of external consultants should be discouraged if at all possible. Cost considerations are but one reason, another being the psychological factor of a stake in the ownership of change. The process of change is ongoing and those responsible must be identified with the process. This factor is especially relevant during the transition stage when ambiguity is at its peak.

SELECTED BIBLIOGRAPHY

- Ahluwalia, Montek S., Carter, Nicholas G., Chenery, Hollis B.,
"Growth and Poverty In Developing Countries, " World Bank
Staff Working Paper No. 309, Washington, D.C. (December,1978)
- Alexander, Robert J., The Tragedy Of Chile, Greenwood Press, London,
1978.
- Allen, Thomas J., "Transferring Technology To The Firm: A Study Of
The Diffusion Of Technology In Irish Manufacturing Industry,"
Working Paper No. 942-77 M.I.T. Research Program On The Manage-
ment of Science and Technology, (June 1977).
- _____, Tushman, Michael L. , Lee, Denis, "Technology
Transfer As A Function of Position In The Spectrum From
Research Through Development Of Technical Services, " Working
Paper No. 1005-78, M.I.T. Cambridge, MA, (March 1978).
- Alvarez Bejar, Alejandro R., "El Estado en el Pensamiento de la CEPAL,"
Investigacion Economica, Abril/Junio, 1976, pp 305-322.
- Amin, Samir, Unequal Development, New York, Monthly Review Press, 1976.
- _____, "Self Reliance And The New International Economic Order,"
Monthly Review, Vol. 29, No. 3 (July/August, 1977), pp. 1-21.
- Beckhard, Richard, "Organizational Issues In The Team Delivery Of
Comprehensive Health Care," Reprinted From The Midbank Memorial
Fund Quarterly, Vol. I , No.3 , Part I , (July, 1972).
- _____, Large System Change, Reading, MA, Addison Wesley, 1979.
- _____, Gaspard, Nancy, "Managing Organizational Issues In
Curriculum Change Using An Educational Intervention Strategy,"
Working Paper No. 912-77, Alfred P. Sloan School of Management,
M.I.T. (March, 1977).
- Berry, Brian J.L., "Hierarchical Diffusion: The Basis of Developmental
Filtering and Spread In A System of Growth Centers," Growth Centers
In Regional Economic Development, Hansen, Niles M. (ed),
New York, The Free Press, 1972, pp. 108-138.
- _____, Horton, Frank, Geographic Perspectives On Urban
Systems, Englewood Cliffs, N.J., 1974.
- Blau, Peter M., On The Nature Of Organizations, New York, John Wiley &
Sons, 1974.

- Bromley, Ray, Gerry, Chris, Casual Work and Poverty In The Third World Cities, Chichester, England, John Wiley & Sons, 1979.
- Brookfield, Harold, Interdependent Development, Pittsburgh, PA, University of Pittsburgh Press, 1975.
- Caldwell, Malcom, "Problems of Socialism in Southeast Asia," in Robert I. Rhodes, (ed) Imperialism and Underdevelopment: A Reader London, Monthly Review Press, 1970.
- Center For International Policy, Human Rights and The U.S. Foreign Assistance Program: Fiscal Year 1978, Washington D.C., 1977.
- Chenery, Hollis and Ahluwalia, Montek S., Bell, C.L.G., et.al., Redistribution With Growth, London, Oxford University Press, 1974.
- Clark, Felicia, and Kraus, Richard and Robinson, Gerald, "Participatory Planning and Administration: The Planning Aid Kit and Other Techniques," Basic Needs Paper No. 6, Washington D.C., The World Bank , (January, 1978).
- Cleaver, Harry M., "The Contradictions of The Green Revolution," The Political Economy of Development and Underdevelopment, Charles K. Wilber, (ed), New York, Random House, 1973, pp.187-197.
- Connor, Walter D., Socialism, Politics and Equality, Hierarchy and Change In Eastern Europe and The USSR, New York, Columbia University Press, 1979.
- Davis, Harlan L., "Appropriate Technology: An Explanation and Interpretation of Its Role In Latin America," Interamerican Economic Affairs, Vol. 32, Summer, 1978, pp. 51-66.
- Diebold de Cruz, Paula, "A Study of Trends and Priorities In Education In Latin America and the Caribbean," U.S. Agency For International Development, AID/LAC-C-1278, Washington D.C., (September, 1979).
- Dos Santos, Theotonio, "The Structure of Dependence," The American Economic Review, Vol. 60, No. 2 (May 1970), pp.231-236.
- _____, "The Crisis of Development Theory and the Problem of Dependence in Latin America," in Henry Bernstein (ed) Underdevelopment and Development: The Third World Today, Harmondsworth, England, Penguin Books, Ltd., 1973, pp. 57-80.
- Durham, Hobart N. (ed), World Patent Litigation, The Bureau of National Affairs, Washington D.C., A.W. Sijthoff Publishers, 1967.

- Foreign Policy Association, "International Development, Can Rich 'North' and Poor 'South' Cooperate?" In Great Decisions '78 New York, 1978.
- ForoLatinoamericano. "El Desarrollo de America Latina Y La Politica de los Estados Unidos," Comercio Exterior (Mexico) No. 7, 1977 pp. 839-48.
- Foxley, Alejandro, (ed), Income Distribution in Latin America, London, Cambridge University Press, 1976.
- Francis, Michael j., "United States Policy Toward Latin America: An Immodest Proposal," Orbis, Winter, 1977, pp. 491-1006.
- Frank, Andre Gunder, "The Development of Underdevelopment," In Imperialism and Underdevelopment: A Reader, Robert I. Rhodes, (ed), London, Monthly Review Press, 1970, pp 4-17.
- Fraser, Arvonne S., "Practical Aspects of Integrating Women In Development Into A Basic Human Needs Program Or Working and Learning For Development," Office of Women In Development, Agency For International Development, Washington, D.C., 1977.
- Freire Paulo, Pedagogy of The Oppressed, New York, The Seabury Press, 1968.
- Friedman, John and Weaver, Clyde, Territory and Function: The Evolution of Regional Planning Doctrine, Los Angeles: The University Press, 1977, Chps 1,4,5,6.
- Furtado, Celso, "Elements of a Theory of Underdevelopment--The Underdeveloped Structures," In Henry Bernstein (ed), Underdevelopment and Development: The Third World Today, Harmondsworth, England, Penguin Books, Ltd., 1973.
- _____, "The Concept of External Dependence in the Study of Underdevelopment," In Charles K. Wilber, (ed) The Political Economy of Development and Underdevelopment, New York: Random House, 1973.
- Glennan, Keith T., Technology and Foreign Affairs, A Report to the Deputy Secretary of State, Bureau of Oceans and International Environmental and Scientific Affairs, Washington D.C. (December 1976).
- Ghai, D.P. and Khan, A.R., Lee, E.L.H., Alfthan, T. The Basic-Needs Approach to Development, Some Issues Regarding Concepts and Methodology, Geneva, International Labour Office, 1977.
- Gilligan, John J., "United States Seeks Improved U.N. Programs to Meet Basic Needs of the World's Poor," U.S. Department of State Bulletin, (August 15, 1977).

- Gilligan, John J., "America's Stake In the Developing World," U.S. Department of State Bulletin, (November 14, 1977).
- Gordon, Lester E., "Economic Planning and Technological Change in Less Developed Countries," Economic Development Report No. 233, Development Research Group, Center for International Affairs, Harvard University, Cambridge, MA, (June, 1973).
- Green, Marshall, "New Directions in U.S. Foreign Assistance For Population Programs," Population and Development Review, Vol.3, September, 1977, pp. 319-322.
- Green, Thad B. and Lee, Sang M., Newson, Walter (eds), The Decision Science Process Integrating the Quantitative and Behavioral, New York, Petrocelli Book Inc., 1978.
- Griffith, Keith, "Rural Development, The Policy Options, " in Edgar O. Edwards (ed) Employment In Developing Nations, 1974, pp. 181-200.
- Gurley, John G., Challengers to Capitalism, San Francisco, San Francisco Book Company, Inc., 1976.
- _____, China's Economy and the Maoist Strategy, New York, Monthly Review Press, 1976.
- Guzman, Gabriel, El Desarrollo Latinoamericano y la CEPAL, Planeta, 1976.
- Hammonds, George, S. and Todd, Murray W., "Technical Assistance and Foreign Policy," Science, Vol. 189 (September 26, 1975), pp. 1057-1059.
- Hansen, Roger D., Beyond The North South Stalemate, New York, McGraw-Hill, 1979.
- Haq, Mahbub ul, "The Crisis In Development Strategies," In Charles K. Wilber, (ed) The Political Economy of Development and Underdevelopment, New York, Random House, 1973.
- Herskovits, Melville J. Cultural Relativism, Perspectives in Cultural Pluralism, New York, Vintage Books, 1973.
- Hinckley, Barbara, Stability and Change in Congress, New York, Harper and Row, 1978.
- Hirschman, Albert O., The Strategy of Economic Development, New Haven, Conn., Yale University Press, 1958.
- Hopkins, M.J.D., et.al., "Evaluating A Basic Needs Strategy and Population Policies: The BACHUE Approach," International Labour Review November/December, 1976, pp. 261-279.

- Iglesias, Enrique V., "Situacion y Perspectiva de America Latina," Estudios Internacionales, (Julio/Septiembre, 1977), pp. 81-123.
- Inter-American Development Bank, Economic and Social Progress in Latin America: Annual Report 1975, Washington, D.C., IDB, 1975.
- _____, Economic and Social Progress in Latin America: Annual Report 1977, Washington, D.C., IDB, 1977.
- Inter-American Foundation, They Know How, Washington, D.C., U.S. Government Printing Office, 1977.
- International Labour Office, ... Employment, Growth and Basic Needs: A One World Problem: Report of the Director General, Geneva, ILO, 1976.
- International Labour Office, "Basic Needs Strategy for Africa," Fifth African Regional Conference, Abidjan, Ivory Coast, Geneva, September-October, 1977.
- _____, JASPA, Basic Needs Approach to Development Problems in the African Region, U.N. Economic Commission for Africa, 1978.
- Junta del Acuerdo de Cartagena, "Technology Policy and Economic Development, A Summary Report," Report on studies undertaken by the Junta de Cartagena agreement for the Andean Integration Process, 1978. (unpublished report).
- Kay, Geoffrey, Development and Underdevelopment: A Marxist Analysis, London, The Macmillian Press Ltd., 1975.
- Kintner, William R. and Sicherman, Harvey, Technology and International Politics, The Crisis of Wishing, Lexington, Mass., Lexington Books, 1975.
- Kotter, John P., Schlesinger, Leonard A. and Sathe, Vijay, Organization, Text, Cases and Readings on the Management of Organizational Design and Change, Homewood, Ill., Richard D. Irwin, Inc., 1979.
- Lange, Oscar, "Planning Economic Development," in Henry Bernstein (ed) Underdevelopment and Development: The Third World Today, Harmondsworth, England, Penguin Books, Ltd., 1973, pp.207-215.
- Lawrence, Paul R., "How To Deal With Resistance to Change," Harvard Business Review, (January-February 1969).
- Lipton, Michael, Why Poor People Stay Poor: A Study of Urban Bias in World Development, London, Temple Smith, 1977.

- Ladas, Stephen, Patents, Trademarks and Related Rights National and International Protection, Vols. I,II,III, Cambridge, Mass., Harvard University Press, 1975.
- Lisk, Franklyn, "Conventional Development Strategies and Basic Needs Fulfillment, A Reassessment of Objectives and Policies," International Labor Review, Vol. 115, No.2, March-April, 1977, pp. 175-191.
- Lorsch, Jay, "Managing Change," in Paul Lawrence and Jay Lorsch, Louis Barnes (eds), Organizational Behavior and Administration, Homewodd, Ill., Richard D. Irwin, 1976.
- Mc Diarmid, Orville John, Unskilled Labor for Development, Its Economic Cost, Baltimore, Johns Hopkins University Press, 1977.
- Mandel, Ernest, An Introduction to Marxist Economic Theory, New York, Pathfinder Press, 1970.
- Maslow, Abraham H., Motivation and Personality, New York, Harper, 1954.
- Mazumdar, Dipat, "The Urban Informal Sector," World Bank Reprint Series: Number 43, Reprinted from World Development, Washington D.C., World Bank, August 1976.
- Meerman, Jacob, "Meeting Basic Needs in Malaysia: A Summary of Findings," World Bank Staff Working Paper No. 260, Washington, D.C., April 1977.
- Meier, Gerald (ed), Leading Issues in Economic Development, New York, Oxford University Press, 1976.
- Mishan, E.J., The Economic Growth Debate, An Assessment, London, George Allen and Unwin, Ltd., 1977.
- Morawetz, David, "Twenty-Five Years of Economic Development, 1950-1975," Washington, D.C., World Bank, 1977.
- Morss, Elliot R., "Measurable Development Results of the Last Quarter Century, Do They Have Policy Implications?" Draft of a paper sponsored by the Office of Evaluation, PPC, Agency for International Development, Washington D.C., (undated).
- Myrdal, Gunnar, Economic Theory and Underdeveloped Regions, London, Methuen & Co., Ltd., 1957.
- Nyerere, Julius, "Contributions," in Paul E. Sigmund, The Ideologies of the Developing Regions, New York, Praeger Publishers, 1972.

- Onyemelukwe, C.C., Economic Underdevelopment: An Inside View, London, Longman Group Ltd., 1974.
- Orrengo Vicuna, Francisco, "Las Alternativas de America Latina Como Clase Media de las Naciones," Estudios Internacionales, (Octubre-Diciembre 1977), pp. 89-110.
- Ortiz Mena, Antonio, "America Latina en Desarrollo: Una Vision Desde el BID," Inter American Development Bank, Washington, D.C., 1975.
- Paauw, Douglas S., "From Colonial to Guided Economy," In Ruth T. McVey, (ed), Indonesia, New Haven, Conn.: HRAF Press, 1963.
- Paddock, William & Elizabeth, We Don't Know How, Ames, Iowa, State University Press, 1973.
- Palmer, Ingrid, "Rural Women and the Basic Needs Approach to Development," International Labor Review, (January-February 1977).
- Pascarella, Perry, Technology--Fire In A Dark World, New York: Van Nostrand Reinhold, 1979.
- Pluciennick, Moyses A., "Organizing Task Groups: An Experimental Study on Shared Perceptions, Emotions and Joint Action," Working Paper No. 1002-78, Alfred P Sloan School of Management, M.I.T., Cambridge, Mass..
- Pinto, Anibal, "Styles of Development in Latin America," CEPAL Review, First Semester 1976, pp. 99-130. Santiago, Chile.
- Prebisch, Raul, "Desarrollo y Politica Comercial Internacional," Pensamiento Politico, (August 1976), pp. 443-72.
- _____, A Critique of Peripheral Capitalism," CEPAL Review First Semester, 1976, pp. 9-76.
- Quade, E.S., Analysis For Public Decisions, New York, American Elsevier, The Rand Corporation, 1975.
- Ravetz, Jerome R., Scientific Knowledge And Its Social Problems, New York: Oxford University Press, 1971.
- Rowe, Edward Thames, "National Attributes Associated With Multilateral and U.S. Bilateral Aid to Latin America, 1960-71." International Organization, Vol. 32, Spring 1978, pp.463-75.
- Rubin, Barry M. and Spiro, Elizabeth, (eds.) , Human Rights and U.S. Foreign Policy, Boulder, Colorado: Westview Press, 1979.

- Schon, Donald A., Beyond The Stable State, New York: Random House, 1971.
- _____, Technology and Change, The New Heraclitus, New York: Delacorte Press, 1967.
- Schumacher, E.F., Small Is Beautiful, Economics As If People Mattered, New York, Harper Row, 1973.
- Seers, Dudley, "The Meaning of Development," In Charles K. Wilber (ed) The Political Economy of Development and Underdevelopment, New York, Random House, 1973.
- Selowsky, Marcelo, "Investment In Education In Developing Countries: A Critical Review of Some Issues," Economic Development Report No. 232, Development Research Group, Center For International Affairs, Harvard University, Cambridge, Mass. (May 1973).
- Sewell. John W., The United States and World Development, Agenda 1977, Overseas Development Council, New York: Praeger, 1977.
- Sloan, John W. , "Dependency Theory and Latin American Development: Another Key That Fails To Open The Door," Inter American Economic Affairs, Vol. 31, Winter 1977, pp.21-40.
- Steele, Fritz, Consulting for Organizational Change, Amherst: University of Massachusetts Press, 1975.
- Streeten, Paul, "The Distinctive Features of a Basic Needs Approach to Development," International Development Review, No. 3, 1977.
- Storni, Fernando, "Desarrollo y Calidad de Vida," Revista del Centro de Investigacion Social, April 1976, pp. 3-18.
- Sunkel, Oswaldo, "El Desarrollo de la Teoria del Desarrollo," Estudios Internacionales, (Octubre-Diciembre, 1977), pp.33-46.
- Taylor, Lance, Model Based Consistency Checks On Medium-Term Growth Prospects In Peru, Economic Development Report No. 229, Center for International Affairs, Harvard University, 1973.
- Teece, David J., The Multinational Corporation and the Resource Cost of International Technology Transfer, Cambridge, Mass.: Ballinger Publishing Co., 1976.
- Tichy, Noel M., Organization Design For Primary Health Care, New York: Praeger Publishers, 1977.
- Todaro, Michael P., Economic Development in the Third World, London: Lingman Group Ltd., 1977.

Todaro, Michael P., Economics for a Developing World, London: Longman Group Ltd., 1977.

Toffler, Alvin, (ed.) Learning For Tomorrow, The Role of the Future In Education, New York:Vintage Books, 1974.

United Nations Department of Economic and Social Affairs, Systematic Monitoring and Evaluation of Integrated Development Programs A Source Book, United Nations, New York, 1978.

Economic and Social Council, Comision Economica para America Latina (CEPAL), "Report of the Fourth Session of the Committee of High Level Government Experts," Quito, Ecuador, (March 12-17, 1979).

United States Agency for International Development, Memorandum for The Acting Administrator From Members of the Administrator's Development Seminar II, Subject: "Recommendations On 'New Directions' policy and Associated Organizational and Management Matters," Washington D.C., (March 11, 1977).

_____, "Statement of Loan Implementation and Disbursement Progress," Bureau for Latin America and the Caribbean, Washington, D.C. (February 1978).

_____, "Evolution of the BHN Concept," a Development Coordination Committee (DCC) Policy Paper, Washington, D.C., (March 1979).

United States House of Representatives, Committee on International Relations of the House of Representatives, "New Directions in Development Aid, Excerpts from the legislation," U.S. Government Printing Office, Washington, D.C., 1976.

_____, Committee on International Relations, Subcommittee on International Development, "Rethinking United States Foreign Policy Toward the Developing World," Hearings and Briefings, August 4, October 12, and November 1, 1977: A Critical Review of A.I.D.; Briefings on Certain Executive Branch Activities in the Foreign Aid Field; The Brookings Institution Report, Washington D.C., U.S. Government Printing Office, 1977.

_____, "International Women's Issues," Hearings and Briefing March 8 and 22, 1978 before the Subcommittee on International Organization and on International Development, U.S. Government Printing Office, 1978.

_____, Committee on Appropriations, Subcommittee on Foreign Operations and Related Agencies, Hearings Foreign Assistance and Related Agencies Appropriations for 1978, Part 4, U.S. Government Printing Office, 1977.

Subcommittee on Foreign Operations and Related Agencies,
Appropriations for 1979, Parts 1,2,3,4,5, Washington D.C.,
U.S. Government Printing Office, 1978.

Hearings before the Subcommittee
on Domestic and International Scientific Planning, Analysis
and Cooperation, of the Committee on Science and Technology,
"Technology Transfers to the Members of O.P.E.C.," Washington,
D.C., September 6-8, 1978.

United States Library of Congress, Foreign Affairs and National Defense
Division, Congressional Research Service, "Issues and Options
In the Coordination of U.S. Foreign Aid Policy," Report prepared
for the Committee on Foreign Affairs, U.S. House of Representatives
96th Congress, First Session, (May 1979).

Walton, John, "Internal Colonialism: Problems of Definition and
Measurement," In Wayne A. Cornelius and Felicity M. Trueblood
(eds.) Latin American Urban Research, Vol.5, Urbanization and
Inequality: The Political Economy of Urban and Rural Development
In Latin America, Beverly Hills, Calif.: Sage Publications, 1975.

Weiss, Charles Jr., "Mobilizing Technology For Developing Countries,"
Science, Vol. 203 (March 16, 1979), pp. 1083-1089.

World Bank, World Development Report, 1979, Washington, D.C. (August 1979).

Wheeler, David, "A Suggested Approach to Basic Needs Planning," Unpublished
manuscript, M.I.T., March 1979.

Williams, Maurice, "Meeting the Basic Needs of the Poorest People: The
Development Challenge of Today," O.E.C.D. Observer, November,
1977.

Young, Andrew, "Framework for a Dynamic North-South Dialogue," U.S.
Department of State Bulletin, Washington, D.C. (September 19, 1977)