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PROPOSAL FOR A PROGRAM
IN APPROPRIATE TECHNOLOGY

In response to Section 107 of the
Foreign Assistance Act of 1961, as
amended.

TABLE OF CONTENTS

| | |
|-------------------------------------|----------|
| I. Introduction and Background | pp. 1-16 |
| II. Outline of Section 107 Program | pp. 1-25 |
| III. Organization | pp. 1-16 |
| Appropriate Technology - Definition | pp. 1-3 |

Attachments

- A. Report on A.I.D. - Private Sector Meetings on Section 107
- B. "Private and Voluntary Organizations and Appropriate Technology", PASITAM
- C. "Appropriate Factor Proportions for Manufacturing in Less Developed Countries: A Survey of the Evidence", Lawrence J. White
- D. "Policies to Encourage the Use of Appropriate Technology", Howard Pack
- E. "Appropriate Institutions for Appropriate Technology", Gary Hansen, Bruce Koppel
- F. "Appropriate Agricultural Technology: Assessment of Non-Farm Impacts", Clark Edwards; "Appropriate Technology for Agricultural Development", John Balis
- G. "The Inducement of U.S. Firms to Adapt Products and Processes to Meet Conditions in Less-Developed Countries", Robert B. Stobaugh and Management Analysis Center

Table of Contents-con't

- H. "Appropriate Technology Study: Some Background Concepts, Issues, Examples and Recommendations", Louis J. Goodman and East-West Center
- I. "IT Organizations and the Indian Sub-Continent", Intermediate Technology Development Group
- J. "Appropriate Technology in Latin America", VITA

PROPOSAL FOR A PROGRAM IN APPROPRIATE TECHNOLOGY

Section 107 of the International Development and Food Assistance Act of 1975 establishes a new grant funded, private program to stimulate the development and dissemination of appropriate technology in developing countries.

The legislation states:

"Of the funds made available to carry out this chapter for the fiscal years 1976, 1977, and 1978, a total of \$20,000,000 may be used for activities in the field of intermediate technology, through grants in support of an expanded and coordinated private effort to promote the development and dissemination of technologies appropriate for developing countries. A.I.D. shall prepare a detailed proposal to carry out this section and shall keep the Senate Foreign Relations Committee and the House International Relations Committee fully and currently informed concerning the development of the proposal. The proposal shall be transmitted to the committees no later than March 31, 1976 and shall not be implemented until 30 days after its transmittal or until passage of each committee of a resolution in effect approving its implementation."

The deadline for submitting the proposal required by the legislation was extended to June 30, 1976. This paper is submitted to the Senate Committee on Foreign Relations and the House International

Relations Committee in compliance with Section 107. It contains three parts:

1) an introduction and background; 2) description of the proposed goals and activities of the Section 107 program; and 3) a statement of the organizational steps A.I.D. proposes to take in carrying out the program. This proposal has been prepared by a work group representing all major A.I.D. bureaus and offices.

I. INTRODUCTION AND BACKGROUND

The Private Sector Focus: Section 107 mandates an expanded and coordinated private effort to stimulate the development and dissemination of appropriate technologies in developing countries. The Congressional Committees interpret the term "private effort" widely. Section 107 is intended to complement on-going A.I.D. programs by stimulating a variety of non-A.I.D. entities to undertake innovative programs in appropriate technology. This includes U.S. private and voluntary agencies, private business, individual citizens, not for profit organizations, and universities whether privately or state supported. Under the legislation, grants can be made directly to LDC private groups or publicly supported groups such as LDC R&D institutions, universities, or others.

In reporting out the legislation, the HIRC suggested that we consult with U.S. private groups active or interested in appropriate technology. These consultations have been a major part of our preparations for this report.

Four day and a half workshops with representatives of U.S. private

and voluntary agencies, businesses, and academic institutions were held in April this year. A larger meeting of private sector representatives was held in May. More than 100 individuals and representatives from private groups attended the meetings.¹

These meetings generated a large number of suggestions on the goals and activities of an appropriate technology program. The program described in this report is drawn largely from these recommendations. The meetings constituted the first step in an on-going dialogue between the private sector and A.I.D.

In addition to the meetings, A.I.D. commissioned a survey of eighty U.S. private and voluntary agencies to ascertain their current and prospective involvement in appropriate technology programs.² The survey notes numerous instances of successful development and use of appropriate technology by private and voluntary organizations. It contains a number of recommendations for enhancing U.S. private agency capacity in appropriate technology.

The overall impression from the meetings and the survey is that the Congressional decision to engage the talents of the U.S. private sector as a complement to A.I.D. programs in appropriate technology was well taken. We have been impressed with the diversity of

¹ The report on the meetings and the list of attendees is appointed as attachment A.

² "Private and Voluntary Organizations and Appropriate Technology" - PASITAM - Bloomington, Indiana, May 1976. (Attachment B)

perspectives and ideas which we have encountered and the high degree of interest shown in the program.

Definition and Description of Appropriate Technology: The HIRC defines appropriate technology as "tools and machines that are suited to labor-intensive production and fit LDC small farms, small businesses, and small incomes." Morawetz defines appropriate technology as the set of techniques which make optimum use of available resources in a given environment.³

In both definitions, appropriateness is determined by the environment. For most developing countries, this is, of course, an environment of scarce capital and limited numbers of highly trained personnel. Unskilled and semi-skilled labor is abundant. The majority of productive enterprises are small. Four-fifths of the farms in developing countries are 12 acres or less; most of the businesses and industrial firms of the developing world are equally small. Family patterns, social structures, and cultures vary widely.

Despite this, much of the technology which has been utilized in LDCs was developed in Western countries which have quite different endowments of capital and labor, skilled workers, size of markets and enterprises, consumer incomes and tastes, and credit and distribution infrastructures.

Use of this capital intensive technology has been identified as

3

David Morawetz, "Employment Implications of Industrialization in Developing Countries: A Survey", The Economic Journal, September, 1974

a contributor to unemployment in developing countries. Capital-labor ratios for new investment projects in LDCs are frequently \$15,000 or more per worker while the capital available per worker is less than a tenth of this figure. The high capital cost of modern technology has also contributed to the development of dual economies -- small, relatively well-off enclaves of high productivity and well-paid workers side by side with relative stagnation among the larger community.

In this context, a conviction has grown that developing countries need technologies which require little capital per worker (labor intensive), are efficient on a small scale, are easily serviced and maintained, do not require high levels of education or training to operate, and utilize locally available materials: In short, technologies which are appropriate to the environment of developing countries.

This prescription has not developed without controversy. Some assert that capital-intensive technologies are highly efficient and produce relatively higher returns per unit of investment. They state that in most sectors there are, in fact, few practical alternatives to modern technology. The so-called spectrum between traditional and modern technologies is really devoid of efficient techniques with alternative capital-labor ratios.

Quite a volume of literature has grown up around this controversy. In preparing this proposal, A.I.D. commissioned a survey of this

literature which indicates that, while the issues are complex and vary with circumstances, the view that LDCs are currently condemned to high capital-labor ratios because there are no efficient alternatives simply is not consistent with the evidence.⁴

The range of technologies available and in use throughout the world is much wider than has been thought. This is true for the majority of industrial products (particularly those with a technical life of more than 20 years), agriculture cultivation and harvesting techniques, excavation, earth moving, and some road building and construction techniques, means of transport, and a variety of service activities.⁵

For instance, the work by a group of economists at Strathclyde University (Scotland) on the sugar and shoe industries in India, Ghana, and Ethiopia demonstrates that over a wide range of technology, both individual profits and employment are higher if factor proportions reflect true factor costs. In these countries, production efficiency can be obtained through more intensive use of labor. Other studies show the possibility of expanding the effective use of appropriate technology in ancillary process, such as handling, packaging,

4

Lawrence J. White, Appropriate Factor Proportions for Manufacturing in Less Developed Countries: A Survey of the Evidence, April, 1976, Attachment C

5

ILO, Employment, Growth and Basic Needs: A One-World Problem, Geneva 1976, p. 144.

6

transporting and storage.

This is not to say that capital-intensive technologies are invariably inappropriate in developing countries. In some circumstances, efficient, labor-intensive technologies may not exist (e.g. petro-chemical industries) or competitiveness in export markets may require precision machine-made products. Developing countries require a mix of technologies. The problem in many developing countries, however, is that the current mixture is felt to be over-rich in a capital-intensive direction to the detriment of both employment and output growth.

In terms of the competitiveness of the small-scale sector vis-a-vis large, capital-intensive enterprises in LDCs, White points out that comparisons of the relative efficiency of small and large firms are extremely difficult since product characteristics are usually different. In addition, larger firms often produce more of their own inputs or do some of their own distribution, both of which alters their capital-labor and capital-output ratios.

However, there is anecdotal and other evidence supporting the robustness of small scale industry. The ILO states, "small units

6

Studies tend to show that the scope for use of alternative technologies is narrower if the characteristics of the product are fixed. If consumers demand drip dry, color fast, cotton/dacron shirts, the scope for substitution of technology in a labor intensive direction is more restricted than if consumers will accept cotton shirts. To this extent, the problem of appropriate technology is also one of consumer demand, which may in part be a function of income distribution.

generally compare favorably with large scale units on the efficiency indicators of particular relevance -- capital-output ratios, capital surplus, yield per acre of land, and propensities to save and invest." ⁷ Pack states that "analysis typically reveals that small firms are at least as efficient as the larger ones in the sense that if both were to face the same socially relevant factor prices ..., the average cost of production in smaller firms would be competitive with that of larger firms, indeed often lower." ⁸

Neither small nor large scale industries have intrinsic advantages across the board. Small scale industry typically employs 50% or more of the manufacturing work force in LDCs, is labor intensive, and hence is a prime user of appropriate technology.

9

In summary appropriate technology may be defined as follows:

-- In terms of available resources, appropriate technologies are intensive in the use of the abundant factor, labor, economical

⁷ ILO, op. cit., p. 147.

⁸ Howard Pack, "Policies to Encourage the Use of Appropriate Technology" Paper prepared for A.I.D., April, 1976, Attachment D

9 A more rigorous definition of appropriate technology is appended to this paper. Other terms which have been used to describe the same concept include optimal, progressive, intermediate, low-cost, middle level and light capital technology. The term "intermediate technology" was coined by E.F. Schumacher, the British economist who helped formulate the concept in the mid-1960's. Gradually, intermediate has given way to appropriate. Among LDCs, the word "intermediate" has come to connote second-best or second-hand. The term appropriate has wider currency and has been adopted by a resolution in 1972 of the UNESCO, and later by the ILO and other international agencies.

in the use of scarce factors, capital and highly trained personnel, and intensive in the use of domestically-produced inputs.

-- In terms of small production units, appropriate technologies are small scale but efficient, replicable in numerous units, readily operated, maintained and repaired, low-cost and accessible to low-income persons.

-- In terms of the people who use or benefit from them, appropriate technologies seek to be compatible with local cultural and social environments.

Appropriate technology includes software as well as hardware. It includes health delivery systems, educational methods, credit systems and management methods which reduce the need for administrative overhead and highly skilled personnel. The concept of appropriate technology also includes products since shifts in the product mix or in quality standards can improve the utilization of a country's factor endowments.

Appropriate technologies, need not - indeed can not - maximize all the above criteria simultaneously. For instance, not all appropriate technologies are simple in their construction or in the degree of technical and engineering knowledge required to produce them. Solar energy equipment and concepts are highly sophisticated as are electric power and improved batteries which might be used to provide energy in remote areas.

Thus stated, the definition of appropriate technology is broad. For operational purposes the Section 107 program needs to concentrate on specific fields and problems within this broad area. The program described in Part II below suggests such a concentration.

Appropriate Technology in Developing Countries: A.I.D. commissioned preliminary surveys of existing appropriate technology activity in Asia, Africa, and Latin America. These surveys are appended to this report, as Attachments H, I, and J.

The picture in developing countries, as one would expect, is mixed. There is a substantial group of skeptics who see appropriate technology as "technological imperialism", a way in which Western nations are trying to keep poor countries in their place so that they can retain access to the energy and resources needed to maintain high consumption Western life styles. At a recent meeting on the employment problem in Latin America sponsored by the ILO, a number of Planning and Finance Ministers asserted that appropriate technology was a means of keeping developing countries dependent on the United States for imports of modern technology. While not rejecting the concept of labor-intensive technology entirely, they stated that Latin America would continue to produce the most modern technologies.

Much of the economics and politics in developing countries favors capital-intensive technology. Public policy with respect to foreign exchange rates, licenses for imported materials and components, interest rates, wages, allocation of investment funds and others are often biased in favor of larger, capital-intensive methods. Regulations tend to favor large enterprises in metropolitan centers over small businesses and

10

One indication that the penchant of government officials for the most modern equipment may not extend throughout society is this wall poster from India: PROTEST MEETING - Against Forcing Computer into South Eastern Railway under Armed Police Guard despite Mass Protest of Workers and Employees. Demonstration - Indian Association Hall - January 13.

entrepreneurs in small cities. Years of training in Western universities or in LDC universities with Western curriculums has yielded "engineering bias" toward Western technology among educated elites. Many of the policies above have political roots and are difficult to extirpate. Nonetheless, while no governments have adopted appropriate technology as a national policy, there are ministries and public agencies in many countries that are sponsoring appropriate technology organizations and appropriate technology work.

In Africa, five countries have appropriate technology organizations which are intended to become nation-wide focal points - Nigeria, Tanzania, Ethiopia, Ghana, and Kenya. A sixth such center is now being planned in Botswana. In addition, the survey commissioned by A.I.D. identified more than a hundred organizations involved in appropriate technology in 32 African countries. These organizations include community development groups, university engineering and agricultural faculties, research institutions and technical centers, and small industry extension units.

In the ten countries surveyed in East and South Asia, we identified 25 public agencies and universities involved in appropriate technology work plus dozens of smaller, mostly private organizations. Pakistan, India, and Bangladesh all have appropriate technology units in one of their central ministries.

In Latin America, government support of appropriate technology is just beginning. One of the first publically-sponsored organizations,

in Honduras, is being planned as this report is written as part of an A.I.D. rural development project. However, the survey of Latin America identified more than 300 organizations, nearly all private, involved in appropriate technology in Latin countries. Forty-six of these have a very high and direct involvement in appropriate technology.

The work being done by these public and private organizations covers a spectrum of appropriate technology. Research and design work includes farm mechanization, food storage, preservation and processing, brick-making and other building techniques, alternative energy, textiles, ceramics, foundries, coconut products, glue, salt, electro-plating, to name just a few. In some countries, such as Kenya, Sri Lanka, and Philippines, appropriate technology organizations are involved in industrial extension, financing of small business, market development, and information systems.

This array of organizations and activities confirms that there is a base for the Section 107 program to build on in developing and disseminating appropriate technology in LDCs.

Other Donor Activity: A.I.D. has not conducted a survey of other donor programs in appropriate technology. The following derives from informal contacts made while preparing this report.

The ILO is perhaps the leader among international agencies. The employment studies conducted by the ILO in Colombia, Kenya, Philippines and other nations have had a major influence on the development of the concept of appropriate technology. The ILO is

now doing an evaluation of small scale industry projects which may prove useful to the management of the Section 107 program.

The World Bank is paying increasing attention to the appropriateness of the technology included in Bank projects. In Egypt, for example, a loan to modernize cotton ginning incorporated labor-intensive rather than capital-intensive machinery. Water projects in Bombay, India and several cities in Colombia are based on a capital-saving technology for water filtration. A recent loan to Yugoslavia is aimed at small-scale agro-industries. Loans for slaughter houses based on labor-intensive techniques have been approved for Honduras and Cameroon. The Bank has done extensive work on labor-capital substitution in road construction.

The Peace Corps has considerable experience in village-level appropriate technology and is preparing training materials based on its work. These materials will be made generally available. The principal subjects on which the Peace Corps is now working are small farm grain storage, health education, construction of buildings and roads, forestry and conservation in arid lands, freshwater fisheries, and well construction. Peace Corps volunteers are also developing a program of bio-gas plants in Nepal.

In terms of other agencies, IDRC in Canada is funding Technonet/Asia, an experimental small scale industry extension service operating in a half dozen Asian countries. UNIDO is developing plans for a Clearing House on Industrial Information which may complement the

Section 107 program.

Overall, the state of the art among other donors and agencies seems roughly parallel to that in developing countries and A.I.D. itself. There is some official interest in the subject and pockets of activity in all agencies. There is need for greater communication and coordination among agencies working on appropriate technology and this will be one of the aims of the Section 107 program.

Current A.I.D. Programs in Appropriate Technology: A.I.D. has a diversified portfolio of projects directed toward development and use of low-cost, labor-intensive technology. This includes the small-scale agricultural equipment project begun at the International Rice Research Institute in the Philippines and currently being extended to Thailand and Pakistan. It includes the small industry program run by the Georgia Institute of Technology. It also includes projects in low-cost housing, low-cost roofing, conversion of saw dust and other agricultural wastes to energy, construction of simple grain storage facilities, solar kilns for drying timber, village level food processing, non-formal education, and a major program in low-cost health delivery systems. There are about 40 current projects which directly bear on development and dissemination of appropriate technologies.

In addition, there are many projects in which appropriate technology plays a role. For instance, A.I.D. is currently helping develop agricultural research capabilities in more than two dozen countries. All of these are concerned with turning out technology which meets

the conditions of small farmers. Much of A.I.D.'s economic research on questions of employment and development strategy bears on the question of choice of technology.

The Congress has indicated that it expects A.I.D. to continue activities in appropriate technology in addition to the monies allocated for Section 107 grants. The House Appropriation Committee states that it expects such activities "to account for a steadily increasing share of A.I.D.'s development budget... beyond the modest allocation under Section 107."¹¹

There are two main areas for expansion. One is to expand funding for projects such as those listed above which are directly concerned with assisting LDC's develop and utilize appropriate technologies. Such projects would derive from sector or other analysis of country needs and would be part of the on-going development assistance program for the country. A second area for expansion is to insure that questions of choice of technique are carefully attended to in all A.I.D. projects, whether they are titled appropriate technology projects or not. Peter Timmer's analysis of the choice of rice milling technology in Indonesia indicates that A.I.D. financed engineers recommended capital-intensive technologies even though their own economic analysis showed that more labor intensive techniques would generate both higher returns and

¹¹ Foreign Assistance and Related Programs Appropriation Bill, 1977, Report of June 3, 1976, p. 14.

12
more jobs. The need for rigorous consideration of choice of technique runs throughout A.I.D.'s program.

Expansion of A.I.D. projects to develop and disseminate appropriate technology in LDCs implies a need to develop criteria to distinguish between technical assistance activities which A.I.D. might fund directly and those which might be funded through Section 107 grants. We have not attempted to spell out these criteria in this paper. This should be done as the goals and activities of the Section 107 program are clarified, and as the new Section 107 organization develops demonstrated competence in given areas.

12

C. Peter Timmer et al, Choice of Technology in Developing Countries: (Some Cautionary Tales), Harvard University, 1975, pp. 16-26.

II. OUTLINE FOR THE SECTION 107 PROGRAM

A. INTRODUCTION:

The program outlined in this section reflects the priorities and recommendations for action expressed in A.I.D.'s April and May meetings. It is an initial configuration. It has been drawn from recommendations of U.S. private groups and tailored by A.I.D.'s internal judgment as to priorities for action. Several steps are needed to sharpen it further.

First, consultations with developing countries are required. One of the first steps taken by the management of the Section 107 program should be to hold participatory planning meetings with LDC groups active or interested in appropriate technology. These meetings should help clarify priorities and determine opportunities for action.

Second, more detailed A.I.D. - private sector planning is needed for each section of the program. The meetings produced a preliminary overall design with five main areas of activity. Further joint planning will be needed in each area and this may rebound to alter the overall design.

The outline below describes a comprehensive program with funding of approximately \$10 million dollars per year. This program will not spring to life full-blown at some date in the future, but will necessarily start small. Hence, this program can be considered a guide for future development. The ultimate

shape of the program will be determined by both planning and action-- pursuing promising activities and winnowing out less successful ones.

B. Goals and Policies for Section 107

Goals: The over-all goal for the program expressed at the April-May meetings is to assist developing countries strengthen their own capacities to develop, adapt and utilize appropriate technology. Development of indigenous capacities for appropriate technology involves policies and institutions as well as hardware. It includes management, tax structures, marketing infrastructure, education, financial institutions, and other concerns.

13

This goal is ambitious for a \$10 million per year venture. Yet - as was mentioned in all our consultations - development and dissemination of appropriate technology in and by LDC's is a nascent endeavor. There are no clearly lit or conventional paths to accomplishing the job. A great deal of experimentation, learning from experience, and innovations in approaches to the problem as well as specific innovations in technology are required. It is here that the primary contribution of the Section 107 program to the larger problem of appropriate technology should be found.

The program is intended to serve, not just as a funder of

13

There was a clear consensus that while development of new technologies or transfer of technology from developed to less developed countries or among developing countries may be a part of the program, this is not the goal of the program in the first instance.

privately run projects, but as a source of experimentation, evaluation and ideas in appropriate technology which can be picked up by LDC governments and aid donors or be spread by private enterprise. This is a basic reason for using A.I.D. funds under Section 107 to engage and stimulate the talents of a wide-range of private U.S. and LDC groups. The Section 107 program is seen as a forum for innovation -- a provider of yeast to
14
leaven the larger efforts of aid donors and LDC governments.

In this context, the operational goal of the program can be stated as:

--carry out innovative projects in appropriate technology in LDC's which enhance the on-going capacities of developing countries to develop and utilize appropriate technology; advance the state of practical knowledge about the problems of appropriate technology and develop through trial and

14

As an illustration, we have an application from a U.S. small industry development group which is linked with a group in the Philippines. They propose a pilot project to provide village or household potable water systems using a ceramic filter recently developed under a Swiss government research contract for their army. The filters are reportedly extremely effective and inexpensive; they use locally available materials and could be the basis for a local industry. The pilot project estimated at \$100,000 would be to see if the filters can be fitted into a system which meets local needs. If successful, dissemination might be by the Philippine government and/or by private industry.

The significance of this illustration lies in the fact that it picks up a little known technology, combines a private U.S. group and a Philippines group with local knowledge, and seeks a quick acting, flexible source of funding for a pilot effort.

evaluation, surer means for assisting developing countries develop, adapt and utilize appropriate technologies.

It is important to stress that pursuit of this goal in a particular country or project should begin - not with consideration of technology - but with identification of real needs of people in their local environment. Countries do not face appropriate technology problems in isolation. They face development problems of which technology is one part. Appropriate technology is part of a multi-disciplinary approach to development problems and it is the problems which constitute the analytical foundation for appropriate technology programs.

For purposes of program management the goal stated above will need to be refined into specific project goals whose accomplishment can be evaluated. It also needs to be linked to a higher order of goals which derives from the aid legislation itself and forms the backdrop for all Section 107 activities. As expressed at our April-May meetings, this is to: (1) help contribute to broad based growth of jobs and output in LDCs through more effective use of resources; (2) assist the poor participate in development by raising their productivity and standards of living; and (3) help foster, through technical and economic growth, national independence and self-reliance. This umbrella of principles animates all Section 107 activities.

Program Policies: As a matter of policy, the program will focus on the small scale sector in LDC's -- small farms and small and medium scale enterprises. It will focus on appropriate technology to provide low cost services and consumption goods for the poor. The concentration on the small scale sector is not intended to be exclusive. In terms of jobs and improving income distribution, the program is also concerned with appropriate technical choice in larger enterprises and government public works as well as with exploiting subcontracting and other complementarities between the large and small scale sectors. In addition, the focus on the small scale sector should not be calcified as exclusive attention to the smallest farms or enterprises. These may not be productive users of appropriate technology. The point is that, while focusing on the small scale sector is basic to the program, the interpretation of this policy will need to be flexible. Fidelity to the concept cannot be ensured by definitions, but will be the responsibility of program management.

The program is expected to be oriented largely though not exclusively toward rural areas. Included are villages, market towns, and those small cities which are centers of rural regions. Although this policy was not endorsed by all participants in A.I.D.'s meetings with private groups, we believe it is operationally sound. The primary focus of the present U.S. assistance legislation and many

(not all) of the private U.S. agencies concerned with appropriate technology is toward rural development. Again, this emphasis on rural areas is considered a predominant program direction, not an exclusive focus. For instance, there is some feeling that the export oriented, traditional goods sector may be a natural entry point for appropriate technology programs in some countries and while this industry may not be rural, it may be a base from which a more rural orientation can be developed.

As a matter of policy, specific attention will be given to the role of women throughout the program.

In work overseas, emphasis will be given to working with existing, qualified developing country institutions concerned with appropriate technology rather than creating new ones. This policy was strongly recommended by the private groups consulted during our April workshops. As described in Section I, there are many institutions in developing countries already working on or around appropriate technology.

As a matter of policy we believe grants under Section 107 should be given to private or publicly-supported institutions in developing countries regardless of whether A.I.D. has a Mission and a bilateral program in the country. However, by law A.I.D. can not provide direct assistance to more than 40 countries. There is a fairly complex set of considerations which apply in determining what constitutes direct assistance and we recognize that a blanket application of this policy is not possible. It depends

on legal judgments which will be made on specific proposed grant activities when the program gets underway.

As a matter of policy, we believe grants under Section 107 should require prior notification but not prior approval of Missions and Embassies in developing countries.

Emphasis will be given to maintaining close links with U.S. groups concerned with appropriate technology for the United States. Efforts will be made to encourage a return flow of information and experience from LDC efforts into the United States.

C. Program Areas Under Section 107:

As stated above, five areas for activity under the program emerged from the April-May meetings. These are:

1. Communication and coordination: Programs to gather and evaluate past and present experience with appropriate technology; to improve communication among practitioners of appropriate technology; and provide both information about selected specific low-cost technologies, and models to be tested and adapted.
2. National policies for appropriate technology: Efforts to encourage LDCs to adopt economic and other policies which facilitate choice of appropriate technology by private entrepreneurs.
3. Appropriate technology projects in LDCs: Grant projects in fields such as assisting LDC small businesses, assisting local R&D units, farm machinery and food processing, health, and energy. This is the main business of the program; the program will be organized around

six or so types of projects or functional areas, e.g. agricultural machinery, small business enterprise, health, energy.

4. Education: Projects to assist LDCs develop innovations in education systems which increase the relevance of their education investments for appropriate technology.

5. U.S. business: Programs to find means to involve U.S. businesses, on a case-by-case basis, in appropriate technology programs in developing countries.

Further explanation of these program areas follows.

1-Communication and Coordination-

This is a key function for a program which seeks to expand knowledge about alternative technologies and the do's and don't's of mounting programs to develop and disseminate appropriate technology. The private groups consulted during A.I.D.'s April and May meetings recommended strongly that the starting point for an expanded program should be to develop existing sources of information about appropriate technology, to encourage more communication among groups active in appropriate technology, and to link them to potential LDC users. Nearly one-third of the action recommendations we received during our April and May meetings concerned the need for better information. The immediate aim will be to identify and organize existing sources of information rather than create new data banks or facilities. For instance, the PASITAM survey of private agencies indicates that many of them have unique experiences with appropriate

technology, but they lack the resources to communicate this experience to others.

Improving communications among organizations and groups active in appropriate technology is one aim of this part of the program. Another is to improve understanding and acceptability of appropriate technology among a wider audience of LDC and DC opinion leaders and policy makers. One of the barriers to expanding activities in appropriate technology in LDCs is widespread lack of understanding or negative attitudes toward the concept. Stated simply, some selling of appropriate technology is necessary. This requires - not crude proselytizing - but marshalling and presenting better information about appropriate technology in a variety of formats for different audiences.

A third aim of this aspect of the program is to develop better coordination and division of labor among groups and institutions active in appropriate technology. We received many recommendations concerning the need for an international federation of appropriate technology organizations. We understand that ITDG in London and the ILO are interested in this concept. A long-range goal in this connection would be to strengthen developing country abilities to collaborate among themselves in appropriate technology endeavors.

Some of the activities suggested during our April workshops for carrying out this segment of the program are listed below:

- (1) Surveys and case studies of existing or completed projects (successful or unsuccessful) to develop and disseminate appropriate technology.
- (2) Video tapes or other visual media to capture the on-going experience of practicing appropriate technology groups. Using existing groups to teach other appropriate technology groups.
- (3) Travel grants - Funds for cross-fertilization of ideas through travel of practitioners, government officials, or individual entrepreneurs.
- (4) Workshops and seminars for government and private persons in both DCs and LDCs.
- (5) Grants to U.S. and developing country organizations involved with appropriate technology to expand their capacities to communicate their experience to others.
- (6) Exchange of proven and prototype equipment.

2-National policies for appropriate technology-

Government policies have a critical impact on widespread adoption of appropriate technology by private entrepreneurs. These include policies which affect the prices faced by entrepreneurs for labor and capital, policies on credit and finance, and regulatory policies affecting small businesses. The types of policy actions which are open to government to encourage adoption of more socially useful, appropriate technology are extremely sensitive politically and include:

- (1) Undertaking programs to increase the supply of wage goods (e.g. food) in order to reduce their price.
- (2) Limiting the growth of wages paid by the government. These often serve as a guidepost for private sector wages.
- (3) Removal of the minimum wage, particularly for new

employees, or reducing it to the levels prevailing in the craft sector.

- (4) Limiting fringe benefits such as social security.
- (5) Maintaining the official exchange rate at its equilibrium value, i.e., that at which the supply and demand for foreign currency will be equal, without imposition of tariffs, administrative limits on imports and so on. Alternatively, and less desirably, tariffs on imported capital goods could be introduced to raise their cost in domestic currency.
- (6) Removal of interest rate ceilings.
- (7) Elimination of tax incentives which reduce the cost of utilizing capital in production.
- (8) Elimination of the licensing of imported raw materials, a practice which has often been shown to discriminate against small, labor intensive enterprises.

Two comments can be made on these policies: First, it would be difficult to construct a more politically contentious set of policies. Second, with the exception of individual economists at our meetings, few of the U.S. private groups we talked to see themselves as working on this sort of macro-policy issue.

This presents a problem for the program. Although it is possible to fund micro projects to develop and disseminate appropriate technology in LDCs, such efforts are probably unsustainable over time unless the environment for use of appropriate technology is favorable. This requires competition in product markets and reduction of distortions in relative factor prices.

In this context, we believe one of the goals of the program should be to find better means to encourage planners and policy makers to

design economic and institutional policies which facilitate use of appropriate technology by private entrepreneurs.

As an example of techniques which might prove useful in this regard, Pack recommends using Section 107 funds to systematically catalog alternative economically efficient techniques for various industries. For example, Pack shows the aggregate employment and capital effects of four weaving techniques as follows:

| Type of Loom | Requirements per 100 million square yards per annum (1) | Investment (2) | Capital/Labor Ratio (2) (1) (3) | Investment Funds Saved Using Lancashire (4) | Additional Indirect Employment (5) | Percentage Increase Output (6) |
|--------------|--|-------------------|---------------------------------------|---|---|---|
| Lancashire | 2,180 | \$ 35,820,000 | \$ 1,645 | | | |
| Battery | 1,110 | 71,635,000 | 6,454 | \$ 35,815,000 | 21,772 | 100 |
| Airjet | 820 | 78,777,000 | 9,665 | 42,957,000 | 26,114 | 120 |
| Sulzer | 510 | 150,063,000 | 29,715 | 114,243,000 | 69,449 | 319 |

Columns 1 and 2 indicate the inputs required to produce an additional 100 million square yards of material. Column 3 indicates the capital-labor ratio associated with each type of process. Column 4 shows the amount of investible funds saved by adopting the Lancashire loom, the least capital intensive one, rather than each of the others. Column 5 indicates the additional employment which could be generated by investing the funds thus saved in an activity whose capital-labor

ratio was no greater than that of the Lancashire loom. These must be added to the differences shown in Column 1 to derive the total difference in employment. Finally, Column 6 presents the percentage increase in output which could be generated by investing the saved funds in additional weaving capacity.

The table shows that using the Lancashire loom and investing the capital saved from not using the Sulzer loom, would produce about 71,000 more jobs and 319% more output than if the Sulzer loom was used.

Pack states that such comparisons in other industries are likely to yield equally large benefits and that these calculations may be helpful in stimulating LDC governments to consider the policy changes needed to realize these benefits.

Other activities suggested at our meetings to facilitate policy changes in LDCs include:

--Grants through private U.S. entities or direct grants to LDC institutions such as universities, science policy councils, and ministries of planning, industry or agriculture to help develop their capabilities for analyzing and choosing alternative technologies and for considering effect of alternative technologies on national economic and social development.

16

16

A recent study in India financed by the Ford Foundation (Tata Economic Consultancy Services, "Industry in the Second India", Orient House, Bombay, 1975.) projects industrial growth through the year 2000 assuming alternative growth strategies. Were the product mix and the technologies employed selected to increase the output to capital ratio, it should be possible to virtually eliminate underemployment and increase the GNP by 80% in the year 2000 over a projection of the currently employed strategy of relatively low output to capital industry. (Information supplied by Joseph Stepanek.)

- Travel and consultation grants to facilitate interchange of planners and policy makers among developing countries. For instance, visits to countries which have active appropriate technology policies by officials of countries which are considering such policies and programs.
- Identification of gaps in knowledge about appropriate technology and alternative policy choices and preparation of research agendas for possible funding by other agencies. (Funds from this program would not be used for research, but could be used to stimulate needed research financed by others.)

3-Selected innovative projects to develop and disseminate appropriate technology in developing countries-

This is the key activity under Section 107 in terms of the goal of the program -- developing innovations in appropriate technology, testing innovative approaches to appropriate technology, and enhancing the on-going capacities of developing country governments, institutions, and private sector to develop, adapt, and disseminate appropriate technology.

Although there is virtue in diversity, the program will need to concentrate on certain categories of problems and activities. Areas for concentration suggested so far include:

- Agricultural machinery and rural based food processing industries.
- Projects to assist small and medium scale enterprises, particularly in rural areas; facilitate utilization of appropriate technology for small and medium scale enterprises by channeling appropriate assistance to them in management, credit, marketing, as well as in technology.
- Energy for rural areas; cooking fuels.
- Health, sanitation.
- Low-cost housing
- Projects to strengthen capabilities of LDC institutions for identifying local problems and developing and disseminating appropriate technology in response to those needs. For instance, assistance to LDC research institutes or industrial extension services.

Some of these areas are broad and need further sharpening. Other areas suggest themselves: rural works, construction. One of the prime tasks of the program management will be to define the portfolio of projects as a result of consultations with developing countries and A.I.D. missions, and further planning with the private sector.

17

For a perceptive analysis of the problem of strengthening LDC institutional capacities in appropriate technology, see the paper by Bruce Koppel and Gary Hansen: Appropriate Institutions for Appropriate Technology, April, 1976, Attachment E.

An important point here is that at the project level, the multi-disciplinary aspects of appropriate technology come to the fore. As stated earlier, technology is only an ingredient in the solution of a particular development problem. The relative role of technology in a project depends on the nature of the problem and the context of the target group. This merely reiterates the truism that any specific project in an LDC must start with identification of local needs, consider the many ingredients necessary to solve the problem, and place the technology involved in its proper role.

4-Education and training-

The goal is to assist developing countries develop educational innovations which increase the relevance of their educational investments for appropriate technology.

There was a strong feeling at all the meetings that the manner in which LDC education systems are planned, curricula designed, and educational pedagogies and technology chosen is a critical part of fostering more appropriate technological development. There is evidence that curriculums in developing countries in fields such as engineering are oriented to Western standards, overly academic, or discipline oriented. Also, the formal education system reaches only a fraction of the populace giving rise to needs for grassroots training methods and programs.

While there was consensus on the problem - sufficient to warrant

its inclusion as one wing of the program - there were relatively few concrete ideas on penetrating the problem presented at the April-May meetings or in the papers we commissioned. Funds would be spent on pilot or innovative efforts which would complement or feed into larger programs. Some action ideas suggested at the meetings were:

- Grants to assist LDC institutions develop model appropriate technology design and lab courses in engineering and technology education.
- Grants to develop multi-disciplinary programs in "development technology" at developing country universities. Basic technological and engineering skills would be one aspect of such programs, but it would also include micro and macro economics, industrial and rural sociology, regional development, and R&D and extension management.
- Development of pilot programs for management training and on-the-job technical training.

5-Involve U.S. Business in Appropriate Technology Programs in LDCs-

The goal is to involve U.S. businesses in development and dissemination of appropriate technology in developing countries either by facilitating direct investments or through organized transfer of relevant business management experience and technology.

There was a consensus among the participants at the meeting that U.S. businesses should play a role in the appropriate technology effort. It was noted that many U.S. small businesses employ technology

and managerial practices which are relevant to kindred businesses in developing countries. However, there was little agreement at our April-May meetings on how U.S. companies could be best involved, particularly if the aim is a long-term, unsubsidized involvement which profits the companies.

To gain a better picture of possible U.S. business involvement in appropriate technology programs, A.I.D. commissioned an analysis of U.S. investments in developing countries, particularly evidence regarding the propensity of U.S. firms to make changes in product design or manufacturing processes in response to LDC conditions.¹⁸

The survey indicates that most products manufactured in developing countries by U.S. firms are generally mature and well-established. Examples might be non-leak proof batteries or inexpensive motor scooters. The design and technology for these products has been well-worked out and the market for them in the U.S. and Europe is declining. Firms are generally loath to invest funds and engineering time in changing these product designs for developing country conditions. This tendency is reinforced by the strong preference for "Western" goods which often prevails in LDCs. Locally manufactured goods with Western brand names can often

18

"The Inducement Of U.S. Firms To Adapt Products And Processes To Meet Conditions In Less Developed Countries", Robert B. Stobaugh, Harvard Business School, with Management Analysis Center, Inc., Cambridge, June, 1976.

command premium prices which further reduces the incentive for product adaptation.

The survey concludes that development or adaptation of simplified, but modern, products for low income markets by large multinational enterprises has not occurred often in the past and does not seem likely to expand significantly in the future. These firms are more interested in developing new products for high-income markets. The report notes, however, that development of such products might prove fruitful for small engineering firms.

The evidence on the willingness of U.S. firms to utilize labor-intensive manufacturing processes in LDCs is mixed. White reports that a number of surveys of multi-national corporations by Reuber (1973), Hughes and Seng (1969), Baranson (1971), Yeoman (1968), and Gregory and Reynolds (1965) have concluded that only a modest amount of technological adaptation has taken place, and that has been mostly in response to lower volumes, not local factor costs.¹⁹

But there is an interesting paragraph in Boon (1975, p. 270) that is worth recounting at some length. He describes an interview at an engine plant owned by a multi-national corporation in Mexico. At the beginning of the interview, the management assures Boon that the Mexican plant uses exactly the same technology as that used in

the parent plant in the developed country. But as Boon tours the factory, it becomes clear that the factor proportions are different. The main machinery processes are automated, but second-hand equipment is used. And all of the auxiliary processes, like packaging, handling, transporting and storing, are done much more labor intensively.

White feels that any researcher who looks around a multi-national corporation in an LDC is likely to find substantial adaptations of capital-labor ratios, particularly in auxiliary processes. This is the case for Boon (1975), Pack (1972, 1976), Barensen (1967, pp 59-62); Strassmann (1968, chs 5 and 6), Mason (1970), ILO (1972b, pp. 446-450), Wells (1973), and Armas (1973). Ranis (1971, 1973, 1974, 1975), Helleiner (1973a; 1973b), and Baerresen (1971) find multi-national corporations adapting to labor-intensive processes for export products.

Both locally controlled firms and multi-national corporations can and do adapt their factor proportions. Is either group more likely to adopt more labor-intensive methods? On this question, Strassmann, Pack, and the ILO mission to Kenya all find the multi-national corporations to be more labor-intensive; they explain this on the grounds that adopting labor-intensive technology requires good management and multi-national corporations have this in abundance. Mason (1970;1973) finds that for a group of matched pairs of firms, U.S. controlled firms tend to be somewhat

more capital-intensive than locally owned Philippino or Colombian firms; he explains this on the grounds that the U.S. firms pay higher wages and have access to cheaper capital. Radhu (1973a) also finds foreign firms to be more capital intensive than locally owned Pakistani firms. But Cohen (1973; 1975) finds no significant differences between foreign and Korean firms producing for export markets. The evidence is clearly mixed.

White concludes that although the multi-national corporations may not be the heroes of appropriate technology, they appear to be far from the villains that many make them out to be. They have the management expertise, and they are frequently willing to use it to adapt to labor intensive processes.

These surveys are general. But they clearly indicate that U.S. firms investing in LDCs are not a monolith. As our meetings with the private sector clearly confirmed, there are companies and people within companies who are clearly concerned with the problems in developing countries and are seized with the idea of appropriate technology. Ford and General Motors are both producing and marketing low-cost vehicles in developing countries.

What this indicates is that opportunities for involving U.S. firms in appropriate technology doubtless exist on a case by case basis, and the strategy for the Section 107 program -- initially at least -- is to search out such opportunities and seek to capitalize on them. There was a clear consensus at all our meetings that more investigation of

such opportunities should be undertaken and modest experimental programs launched.

Some initial ideas for activities which emerged at the meetings include:

- (1) Establish a system (possibly through banks) to seek out medium-sized U.S. companies for matching identified needs in developing countries.
- (2) Conduct surveys and in-depth analysis to determine what it takes to get U.S. small business to participate in the process of technology transfer.
- (3) Fund a two-way exchange program for managers of U.S. and LDC small business to facilitate transfer and know-how and technology.
- (4) Assist emerging small scale industry projects to develop by encouraging the direct involvement of similar U.S. small businesses.
- (5) Organize a number of firms in a specific U.S. small scale industry to help them transfer technology and management practices to similar firms abroad. For instance, the Denver Research Institute is considering organizing about 30 small metal working firms in Colorado as a resource for technical and managerial advice for similar working firms in Mexico.

- (6) Training or orientation programs in the choice and evaluation of appropriate technologies for U.S. equipment suppliers, U.S. manufacturing companies, and U.S. consulting firms. Such courses could be given on an industry basis and include entrepreneurs from LDCs.

In addition, monetary incentives might be used to encourage U.S. firms to consider alternative technology, although we believe the Section 107 program should be very cautious about using grant funds as incentives. Some suggested ideas are:

- a) Ask U.S. investors about to invest in a less-developed country to develop a new design of plants that would employ more labor and use less capital than their customary plant designs. If the investor, after having developed a new design decided not to use it, Section 107 grants would pay for the extra expenses incurred in making the design (a limit on the expenses provided would be set in each case) and would obtain the rights to the design so that it could be made available to other firms. If on the other hand, the new design were to be adopted by the firm that developed it, no reimbursement would be due.
- b) Give grants to U.S. equipment manufacturers to encourage the development of appropriate technologies for less-developed countries. The reward system might be similar

to that discussed above under (a); i.e. the firm is paid for the design if it does not use it, but not paid if it does.

CODA - Window on the West

All the activities and goals described for the program above are directed toward developing countries. Yet part of the audience for the Section 107 program lies in the United States. This is true in several senses.

First, as already stated, the program is to serve as a source of expertise, knowledge, and influence on A.I.D. and other donors.

Second, there are actions - large and small - which can be taken in the United States to facilitate the development and dissemination of appropriate technology in developing countries. For instance, U.S. universities can be encouraged to introduce appropriate technology into engineering courses for foreign students. There are both national and international policies (for example, international patent policies) which can hamper LDC efforts to develop their own appropriate technologies. A program of the size of Section 107 cannot do much to deflect these forces. But it can maintain a watch on them and - at the least - not proceed on the narrow assumption that the problem of appropriate technology for LDCs lies solely overseas.

Third, there is a significant movement in this country toward lower cost, small scale, decentralized technology. The National

Center for Appropriate Technology is being established in Montana under federal funding. There are numerous private groups at work. The appropriate technology program needs to build links to these groups both to help overcome the notion that appropriate technology is suited only for underdeveloped countries and to encourage two-way flows of information between domestic and overseas groups.

III. Organization

A. INTRODUCTION: When the House International Relations Committee wrote Section 107, they felt that a small, independent, non-profit entity should be established outside A.I.D. to make grants and coordinate Section 107 activities. According to the staff of the Committee the reasons were:

--a feeling that a small unit would be more flexible, could act quickly, and better fulfill the innovative spirit of Section 107 than an A.I.D. office.

--a feeling that an independent private entity with a governing board from the private community would more readily garner private sector support and stimulate private efforts.

The HIRC realized that an outside organization might drift away from A.I.D. They felt this could be overcome by appropriate linking mechanisms.

The committee originally planned to require an independent institute as part of the new legislation. At our request, they deleted this provision and requested that A.I.D. "study proposals for an institute of intermediate technology." This has been a major part of the A.I.D. work group's task.

A.I.D. identified three organizational options for the program. These are: (1) a new, independent, private, non-profit organization to make grants and contracts to carry out Section 107 activities; (2) a new, independent government corporation outside A.I.D. (on the model

of the Overseas Private Investment Corporation or the Inter-American Foundation); or (3) an Office of Appropriate Technology inside A.I.D. responsible for the full range of Section 107 activities.

After careful consideration, A.I.D. has decided on an independent, private, non-profit organization to carry out Section 107 activities. We have chosen this option because we believe that it can best fulfill the innovative, private aspects of the program.

An independent, non-profit organization will be an organization of and by the private sector. It will have a board consisting of representatives of business, private and voluntary agencies, universities, and others. The orientation of both the board and staff will be toward the private sector. As such, we believe the program will readily garner private sector support.

In addition, experience with similar organizations has shown that they generally have a great deal of flexibility and can make grants rapidly in response to perceived opportunities. There is less procedural red tape and more rapid decision-making. Such organizations have a great deal of flexibility in hiring and managing staff — a condition which does not pertain in A.I.D.

We believe these attributes have an important bearing on the innovativeness of the program. Certainly no organizational format can ensure innovativeness, but the flexibility, links with the private sector, and ability to act rapidly which are characteristic of a small, independent organization are to some extent preconditions for innovation

and thus we have endorsed this alternative.

At the same time, A.I.D. is concerned that the Section 107 program serve as an energizer and resource for A.I.D.'s development program.

As stated in Section I, A.I.D. already has a diversified portfolio of activities in appropriate technology. Congress expects - and A.I.D. intends - that we increase our concern with appropriate technology both in terms of specific appropriate technology projects and as an integral part of our development activities.

Hence, it is vitally important that ideas generated in Section 107 experimental programs reach the programmers of other A.I.D. funds. It is important that A.I.D. be a strong customer for real, useful, innovative, replicable, and adaptable appropriate technology emanating from the Section 107 program.

A.I.D. is concerned that appropriate linkage mechanisms be established and a strong degree of complementarity be maintained between activities carried out under Section 107 and the overall A.I.D. program. We expect that there will be close consultation between A.I.D. and the management of the new Section 107 entity in developing policy, program goals, and strategy. This collaboration would be a continuation of the A.I.D. - private sector dialogue begun during our April and May meetings.

Complementarity between A.I.D. and the new Section 107 program does not mean a one to one correspondence of policy and program. If

the new organization is to fulfill its innovative mandate, it needs freedom to move into areas and activities in which A.I.D. is not currently active. In this sense, ensuring complementarity becomes something of a balancing act: maintaining broad congruity with A.I.D.'s priorities while preserving enough freedom to embark on new initiatives. Keeping these in balance will require close communication and collaboration between A.I.D. and the management of the new entity.

In terms of specific activities, there are a number of on-going and prospective A.I.D. projects which might be referred to the new 107 entity for possible funding as grant projects. We believe over time a division of labor will evolve under which certain types of actions will be funded by Section 107 and others through normal A.I.D. channels. However, such a division of labor should evolve only as the new organization demonstrates its competence in given areas. The criteria for deciding which types of projects might be referred to the new organization and which types should be funded by A.I.D. directly should evolve as the Section 107 program develops and be based on development of demonstrated competence by the new entity.

The basic point is that A.I.D. expects to continue to be a creative actor in appropriate technology; the existence of the Section 107 program does not absolve the agency from this responsibility. A.I.D. bureaus and offices will continue to develop appropriate technology projects and activities. As the new organization develops, it is expected to become a growing resource for A.I.D. efforts, but it

is not intended to substitute for A.I.D. efforts nor will it be the only resource available.

B. Organizational Framework: The decision to establish a new, independent, private entity for Section 107 is one aspect of the proposed organizational framework for appropriate technology. Beyond this, there need to be appropriate mechanisms for linking the Section 107 and A.I.D. program. Hence, the organizational format we propose has several parts.

The first is the new, non-profit Appropriate Technology Fund. This organization will receive an annual grant from A.I.D. for Section 107 programs and will, in turn, make sub-grants to contract with private or publically supported groups in developed and less developed countries.

The second is establishment of a small office within A.I.D. to act as liason with the new Fund, and service appropriate technology activities carried out by A.I.D.'s bureaus and missions. This office will have the prime responsibility for ensuring complementarity between A.I.D. and the Section 107 program. It will oversee the annual grant to the new entity. It will provide information and help locate technical help for bureaus and Missions which are working on appropriate technology problems.

Linking these two organizational elements will be a series of policies and procedures which will govern - in effect - the quality and effectiveness of the relationship between them. These include among other things: provisions for A.I.D. participation at the board level of the new organization; provisions for A.I.D. participation in

technical panels or conferences called by the Fund; and provisions in the grant agreement designed to insure consultations on policy and program, and flexibility in day to day operations.

We outline each of these three elements below. Much detailed planning remains to be done. This will be carried out following approval of this report by the Congress.

C. The Appropriate Technology Fund: The Fund will be an independent, non-profit corporation located in the Washington area.

The Fund will not be an operational entity in the sense that it will run appropriate technology programs overseas. It will be a facilitator of actions in appropriate technology taken by others. It will make grants to or contracts with private groups; serve as a resource for A.I.D. programs; serve as a communications channel; and help organize and coordinate the activities of various U.S. and LDC groups active in appropriate technology.

More specifically, the functions of the Fund will be to:

1. Develop overall policy and programs for Section 107.
2. Encourage innovations in appropriate technology and projects to develop and disseminate appropriate technology in LDCs; receive, review, and approve projects and grants.
3. Evaluate appropriate technology projects and programs; seek widespread utilization of appropriate technology innovations, or adoption of appropriate technology programs,

- by LDC governments, private enterprises, or A.I.D. donors.
4. Promote awareness of appropriate technology; serve as a communication point; help transfer selected information about appropriate technology.
 5. Encourage networks of organizations interested in appropriate technology in the United States and LDCs; help coordinate activities of organizations interested in appropriate technology.
 6. Serve as a source of, and link to, appropriate technology resources for A.I.D. projects and programs.
 7. Receive and disburse funds from A.I.D. and other organizations; hire staff and consultants.

The Appropriate Technology Fund will be empowered to receive funds from sources other than A.I.D. for programs in appropriate technology. This could include contributions from U.S. foundations or corporations. It could include support or contracts for specific projects. While A.I.D. welcomes such contributions, we are assuming that A.I.D. will provide most if not all of the funding for the Fund. A.I.D.'s decision to establish the Fund is not based on the expectation that it will become self-supporting or receive major outside contributions in the foreseeable future.

The Section 107 authorization extends to 1978, but the proposal for a new, independent fund assumes implicitly that the Congress will continue the authorization beyond this date assuming adequate performance. We believe - if the Congressional Committees accept this proposal -

that they should provide explicit assurance that they understand the funding basis for the new Fund and that they will not condition future funding on criteria other than performance.

We believe the Board of Directors for the Fund should include representatives from business, private and voluntary agencies, academic institutions and alternative technology groups in the United States. We believe at least two A.I.D. officers should participate regularly in Board meetings as non-voting observers and as advisers on A.I.D. policies.

In terms of organization and staffing, we have drawn up organization charts, staffing patterns, and cost figures for two illustrative versions of the Appropriate Technology Fund. These are attached to this report. They are intended to indicate the approximate maximum magnitude of the outside office and serve as a guide for planning.

In drawing up these organizational proposals, we consulted with two organizations which are analogs for the proposed Appropriate Technology Fund: the Inter-American Foundation, and the Pathfinder Fund in Boston.

The Pathfinder Fund is an independent, non-profit fund which receives \$4-5 million per year from the A.I.D. Population Office. It, in turn, makes small sub-grants to LDC and (some) U.S. organizations for family planning projects. It has a staff of 27 persons at its Boston headquarters and 35 employees (all foreign nationals) in 6 field offices overseas. Its administrative and staff costs amount to about \$1.0 million out of a \$4.5 million budget. (\$600,000 for the Boston staff; and \$400,000 for the

regional offices.) It receives 90% of its budget from A.I.D. Pathfinder makes about 180 small grants a year ranging between \$2,000 and \$20,000.

The Inter-American Foundation is larger. It is an independent government corporation which makes grants to LDC private groups for social and community development projects. Its budget is about \$20 million a year; its grants average about \$120,000 each — the smallest being \$400 and the largest \$1.8 million. It has a staff of 64, a 1 in Rosslyn, Virginia. Total costs for salaries and administration are about \$1.8 million per year.

We estimate that the proposed Appropriate Technology Fund established for Section 107 would be somewhat larger than Pathfinder's 27 man Boston headquarters and smaller than IAF. We follow the IAF pattern of having no overseas offices. We have estimated average grants of \$100,000, and a maximum annual budget of \$10.0 million per year.

Appropriate Technology Fund - Alternative A: The first version of the Fund would be at maximum a 30 man office consisting of 12 program professionals, 8 administrative staff, and 10 clerical/secretarial staff. The professionals include a director and deputy, eight specialists in fields such as small business enterprise, and agriculture machinery and food processing, and a two man communications/information/evaluation staff. Total annual staff and overhead costs are \$1,004,820.

Appropriate Technology Fund - Alternative B: This is based on consultations with the Pathfinder Fund. The estimated maximum total staff under this alternative is 34 and administrative and overhead costs would be \$1,021,738.

The principle difference between this and Alternative A is that it: (1) reduces the administrative staff; and (2) strengthens the professional staff. On the professional side, there are two specialists in each functional area and, except for an editorial associate, there is no separate communications staff. Communications and information would be part of the job of the functional specialists and thus better integrated into the ongoing program. The smaller administrative staff is based on Pathfinder's experience. It assumes that auditing and legal services would be purchased from commercial firms.

The organization charts for these alternatives are attached. We emphasize that these charts are illustrative and intended to indicate the approximate eventual size of a mature organization. The organization will start small and evolve as its program grows.

D. Appropriate Technology Liason Office: This will be a small office located in the Technical Assistance Bureau in A.I.D. We currently estimate a staff of two professionals for the office. However, we are planning to conduct a more detailed review of the functions and staff requirements for this office. This will include the expected workload for the office, current and prospective Agency involvement in appropriate

technology programs, analysis of the number of staff in A.I.D. regional and central bureaus who either now carry or potentially could carry responsibilities in appropriate technology and the desirability of utilizing or augmenting this staff rather than further building up a central office.

The functions of the liason office would be to:

- Manage the annual grant to the Appropriate Technology Fund.
- Maintain liason with Fund including attending board meetings.
- Consult on A.I.D. projects involving appropriate technology.
- Provide information about appropriate technology for A.I.D. bureaus and missions.
- Locate technical and other expertise to assist Missions. (From both the Appropriate Technology Fund and other sources.)
- Represent A.I.D. in international meetings on appropriate technology.

The office is intended to serve as a source of information and technical resources to meet Mission needs. Missions, of course, do not normally face appropriate technology problems in isolation. They face development problems of which appropriate technology may be an ingredient. Hence, the office must relate in a multi disciplinary fashion to other staff offices in A.I.D. which are concerned with serving Missions.

The basic role for the internal office is to respond to Mission

and bureau needs for assistance in appropriate technology. It should function as a link in a bottom-up chain which starts with appropriate technology related problems emanating from Missions. It is only by reflecting the real concerns of Missions and bureaus that it can best represent the concerns of the Agency in dealing with the outside office. 20

For these reasons, we believe the internal office should be quite small. It should develop and maintain strong links with staff in the missions and the regional and central bureaus who are concerned with appropriate technology. We believe the current A.I.D. Appropriate Technology Work Group might be continued as a means for funneling the concerns of regional and other bureaus into the internal office and hence on to the new Appropriate Technology Fund.

E. Policy and Procedures: The policy and procedures adopted by the Board of Appropriate Technology Fund and by A.I.D. in its grant agreement with the Fund will be critical in maintaining the proper balance between operational independence and flexibility for the new organization and close communication and complementarity with A.I.D. Tension between these two operational principles is inherent in the Section 107 legislation.

20

We do not mean that the internal office will not be an active promoter of appropriate technology concepts within the Agency. We do believe that the office can best be an active promoter of appropriate technology by relating to real problems of Missions not by selling activities conceived in Washington.

On the substantive level, Section 107 creates a tension between the innovative, private aspects of the program -- with its concomitant need for independence from A.I.D. -- and the requirement that the program serve as a resource for A.I.D., with its concomitant need to stay close to A.I.D.

On the administrative level, there is a tension between the need for procedural flexibility, rapid action, and minimal red tape, and A.I.D.'s ongoing need to ensure accountability and proper expenditure of funds.

These tensions will persist. Maintaining the proper balance between them will require close communication and careful consideration of policy and procedures governing mutual relations between A.I.D. and the new entity.

These procedures fall in three areas:

(1) Procedures in over-all program and policy: Here we believe the operating principle should be to encourage the closest possible coordination and consultation between A.I.D. and the Appropriate Technology Fund. We believe the new organization should develop open, participatory processes for policy and program development which engage A.I.D. staff as well as U.S. and LDC private sector groups. The workshops held in April this year constituted a first step in this direction and we believe similar methods should be used in the future.

We recommend that two A.I.D. persons participate ex officio

on the board of the Fund, and that A.I.D. join in technical panels, advisory boards or planning conferences sponsored by the Fund. The basic principle to be followed between A.I.D. and the new Fund is close coordination in development of over-all policy and programs and maximum freedom in day to day operations.

(2) Procedures Governing Specific Sub-Grant and Contract Activities:

Here the operating principle should be to provide flexibility for the outside entity to approve specific sub-grants and contracts without prior approval from A.I.D. This will require development of criteria and guidelines for the Fund's financial/accounting system, procurement system and programming and grant approval process. Once these guidelines have been mutually agreed upon, the Fund should have latitude to approve individual projects without prior A.I.D. approval.

(3) Operational Procedures: Again we believe that the operating principle should be to provide maximum flexibility to the new agency and to its grantees. As stated in Section I, we recommend that the Fund have authority to approve grants for activities in non-A.I.D. countries subject to the existing statutory limitations on direct A.I.D. assistance. We recommend that grants and travel by the Fund staff require prior notification but not prior approval of Missions and Embassies.

We also recommend that a mutually agreed upon ceiling on operating expenses be established in the grant agreement so as to maintain an appropriate balance between operating and program expenses.

In addition, the A.I.D. grant handbook contains 15 pages of optional provisions which stem from A.I.D. policy and may be waived by A.I.D. These include provisions such as Buy America, Fly America, and Ship America. Some of these policies are generally sound. Others, such as the Buy America provision, need reconsideration.

The grant agreement will be the instrument for considering these policies and we will seek to follow a policy of minimum restrictions.

Next Steps: Assuming approval of this report by the House International Relations Committee and the Senate Committee on Foreign Relations, A.I.D. will move immediately to implement the actions recommended in this paper. The next steps to be taken include:

- Creation of the internal A.I.D. appropriate technology office including designation of its staff members.
- Planning for the Appropriate Technology Fund including identification of incorporators and inviting the incorporators take the necessary steps to draw up articles of incorporation for the Fund.
- Planning for consultations with LDC governments and private groups about programs and priorities in Section 107.
- Joint A.I.D. - private sector planning regarding the organization, staffing, and initial budgets for FY 1977 and FY 1978 for the Fund; development of a draft grant agreement and policies.

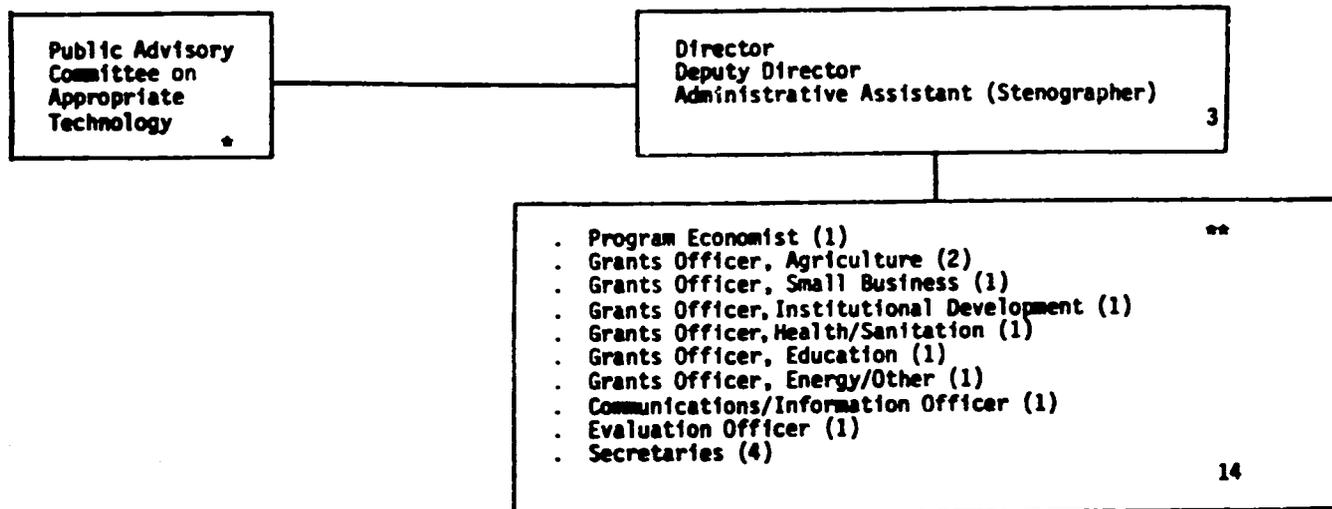
--Review of current A.I.D. efforts in appropriate technology and consideration of means to better integrate appropriate technology into A.I.D.'s program. This review will include reconsideration of staffing and location of the internal appropriate technology office as well as other bureau staff.

Estimated Annual Costs for a
Proposed Organization Within A.I.D. for Appropriate Technology
(Alternative A)

| I. <u>Salaries and Benefits</u> | | \$662,765 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|----------|-----------|---------------------|--------|-------|----------------------------|--------|-------|-------------------------------------|--------|-------|------------------------------|--------|-------|---|--------|-------|--|--------|-------|--|--------|-------|-----------------------------------|--------|-------|--------------------------------------|--------|-------|--|--------|-------|---|--------|-------|--|--------|-------|--------------------------------|--------|-------|-----------------------------------|--------|-------|-----------------------------------|--------|-------|-----------------------------------|--------|-------|-----------------------------------|--------|-------|---|--|--|---|--------|-------|---|--------|-------|----------------------------------|--------|-------|----------------------------|--------|-------|--------------|--------|-------|-------|---------|--------|--|
| A. <u>Central AT Entity*</u> | <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: center; border-bottom: 1px solid black;">Salaries</th> <th style="text-align: center; border-bottom: 1px solid black;">Benefits</th> </tr> </thead> <tbody> <tr><td>1. Director (GS-17)</td><td style="text-align: right;">37,800</td><td style="text-align: right;">3,553</td></tr> <tr><td>2. Deputy Director (GS-16)</td><td style="text-align: right;">37,800</td><td style="text-align: right;">3,553</td></tr> <tr><td>3. Administrative Assistant (GS-10)</td><td style="text-align: right;">16,306</td><td style="text-align: right;">1,533</td></tr> <tr><td>4. Program Economist (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>5. Communications/Information Officer (GS-14)</td><td style="text-align: right;">29,546</td><td style="text-align: right;">2,777</td></tr> <tr><td>6. Grants Officer, Agriculture (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>7. Grants Officer, Agriculture (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>8. Grants Officer, Health (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>9. Grants Officer, Education (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>10. Grants Officer, Small Business (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>11. Grants Officer, Institutional Development (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>12. Grants Officer, Energy/Other (GS-15)</td><td style="text-align: right;">34,441</td><td style="text-align: right;">3,237</td></tr> <tr><td>13. Evaluation Officer (GS-14)</td><td style="text-align: right;">29,546</td><td style="text-align: right;">2,777</td></tr> <tr><td>14. Secretary/Stenographer (GS-7)</td><td style="text-align: right;">12,150</td><td style="text-align: right;">1,142</td></tr> <tr><td>15. Secretary/Stenographer (GS-7)</td><td style="text-align: right;">12,150</td><td style="text-align: right;">1,142</td></tr> <tr><td>16. Secretary/Stenographer (GS-7)</td><td style="text-align: right;">12,150</td><td style="text-align: right;">1,142</td></tr> <tr><td>17. Secretary/Stenographer (GS-7)</td><td style="text-align: right;">12,150</td><td style="text-align: right;">1,142</td></tr> <tr><td colspan="3" style="padding-top: 10px;">B. <u>Staff Augmentations in other AID entities, Supportive of the AT Program</u></td></tr> <tr><td>1. Grant Administration Officer (GS-15)</td><td style="text-align: right;">25,198</td><td style="text-align: right;">2,369</td></tr> <tr><td>2. Grant Administration Officer (GS-13)</td><td style="text-align: right;">25,198</td><td style="text-align: right;">2,369</td></tr> <tr><td>3. Secretary/Stenographer (GS-7)</td><td style="text-align: right;">12,150</td><td style="text-align: right;">1,142</td></tr> <tr><td>4. Program Analyst (GS-13)</td><td style="text-align: right;">25,198</td><td style="text-align: right;">2,369</td></tr> <tr><td>5. Other (2)</td><td style="text-align: right;">43,057</td><td style="text-align: right;">3,902</td></tr> <tr><td style="text-align: right;">Total</td><td style="text-align: right; border-top: 1px solid black;">605,957</td><td style="text-align: right; border-top: 1px solid black;">56,808</td></tr> </tbody> </table> | | Salaries | Benefits | 1. Director (GS-17) | 37,800 | 3,553 | 2. Deputy Director (GS-16) | 37,800 | 3,553 | 3. Administrative Assistant (GS-10) | 16,306 | 1,533 | 4. Program Economist (GS-15) | 34,441 | 3,237 | 5. Communications/Information Officer (GS-14) | 29,546 | 2,777 | 6. Grants Officer, Agriculture (GS-15) | 34,441 | 3,237 | 7. Grants Officer, Agriculture (GS-15) | 34,441 | 3,237 | 8. Grants Officer, Health (GS-15) | 34,441 | 3,237 | 9. Grants Officer, Education (GS-15) | 34,441 | 3,237 | 10. Grants Officer, Small Business (GS-15) | 34,441 | 3,237 | 11. Grants Officer, Institutional Development (GS-15) | 34,441 | 3,237 | 12. Grants Officer, Energy/Other (GS-15) | 34,441 | 3,237 | 13. Evaluation Officer (GS-14) | 29,546 | 2,777 | 14. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | 15. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | 16. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | 17. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | B. <u>Staff Augmentations in other AID entities, Supportive of the AT Program</u> | | | 1. Grant Administration Officer (GS-15) | 25,198 | 2,369 | 2. Grant Administration Officer (GS-13) | 25,198 | 2,369 | 3. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | 4. Program Analyst (GS-13) | 25,198 | 2,369 | 5. Other (2) | 43,057 | 3,902 | Total | 605,957 | 56,808 | |
| | Salaries | Benefits | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Director (GS-17) | 37,800 | 3,553 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Deputy Director (GS-16) | 37,800 | 3,553 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Administrative Assistant (GS-10) | 16,306 | 1,533 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Program Economist (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Communications/Information Officer (GS-14) | 29,546 | 2,777 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. Grants Officer, Agriculture (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. Grants Officer, Agriculture (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. Grants Officer, Health (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. Grants Officer, Education (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. Grants Officer, Small Business (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. Grants Officer, Institutional Development (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. Grants Officer, Energy/Other (GS-15) | 34,441 | 3,237 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13. Evaluation Officer (GS-14) | 29,546 | 2,777 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B. <u>Staff Augmentations in other AID entities, Supportive of the AT Program</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Grant Administration Officer (GS-15) | 25,198 | 2,369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Grant Administration Officer (GS-13) | 25,198 | 2,369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Secretary/Stenographer (GS-7) | 12,150 | 1,142 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Program Analyst (GS-13) | 25,198 | 2,369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Other (2) | 43,057 | 3,902 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total | 605,957 | 56,808 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| II. Overhead Factor (calculated as 25% of salaries and benefits to cover travel, consultants, overtime, space, telephone, administrative procurement, etc.) | Total | <table border="0" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: right;">165,691</td></tr> <tr><td style="text-align: right; border-top: 1px solid black;">\$828,156</td></tr> </table> | 165,691 | \$828,156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 165,691 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \$828,156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*There are now two positions established in the Bureau for Technical Assistance; thus, the net additional would be 21 positions.

ALTERNATIVE A: PROPOSED ORGANIZATION WITHIN A.I.D. FOR APPROPRIATE TECHNOLOGY

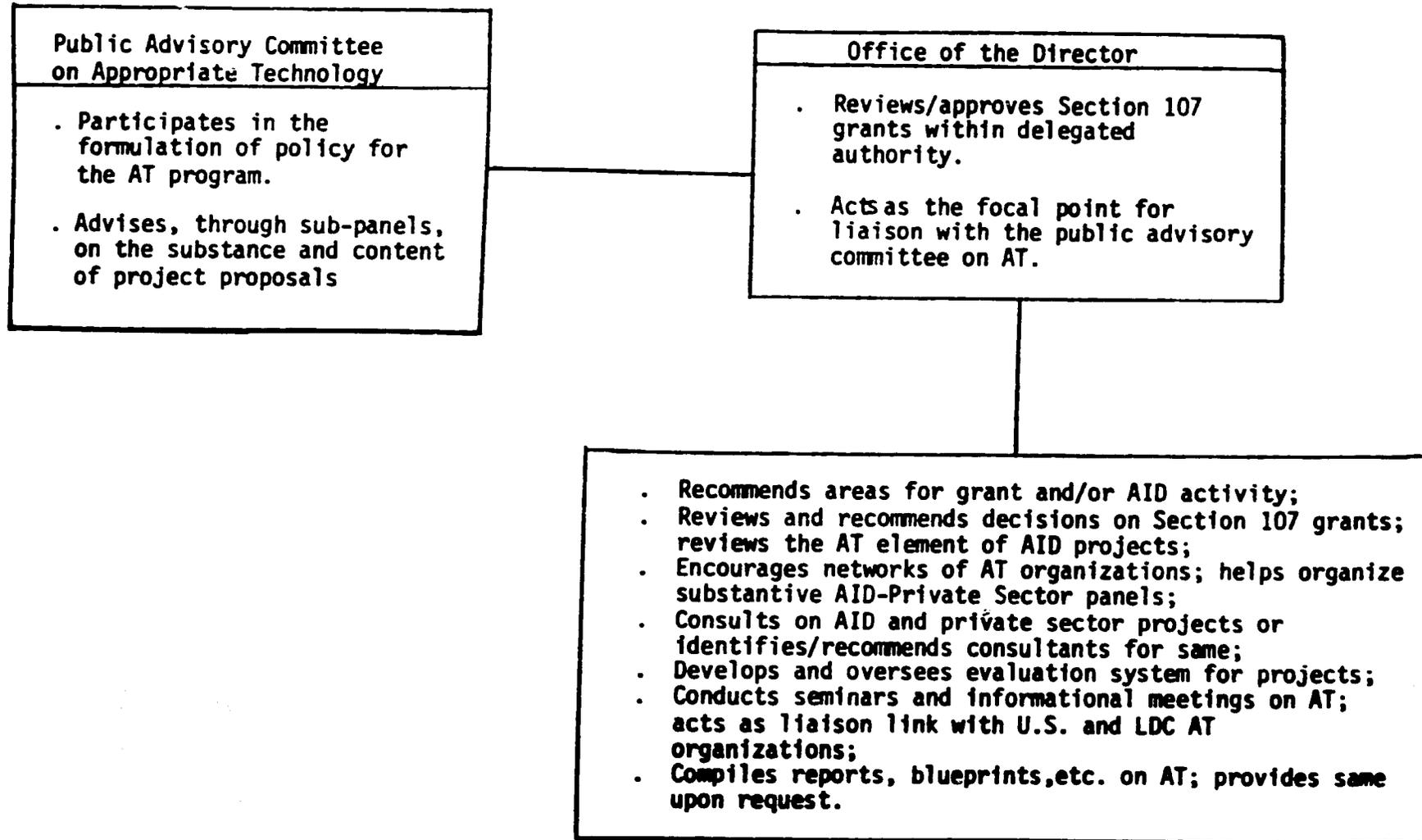


* The assumption is made that sub-committees may be established for specific functional areas, e.g., Health, Small Business, etc.

** Any one of the program specialists could act as chief of the unit assuming he/she is a broad-gauged individual with executive capacity.

NOTE: The total staff of the proposed new AID Office is 17. Grants would be processed by SER/Contract Management. SER/CM estimates 3 additional positions would be required. The program will also use services of GC, Audit, PPC, Public Affairs, etc. Estimated additional workyears are 3.

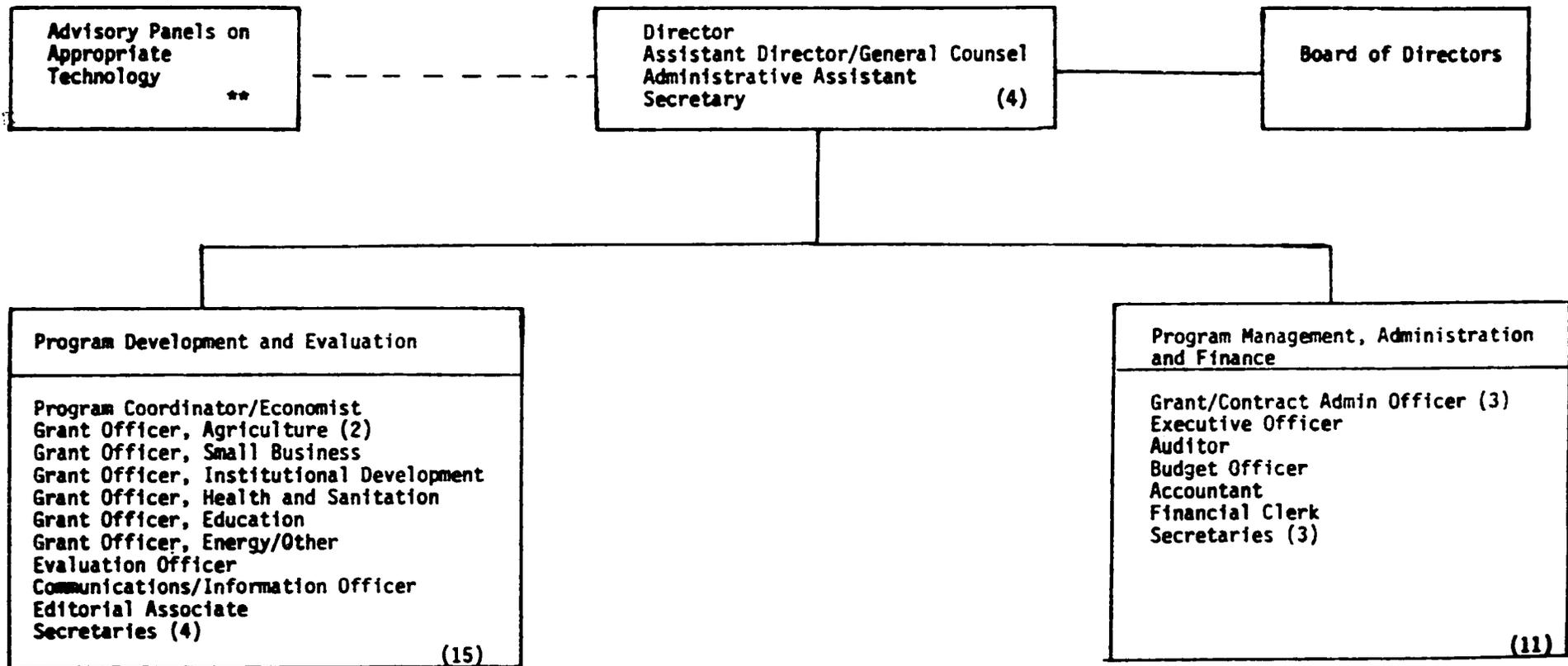
ALTERNATIVE A: PROPOSED ORGANIZATION WITHIN A.I.D. FOR APPROPRIATE TECHNOLOGY



ESTIMATED COSTS FOR A
PROPOSED PRIVATE NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY
(ALTERNATIVE B)

| <u>I. Salaries and Benefits</u> | <u>Salaries</u> | <u>Benefits</u> | 847,985 |
|---|-----------------|-----------------|--------------------|
| 1. Director | 55,000 | 5,170 | |
| 2. Assistant Director/General Counsel | 50,000 | 4,700 | |
| 3. Administrative Assistant | 16,306 | 1,533 | |
| 4. Secretary | 12,150 | 1,142 | |
| 5. Program Coordinator/Economist | 34,441 | 3,237 | |
| 6. Grant Officer, Agriculture (2) | 68,882 | 6,474 | |
| 7. Grant Officer, Small Business Development | 34,441 | 3,237 | |
| 8. Grant Officer, Institutional Development | 34,441 | 3,237 | |
| 9. Grant Officer, Health and Sanitation | 34,441 | 3,237 | |
| 10. Grant Officer, Education | 34,441 | 3,237 | |
| 11. Grant Officer, Energy/Other | 34,441 | 3,237 | |
| 12. Evaluation Officer | 29,546 | 2,777 | |
| 13. Communications Officer | 29,546 | 2,777 | |
| 14. Editorial Associate | 16,306 | 1,533 | |
| 15. Secretaries (4) | 48,600 | 4,568 | |
| 16. Executive Officer (Personnel, GSO) | 29,546 | 2,777 | |
| 17. Auditor | 34,441 | 3,237 | |
| 18. Budget and Fiscal Officer | 25,198 | 2,369 | |
| 19. Accountant | 29,546 | 2,777 | |
| 20. Financial Clerk | 16,306 | 1,533 | |
| 21. Secretaries (3) | 36,450 | 3,426 | |
| 22. Contract/Grant Administrators (3) | 75,594 | 7,107 | |
| Total | <u>780,063</u> | <u>67,922</u> | |
| II. Overtime (500 hours @ \$9.40) | | | 4,700 |
| III. Consultants (350 days @ \$100) | | | 35,000 |
| IV. Travel | | | 50,000 |
| V. Administrative Procurement/External Auditing Services | | | 12,000 |
| VI. Rent, Equipment, Supplies, etc. | | | 55,135 |
| Total | | | <u>\$1,004,820</u> |

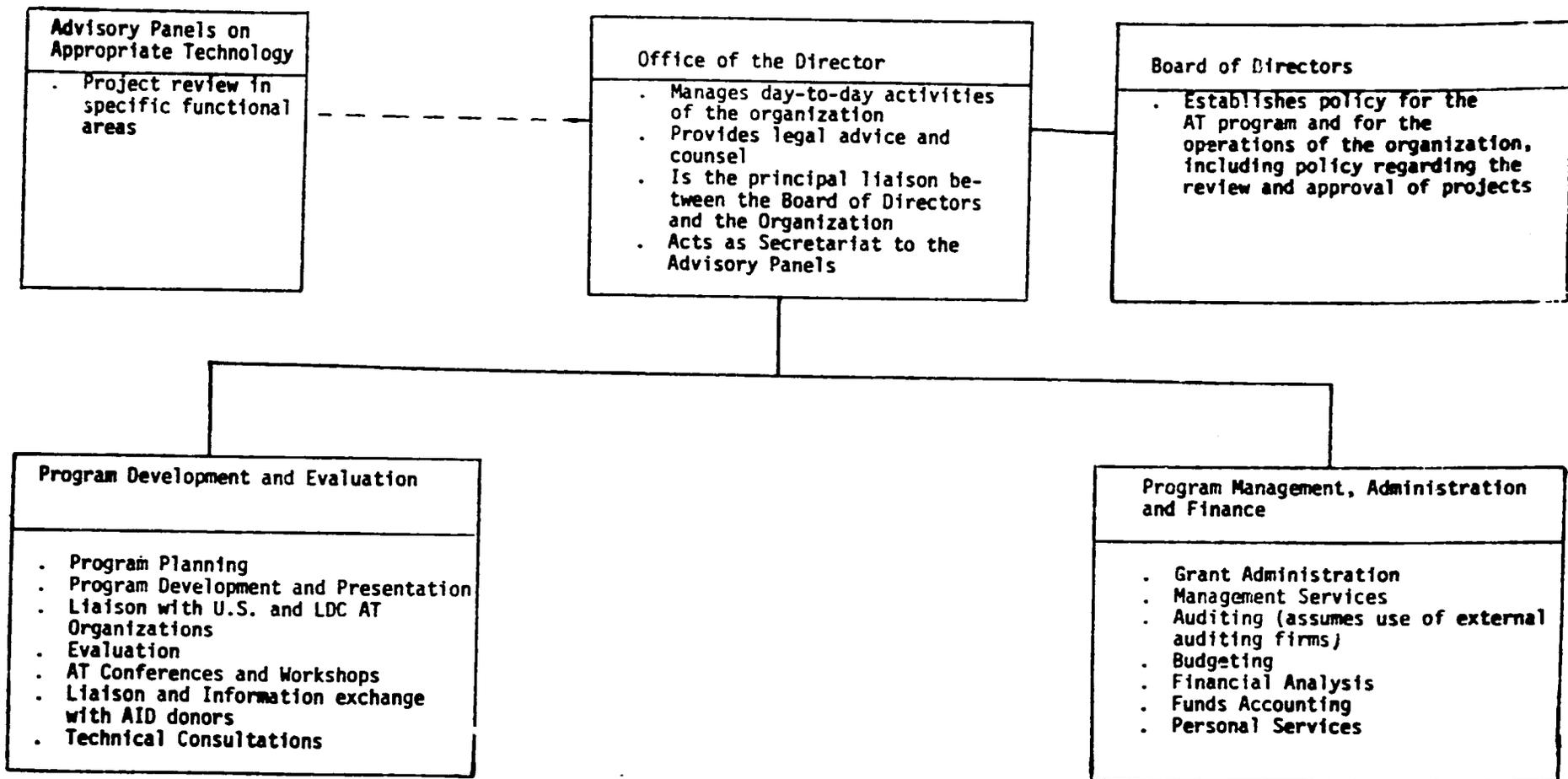
ALTERNATIVE B: PROPOSED ORGANIZATIONAL ARRANGEMENT FOR A PRIVATE, NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY*



* Proposal developed by AID/SER/MP in consultation with AID Work Group on Appropriate Technology.

** The assumption is made that project review panels may be established for specific functional areas; e.g. Health, Small Business, etc.

ALTERNATIVE B: PROPOSED ORGANIZATIONAL ARRANGEMENT FOR A PRIVATE, NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY*



* Proposal developed by AID/SER/MP in consultation with AID Work Group on Appropriate Technology.

ALTERNATIVE B & C: SMALL, INTERNAL OFFICE IN A.I.D.

| Appropriate Technology Liaison Office |
|--|
| <ul style="list-style-type: none">- Chief- Development Officer- Secretary |
| <p>Functions:</p> <ul style="list-style-type: none">-- Manages annual grant to outside Appropriate Technology Fund.-- Maintains liaison with Fund including attending board meetings.-- Reviews and consults on AID projects involving appropriate technology, liaison to U.S. sources.-- Represents AID in international meetings on AT. |

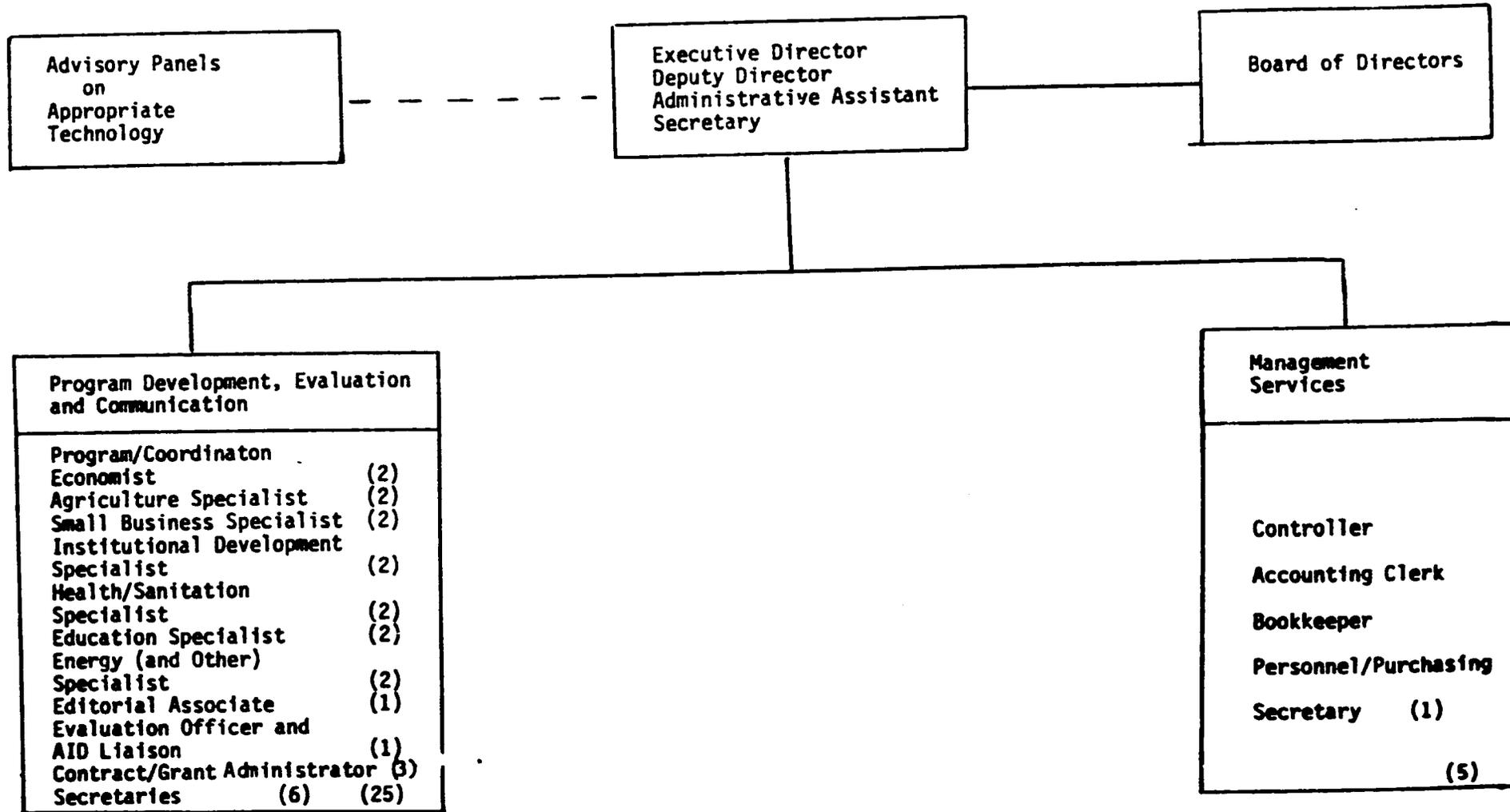
ESTIMATED COSTS

FOR A PRIVATE, NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY
(Suggested by Gaines B. Turner, Director of Operations, Pathfinder Fund)

(Alternative C)

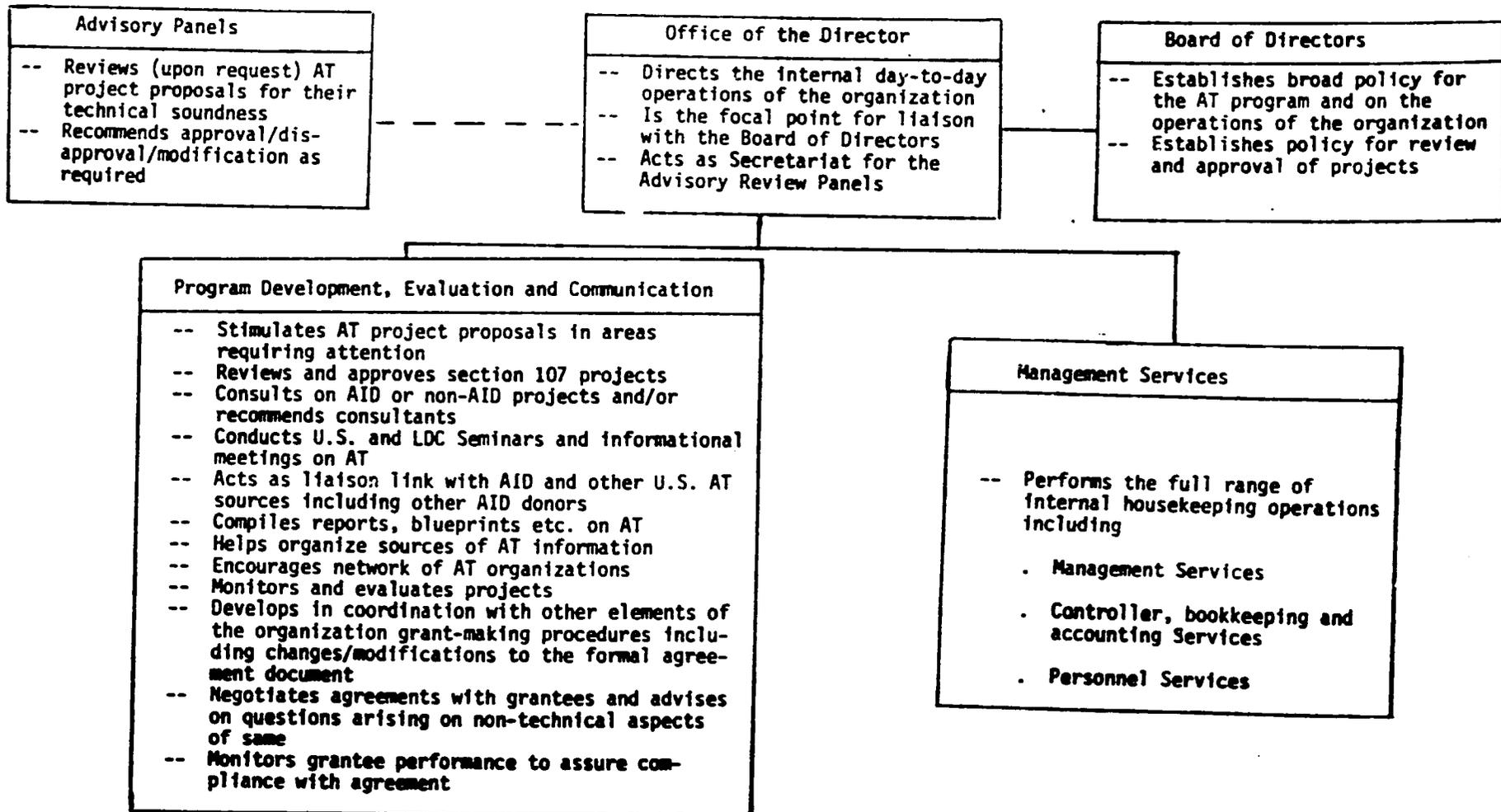
| <u>Salaries and Benefits</u> | <u>Salaries</u> | <u>Benefits</u> | <u>\$856,903</u> |
|--|------------------|-----------------|--------------------|
| 1. Executive Director | \$ 55,000 | \$ 5,170 | |
| 2. Deputy Director | 50,000 | 4,700 | |
| 3. Administrative Assistant | 16,306 | 1,533 | |
| 4. Secretary | 12,150 | 1,142 | |
| 5. Program Coordinator/Economist | 34,441 | 3,237 | |
| 6. Program Coordinator/Economist | 16,306 | 1,533 | |
| 7. Agriculture Specialist | 34,441 | 3,237 | |
| 8. Agriculture Specialist | 16,306 | 1,533 | |
| 9. Small Business Specialist | 34,441 | 3,237 | |
| 10. Small Business Specialist | 16,306 | 1,533 | |
| 11. Institutional Development Specialist | 34,441 | 3,237 | |
| 12. Institutional Development Specialist | 16,306 | 1,533 | |
| 13. Health Sanitation Specialist | 34,441 | 3,237 | |
| 14. Health Sanitation Specialist | 16,306 | 1,533 | |
| 15. Education Specialist | 34,441 | 3,237 | |
| 16. Education Specialist | 16,306 | 1,533 | |
| 17. Energy/Other Specialist | 34,441 | 3,237 | |
| 18. Energy/Other Specialist | 16,306 | 1,533 | |
| 19. Editorial Associate | 16,306 | 1,533 | |
| 20. Evaluation Officer | 29,546 | 2,777 | |
| 21. Contract/Grant Administrators (3) | 75,594 | 7,107 | |
| 22. Secretaries (7) | 85,050 | 7,994 | |
| 23. Controller | 34,441 | 3,237 | |
| 24. Accounting Clerk | 12,150 | 1,142 | |
| 25. Bookkeeper | 16,306 | 1,533 | |
| 26. Personnel/Purchasing | <u>25,198</u> | <u>2,369</u> | |
| Total | <u>\$783,276</u> | <u>\$73,627</u> | |
| II. Overtime | | | 4,700 |
| III. Consultants | | | 35,000 |
| IV. Travel | | | 50,000 |
| V. Administrative Procurement (e.g., audit services, etc.) | | | 20,000 |
| VI. Equipment and Supplies | | | <u>55,135</u> |
| Total | | | <u>\$1,021,738</u> |

ALTERNATIVE C: PROPOSED ORGANIZATIONAL ARRANGEMENT FOR A PRIVATE NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY



Proposal suggested by Gaines B. Turner, Director of Operations, Pathfinder Fund.

ALTERNATIVE C: PROPOSED ORGANIZATIONAL ARRANGEMENT FOR A PRIVATE NON-PROFIT ORGANIZATION FOR APPROPRIATE TECHNOLOGY



ALTERNATIVE B & C: SMALL, INTERNAL OFFICE IN A.I.D.

| Appropriate Technology Liaison Office |
|--|
| <ul style="list-style-type: none">- Chief- Development Officer- Secretary |
| <p>Functions:</p> <ul style="list-style-type: none">-- Manages annual grant to outside Appropriate Technology Fund.-- Maintains liaison with Fund including attending board meetings.-- Reviews and consults on AID projects involving appropriate technology, liaison to U.S. sources.-- Represents AID in international meetings on AT. |

Appropriate Technology - Definition

Appropriate technology is technology which enables developing countries to provide goods and services for their people in a manner which is compatible with their economic and social conditions.

Appropriate technologies relate both to economic and non-economic goals. They are applicable to employment, output, and equity objectives, as well as goals in population, health, nutrition and education.

Given typical LDC conditions of scarcities of capital and skilled labor with an abundance of unskilled and semi-skilled labor, and taking as objectives of development assistance:

- growth of employment and output through more effective use of resources,
- while decreasing inequalities in income distribution,
- emphasis on the basic needs of the poor, both economic and non-economic, and
- increased participation of the poor in all aspects of the development process.

It is expected that technologies appropriate in production will generally have the following characteristics:

- 1) They will be intensive in the use of the abundant factor, unskilled labor, and economical in the use of scarce factors, capital and highly trained personnel.

In the provision of services, appropriate technology relies to the extent possible on less highly-skilled labor - economizing on human capital. Appropriate technologies do not demand sophisticated skills of their users.

- 2) Appropriate technologies are primarily based on locally and domestically-produced inputs, or on the use of national (not expatriate) personnel.
- 3) Appropriate technologies in physical production are economically efficient in small and medium-scale enterprises, replicable by local entrepreneurs, and often produce primarily for a local or regional market.

It is expected that goods appropriate to LDCs in consumption will emphasize the needs of the poor: they will generally be

- low cost,
- accessible to low-income people,
- individually or locally maintainable without extensive support requirements,
- compatible with local cultural patterns.

Appropriate service technologies are those designed to produce manpower and medical care relevant to the requirements of the poor. They, similarly, will be low-cost, accessible, and compatible with local cultural patterns.

None of these characteristics are binding. That is, satisfaction of these criteria does not certify a technology as appropriate. They are merely a set of attributes set out in order to give substance to the definition set out in the first paragraph: technology which enables developing countries to provide goods and services in a manner compatible with their conditions.

What is appropriate in each country's development situation will be different in every case. For example, in a small country with a

limited internal market, production for export may be important, for which a different product may be appropriate than for domestic consumption.

While appropriate technology emphasizes small-scale production, in a number of circumstances, such as economies of scale, large-scale production may be appropriate.

Appropriate technologies are expected to contribute to employment, output, and equity objectives, meeting the needs of the poor, and increasing participation by the poor in a number of ways. Emphasizing labor-intensity and employment of relatively unskilled labor will cause additional broadly-based employment of those at the bottom of society. Broad expansion of low but adequate income employment improves income distribution, contributing to a major social objective: equity. Encouraging the use of locally or domestically-produced inputs emphasizes the backward linkages of an appropriate technology: its downstream effect on domestic employment and output.

Small-scale production allows regional dispersal of enterprises, especially over rural areas, each satisfying a limited market. Some governments consider this an objective, as well as the regional self-sufficiency promoted by local industries using local inputs. Low-cost goods and services and compatibility with local culture emphasize that appropriate technologies are aimed toward the poor.

ERRATA

NAME CORRECTIONS ON COMMITTEE LISTS

April 4-5, 1976 Meeting

- # 5 - Dennis Goulet
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April 19-20, 1976 Meeting

- # 8 - Michaela Walsh
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New York, N.Y. 10020

April 26-27, Meeting

- # 10 - Patricia Cloherty
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May 10, 1976 Meeting

- # 32 - Michaela Walsh
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Attachment A - Record of Meetings with Private Groups and Individuals to Discuss Section 107 Program.

The House International Relations Committee suggested that A.I.D. consult with U.S. private groups in drawing up plans for implementation of Section 107. These consultations were a major part of the preparation for this report.

A.I.D. organized four, day and a half meetings in April with groups of up to 12 representatives from private and voluntary agencies, academic institutions, and U.S. business. The purpose of the meetings was to understand the perceptions and recommendations of these organizations on such topics as: (1) the definition of appropriate technology and its relevance to LDC problems; (2) the barriers and opportunities to use of appropriate technologies in developing countries; and (3) actions which the U.S. private or public sector might take to stimulate the development and dissemination of appropriate technology in developing countries.

A larger meeting followed on May 10. This was open to any members of the private sector who did not attend the smaller sessions. In all, more than 100 organizations and individuals participated in the meetings. The schedule was as follows:

April 4-5 - Group of 12
April 12-13 - Group of 12
April 19-20 - Group of 12
April 26-27 - Group of 12
May 10 - General Meeting

The list of attendees at the meetings is attached. The results of the meetings are also attached and are organized in accordance with the workshop agenda, which consisted of the following principal components:

- Brainstorming (and brainwriting) on the barriers and opportunities to the development and dissemination of Appropriate Technology (AT) in Less Developed Countries (LDC).
- Identification of actions that the U.S. public and private groups should take to stimulate the development and dissemination of AT in the LDCs.
- Priority ranking of actions according to a criterion of importance.

In terms of the process used, we believe the following observations can be made:

- (1) The participants were given ample opportunity to clarify, define, and internalize the meaning and purpose of AT as it relates to the identification of a strategy for Section 107.

- (2) The diversity of ideas regarding barriers/opportunities for AT, and the list of actions generated through the group interaction technique, provided the A.I.D. and the Section 107 management with a useful map for program implementation.
- (3) The utilization of group interaction techniques (such as the Brainwriting Pool and Nominal Group Technique) expedited the process of idea generating even though a significant number of participants would not be considered as being "experts" in the field of Appropriate Technology.
- (4) The interest and motivation of the participants was sustained throughout the one-and-a-half day workshop process; at the closing hour of each workshop a rapporteur was identified by each separate group. His responsibility was to integrate and disseminate to the other members the principal findings and recommendations of the group.

We believe the workshop process has significantly contributed in developing a constituency for the dissemination of AT-related ideas among the academic and other public and private sector communities. However, there was no representation from and input to the idea generation process from the perspective of the LDCs. It is, therefore, strongly recommended that workshops of similar format and duration be staged at different geographic locations in an effort to solicit the insights and inputs from relevant LDC administrators, planners and/or experts on the meaning of AT.

COMMITTEE ON APPROPRIATE TECHNOLOGY
MEETING OF APRIL 4-5, 1976
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WORKSHOP
Report of Meeting of April 4-5

As the first group of twelve individuals consulted by AID, the April 5 group may well have gone about its task and answered questions differently than those of subsequent groups. Nonetheless, I gather that our key question, "Identify specific actions which US public and private sectors might take to develop and disseminate appropriate technology in developing countries", was common to all four groups. Our sixteen top choices, together with some interpretation, follow:

- 1) Consciousness-raising. Devote considerable effort to explaining appropriate technology to officials and institutions like AID, other development institutions, contractors, and the like. LDC leaders would be included in this campaign. Special attention should be devoted to those who will work in direct contact with LDCs, i.e. the field workers themselves. A check list of do's and don't's for the introduction of appropriate technology might be useful, with particular focus on the technology's impact on women and children.
- 2) Strengthen LDC capacities. With an ultimate goal of a technology policy based on self-reliance, strengthen the capabilities of LDCs to develop their own appropriate technologies, individually and in horizontal collaborative relationships. Encourage research facilities in LDCs to reorient their programs to appropriate technologies.

- 3) Talent Bank. Identify and make available a list of individuals and institutions who are practitioners of appropriate technology. (This recommendation was really part of a broader group concern to collect information and set up an accessible network for it.)
- 4) Stress on LDC Institutions. In any program to introduce and disseminate appropriate technology, select as entry points existing LDC institutions that already have credibility and access to the poor majority.
- 5) Information System. Develop a world-wide network for information pertaining to appropriate technology.
- 6) Successes and Failures. Collect, and presumably make available in a system called for earlier, case studies of successes and failures in appropriate technology introduction and implementation. Such case studies should pay particular heed to the entire social-cultural-institutional context of the success or failure. (An aside: The intent of part of this recommendation was to stress that technology is but one part of a successful project or program.)
7. Selection of channels. In funneling appropriate technology resources to the LDC's poor, select only those institutions (presumably public and private) which have a proven track record of reaching effectively the poor majority and of collaborating with them on terms that enhance their self-reliance and dignity. Consider as channels U.S.-oriented appropriate technology institutions, in addition to those international organizations more familiar to this audience.

In any event, eliminate as many bureaucratic middlemen as possible.

- 8) Multi-national Corporation Involvement. While we never got too specific on this point, steps should be taken to develop mechanisms and incentives for multinational corporations to contribute to the development and dissemination of appropriate technology.
- 9) Match Appropriate Technology to recurrent problems.
Again as part of our group's clear overall emphasis on intelligently preparing for a campaign to develop and disseminate appropriate technology, we would spend considerable effort on identifying recurrent problems in LDCs (like cooking fuels) and then assessing, in general and specific terms, alternative appropriate technological solutions to those problems. (Presumably we could then avoid a passive and ad hoc implementation program.)
- 10) Reciprocal Bridges. Through a complex recommendation (that I'm not sure I have recorded faithfully), we advocated the encouragement of direct links between local LDC institutions and US groups, on a reciprocal, sharing basis. Field education opportunities, bilateral ones, might be an example of this broader recommendation. (In addition to its inclusion of some points alluded to earlier, this recommendation would stress how much the US has to learn from LDC groups.)
- 11) Develop appropriate methodology. Again as part of this group's concern for an out-front strategy, reflected in several earlier recommendations, we would advocate the

development of a methodology for problem identification and problem solving which would ultimately lead to a self-reliant appropriate technology policy and program. A methodology that perpetuates dependency on advanced country technology would be destructive.

- 12) LDC education. Support the development in LDC engineering and technology institutions of design and laboratory courses which enhance appropriate technology.
- 13) Incentives for Appropriate Technology. The provision of specific economic incentives to national, state and local institutions may well be essential to any appropriate technology program.
- 14) Build on what is available. This recommendation would encourage us to concentrate on problem definition, on implementation and on dissemination, rather than on new R & D and R & D facilities (or "new wheel invention").
- 15) LDC Input. This recommendation, while specifically urging that future consultations seek out credible LDC spokespersons to advise on an Appropriate Technology program, was clearly voicing a broader concern: that we have not yet found the best way to involve LDC people in our overall dialogue about appropriate technology, its principles, its applicability and its practises.
- 16) Define needs with LDC rural leaders. Related to the above recommendation, clearly, was the suggestion that needs be defined in full dialogue with rural community leaders, certainly including women.

The above, sixteen recommendations, drawn from a list of forty-three, does not truly do justice to all of the recommendations and concerns voiced by the twelve participants. The list also doesn't include some very specific ideas which though universally praised did not end up in our top fifteen, ideas like reforming the international patent system or facilitating international student exchange programs. Nonetheless, the list does seem to reflect most of the major issues and suggestions, with perhaps a couple of exceptions:

- a) The relationship between "women in development" and appropriate technology might have been stressed more.
- b) Our collective anxiety, that we were talking to ourselves, rather than with LDC people, about appropriate technology, was very pervasive in our group.
- c) The interface between appropriate technology efforts in this country and those directed overseas doesn't come out strongly in our recommendations.
- d) The role, power and attitudes of LDC elites and elite structures was not confronted directly in our recommendations, though they were of great concern to our group.
- e) Though this conversation wasn't completed, some felt at the end that our recommendations demonstrated little "people orientation".

Finally, like the other groups, I suspect, we never defined appropriate technology other than by a film. I, at least, was left with the question: Is appropriate technology something new, some things new, or a new way of looking at the role of technology in society?

PRIORITY RANKING OF APRIL 5 MEETING

Actions suggested by Workshop in response to question: What actions should be taken by the U.S. public or private sector to stimulate development and dissemination of AT in LDCs? The top 16 recommended actions were:

1. Educate AID, other international agencies, and contractors about AT. - includes LLC officials

Learn how to select and train field workers sensitive to LLC needs.

Generate checklist of do's and don'ts for AT introduction - Be aware of cultural impact, social and effect on women and children.
2. Strengthen LDCs capacities to collaborate horizontally in creating AT's - self reliance.

Encourage existing R&D institutes in LDCs to re-orient for AT.
3. Identify appropriate science and technology practitioners to create a reservoir - talent bank - for AT assistance.
4. Identify existing LDC institutions that access the poor and use as entry points.
5. Develop world-wide AT information network.
6. Collect examples (case studies) of success and failures of AT with institutional context.
7. Funnel resources to LDC grass roots groups mainly thru U.S. organizations with right values.

Eliminate as many bureaucratic middleman as possible.

Subsidize experienced U.S. groups in AT to work on international AT implementation.
8. Develop mechanisms and incentives for and in MNC involvement in AT.
9. Identify problem clusters and problem structures with resources and specify AT's potential contribution.

Problem-specific contribution of the AT alternatives.
10. Build reciprocal bridges between local and U.S. groups.

Subsidize bi-lateral field education opportunities.
11. Develop problem identification and solving methodology suitable for self-AT.
12. Support development of AT design and Lab courses in LDC engineering and technology education.

13. Promote the proper nation-state and local incentives for AT; (economic incentives).
14. Emphasize problem definition, implementation and dissemination rather than new-wheel invention.
15. Incorporate into Ad Hoc Committees credible LDC spokespersons to advise on the establishment of AT or LDC institutions.
16. Identify country-specific needs together with LDC rural community leaders, 1/2 of whom are women.

COMPLETE LIST OF ACTIONS - GENERATED
BY APRIL 5 MEETING

- (1) Collect examples (case studies) of success and failures of AT with institutional context.
- (2) Develop mechanisms and incentives for and in LDC involvement in AT.
- (3) U.S. private groups to solve technological and managerial bottlenecks of LDCs.
- (4) Identify existing LDC institutions that access the poor and use as entry points.
- (5) Build reciprocal bridges between local and U.S. groups.
 - (7) - Subsidize bi-lateral field education opportunities.
- (6) Incorporate into Ad Hoc Committees credible LDC spokespersons to advise on the establishment of AT or LDC institutions.
- (8) Develop methods of self-identification of doers in LDC communities.
- (9) Identify and declare as LDC areas within U.S. and demonstrate AT in these areas
 - (a) making AT more feasible to outsiders by demonstrating feasibility.
- (10) Funnel resources to LDC grass roots groups mainly thru U.S. organizations with right values
 - (17) - Eliminate as many bureaucratic middleman as possible.
 - (31) - Subsidize experienced U.S. groups in AT to work on international AT implementation.
- (11) Educate AID, other international agencies, and contractors about AT. - includes LDC officials -
 - (20) - Learn how to select and train field workers sensitive to LDC needs.
 - (13) - Generate checklist of do's and don'ts for AT introduction - Be aware of cultural impact, social and effect on women and children.
- (12) Support development of AT design and Lab courses in LDC engineering and technology education.
- (14) Identify mechanisms for AT acceptability in different cultures.

- (15) Promote the proper nation-state and local incentives for AT; (economic incentives).
- (16) Emphasize problem definition, implementation and dissemination rather than new-wheel invention.
- (18) Actualize a new U.S. position sensitive and listening to the poor majority, rather than the power elite.
- (19) Encourage an international AT Federation - subsidize field networks who will help organize it.
- (21) Establish reciprocity relationships between donor and donee - Build relationships on mutual needs and benefits.
- (22) Strengthen LDCs capacities to collaborate horizontally in creating AT's - self reliance.
(23) - Encourage existing R&D institutes in LDCs to re-orient for AT.
- (24) Identify problem clusters and problem structures with resources and specify AT's potential contribution.
- (25) Problem-specific contribution of the AT alternatives.
- (26) Increase international student exchange programs in AT.
- (27) Develop world-wide AT information network.
- (28) Mount a public education campaign within U.S. in the role of AT.
- (29) Encourage a diversity of projects and methods.
- (30) Identify country-specific needs together with LDC rural community leaders, 1/2 of whom are women.
- (32) Develop problem identification and solving methodology suitable for self-AT.
- (33) Enlist producer cooperatives as lead instruments in the AT process.
- (34) Support modifications of international patent and copyright system.
- (35) Improve LDC negotiations strength in technology transfer process.
- (36) Encourage indigenous LDC Vista-type program - college students - Iran program.
- (37) Experiment with travelling AT demonstration projects.

- (38) Encourage U.S. inter-private sector collaboration in developing and disseminating AI.
- (39) Establish as U.S. policy the new framework identified by the AI Committee.
- (40) Support integrated, total immersion community AI models in LDCs.
- (41) Dissemination campaign of AI concepts to LDCs (philosophy as well).
- (42) Identify appropriate science and technology practitioners to create a reservoir - talent bank - for AI assistance.
- (43) Impact on women.

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MEETING OF APRIL 12-13, 1976
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PRIORITY RANKING OF APRIL 12-13 MEETING

Actions suggested by Workshop in response to question: What actions should be taken by the U.S. public or private sector to stimulate development and dissemination of AT in LDCs? The top 15 recommended actions were:

- | <u>RANK</u> | <u>ACTION</u> |
|-------------|--|
| 1. # 4 | Identify specific emerging small-scale industry projects that can utilize AT in delivering their products/services. (production) |
| 2. # 7 | Identify, record and/or codify cases where development and dissemination of AT in LDC's have occurred in the field of cooperatives - emphasis on cooperatives. a. Disseminate AT on basis of U.S. experience plus LDC inter and intra. b. Develop guidelines for formulation of pilot AT projects c. Implement and evaluate pilot projects. |
| 3. # 1 | Identify and implement in the field existing specific micro action-oriented projects, not merely research-oriented. |
| 4. # 9 | Support for identification and specifications of conditions of use and assessments of impact of existing AT which is transferable - technology assessment for AT. |
| 5. # 3 | Convince LDC governments of the benefits to be derived from the labor-intensive programs. a. Many governments do not understand; b. Starting point for AT c. Use international agencies d. AID role to facilitate. |
| 6. # 15 | <u>Assist emerging</u> small scale industry projects to develop into viable enterprises by integrating the direct involvement of similar U.S. or other small businessmen. |
| 6a. # 28 | Encourage AT education and training activities. |
| 7. # 17 | Develop AT public information program for AID missions and LDC governments. a. Sponsor LDC seminar with video tapes of successful AT projects. |

| <u>RANK</u> | | <u>ACTION</u> |
|-------------|------|---|
| 8. | # 37 | Help implement AT utilization in emerging enterprises by channeling appropriate private sector management, marketing and engineering assistance to them. |
| 9. | # 2 | Identify and evaluate existing AT projects in the context of the political environment and utilize to influence the political process. |
| 10. | # 16 | From demonstration project experience, establish process for formulating national policies in support of AT. a. Tie AT into AID loans, |
| 11. | # 19 | Organize a program of investment promotion both nationally and internationally to develop perceived opportunities for AT. |
| 12. | # 13 | Establish an international communication network of AT organizations and resources. |
| 13. | # 33 | Gather and analyze information on AT and publish results. |
| 14. | # 34 | Facilitate credit to small business through existing institutions. |
| 15. | # 26 | With focus on incentives to use AT, help finance emerging indigenous industries by assisting in locating base-equity capital on which to build the overall funding package. |

COMPLETE LIST OF ACTIONS - GENERATED
BY APRIL 12-13 MEETING

1. Identify and implement in the field existing specific micro action-oriented projects, not merely research-oriented.
2. Identify and evaluate existing AT projects in the context of the political environment and utilize to influence the political process.
 - a. Influence the decision-makers
3. Demonstrate to LDC governments the benefits to be derived from the labor-intensive programs.
 - a. Many governments do not understand -;
 - b. Starting point for AT
 - c. Use international agencies
 - d. AID role to facilitate.
4. Identify specific emerging small-scale industry projects that can utilize AT in delivering their products/services.
5. Support, with travel funds, for LDC students to conduct thesis work on AT in their country.
 - a. If he becomes teacher, multiplier effect is good.
6. Develop and nurture a global AT communication network - (eliminated - merge into 13)
7. Identify, record and/or codify cases where development and dissemination of AT in LDC's have occurred in the field of cooperatives - emphasis on cooperatives
 - (18) Disseminate AT on basis of U.S. experience plus LDC inter and intra.
 - (29) Develop guidelines for formulation of pilot AT projects
 - (40) Implement and evaluate pilot projects
8. Have the end users of technology principally in the private sector, identify the perceived problem that they would like to cope with.
9. Support for identification and specifications of conditions of use and assessments of impact of existing AT which is transferable - Technology assessment for AT.

10. Identify specific projects with other developmental goals than AT and provide AT type grants to add an AT element to existing programs.

- a. Build AT into on-going projects - agricultural, nutrition, etc.

11. Listen to what LDCs want to do with AT and make selection of actions.

- a. Goals of AT presumably are to reduce poverty, reduce unemployment, increase equity.

12. Establish careful programming and evaluation systems in AT projects.

- a. Build a systematic body of knowledge

(31) Providing funding for evaluating Section 107 activities.

13. Establish an international communication network of AT organizations and resources.

14. Suggest to LDC governments the necessary price change required.

- a. - Encourage proper price policy

15. Assist emerging small scale industry projects to develop into viable enterprises by integrating the direct involvement of similar U.S. or other small businessmen.

- a. 12.5 million U.S. small businessmen

16. From demonstration project experience, establish process for formulating national policies in support of AT.

- a. Tie AT into AID loans;

17. Develop AT public information program for AID missions and LDC governments.

(27) Sponsor LDC seminar with video tapes of successful AT projects.

18. Disseminate AT on basis of U.S. experience plus LDC intra & inter.

19. Organize a program of investment promotion both nationally and internationally to develop perceived opportunities for AT.

20. Provide PVO's small grants for feasibility identification and assessment of alternative technologies for achieving project objectives.
21. Introduce trade-fair, plus association meetings by providing incentives to private entrepreneurs to organize such meetings.
22. Help development of small number of AT institutes abroad.
23. OJT on-site training preferably in LDCs of local nationals in AT.
24. Focus attention on family farm units and village structure to assure women's participation and not disrupt tradition.
25. Help government deal with groups who will "lose" from AT.

26. With focus on incentives to use AT, help finance emerging indigenous industries by assisting in locating base-equity capital with which to build the overall funding package.
27. (See # 17)
28. Encourage AT Education and Training activities.
29. (See # 7)
30. Promote a communications program in LDCs to take advantage of AT opportunities.
 - (35) Utilize existing communication networks for disseminating AT.
31. (See # 12)
32. Identify and assist existing vocational institution to strengthen their AT generation capability, not establish new ones.
33. Gather and analyze information on AT and publish results.
34. Facilitate credit to small business through existing institutions.
35. (See # 30)
36. Involve MNC's in AT.

37. Help implement AT utilization in emerging enterprises by channeling appropriate private sector management, marketing and engineering assistance to them.
38. Seek international consensus on the definition of AT.
39. Stimulate development of new and innovative AT (hardware and software)
40. (See # 7)
41. Consider AT to be what is appropriate to the economy and all of its sectors (urban and rural).
42. Bring a carefully selected limited number of small entrepreneurs to workshops on AT.
43. Involve U.S. students in AT - send them abroad.
44. Explore innovative methods of extending equity capital to small business - very small business.

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PRIORITY RANKING OF APRIL 19-20 MEETING

Actions suggested by Workshop in response to question: What actions should be taken by the U.S. public or private sector to stimulate development and dissemination of AT in LDCs? The top 15 recommended actions were:

| <u>RANK</u> | | <u>ACTION</u> |
|-------------|------|---|
| 1. | # 12 | Support development of AT institutions in LDCs. (demonstration, training, financing, marketing, R&D) |
| 2. | # 2 | Develop a participatory process for choosing AT. Changing the policy environment. a. Use 2 to demonstrate to policy makers that AT is consistent with broad based development. (favorable environment for private groups to work) b. Where 14 has been successful, assist leaders to redesign policy to favor private use of AT. |
| 3. | # 13 | Focus U.S. effort on the "right" things by the right groups. (small, innovative groups) |
| 4. | # 6 | Provide financial support to encourage R&D of AT both in DCs and LDCs (applicable to both). |
| 5. | # 11 | AID should bargain harder with LDC governments to change policies in favor of AT. |
| 6. | # 17 | AID to stimulate growth and development of organizations which will work at local levels in LDCs on developing small scale enterprise, particularly in rural sectors. |
| 7. | # 7 | Spot 40 extremely effective local level organizations and give them each a grant to hire 1 person for AT. |
| 8. | # 21 | Select 50 target communities in LDCs as demonstration projects over the next three years. |
| 9. | # 18 | Focus specific attention on development of definite guidelines to ensure that women receive equal participation in AT efforts. |

10. # 19 AID to give many small grants to present U.S. producers of AT to work with people in LDCs, both learning how to adapt U.S. AT to LDC needs and resources. -- grants of \$10,000 - 20,000 each to visit LDCs to learn.
11. # 28 Establish a system (possibly through banks and other means) to seek out medium size U.S. companies for matching expressed needs of LDCs.
12. # 34 Mobilize the resources of American business to help introduce AT in LDCs. - (Cut U.S. & LDC government restraints to this activity in trade for engaging in AT).
13. # 4 Establish a U.S. based public-private consultative board for AT.
14. # 20 Establish an international information clearing house on AT with participation shares to be sold to government and private industry.
15. # 29 Survey and study of current organizations operating in LDCs and DCs capable of AT transfers and locate them geographically. - Annotated Atlas. (includes ideas of lateral transfer).

COMPLETE LIST OF ACTIONS - GENERATED
BY APRIL 19-20 MEETING

1. Provide mechanism for return flow of AT ideas to U.S.
2. Develop a participatory process for choosing AT. Changing the policy environment.
 - (14) Use 2 to demonstrate to policy makers that AT is consistent with broad based development. (favorable environment for private groups to work)
 - (26) Where 14 has been successful, assist leaders to redesign policy to favor private use of AT.
3. Identify the countries that A.I.D. wishes to help. (Receptivity and past involvement)
4. Establish a U.S. based public-private consultative board for AT.
5. Develop a model U.S. (bilateral) institute whose purpose is transfer of AT. (R&D - coordinate with LDCs - AT institutions in LDCs - transfers - needs fast delivery)
6. Provide financial support to encourage R&D of AT both in DCs and LDCs (applicable to both).
7. Spot 40 extremely effective local level organizations and give them each a grant to hire 1 person for AT.
8. Use existing public institutions to stimulate private corporate sections in both DCs and LDCs to use AT. (Short term incentives not long term subsidy).
9. Establish methodology for carrying out at local level in LDCs. feasibility studies for determining AT.
10. Support emergence of a theory of development that applies to LDCs and DCs.
 - a. Look for parallelisms between LDCs and DCs.
11. AID should bargain harder with LDC governments to change policies in favor of AT.
12. Support development of AT institutions in LDCs. (demonstration, training, financing, marketing, R&D)
13. Focus U.S. effort on the "right" things by the right groups. (small, innovative groups)

14. (See # 2)
15. Send a team of AID representatives to the selected countries to establish the political acceptability of AID and then establish need of those countries.
16. Establish a vehicle in LDCs - with regional branches - to seek out and identify rural needs as related to mass benefits.
17. AID to stimulate growth and development of organizations which will work at local levels in LDCs on developing small scale enterprise, particularly in rural sectors.
18. Focus specific attention on development of definite guidelines to ensure that women receive equal participation in AT efforts.
19. AID to give many small grants to present U.S. producers of AT to work with people in LDCs, both learning how to adapt U.S. AT to LDC needs and resources. -- grants of \$10,000 - 20,000 each to visit LDCs to learn.
20. Establish an international information clearing house on AT with participation shares to be sold to government and private industry.
21. Select 50 target communities in LDCs as demonstration projects over the next three years.
22. Team social science students from LDC and U.S. to work 2 years in an AT project.
23. Establish better education in the U.S. for LDC students to use AT in LDCs (economics and engineering)
24. Support development of AT institutions in the U.S. - R&D, demonstration, education, training - support U.S. practitioners for work overseas.
25. Administration and Congress place highest priority on non-nuclear energy AT (to combat nuclear proliferation and development of weapons).
26. (See # 2)
27. Transmit identified needs to AID/Washington for finding appropriate private or public sources of required AT.
28. Establish a system (possibly through banks and other means) to seek out medium size U.S. companies for matching expressed needs of LDCs.

29. Survey and study of current organizations operating in LDCs and DCs capable of AT transfers and locate them geographically. - Annotated Atlas. (Includes ideas of lateral transfer).
30. Encourage exchange of public and private sector personnel interested in AT - both in LDCs and DCs.
31. Help LDC foreign students in U.S. to network for R&D of AT for their own countries.
32. Establish systematic release time program for U.S. businesses.
33. Provide support for trade association executives to spend six months in the field with AT.
34. Mobilize the resources of American business to help introduce AT in LDCs. - (Cut U.S. & LDC government restraints to this activity in trade for engaging in AT).
35. Support development of worldwide interactive network of AT institutions with substantial financial resource bases. ,
36. Create or strengthen history of technology programs.
37. Strengthen realization that technology preceded science not vice versa.
38. Train a cadre of experts from various fields such as engineering, education, health, etc. in methods of facilitating local consensus on economic development.
39. Confer prestige on AT activities.

4/21/76

GOALS

1. More participation
 - a. in the polity
 - b. in the economy
2. Raise personal incomes
3. Improve productivity of those without measurable incomes.
4. Raise GNP
5. 2400 calories per day
6. "Reasonable" population growth
7. Tech. Self-reliance
8. Eff. use of available resources.

GROUP A

LDC - BARRIERS

- I. Barriers to Diffusion
 - a. Low income/demand
 - b. Avoidance of risk
 - c. Large farmers adopt first
- II. Political Barriers
 - a. Elites threatened by AT
 - b. Elites like Western tech.
 - c. Planners seek visible, large projects
 - d. Need for political system which allows individual to progress
- III. Population

LDC - OPPORTUNITIES

- I. Goal - Development From Within - Not Transfer
- II. AT Can Contribute to Political Change. Bubble Up.
- III. AT Can be Product of Modern Science; Skill Intensive - Not Always Old
- IV. AT Applicable to Stimulating Exports
- V. Interchange or Existing AT Among LDCs.

USA - BARRIERS

- I. Business - AT is:
 - a. High risk; low profit operation; small market U.S. business
 - b. Lack knowledge - how to do
- II. Technology - U.S.
 - a. U.S. R&D plus technology not suitable
 - b. Source of technology is in other countries.
- III. Education
 - a. Our "mass produced" education system is not suitable - U.S. & LDC barrier,

USA - OPPORTUNITIES

- I. AT Offers Opportunity for U.S. Business to Remove Anti-U.S. & MNC Bias
- II. U.S. AID Static - Capital Must be Stretched
- III. U.S. Must Learn to Penetrate Beyond the Elites - Learn How to Help People

BARRIERS

OPPORTUNITIES

LDCs

1. Economic policies
2. Bias toward bigness, the "latest"
3. Lack of incentives
4. Lack of participation
5. Lack of information & communication systems

1. Chance to "prove" AT is "appropriate" as participatory, bubble up, inter-disciplinary, indigenous, social welfare maximizing process.

2. The time is "ripe"

3. Develop methodology to determine what is "appropriate."

USA

1. Cultural & economic blinkers.
2. Lack of clear-cut goals, policies.
3. Lack of broad-gauged specialists.
4. Lack of info. & comm. system.
5. Lack of delivery system
6. U.S. business
7. AID

1. U.S. business

2. Learn a lot

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PRIORITY RANKING OF APRIL 26-27 MEETING

Actions suggested by Workshop in response to question: What actions should be taken by the U.S. public or private sector to stimulate development and dissemination of AT in LDCs? The top 10 recommended actions were:

RANK

ACTION

1. # 2

Produce series of video tapes with AT groups with experience (Not a report about them)

15

Teach AT groups to teach other AT groups - provide opportunity - real - time or not - across cultures.

17

Appalachian Pipeline

A process of persons starting or operating small enterprises (rural or manufacturing or merchandising or commercial services or public service) to visit other communities (within or outside national boundaries) in order to form on-going alliances with individuals and groups visited.

Subrecommendations: No emphasis on the visitor to report to the sponsoring agency or to evaluate the visit --

And special emphasis on reporting to or linking with the community that he or she participates with regularly.

A process for persons with entrepreneurial desires to "Fail Young"

27

Distribute # 2 and # 15 to broadest entities encouraging live local follow-up discussion and feedback.

2. # 1

Establishment of bilateral (problem-solving) communication system among groups which are AT opportunity oriented.

14

An "objective" multi-national organization to gather AT problems/opportunities world-wide for submission to the U.S. steering committee.

26

Establish criteria: (a) small institutions, (b) with distributed representation; (c) specific problem oriented; (d) ad hoc orientation; (e) incentives for private involvement.

3. # 30

Encourage LDC governments to adopt AT oriented policies and help them identify and implement those policies.

| <u>RANK</u> | | <u>ACTION</u> |
|-------------|------|--|
| 4. | # 5 | AID should limit its role to setting <u>broad</u> guidelines. (backed by funds) |
| | # 18 | Private foundations in U.S. to play a role as capital sources thru program - related investments. |
| | # 29 | Develop financial incentives for U.S. private sector involvement in AT. |
| 5. | # 9 | Set up seven-ten men standing committee to apply the \$20.0 million through existing programs. |
| 6. | # 6 | Help LDCs discover felt and potential demand for AT. |
| 7. | # 8 | Identify qualified U.S. businessmen, seek LDC collaboration in identifying local needs for assignment of the identified businessmen. |
| | # 21 | Test in four LDCs, identify greatest AT needs in each, select qualified AT businessmen to transfer the AT. |
| 8. | # 12 | Determine by survey - discussion what it takes to get U.S. small business to participate in the process of technology transfer. |
| 9. | # 23 | Emphasize technological diffusion for women in LDCs. Research role of women and work through existing women's groups. |
| 10. | # 28 | Set up VITA linkages (a) businessmen, (b) others. |

COMPLETE LIST OF ACTIONS - GENERATED
BY APRIL 26-27 MEETING

1. Establishment of bilateral (problem-solving) communication system among groups which are AT opportunity oriented.

(14) An "objective" multi-national organization to gather AT problems/opportunities world-wide for submission to the U.S. steering committee.

(17) Appalachian Pipeline

A process for persons starting or operating small enterprises (rural or manufacturing or merchandising or commercial services or public service) to visit other communities (within or outside national boundaries) in order to form on-going alliances with individuals and groups visited.

Subrecommendations: No emphasis on the visitor to report to the sponsoring agency or to evaluate the visit --

And special emphasis on reporting to or linking with the community that he or she participates with regularly.

A process for persons with entrepreneurial desires to "Fail Young"

(26) Establish criteria: (a) small institutions, (b) with distributed representation; (c) specific problem oriented; (d) ad hoc orientation; (e) incentives for private involvement.

2. Produce series of video tapes with AT groups with experience (Not a report about them.)
3. Visits for LDC policy-makers to U.S. (a) to small enterprises and (b) social critics. (People who are re-thinking post-industrial society).
4. Process for people with entrepreneurial desires to "Fail young."
5. AID should limit its role to setting broad guidelines. (backed by funds)
6. Help LDCs discover felt and potential demand for AT.
7. AID financed (study) team of four people to do 30 days sample study in the countries of specific examples of need for AT.

(20) In response to (7), request from resource groups specific project proposals.

(31) AID survey ref. (7) & (20).

8. Identify qualified U.S. businessmen, seek LDC collaboration in identifying local needs for assignment of the identified businessmen.

(21) Test in four LDCs, identify greatest AT needs in each, select qualified AT businessmen to transfer the AT.

9. Set up seven-ten men standing committee to apply the \$20.0 million through existing programs.

10. Private effort identification of AT relevant innovations in key standard industrial codes.

11. Encourage involvement of trade and technical schools in LDCs.

12. Determine by survey - discussion what it takes to get U.S. small business to participate in the process of technology transfer.

13. Set up steering committee to (a) identify and link select number of private institutions with demonstrated capability for R&D in AT for small/medium; (b)-develop consortium of U.S. small firms to interact with (a), and (c) to establish information exchange systems, suing printe and non print.

(25) Small is beautiful - Start with 4-5 LDC AT centers world-wide and exchange in context of interaction of # 13 a, b, common problems and generated solutions on (a. choice of technology, (b. markets surveys; (c. quality control (d. managerial. (Do not use semantics of technology transfer to third world.)

(34) AID to provide financial assistance to encourage interaction of LDC AT centers, the managers of a number of small/medium firms in their countries and the consortium of U.S. small/medium business firms. Must emphasize the AT process must be indigenized.

14. (See # 1)

15. Teach AT groups to teach other AT groups - provide opportunity-real-time or not - across cultures.

16. Take specific interest in a particular LDC (or region) to identify (a) technological bottlenecks; (b) cultural patterns inherent in existing indigenous technology and (c) roles of existing institutions. Horizontal cross-fertilization (d) encourage innovation at LDCs.

17. (See # 1)

18. Private foundations in U.S. to play a role as capital sources thru program - related investments.

(5) AID should limit its role to setting broad guidelines. (backed by funds)

- (29) Develop financial incentives for U.S. private sector involvement in AT.
19. Help establish AT focal points in LDCs.
 20. (See # 7)
 21. (See # 8)
 - 22.
 23. Emphasize technological diffusion for women in LDCs. Research role of women and work through existing women's groups.
 24. Identify and monitor other organizations concerned with generating and delivery of technology re agriculture; agro-business; manufacturing and services.
 25. (See # 13)
 26. (See # 1)
 27. Distribute # 2 and # 15 to broadest entities encouraging live local follow-up discussion and feedback.
 28. Set up VITA linkages (a) businessmen, (b) others.
 29. (See # 18)
 30. Encourage LDC governments to adopt AT oriented policies and help them identify and implement those policies.
 31. (See # 7)
 32. AID-LDC information program on nature, range U.S. small business sector.
 33. Provide technical assistance in appropriate market development technology to existing enterprises in LDCs - (knowledge not hardware).
 34. (See # 13)
 35. Create or reinforce institutions responsive to people by (a) listening to brainstorming with failures, (b) listening to brainstorming of innovators, (c) recorded

GROUP A

LDC - BARRIERS

USA

I. Government & Policy - Elites

I. A.I.D.

- A. Preference for high technology
- B. Lack of Gov't. policies - economic R&D etc.
- C. Resistance to change.

II. Education

- A. Rigidity of colonial based ed. system - lack problem solv bias
- B. Lack of training for small entrepreneurs
- C. Lack of management know-how & training
- D. Lack of tech. base - low stock of tech. people & facilities

III. Institutional Barriers - Lack of Credit - Capital - Lack of Information

IV. Entrepreneurship - (Inventors, innovators, entrepreneurs, managers.

LDC - OPPORTUNITIES

- I. Existing mechanisms - co-ops unions
- II. Opportunity with women
- III. Availability of anthropological information
- IV. Younger generation.

BARRIERS - LDC

1. Dominant Groups
AT is second class
Rigid social structure
Values
Local leaders, etc.
2. Poor capital markets
3. "Inappropriate" policies

BARRIERS - USA

1. Big is beautiful and small is uncomely
2. U.S. politicians
3. Subject (AT) undefined
4. AID can't spell

OPPORTUNITIES - BOTH LDCs & USA

1. Push people-oriented development
2. Accelerate growth
3. Strengthen AT institutions
4. Build info-comm. systems
5. Market development
6. Help family planning
7. Promote economic discipline
8. Improve management

OPPORTUNITIES - USA

1. Leadership role in AT
2. Involve U.S. small business
3. AID can involve lots of Americans.

MAY 10 MEETING ON APPROPRIATE TECHNOLOGY

The participants at the May 10 meeting divided into small groups to discuss the goals, activities, and organization of the Section 107 program. An experimental procedure was used, which, while not entirely satisfactory, did provide A.I.D. with insights as to the sentiments of the large and diverse group of persons present.

Attached is a list of attendees at the May 10 meeting and the transcripts of the reports by the small groups on the goals and activities for the program.

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GOALS

First Group

The group in the back began by realizing that we didn't have enough time to look at all the goals and activities and realized that it was much easier to pick out goals than activities. In general when we voted on these goals, we felt that it was easier to vote on the lesser goals, those which did not necessarily make an overriding statement of our purpose. Our first vote was on the most important issue of the changing of values toward appropriate technology. It received only one vote. Since it was the most fundamental issue, it was left for last and all the arguments were not discussed. It reflects the group's sentiment that interventionist attitudes have to be avoided. It was felt that an attempt to change values was ultimately interventionist rather than changing values or attitudes, a better approach would be a demonstration goal which you'll see is presented in number 2 and received nine votes. Our attitude then, is generally expressed in terms of demonstrating the values as opposed to changing the value. We believe that demonstrating appropriate technology properly would reveal their inherent value.

This non-interventionist attitude is reflected in the next goal which is assisting LDCs to develop appropriate technology and to reduce dependence on the West. This negative approach reduces dependency on the West and aids LDCs. That is two important votes were taken in favor of assisting LDCs develop appropriate technology and reducing dependency on the West.

The goal receiving the largest number of votes had an interesting debate behind it. There were two goals: increase the political power of the poor and increase the economic power of the poor. The first received little support; it was argued that increasing the political power of the poor might in fact thrust our values on LDCs. In other words, suggesting participatory democracy as a political goal imposed our own values rather than those of the poor. The goals should emphasize the economic goal rather than the political power; this got 12 votes. Of course the four who voted for increase of political power also voted for the increase in economic power. Four and five would be the goal that U.S. technology transfers should be made relevant and there should be an emphasis on investigating the role of U.S. business and private enterprise in developing appropriate transfers. The last one was to strengthen collaboration among LDCs on the transfer of technology. Again, this is non-interventionist, and this approach and attitude colors all our priorities.

Second Group

The first goal is to strengthen LDC capacities in appropriate technology. The mechanisms for strengthening should be flexible and should include any strengthening of capacities.

To increase productivity, employment and improve income distribution is the overall goal. People should have jobs and more flexibility regardless of where they are in the society.

The next emphasis stressed developing methods for the poor to participate in the use of appropriate technology. There was a general consensus in the group that appropriate technology was a movement in under-developed countries which enabled the poor or the people not normally participating in the developing economy to get some share of its product.

The next emphasis was in terms of transferrring appropriate technology, either ideas or experience. We chose the widest interpretation to increase global interchange of information about appropriate technology. This was discussed at some length to determine what mechanisms could be used for this or whether it should be from LDC to LDC or advance country to developing country; emphasized that wherever the information/experience could be helpful we should try to develop mechanisms to transmit it to people who need help and would like to use the information.

The next emphasis was on agricultural and rural development. In our group there was some discussion of using that as one focal point. However, it was agreed by most people that the emphasis should be on agricultural and rural development and not on the cities.

Third Group

We had approximately 14 goals among the various members of our group. Among which there was a fair amount of duplication, but we didn't utilize the voting procedure, we discussed and arrived at a consensus in general. We felt that many of the goals, however, were all parts of a fewer number of overall goals. We distributed them this way:

- (1) first priority the goal of making the technology utilized by the LDCs relevant to their needs. And under that, of course, we listed two of the others that were originally listed as separate goals changing the phraseology slightly to increase the understanding of appropriate technology within the DCs and also increasing the acceptability.

Now when you say those two things you also imply the change of attitude within the U.S., within the western countries, and within the industrialized countries as to appropriate role of appropriate technology within their own society. Thus we all felt that it was difficult, if not impossible, to encourage the use of what we all consider appropriate technology in developing countries - if it's only for them and not for us.

(2) Second goal in order of priority - and I must say there was some discussion about really what was second in priority - was the goal of increased capacity within the LDCs and under this we assumed quite a few other things which weren't mentioned specifically among the goals. They are: (a) their increased capacity for management, which we all felt was important to utilization of technology relevant to their needs; and (b) the development of tax structures which would provide incentives to the increased capacity within developing countries for developing and devising their own technologies appropriate to their needs and also for utilizing technologies transferred from the outside.

Among the things needed for increasing the capacities within the LDCs were changing the marketing structure and changing the education system. One of the cards mentioned the goal of modifying the educational system essentially to make the appropriate technology approach and the technological solutions respectable. We felt this was part of the whole goal of increased capacities within the LDCs.

We had a 5th item under that -- financial institutions -- the way financial institutions within the countries operate or the creation of new financial institutions that would operate on a more reasonable basis for a small scale enterprise and encourage small scale enterprises, small scale businesses, and small scale technologies.

We had one rather vocal advocate for emphasizing the increased participation of small farmers; but the group as a whole felt that rather than emphasize small farmers, one should emphasize the poor in general. I heard comments from other groups that this whole approach should be aimed at the rural poor and ignoring the the urban poor but some of us felt that this was not wise. There is a large number of people collected in the urban areas who are just as poor and in many cases poorer than people in the rural areas because they've lost the ability to grow some of their own food. So we felt that it would be a mistake to confine this strictly to the rural poor.

Fourth Group

Our group worked without votes. We were on a consensus basis and very much within the card system which means there were definite omissions from a substantive point of view such as those of capital market that we never go to. But along the lines of things mentioned before, we came up approximately 10 goals lined up as in categories with priority number 1 a, b, c, number 2, a, b, c, and so on. I think the major consensus of the group was around the proposition that the appropriate technology program be devoted primarily to assisting the poor and this included the goal to assist the poor of developing countries to achieve access to the means for raising their productivity and standard of living. It extended to assisting the poor to become both stronger politically and economically. It included both of these and I gathered from previous speakers that some of the groups broke down around whether it ought to have additional political strength as an objective. However our group felt that the political strength was appropriate.

The second category of goals that the group supported was to strengthen LDC capacities with an ultimate goal of a technology policy based on self-reliance. There was another goal that had also been stated in terms of reduction of reliance on the technology of the West and those two, we paired together and called "self-sufficiency tenant for the LDCs."

The third area related to the LDCs efforts to develop appropriate technologies among themselves was stated as follows: strengthen developing countries' abilities and opportunities to collaborate among themselves and developing and transferring appropriate technology within and between themselves. The sub-goal under that, in terms of the proposed AID program, had to do with developing better mechanisms to affect that communication.

The fourth goal that we dealt with had to do basically with the use of small scale enterprise as the appropriate sector through which appropriate technologies would be developed. The goal specifically states to facilitate growth of LDC's middle and small scale industries sector as important vehicles for dissemination of appropriate technology.

Related to that was another goal that fleshed out the one that I stated. This new goal states that this would take place specifically in agriculture, rural development, small business enterprise and energy. It stated areas through which one would work in the private sector. I think there was always a sense in the group that too often when you talk about small scale enterprise, you tend to rule out public sector participation in an area such as irrigation, energy and so on. I think the group felt that the public sector role and participation is appropriate whether you use private sector mechanisms as well.

Our fifth goal was stated in terms of the U.S. ---- being a human resource base ---- develop the reservoir of persons in the U.S. who are technically competent and who are sensitive to social, cultural and economic differences. Those are five priorities and I will say we did debate this question of social change and state that as one of the objectives of the program. I think it was clear in our group that we have such a difference of values represented in the group. We felt that we couldn't set that out as an objective for the program itself because of the difficulty for solution and also this notion of imposition of values, etc. -- which was stated as something definitely to be avoided.

Fifth Group

Some of the ideas that are here reflect obviously discussion of some of the same topics discussed in the other groups. But nonetheless, I'm going to go through them. I would make one further caution and that is our thinking process was interrupted by the bell so to speak. These are discussions that are in the process of developing and not necessarily the final idea by any manner or means.

We ended up with six ideas that we'll put in front of you. Some of which are referred to in somewhat shorthand on the sheet. The shorthand probably referring to the key concept in the ideas we talked about.

Number one is a long definition which you'll see is still evolving in all the marks made on it. We started out with a concept of institutionalizing a capability within LDCs to create a favorable climate for developing, designing, defusing and adapting through both national services and local governments as well as private sector industries.

Number two, we ended up with an item which is exactly as it appeared on the card. To increase participation of the poor in the economy, leading not only to decent employment, but to greater political power for the poor. I'm not sure if we would prefer this number to some of the other items referring to the poor but it is certainly a part of our thinking. I might add that this is not necessarily number 2 in rank but just number 2 in terms of evolution and discussion.

Third item was to encourage policy makers and leaders in developing countries to undertake low capital labor intensive methods of production to stimulate economic growth. There was quite some discussion of the definition of being either low capital or labor intensive and we ended up actually feeling that both attributes were necessary in terms in a definition.

Number four is to develop better mechanisms for communicating information about specific appropriate technologies from those who have it to those who need it. And in our discussion of another item we make it clear that we were talking about appropriate technology transfers among countries that are using it as well as those who have perhaps discarded it.

Then, number five was to open doors in LDCs for present small scale industries and enterprises to use their skills and experiences to facilitate growth of small LDC enterprises. This was again an opening of doors that one might relate to policy in terms of the discussion that we had as well as an opening of doors for investment in transfers of capital and other resources that are part of the package.

The last item that came up in the course of our discussion and one that unfortunately time interrupted us or perhaps we would have added to it considerably was an item referring to encouragement of cooperative use of capital inputs. One might talk in terms of cooperatives for farm tractors or one might talk about cooperatives for farm tractors or one might talk about cooperative enterprises for small businessmen some how or another, formed an association which ended up in productive joint contribution in the economic realm.

Sixth Group

Our group felt one has to make connections between LDCs and DCs to say there are developing countries in our country. Let's not get trapped into identifying certain underprivileged or over privileged areas. Human development and human exchange and the ways that gets things organized -- that's what we're really talking about.

The goals we selected were:

- (1) Strengthen LDCs capacities with an ultimate goal of a technology policy based on self-reliance.
- (2) Increase economic participation and improve income distribution.
- (3) Identify specific technology bottlenecks in developing countries and provide solutions either by the existing technology or through R&D.
- (4) Strengthen abilities of small and local level groups in various LDCs to collaborate among themselves in developing and transferring appropriate technology with and between themselves.
- (5) Emphasize learning from experience.

(6) Encourage communications among and between appropriate technology groups in all countries using small technologies for information, exchange and dissemination, and direct visits.

(7) Specific attention placed on development of definite guidelines to ensure equal participation of women in appropriate technology efforts - not increase the participation, but equal participation.

(8) Strengthen capabilities in the U.S. of individuals and small medium size groups, institutions, etc. to aid, develop, adapt intermediate technology and appropriate technology for use in LDCs to be testing LDCs for technological and economic suitability on the other hand and for cultural suitability on the other.

Seventh Group

We came to an agreement on a number of issues that basically weren't considered goals as much as the definition of appropriate technology.

The first one was that we were dealing with the poor, and it was specifically mentioned that we were not dealing with just the rural poor but also the urban poor.

The second basic tenet that we came up with is that we were specifically focussing on women and that women should be a definitive part of the programs of appropriate technology.

Third, we focussed specifically on the fact of employment generation and income distribution as a basic tenet of appropriate technology.

The fourth was self-reliance and self-sufficiency. There were a number of goals on these cards that dealt with reducing the dependence on the West. Also establishing an organizational capacity in the local developing countries so that they themselves could generate projects and not depend on the transfer from developed countries. This was sort of a basic tenet that we should always think of projects, for example, in terms of phrasing out in the sense that we should be promoting self-reliance.

Fifth, and last, appropriate technology has to be relevant which is almost speaking in double talk; but appropriate technology must be appropriate to the needs of the developing country so that it can deal within a social context in which it is placed and therefore be able to anticipate future and further changes in the society. Now beyond that, we came to a vote on a number of other things we considered goals and these are very quickly summarized in terms of (1) there was a goal stated on one of the cards in terms of utilizing existing institutions that have proven capacity in LDCs and that we

should work through them on specific projects and specific activities and this is a major goal; (2) we had the idea of not forgetting the human element of development.

We were concerned to, that there was no focus on our cards on human element and that we weren't really just talking about technology transfer as such, but really concentrating on the human element which specifically translates into the "facilitate management of appropriate technology within the less developed countries" so that such programs can be absorbed. This is one of the few points our group has that hasn't been mentioned or basically mentioned.

The other specific goal was to facilitate medium and small scale industry in less developed countries. We focussed quite specifically on the need for generating employment through small business development.

Appropriate technology programs not only have to be relevant but we have to demonstrate the utility of these programs to the policy makers in the sense that these can not be isolated projects but rather should have as a goal to pinpoint on policy makers so that policies can be changed in order for appropriate technology to be further stimulated within the economy.

ORGANIZATION

First Group

We designed a complete AID structure which we assumed would be adopted.

First, establish a strong private sector advisory board, not White House appointed, to assist AID in setting guidelines for Section 107 programs.

Second, this advisory board should limit its role to setting the board guidelines for use of funds spent by the private sector.

Third, a willingness to take risks will be an essential ingredient of a successful program.

Fourth, the enabling aid entity, with rotation from the private sector onto the staff, should be a small staff which would draw upon external resources, consultants, contractors for technical advisory or support services as required.

The decisions by the AID appropriate technology entity, and we actually would prefer to call it an entity rather than a staff, but their decisions on specific projects should be made speedily with reference to USAID Missions only for general concurrence and recognition that the private sector are responsible for carrying them out. The Bureaus should not have funding responsibility for dividing up the Section 107 funds. Our group had a lot of discussion on that, but that was important.

Also, it should be clearly understood that the AID staff is responsible to the advisory board for effectively carrying out its guidelines. The group came to this conclusion since we felt that unless a strong advisory board that had strong representation from the private sector it would become enmeshed in bureaucratic procedures. Therefore we feel that a strong advisory board with AID responsible for actually divvying up the effective use of the funding, will lead to a stronger and more successful program than if we try to establish an entirely new entity which would take about three years and whose success is doubtful. By having it remain centralized within AID rather than divvying it up among the Bureaus, this will encourage the type of dialogue with the private entities that has already been demonstrated by the success of these meetings.

Second Group

We discussed the possibility of an operation set up outside of AID, but I think the consensus was that the task could be best accomplished with a minimum of administrative difficulty by following the recommendation of the card which creates an Office of Appropriate Technology within AID to coordinate Section 107 activities. There was some slight unhappiness

with this conclusion from at least two members of our group but they decided to go along with this general conclusion on the assumption that there would be a strong advisory group. However, in connection with the advisory group, it was emphasized that the group should be chosen as individuals rather than as organizations, so that the administrator wouldn't face the problem of choosing representative agencies since these people, although they would be members of various agencies, would speak in their personal capacities.

Finally, we should incorporate a mandate to hold annual seminars to exchange experiences and views in connection with the operation of the program.

In connection with this organizational setup to which we agreed, several points were made which should characterize the administration. Emphasis should be on flexibility and innovativeness in procedures and funding with a possibility of quite small grants.

The enabling entity should be a small staff which would draw upon external resources such as consultants and contractors for technical advisory or support services.

Further, the organization must have long term orientation and structure since quick results within two or three years are not likely, particularly if LDCs are to learn how to operate its successful appropriate technology program independently. At the very beginning you pointed out that we could think in terms longer than 3 years. Our members were trying to emphasize this particular point.

Third Group

First, in order to establish an appropriate technology office in AID, somebody must be responsible for the program; also, somebody must push the idea or the money will disappear if it isn't somehow institutionalized.

A private sector advisory board with the best minds is necessary. The best people you can find, but only as advisors. Presumably, the advisory board will not meet very often. Working level groups should have some members outside of AID and should be divided by sectors since you obviously have very different kinds of expertise.

How the National Academy of Sciences, with all its complicated structure, will fit in with this board is something none of us knew enough about to consider, but certainly they had been doing things like this.

And lastly develop a communications network so that what you do will get around the world. All of these things seem fairly obvious. I don't know whether there are more problems that we missed.

Fourth Group

The three items you see on the board reflect the comments already made. The first one is an independent public - private entity involving five major groups - AID, Science, Education, Business and "idealists", but not under the control of any one. Also we felt it very important that this group meet with representatives of the LDCs.

The second statement is a new U.S. based public - private consultant board on appropriate technology. Whether or not that would include AID was a point we had not reached a conclusion on as far as our recommendation goes.

The third one, the consortium of existing agencies and entities working in the appropriate technology field. With a few specific thoughts under that:

- a. That AID control all grants and contracts
- b. That the advisory group be public - private, be a consulting group (be consulted before the grants are made)
- c. That distinct room be made for an important independent educational and informational group. The educational group particularly because so much will depend upon institutes and universities and training groups and second an informational because we felt that in this area of appropriate technology, information must be disseminated with great care and great thoroughness.

Fifth Group

What's fascinating to me, although I really didn't participate in this discussion as much as I would have liked to, I have in the last year participated in a year long discussion trying to set up a similar organization domestically. We have run into all the same questions and we haven't come up with solutions that are very far from what we have come up with so far.

The group didn't really consider whether it should be inside or outside AID. We felt that that was a secondary issue; more important questions needed to be asked such as how to set up an organization that would remain small and would be innovative, that would have a minimal amount of bureaucracy and paperwork tied up with it. Where would there be very clear lines of authority so that grantees would know or people who want to get a hold of that money will know exactly where to go for it. There should be an ability to make rapid decisions and get the money out as quickly as possible. Now we didn't say that it was in or out of AID. What we did say was that none of us are very familiar with the bureaucracy of AID. So, we left it alone.

There should be rapport with the private sector and I'm a little unsure about whether we meant the domestic private sector or the private sector in the less developed countries and rapport with the local community groups that would be the recipients and the users.

Also, that the organization should be set up so that it could attract money from outside AID, could attract other foundation money.

There were 3 models that were proposed. The first would be set up similar to a private foundation with a board of trustees. We used AID since AID probably would be setting the policy guidelines and would act as the board of trustees with three or four staff members. They draw on a variety of consultants to help them make decisions as to what proposals should be funded. Then, some speculation as to whether those consultants should have specific kind of expertise like housing, food, health, and if they did, how we would then interrelate them and integrate them so that when it hit the local area, it would be a comprehensive approach.

There was a sense that there would be advisory committees and that the advisory committees would be representative of public - private sector and the users. There is a sense that if it were located outside AID, that it might be more flexible and there would be more availability or access to contacts and resources than if it were inside AID.

Sixth Group

Some of our group has had some familiarity with AID bureaucracy so that we took up the organizational question immediately as to whether it should be inside or outside of AID. We came to a consensus that an organization outside AID would be better basically for reasons of operational flexibility in procedure and funding, as well as the ability to involve key and perhaps unusual individuals and businessmen, academics who had experience in development. Also because the developing countries would see this organization as an independent entity and not necessarily as an arm of the U.S. Government.

Then, when we got to the question of specifics - how this should be organized - we broke down a little bit and we debated between having an advisory committee, setting up an advisory committee with an oversight function or a board of directors and we generally came to a consensus that we'd like to see a board of directors to direct an operational staff.

Then we broke it down again between an independent non-profit organization or a government corporation, and came to some consensus that we needed a small staff. Someone said three or four, but I think we're talking more in terms of 20 to 30, but that small staff would draw upon external resources

for technical support or required support services. The staff would be geared to people who know the issues involved in appropriate technology, not just technicians, and people who have a familiarity with social, economic, cultural problems involved with the technologies. There was one side that felt an independent non-profit organization would be the best route, then there was some talk of a government corporation that would periodically get appropriations from Congress with no strings attached to AID that would contract out to technicians and industries and peoples involved in programming.

Seventh group

We started out talking about the pros and cons of whether or not the focus should be located within AID or outside of AID. Clearly that's the first decision AID has to make. We came down on the side of creating a small independent non-profit corporation to make Section 107 grants and to coordinate Section 107 activities.

We spent some time talking about why we had, by a process of elimination, come to that conclusion. We went through the pros and cons of having a focus within AID. Obviously, all of our perceptions varied with how much experience we had had with and from some cases AID structures. I think some of the compelling reasons for going a non-AID route in our recommendation was: that in any kind of an emphasis on technology be it appropriate or otherwise, the need to involve the private sector is much more acute than is ordinarily the kind of priority or special effort that might come out of AID; in other words the fact that we are working with technology suggests a much closer interrelationship with the private sector in itself than a similar effort in other kinds of priority areas like integrated rural development.

A second fear if you like, of working from an entity within AID, was a general observation of how difficult it is to integrate a totally new direction into the entirety of the AID operation without expending a tremendous amount of time, call it bureaucratic time if you will.

Further, we felt the advisory board structure, that someone suggested already, is generally not a powerful enough force on a government institution to have the kind of relationship with the private sector that we felt was strongly advisable. Sometime we had a couple of concerns about abandoning working from within AID. One is the obviously enormous amount of expertise and contacts that exist within AID and our recommendation would certainly spend considerable time on trying to seek the best ways of tapping AID institutions and AID personnel with their particular expertise.

A second was a quick point raised and then dropped. If we went outside of AID that would make it more difficult for the focus on appropriate technology to get fully within the main stream of development thinking and of different development organizations. We felt too that that could be overcome but was nonetheless a problem to be noted.

Finally, and this is certainly in that same context, we as a group had tremendous praise and admiration for the way AID has handled itself so far. Admiration for this kind of effort to involve the private sector, and we are wondering whether or not that kind of momentum and that kind of mentality, which admittedly is a bit of an unusual procedure for AID, could be maintained and become operational. General consensus was probably not. In any event, we would opt for a small independent organization and we would have a board of directors that would be fully representative i.e., would include members of alternative technology groups, private volunteer organizations from academia and the business world hopefully at a working level not just a compilation of big powerful names.

We would ask AID in some way to act in an exofficio capacity related to this board of directors.

The organization as implied on the chart would have grant making authority. Now we had considerable division in this, wondering whether the usual kinds of restrictions on sub-grants or sub-contractors particularly those to local organizations in different developing countries could be eased somewhat so that the small independent organization could remain at least small and not have built up a tremendous super-structure of administrators and contract experts to be sure that we're always buying American and that kind of restriction.

We had considerable nostalgia, if not nostalgia but certainly a wish, that the way we could start was to select a few good people or one good person and have that person pull together all these disparate elements and disparate ideas in a complete package, but as I say ultimately agreed, we had to start somewhere which was in the relationship of this entire appropriate technology effort to AID.

We also felt that it would be strongly advisable if consultations such as this, i.e., involvement of a very broad sector of people that are somehow interested in the subject could in addition to a board of directors of such an institution maintain some kind of contract with the organization.