

The United States and Development Assistance

**BACKGROUND PAPERS FOR THE TASK FORCE
ON DEVELOPMENT ORGANIZATIONS**

JUNE 1992

CARNEGIE COMMISSION
ON SCIENCE, TECHNOLOGY, AND GOVERNMENT

The goal of the Carnegie Commission on Science, Technology, and Government is a nation better prepared to respond to the opportunities and hazards of scientific and technological advances.

The Commission was established by Carnegie Corporation of New York in 1988 to assess, and recommend improvements in, the mechanisms by which the federal government and the states incorporate scientific and technological (S&T) knowledge into policy and decision making. The Commission's special focus is on the organization of government as it affects decision-making processes, rather than on specific policy options.

The Commission is considering how government can be better organized so that policy options can be systematically formulated using the best available S&T expertise; what mechanisms for analysis need to be strengthened or created; and what technical competency is needed in government.

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The Commission is an independent bipartisan body with a five-year charter. In addition to eminent scientists and engineers, the Commission and its Advisory Council include former officials who have served at high levels of government, as well as leaders from the private sectors of American society.

This collection of background papers was prepared for the Commission's Task Force on Development Organizations. The views expressed are those of the authors and not necessarily those of the Carnegie Commission on Science, Technology and Government or of the Task Force.

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PREFACE

The Carnegie Commission on Science, Technology, and Government was established in 1988 to determine ways in which the United States Government could better promote and utilize scientific and technological advances. As part of this work, the Task Force on Development Organizations was created to examine the foreign assistance work of the Government, and to determine ways in which that work could be strengthened, particularly through the more effective use of science and technology. The Task Force's final report will appear in November 1992.

The Task Force on Development Organizations commissioned a series of background papers to provide information on the U.S. Government's development assistance effort, as well as information on development assistance programs of other national governments. Because the level of detail that appears in these papers will not appear in the final report of the Task Force, this document collects those background papers together, in order that they might be made available to the public.

The first of the ten reports details the foreign assistance act of 1961, which created the United States Agency for International Development (USAID) and outlined much of its mandate. Also listed are the amendments to this act. The second paper lists the various departments and agencies of the U.S. Government that participate in development assistance, and provides a brief explanation of the function of each group.

Reports 3 and 4 deal with USAID: its budget, its mandates, and particularly, its organization. Report 5 is a case study of vaccine development, which illustrates the complexity of designing and implementing a multi-agency project. Report 5 was prepared in 1989, using 1987-88 data. Because of the size of the task, this information has not been updated; the report is presented as a "snapshot" look at the agency at that particular point in time.

Reports 6 through 9 illustrate lessons in development assistance gleaned from observations of national agencies other than the U.S. Government, and of multinational groups.

Finally, Report 10 reviews the reports of eight "reform commissions" that previously studied and commented on development assistance within the U.S. Government, and sets forth lessons to be learned from these experts.

The views expressed in these background papers are those of the authors and not necessarily those of the Carnegie Commission on Science, Technology, and Government or of the Task Force.

These papers were compiled by Maryann Roper, Science Consultant at The Carter Center, and Jesse Ausubel, Director of Studies for the Carnegie Commission.

1.
FOREIGN ASSISTANCE LEGISLATION

Susan Raymond

This paper was prepared for the October 1990 meeting of the Task Force on Development Organizations of the Carnegie Commission on Science, Technology, and Government, in New York City.

Legislation enabling non-military foreign assistance for developing countries consists of a jumble of laws dating from the early 1960s. Most authorities are amendments to the first Foreign Assistance Act of 1961. To implement this Act, the United States Agency for International Development (USAID) was created by Executive Order of President John F. Kennedy in November 1961.

THE LEGISLATION

The Foreign Assistance Act of 1961, as amended, provides the ongoing authorization for USAID, for the Overseas Private Investment Corporation (OPIC) and for the Peace Corps, as well as for specific programs such as the American Hospitals and Schools Abroad program.

Rather than repeal the Act, change in USAID's direction has been accomplished by amendments. After thirty years, the Act has been amended some 78 times. Of those amendments, about 38 have been accomplished by laws which themselves contain additional provisions which, although not changing prior to legislation, add on new program mandates. The 1961 Act is now a Christmas tree of specifics, spelling out which programs will be pursued for which foreign populations up to what dollar limits with what administrative restrictions.

Annex 1, the 14 page Table of Contents for foreign assistance acts, provides an illustration of the range of program mandates and priorities imposed on USAID. The Act orders that projects be developed for women, children, endangered species, forests, housing, disasters, cities, farms, refugees, narcotics, employee stock ownership plans, global security, food security, post-harvest losses of food, refugees, locusts, oral rehydration...the list goes on, including an airport at Pinecreek, Minnesota!

Once the authorizations process is complete, an appropriations bill is developed. While the authorizations law, i.e., the Foreign Assistance Act, orders an expenditure in a particular category and may specify a particular level of spending, it is only when money is actually appropriated for that activity that programming can take place.

The appropriations constraint on development programming can be just as specific as that of authorizations. In recent years, Congress has seen fit to appropriate Development Assistance (DA) money virtually on a line-item basis. This process of "earmarking" specifies precisely how much money USAID will be allowed to spend on any one program area in an upcoming fiscal year. Moreover, in many areas, the earmarking can become exceedingly fine, specifying expenditures at the level of thousands of dollars in a total appropriation of billions of dollars. For example, the 1989 bill specified the expenditure of \$500,000 specifically for orphans of natural disasters, or \$1.5 Million for the Caribbean Law Institute, or even \$11,500 for the entertainment expenses of USAID.

Congressional micro-management of USAID extends beyond the main authorization and appropriations committees. As Annex 2 indicates, there are 21 Committees and 38 Subcommittees in Congress with explicit authority to become involved in U.S.-supported project and program activities in developing countries.

USAID'S ASSISTANCE CATEGORIES

USAID administers two basic types of assistance. First, the Economic Support Fund (ESF), which is designed to provide assistance to countries which are politically important to the United States. ESF appropriations are expended through direct cash transfers, commodity import programs, or specific development projects. Total ESF funds are about \$3 Billion. Egypt and Israel account for about 60% of the funds, with 18 other countries sharing the remaining resources.

ESF money is appropriated by country account, with amounts per country determined by Congress. Within each country allocation, however, USAID has a relatively free hand to determine the nature and level of sectoral programming. Within the total country limits set by USAID and Congress, program content can be relatively freely set to specific country needs.

The second type of resources is called Development Assistance (DA), which is used mainly to fund multi-year projects. Total annual DA appropriations amount to approximately \$1.7 Billion.

Congress earmarks DA in "functional accounts", i.e., specifically against sectors (health, education, etc.) setting specific levels of expenditure against specific areas. The only DA which is not so constrained is the Development Fund for Africa (about half a billion dollars), which USAID is permitted to allocate as it sees technically fit in the most receptive Sub-Saharan African countries.

USAID also programs and administers three other types of funds: the Housing Guarantee Program which creates mortgage funds for developing country housing; the sale and donation of agricultural commodities through the P.L. 480 program, administered together with the Department of Agriculture; and disaster assistance funds and programs.

CONGRESSIONALLY TARGETED FUNDING: "EARMARKING"

By mandating a multitude of program directions and earmarking specific funds for their implementation, Congressional oversight of USAID reduces the ability of foreign assistance programs to adjust to changing needs or to respond to new opportunities to support developing country requests which do not conform to mandated program areas. That process of constraint has increased over time. For example, of the over \$3 Billion in ESF funding, only 2% is

unrestricted by Congress, down from the 44% unrestricted as recently as 1985. Non-earmarked DA (the Africa Fund) amounts to only approximately 28% of total Development Assistance funding.

The implications for programming are clear. An example will suffice. Less than a third of the women in Yemen have a primary school education, one of the lowest proportions in the world. Lack of female literacy is considered a major reason for low levels of family planning acceptance and high levels of infant and child mortality in that country, despite decades and hundreds of millions of dollars of donor assistance in these latter two areas. USAID has long recognized the importance of literacy and encouraged Yemen to expand women's programs.

If Yemen were tomorrow to decide that women's education was a national priority and were to come to USAID for assistance, USAID would find it difficult to respond. Yemen's programs are funded with DA money which, as noted above, is earmarked by sector. That earmarking has significantly reduced the amount of funding allowed to be allocated to education programs. As a small country, Yemen would be hard pressed to compete for limited funds. The alternate source, the Women In Development program, is authorized not to exceed \$10,000,000 worldwide.

Equivalently, projects are often designed and given goals not originally intended by requesting governments simply to ensure that they meet Congressionally mandated program areas. The resulting goals may be ones that the Project cannot possibly meet (hence ultimately receiving a poor evaluation) but which ensure that Project funds are approved. Alternatively, Projects in such areas as regional trade development and private enterprise support have languished either for lack of Congressional authorization or for lack of funding in their explicitly earmarked categories.

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A. FOREIGN ASSISTANCE

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SENATE

1. **Committee on Agriculture, Nutrition and Forestry**
 - Subcommittee on Domestic and Foreign Marketing and Product Promotion
2. **Committee on Appropriations**
 - Subcommittee on Agriculture, Rural Development and Related Agencies
 - Subcommittee on Foreign Operations
3. **Committee on Banking, Housing and Urban Affairs**
 - Subcommittee on International Finance and Monetary Policy
4. **Committee on the Budget**
5. **Committee on Energy and Natural Resources**
 - Subcommittee on Energy Research and Development
6. **Committee on Environment and Public Works**
 - Subcommittee on Environmental Protection
 - Subcommittee on Hazardous Wastes and Toxic Substances
7. **Committee on Finance**
 - Subcommittee on International Debt
 - Subcommittee on International Trade
8. **Committee on Foreign Relations**
 - Subcommittee on African Affairs
 - Subcommittee on East Asian and Pacific Affairs
 - Subcommittee on European Affairs
 - Subcommittee on International Economic Policy, Trade, Oceans & Environment
 - Subcommittee on Near Eastern and South Asian Affairs
 - Subcommittee on Terrorism, Narcotics and International Communications
 - Subcommittee on Western Hemisphere and Peace Corps Affairs
9. **Committee on the Judiciary**
 - Subcommittee on Immigration & Refugee Affairs
 - Subcommittee on Patents, Copyrights & Trademarks
10. **Committee on Small Business**
11. **Senate Drug Enforcement Caucus**

HOUSE OF REPRESENTATIVES

1. **Committee on Agriculture**
 - **Subcommittee on Department Operations, Research, and Foreign Agriculture**
2. **Committee on Appropriations**
 - **Subcommittee on Foreign Operations, Export Financing and Related Programs**
 - **Subcommittee on Rural Development, Agriculture and Related Agencies**
3. **Committee on Banking, Finance and Urban Affairs**
 - **Subcommittee on International Development Institutions and Finance**
4. **Committee on the Budget**
 - **Defense and International Affairs Task Force**
 - **Economic and Trade Policy Task Force**
5. **Committee on Energy and Commerce**
 - **Subcommittee on Commerce, Consumer Protection and Competitiveness**
 - **Subcommittee on Health and the Environment**
6. **Committee on Foreign Affairs**
 - **Subcommittee on Arms Control, International Security and Science**
 - **Subcommittee on Asia and Pacific Affairs**
 - **Subcommittee on Europe and the Middle East**
 - **Subcommittee on Human Rights and International Organizations**
 - **Subcommittee on International Economic Policy and Trade**
 - **Subcommittee on International Operations**
 - **Subcommittee on Western Hemisphere Affairs**
7. **Committee on Science, Space & Technology**
 - **Subcommittee on Natural Resources, Agricultural Research and Environment**
 - **Subcommittee on Energy Research and Development**
 - **Subcommittee on Science, Research and Technology**
 - **Subcommittee on International Scientific Cooperation**
8. **Committee on Small Business**
9. **Select Committee on Hunger**
 - **International Task Force**
10. **Select Committee on Narcotics Abuse and Control**

SCIENCE AND TECHNOLOGY FOR DEVELOPMENT IN THE FEDERAL GOVERNMENT: ORGANIZATIONAL SKETCHES

Susan Raymond

This paper was prepared for the October 1990 meeting of the Task Force on Development Organizations of the Carnegie Commission on Science, Technology and Government, in New York City.

Interactions of the United States with the developing world are scattered throughout the Federal Government. There is no central way to determine how much money is committed by agencies to scientific and technological development work or to relationships within the developing world or specifically within any one country. There are also definitional problems as to when or whether an activity linked to a developing country actually has science and technology (S&T) implications for that country's development, or simply is resident within the country. Satellite tracking stations in developing countries present an example of such a mixed activity.

FEDERAL AGENCIES INVOLVED IN FOREIGN ASSISTANCE

In general, Federal agencies are authorized only to address U.S. domestic problems unless a foreign issue has repercussions on the U.S. domestic scene.

The Agency for International Development (USAID) is virtually the only, and is certainly the largest, U.S. Government entity authorized to design and implement programs in developing countries using federal budget monies. Hence, much of the work carried out via federal agencies is actually paid for by USAID. The agencies are, in effect, contractors to USAID via a mechanism called a Participating Agency Service Agreement (PASA). As will be noted in some descriptions, this can amount to significant levels of operational funding for offices or bureaus which, without it, have budgets only for salaries but not for activities. Without the resources from a USAID PASA, such offices lack funding to do any foreign work. In FY1990, USAID paid other federal government departments and agencies well over \$100 Million through PASA arrangements for technical expertise or for program support.

This use of federal agencies by USAID has been the subject of some controversy over the years. Section 621A of the Foreign Assistance Act of 1963 states that U.S. Government agencies may be used by USAID only if their expertise is unique or if the task was such that a private sector contractor would not be competitive, and only if the use of the federal agency at issue would not deter the U.S. Government from performing its requisite domestic functions. Policy Directive A76 of the White House Office of Management and Budget (OMB) reinforces this regulation by directing USAID to give clear preference to contracting out tasks rather than utilizing Government agencies.

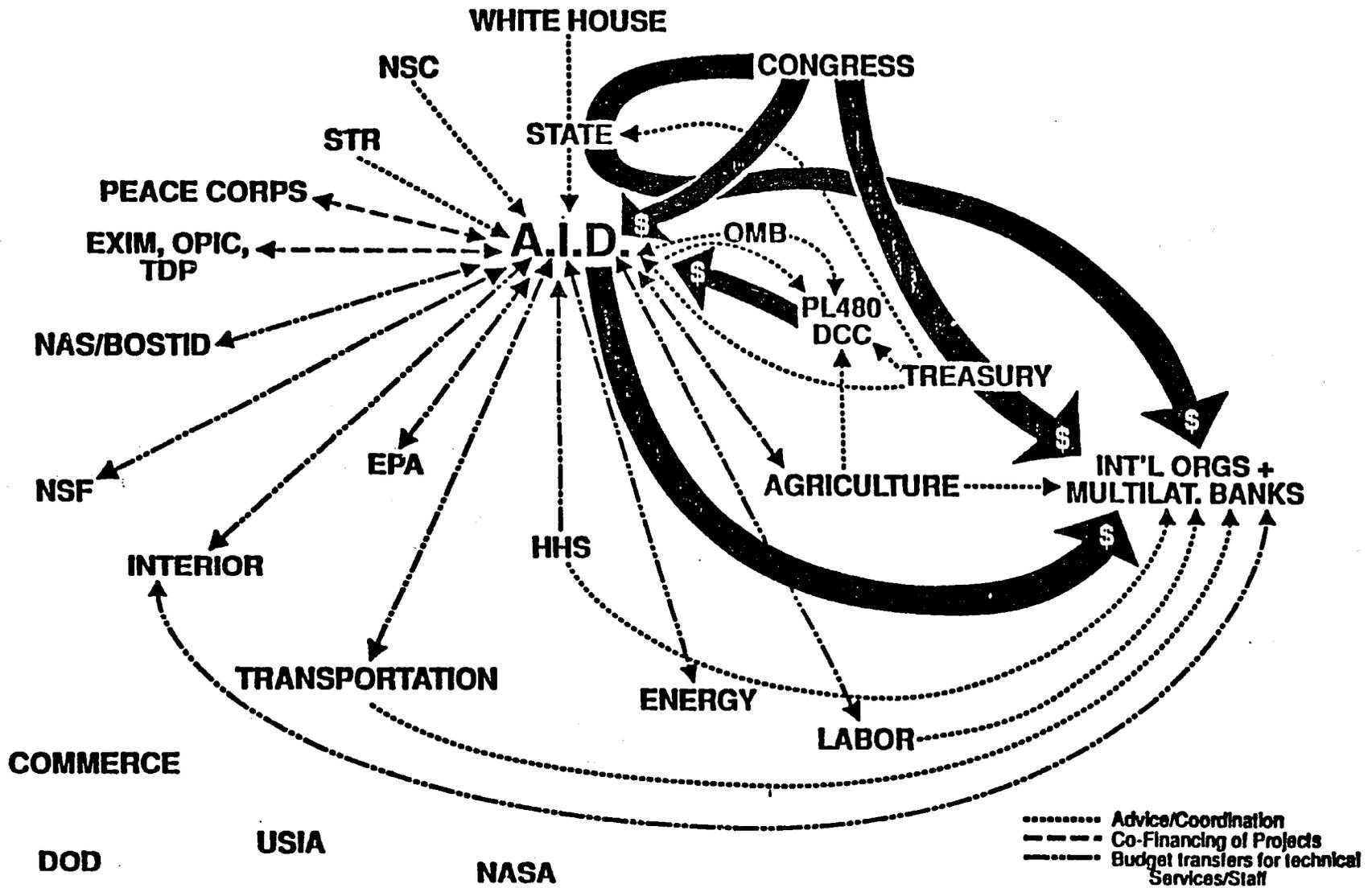
It should be noted that the vast majority of formal S&T agreements between foreign nations and U.S. Government agencies involve Europe, the Soviet Union and high-income Asian nations. Using data from the 1990 S&T and American Diplomacy report arrayed against the World Bank's income categories, one finds that only 4% of U.S. S&T agreements are with low income nations. Less than a quarter are with nations which are AID recipients. Thus, the diplomatic linkages or infrastructure to underpin non-AID S&T relationships with foreign governments appears to be weak.

In any event, a brief review of the loci of international activities in Federal agencies may prove instructive. Figure 1 traces the major Federal agencies involved in foreign assistance as well as their relationships.

FIELD OPERATIONS

A development presence in the field is almost totally reserved to the State Department (via USAID), the Department of Commerce (Foreign Commercial

FIGURE 1. FEDERAL AGENCIES INVOLVED IN FOREIGN ASSISTANCE



..... Advice/Coordination
 - - - - Co-Financing of Projects
 ——— Budget transfers for technical Services/Staff

Service Officers), the Department of Agriculture (Foreign Agricultural Service Officers), and the Peace Corps.* Of these, the Commerce and Agriculture interest is in U.S. trade and U.S. food sales respectively, not in in-country development. Thus, except for Peace Corps volunteers, the only U.S. Government continuous commitment to development is housed in USAID and its foreign missions.

U.S.-BASED TECHNICAL SUPPORT

In general, resources for development programs come to federal agencies from one or more of three sources. Few agencies have specific appropriations to themselves address a problem with foreign roots and therefore to have operations or programs abroad. These are generally in cases where the problem at issue has implications for U.S. domestic status, e.g., AIDS research in Africa by the Centers for Disease Control.

Barring use of their own appropriations, agencies rely either on dollar transfers from USAID or on access to local currencies created by food sales from the P.L. 480 program. These latter funds have often been the critical element in transferring U.S. agency S&T expertise abroad (See Report 5: VAP/VIDX case study in this collection of background papers, and U.S. Department of Agriculture discussion below). The degree of USAID control over programming of these funds has fluctuated over time, but current policy is to require significant USAID input and clearance over local currency use at the field mission level.

GOVERNMENT DEPARTMENTS

DEPARTMENT OF AGRICULTURE

Although technically barred by legislation from working outside the U.S., the Department of Agriculture is involved in the developing world in three ways. The Foreign Agricultural Service, described above, reports to the United States

*The U.S. Public Health Service has only one attache remaining abroad, posted in India.

Department of Agriculture (USDA) and works out of U.S. embassies.

Second, the Office of International Cooperation and Development (OICD) of the USDA is the pathway for USAID to access USDA technical experts. The Office itself has no operating budget; its appropriation covers only the salaries of its 260 staff members (total appropriation is about \$5 Million). USAID transfers annually between \$10 - \$12 Million to OICD for direct technical assistance to the field. OICD staff can also be seconded to USAID. Another \$30 Million is transferred through OICD to USDA's International Training Division to handle placement and costs of the training of foreign nationals in U.S. agricultural programs.

To allow some organizational predictability at OICD, its operations are financed by a flat budget transfer from USAID each year, and expenditures are drawn down against that transfer. While there are additional points of contact (e.g., the Research Division of USDA), the resources involved are minor.

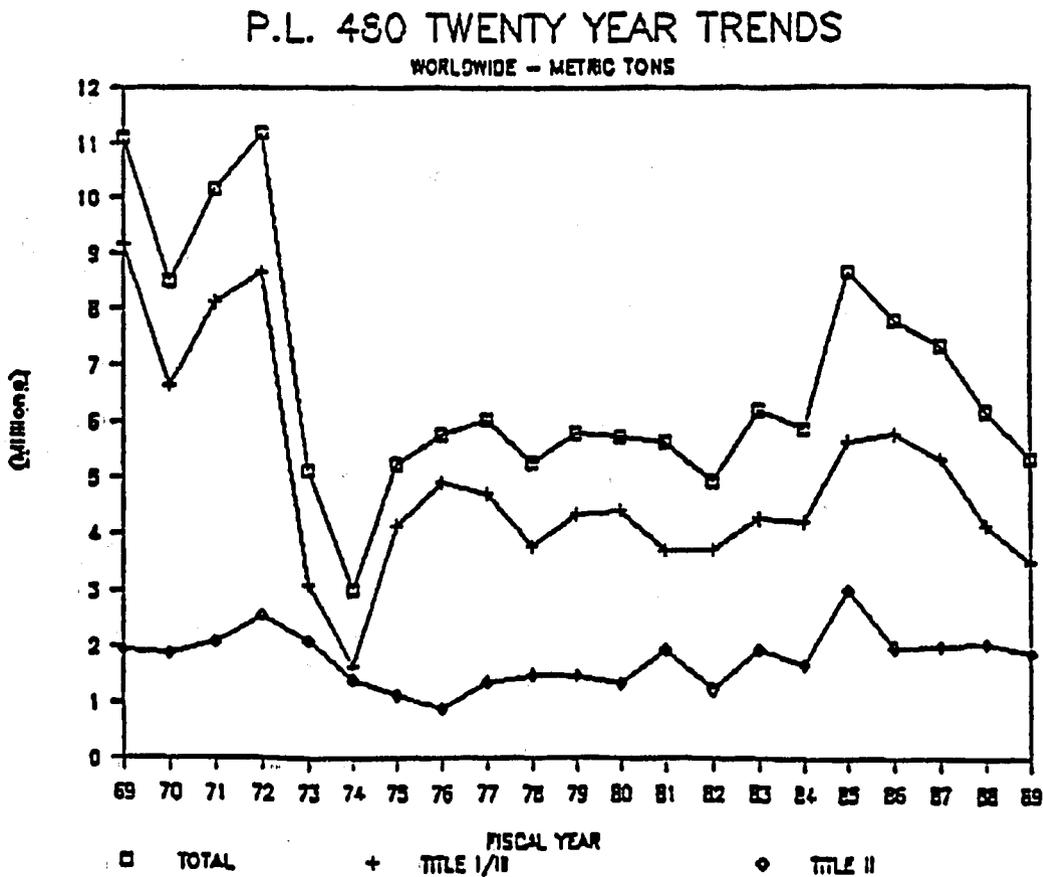
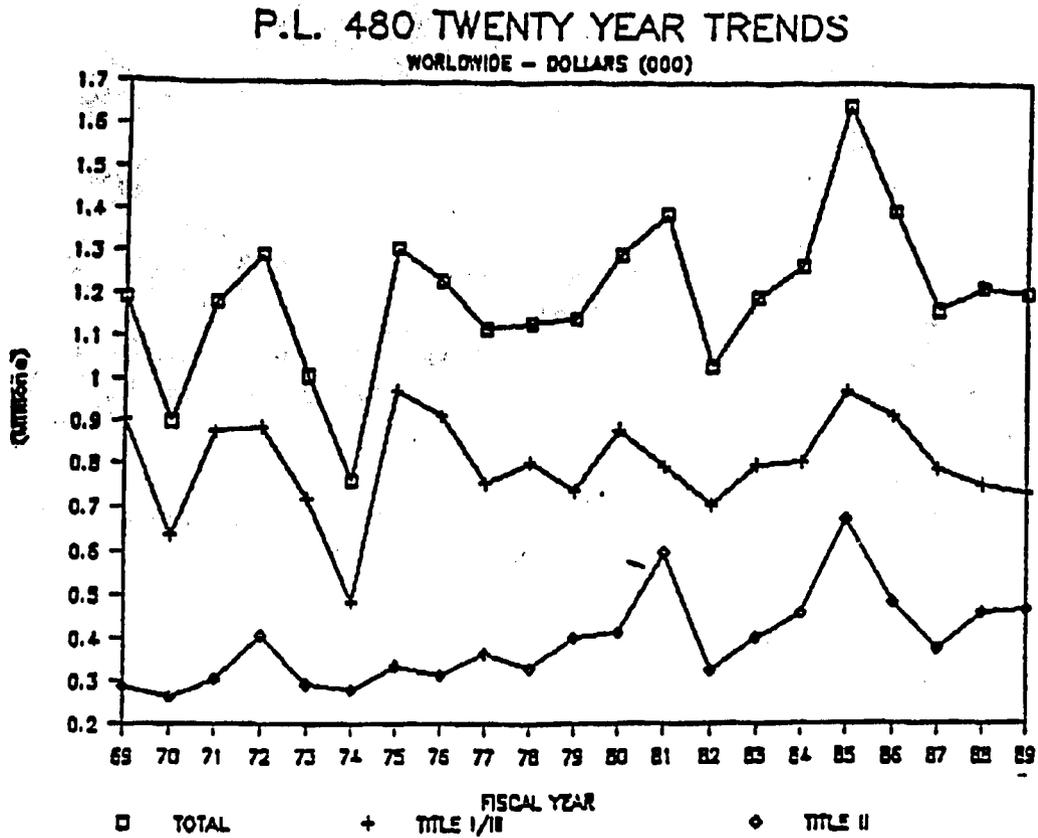
The third way in which USDA interacts with the development process is via the P.L.480 program. The program was created as the safety valve for USDA's domestic price stabilization program, i.e., to allow the purchase of surpluses so as to maintain price stability.

The management of P.L.480 purchases of U.S. grain and distribution of that grain to developing countries is carried out via the Development Coordinating Committee (DCC) comprised of representatives of the State Department, USDA, USAID, OMB and the Treasury Department. Disbursement and distribution decisions require a unanimous vote of the DCC. The grain stocks themselves are managed by the Commodity Credit Corporation.

P.L.480, then, is not technically part of the USDA, but it is USDA's price support program which triggers the accumulation of grain stocks which, in turn, become development assistance currency. The regular conflicts which arise in the DCC over P.L.480 relate to the differing goals of the member organizations. For example, USDA may want to buy (and DCC may want to ship) grain at a particular point in time that meets the need and schedules of U.S. growers. Yet, that may be the worst time from the point of view of developing country recipients because it may disrupt markets by introducing free supplies at the time of harvest and thus depress prices. USDA goals are U.S. price support; USAID goals are local development. Similarly, the State Department may want grain shipped at a particular point in time or to a particular country for political reasons that bear no relationship either to U.S. price needs or to local market development.

Despite the problems, P.L.480 remains a significant part of U.S. development assistance. Figure 2 traces the last twenty years of the program.

FIGURE 2. THE PL480 PROGRAM: THE PAST TWENTY YEARS



While tonnage shipped has clearly declined since 1989, the dollar value of that tonnage (and thus the local currency generated for development activities) remains at about \$1.3 Billion.

DEPARTMENT OF THE TREASURY

Treasury is responsible for oversight of the multilateral banks to which U.S. funds are committed. This includes the World Bank, the regional banks (e.g., the Inter-American Development Bank), and the European Development Bank. The Treasury staff for this purposes totals about 20 professionals, linked to five staff for multilateral coordination at USAID and 5 at the State Department.

Treasury's role in the multilateral banks has changed over the last ten years. Previously, many of the Treasury staff were actually seconded from the State Department, and the emphasis was on coordination and liaison between Congress and the banks on the implementation of policy issues such as the use of appropriate technology. Since the early 1980s, however, Treasury has come to play a more active role in oversight. Now, only a third of the staff have State/USAID experience. The remainder have a range of financial expertise and review each bank project for its financial integrity and its U.S. market implications. There is now less of a technical link between USAID and Treasury over the technical or development merits of a project, and more independent Treasury assessment.

Treasury also serves as an implementing agency for U.S. financial assistance to Eastern Europe. AID funds Treasury projects in financial and banking technical assistance as well as currency stabilization.

PEACE CORPS

The Peace Corps now fields approximately 5000 volunteers to programs in 47 countries around the world. The emphasis of volunteers is two-fold: training and teaching, and the design and development of model programs to be implemented subsequently by nationals of the host country.

Peace Corps program areas are initially specified by the requesting government. As time goes by, however, Peace Corps representatives themselves suggest new program areas to governments which may reflect either changing local conditions or new sets of skills that are being recruited into the Peace Corps itself.

The majority of the Peace Corps' work is carried out independently of other federal agencies. There is some cooperation with USAID through a supporting agency agreement. Peace Corps volunteers at times assist in implementing USAID projects by, for example, helping to set up model oral rehydration programs which USAID has funded. In the past, Peace Corps volunteers have also occupied technical positions in USAID's overseas missions, but this practice has been criticized as not in keeping with the intent of the volunteer program and has thus been stopped.

Just over 10% of Peace Corps volunteers are engaged in teaching and teacher-training in mathematics and sciences. The vast majority, however, remain engaged in community-level efforts to establish small-scale development projects.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Undoubtedly, the Department of Health and Human Services (DHHS) is one of the most far-flung departments of the Government and has some of the deepest involvement in international development. There are several points of contact between the DHHS Public Health Service (PHS) and the developing world, but there is no comprehensive data available on how much money or how many personnel are involved in developing country programs.

The Office of International Health (OIH) is attached to the Assistant Secretary for Health and is charged with administrative support and coordination of DHHS international activities. These include both USAID-related work and independent roles in such areas as representation at the World Health Organization's General Assembly (DHHS chairs the U.S. delegation) and management of foreign delegations visiting DHHS. OIH currently employs approximately 5 professionals. Although the technical interrelationships between USAID and DHHS agencies such as CDC are direct, the transfers of funds take place via OIH. The Office itself receives direct funds for overhead from USAID for each task carried out. OIH can also carry out PHS field activities in some countries using the Office's access to P.L.480 local currencies.

The total amount of money transferred to HHS for purposes of access to DHHS personnel alone in FY90 was \$38 Million in salaries and overhead. This does not include the funds transferred to finance actual project activities carried out by DHHS and its agencies.

There are three sets of PASAs between USAID and DHHS technical agencies. The Centers for Disease Control (CDC) is widely utilized by USAID

for project design work, for field assessments of disease threats, and, in some cases, for actual project implementation. The various Bureaus at USAID draw down against the CDC PASA as needed. Unlike relationships with some Departments (e.g., Department of Transportation), USAID's non-competitive use of CDC is rarely challenged since private firms do not have the level of disease control expertise vested in CDC.

The National Institutes of Health (NIH) are less utilized than CDC, but some technical assistance and advice is sought by USAID, especially from the National Institute of Allergy and Infectious Diseases. The Institutes, however, also have direct scientific relationships with developing countries and international organizations via research contracts and grants and via visiting scientist programs. Approximately 30% of NIH's scientific staff is comprised of visiting foreign scientists. The role of coordinating these activities and foreign visitors at NIH is vested in its John H. Fogerty International Center which also provides the site for international scientific conferences. In terms of actual budget allocations, only about 1% of the NIH budget is allocated to international activities. This considerably underestimates the level of effort, however, as it does not include time and effort of individual scientists in international collaboration.

The newest DHHS entry into the international development arena is the Health Care Financing Administration (HCFA) which has agreed to a PASA arrangement with the East Europe/Near East (ENE) Bureau of USAID. HCFA will provide a full-time expert for ENE staff, and will assist the Bureau in identifying domestic financing experts whose skills and experiences, especially with reimbursement programs for health services to the disadvantaged, match specific problems in developing countries. The total value of the HCFA PASA is \$1.1 Million.

Other agencies of DHHS (e.g., the Food and Drug Administration) periodically are drawn into international development work through the central HHS PASA, but are less frequently called upon.

DEPARTMENT OF THE INTERIOR

Interior has two subdivisions with a history of development involvement. A minor role has been played by the National Park Service in providing technical assistance (largely USAID financed) for natural resources and endangered species management. The major player has been the U.S. Geological Survey (USGS) whose three divisions all have international operations.

The Water Resources Division has an international program which provides three types of services. Short-term temporary technical assistance is provided for groundwater evaluations, water resources inventories and the like. These services are provided on a reimbursed basis, and clients include USAID, United Nations agencies, OAS and the World Bank. Long-term technical assistance is provided on rare occasions, also on a reimbursed basis. For example, the USGS has provided long-term technicians to governments for groundwater evaluation, and is reimbursed directly by the client government. (These activities often are hotly contested by U.S. firms who wish to provide the same services.) Third, the Division is actively involved in training foreign nationals in the U.S. and in their home countries.

The Geological Division of the USGS has similar international programs in mineral resources exploration, seismology and natural hazards assessment.

The Mapping Division provides fee-reimbursed services internationally in areas related to remote sensing and cartographics.

DEPARTMENT OF TRANSPORTATION

The locus of developing country work in the Department of Transportation (DOT) is the Office of International Transportation and Trade which works with USAID in all aspects of transportation infrastructure. In addition, the Federal Highway Administration is involved in short- and long-term technical assistance in development programs, albeit to a much lesser degree than was the case prior to the shift of U.S. programs to basic human needs.

Currently, the DOT has bilateral S&T arrangements with 24 countries and participates in 15 international organizations. In terms of diplomatic arrangements, the DOT is second only to the Geological Survey in the numbers of relationships with the poor and middle income countries.

DEPARTMENT OF LABOR

The International Bureau of the Department of Labor has three offices. The Office of International Organizations provides U.S. representation to the ILO and to the Manpower and Social Affairs Committee of the OECD. The Office of International Economic Affairs conducts analyses of the U.S. labor impact of international trade and economic development. It also participates in U.S. trade negotiations. It is the Office of Foreign Relations which links more frequently

to development assistance, however. It operates in five ways. First, it tracks labor information and data via the Labor Attaches in U.S. embassies abroad, and thus has a field presence in some countries. Second, it provides technical assistance to developing countries on both labor and training problems. Currently, for example, all assistance to East Europe in preparing unemployment programs and data systems is being handled by the U.S. Department of Labor with USAID funding.

In addition to these first two functions, the Office operates an exchange program of research and training with industrialized countries, runs a visitors program for foreign labor officials, and is responsible for case investigation of complaints about workers rights in foreign countries.

DEPARTMENT OF COMMERCE

While there are many sections of the Department of Commerce which collect and analyze data regarding foreign markets, the Foreign Commercial Service (FCS) is the exclusive presence of the Department in the field. The FCS has as its focus the expansion of U.S. exports; it is only peripherally interested in U.S. investment abroad or in business development within the host country. The service sees its primary function as counseling U.S. businesses in the U.S. on entering the export market. It provides a series of services, reports, and conferences/trips to encourage U.S. business in these directions. The Department of Commerce also provides technical information to developing countries via the Bureau of Standards, the Bureau of the Census, and the National Oceanic and Atmospheric Administration. Experts from these agencies are also frequently sent by USAID to provide technical assistance to developing countries governments.

DEPARTMENT OF ENERGY

The Office of International Affairs of the Department of Energy (DOE) coordinates all DOE work abroad. The Department is actively involved in a number of project activities via cooperation with USAID in the developing world. In Thailand, DOE, together with the Department of Commerce, the Trade Development Program and USAID, is evaluating the potential for promotion of advanced coal technology to promote both Thai development and U.S. technology exports. Similarly, in Poland and Hungary, DOE is involved in the application

of clean-coal technology to local coal-fired power plants and in developing the capability for local manufacture of environmental protection equipment.

INDEPENDENT AGENCIES

ENVIRONMENTAL PROTECTION AGENCY

Over the last year, the Environmental Protection Agency (EPA) has expanded its international involvement and expanded its international staff from 27 to 60 persons.

International activities are organized into three divisions: (1) **Program Operations**, which provides management and logistical support, including management of the international visitors program; (2) **International Cooperation**, which staffs all multilateral and bilateral collaboration (e.g., with the United Nations, the World Bank, etc.); and (3) **International Issues**, which develops technical strategies for addressing such inter-nation problems as ozone depletion, climate change, and agricultural commodities trade from countries using pesticides banned in the U.S. This division also carries out experimental field projects. For example, it has joined with USAID in Central America to develop mechanisms to ensure that agricultural produce shipped to market conforms with U.S. pesticide standards, thereby expanding opportunities for trade.

EPA's foreign operations budget is less than \$100 Million, mostly allocated to the provision of technical assistance. Until very recently, all staff were located in Washington. EPA's role as lead agency in the extensive U.S.-Mexico City pollution control agreement has now led to the placement of an EPA staff member in the U.S. Embassy in Mexico City, reporting to the science attache.

TRADE AND DEVELOPMENT PROGRAM

The Trade and Development Program (TDP) was created to promote economic development in developing countries by funding or financing feasibility studies or other services which lead to the export of U.S. goods and services. TDP seeks to assist U.S. firms in meeting competition from companies in other developed countries which have similar programs of trade promotion and finance.

TDP financing has been especially concentrated in technology-based industries and products, especially telecommunications, information processing, power, and mass transit. The annual budget for TDP is approximately \$25 Million. Since its creation in 1980, TDP has financed the planning of 480 projects in 91 countries, with a potential for generating \$7 Billion in U.S. exports.

EXPORT-IMPORT BANK

The Export-Import Bank (Ex-Im) is an independent government agency responsible for facilitating export financing for U.S. goods and services. Ex-Im uses three mechanisms to carry out its role. Annually it has a \$100 Billion export financing guarantee authority, i.e., to guarantee private financing using the faith and credit of the U.S. Government. It normally uses about \$40 Billion of this authority in any given year. Second, it provides subsidized export credits to U.S. from total funds of \$700 Million for this purpose. Third, and most recently, it controls a \$100 Million "war chest" of grant funding for what are referred to as "mixed credits" for U.S. companies. These funds are to be used to provide soft loans (below market rates, grace periods, lengthy terms) to U.S. companies competing with companies of other nations for export markets when the latter companies are similarly subsidized.

OVERSEAS PRIVATE INVESTMENT CORPORATION

The Overseas Private Investment Corporation (OPIC) was originally part of USAID, with separate operations only since 1971. OPIC provides insurance against political risks for U.S. private direct investors in over 100 developing countries, and also provides financing for investment projects. These latter financial credits are targeted at small- and medium-sized U.S. businesses, which OPIC defines as any business not in the Fortune 1000 (implying annual sales of less than \$150 million). OPIC annually provides over \$8 Billion in insurance and \$230 Million in directly financed projects.

NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) has a number of international linkages and programs, notably with Japan, Brazil, Mexico and Europe. It also operates a wide range of global programs, especially with regard to the environment.

In recent years, its relationship to developing country science or to USAID's S&T programs have been more limited.

When USAID was created, NSF was a major part of USAID programming for the development of science, technology and engineering training programs in universities in the developing world. Most of these programs were carried out in countries which were at the higher end of the economic development spectrum (e.g., Costa Rica and India). As USAID's emphasis changed in the 1970s to emphasize basic needs, country emphasis also shifted, toward the poorest of the developing world. Developing scientific departments of universities, expanding science research, and like activities fell out of programming favor, as did the countries in which such activities were likely to take place.

As a consequence, NSF's role in USAID programming declined. Currently, NSF has only a small PASA with USAID, specifically to create review panels upon request to provide advice on S&T projects.

Since 1968, however, NSF has also had its own internal international budget (currently about \$13 Million) to pursue programs which abroad which are of benefit to U.S. science. This amount (0.6% of the total NSF budget) underestimates the NSF international role, however. Many NSF divisions have international linkages, by financing the work or research of U.S. scientists carried out in foreign sites. It is only the International Division, however, whose international S&T programs are focused on active collaboration to benefit both foreign and domestic science partners.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The National Aeronautics and Space Administration (NASA) has over 1000 agreements with more than 100 countries covering a broad spectrum of cooperation, research, and data-sharing. Perhaps of most importance for developing countries is access to NASA's satellite images for purposes of agricultural, water and environmental development. These data are regularly made available to governments and international and bilateral organizations such as the World Bank.

3

**SCIENCE AND TECHNOLOGY AT THE U.S. AGENCY FOR
INTERNATIONAL DEVELOPMENT**

Susan Raymond

This paper was prepared for the workshop on "International Development: Organizing to Harness the Potential of the Science and Technology Community", held at The Carter Center, Atlanta, Georgia, 29-30 October 1989.

Undeniably, progress in science and its application in technological innovation have generated a cascade of economic, social and political changes—most good, some arguably not—which have shaped today's world.

But the innovations of science and technology have not, and do not, reach accomplishment in isolation. The history of progress is one of linkages. The effects of technological breakthroughs are enabled by other changes. Smallpox vaccines could reach those in need because of roads, communications and 4-wheel drive; the Green Revolution could succeed because of land reform; babies live longer if mothers have a primary school education, irrespective of technology. Half of the improvement in life expectancy over the past 25 years is attributable to economic growth, and the other half to technological innovation.

In the future, sustaining or improving past progress in development will depend upon better technological innovation and its application to increasingly difficult problems. But, of utmost importance will be the link between that potential for innovation and the context (political, social, economic, educational) into which it is being placed.

For a donor agency, "science and technology" are not end-points; rather, they are crucial parts of the armaments available for addressing the problems of development. But even these are only parts within a whole. Science and technology must be carefully managed and applied, always with an eye toward maximizing the linkage to the barriers and opportunities of associated sectors in the developing world itself.

Donor agencies in general, and the United States Agency for International Development (USAID) in particular, face a future filled with choices. Times are indeed changing; donors now struggle with how to change as well. There is great diversity among developing nations in terms of the speed and trajectory of their economic and social progress. Consequently, there is great diversity among and within nations in the development problems they face. The range of this diversity requires a more complex and flexible response from donors in their development programs.

But donor money is limited, increasingly limited in the case of USAID. There are large opportunity costs to any choice about how to spend that money. This is particularly true when choosing within such diversity and complexity.

Science and technology applications and choices are part of this pattern of change and choice.

Science and technology (S&T) programs are a major part of USAID's development strategy. This paper is intended to begin to put data substance around the organizational and decision-making questions intended to be addressed by this meeting. How is S&T handled at USAID? What is the status of S&T human resources in USAID? What do we know about the successes of the past? How are future choices made?

This paper will not attempt to provide final answers to those questions. It is a beginning not an end. It attempts to provide some of the parameters of the development choices facing USAID, the S&T dimensions of those choices, and the problems within the internal nature and organization of science and technology (and, importantly, within USAID itself) which may impede effective future S&T flexibility in contributing to development.

This paper will address three areas of concern regarding S&T at the United States Agency for International Development: people, process and performance.

Source documents are noted in the text and a source list is appended. Other information is from original data or personal interviews.

PEOPLE

Most fundamentally, the vibrancy, creativeness, and flexibility of an organization rest with its people. People are the vectors of change. Looking within USAID, how is science and technology organized and staffed, and what weaknesses or strengths does this imply for the pursuit of S&T programs in the future?

SUMMARY

Available data suggest five central trends in S&T staffing in USAID, many of which hint at potential future problems:

1. There is a hollowing out of USAID's staff, as the proportion of technical staff declines due either to attrition or to movement to executive, non-line positions in search of promotions.
2. There is a greying of existing staff as fresh recruitment declines.
3. Contractors are assuming USAID staff roles, often actually working in staff positions, with resultant impact on the origins of projects and policies. Technical staff increasingly play the role of contract managers.
4. Staff expertise has had difficulty keeping pace with changing development priorities and issues.
5. Many of these trends reflect a weakness in manpower planning at USAID.

ORGANIZATION OF SCIENCE AND TECHNOLOGY AT AID

An organizational chart for the United States Agency for International Development is provided in Figure 1. Science and technology at USAID are pursued at five organizational levels.

Agency for International Development

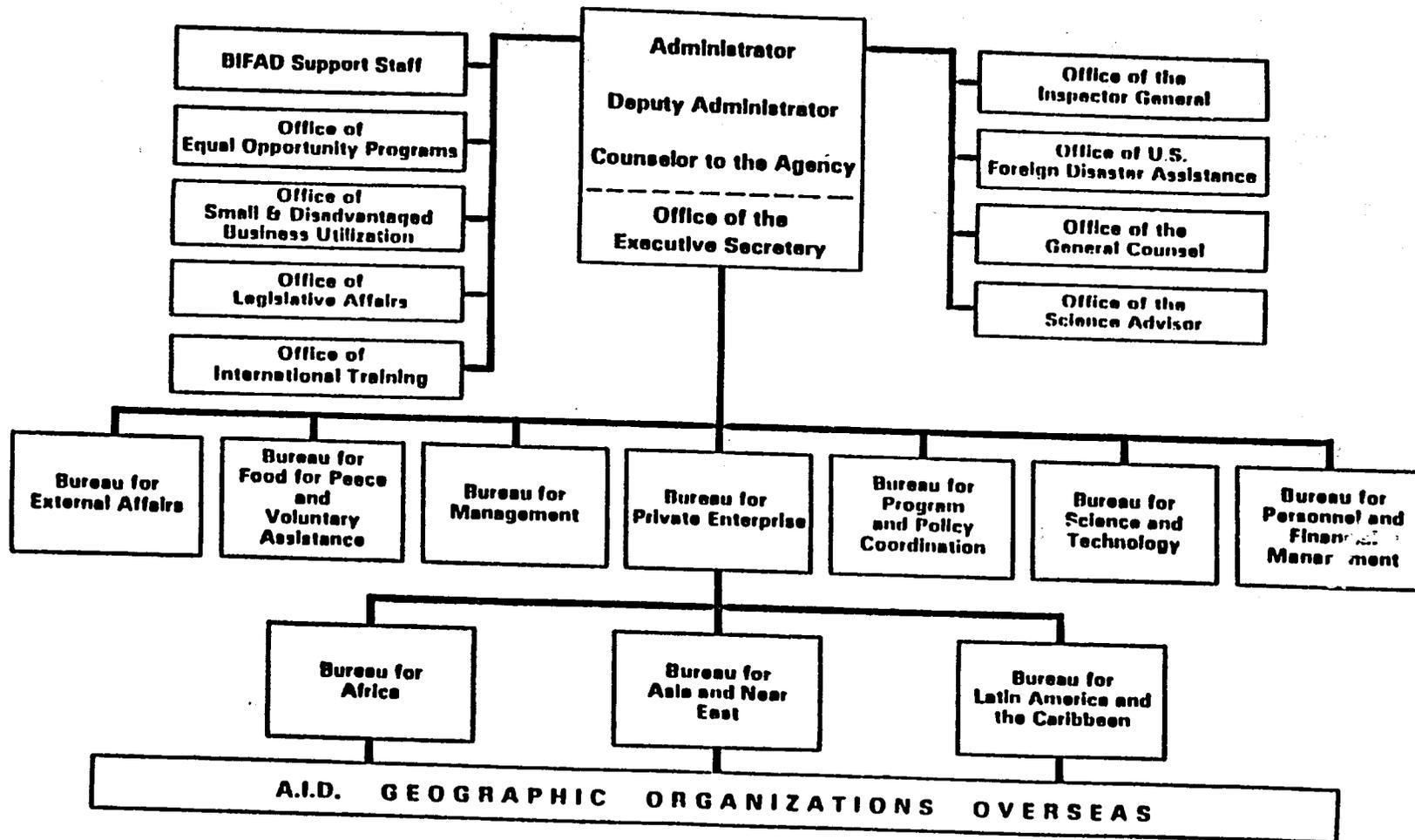


FIGURE 1. UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT: ORGANIZATIONAL CHART

First, The Bureau for Science and Technology is intended to be the repository of technical expertise in the Agency, and to pursue projects and programs which cross geographic and sectoral boundaries. (The position of Senior Assistant Administrator for Science and Technology is now vacant.) The Bureau contains a separate office for research and university relations, which oversees and coordinates science and technology programs with the academic community.

Organizational experts have commented on the need for reorganization of the S&T Bureau. The official organization chart does not accurately detail the complexity of the Bureau. For example, the Population Directorate, shown on the chart as a single unit, is actually split into five divisions; Rural Development has four divisions, and so on. In all, the Bureau has 43 separate units, several having only one or two positions. Taking the average, each unit consists of only 4.2 substantive positions. More than 40 percent of the division-level units within the Bureau fall below the civil service minimum size requirements set by the Office of Personnel Management. (Morss/1989; RAMPS Special Report/1989) The burgeoning of small units all tied into a central manager has impeded cross-sectoral S&T planning, communications and clear lines of authority.

Second, three free-standing offices have S&T involvement, but report directly to the Administrator rather than through the Senior Assistant Administrator for Science and Technology. The Office of the Science Advisor is designed to handle major science research and to provide a link to the science community, for example, to the National Academy of Sciences. The Research Advisory Committee, a group of external experts, reviews all centrally funded research proposals. The Board for International Food and Agricultural Development (BIFAD) provides a link between the Agency and the land grant universities for purposes of agricultural policy, program design and research.

Third, the Bureau for Policy and Program Coordination (PPC) is responsible for policy development. It is, in part, organized by sectors, and S&T sectors have oversight personnel located in PPC.

Fourth, the Regional Bureaus (Latin America and the Caribbean, Asia/Near East, and Africa) each have technical S&T staff in charge of project development and project management.

Finally, the 70 USAID missions in the field are staffed in part by technical USAID personnel appropriate to the sectoral mix of the projects supported by the particular mission.

CAVEATS ON DATA ANALYSIS

Two serious caveats should be noted prior to discussing staffing trends. Both have to do with overall management at USAID, but each seriously affects the reliability of any information about USAID's S&T capabilities or activities.

1. *Staffing Levels*

It is estimated that the total work force of USAID is between 12,000 and 18,000 persons. (Source: Personal interviews; estimates based on aggregation of WP490/1 reporting forms from missions.) Of these, approximately 4700 are direct hire U.S. Government Service or Foreign Service officers, 3200 of which are full time employees in permanent positions. (Source: Revised Automated Manpower and Personnel (RAMPS) data, 1989; includes International Development Interns.)

The remainder are either Foreign Service Nationals ("FSNs", citizens of the recipient country working in the USAID mission in staff positions) or contract personnel. In 1988, the total FSN contingent was just over 1000 persons, so the vast majority of the unaccounted for work force is on contract. These are individuals hired by USAID under contract (in the field or in Washington) to carry out staff-level activities within USAID's own operation. This does not include contract personnel (approximately 1000 overseas) hired by competitive bid to actually implement projects.

Contracted personnel in staff positions are hired via personal service contracts (PSCs) or trust funds which are controlled by mission or project financing. Information on such personnel stationed in Washington is complete. Information on such personnel at the mission level is reported back to a central personnel data bank (Source: RAMPS), but the guidance for the reporting is so vague that accurate reporting is rare.

The effect in the field of this contracting function can be seen from Table 1. These data are for personnel in the field about whom USAID/Washington has some knowledge. The data thus considerably underestimate the field reality.

Thus, all of the increase in USAID presence in the field in the last 8 years is accounted for by contract hires. In 1988, the ratio of contractor to direct hire personnel was nearly 7 to 1. In some missions, it is even greater. For example, USAID Nepal reports a total of 500 staff, only 23 of whom are direct hire, yielding a contractor ratio of over 20 to 1. In terms of its staff core, then, the Agency is increasingly dependent on contract personnel.

TABLE 1. OVERSEAS AID PERSONNEL LEVELS 1981 and 1988

| | 1981 | 1988 | % Increase (Decrease) |
|--------------------------|------|------|--------------------------|
| U.S. Direct Hire | 1115 | 1023 | (8%) |
| Foreign Service National | 1731 | 1057 | (39%) |
| Contractors | 1223 | 6698 | 480% |
| Total | 4069 | 8780 | 115% |

SOURCE: J. Ballantine, Staff data input for the Woods Report, 1988.

2. Data Reporting and Analysis

There are more than 50 separate automated data-processing systems in operation in USAID/Washington, plus an unknown number in overseas missions. For the most part, the financial, personnel and mission reporting systems at USAID are incompatible. Matching S&T payroll to S&T expenditures, for example, is not currently possible.

The Agency spends \$10 Million annually in Washington alone (\$5000 per Washington-based employee) for hardware, software and maintenance services. (Source: Morss & Morss/1988.) No complete inventory of equipment or automation procurement exists for overseas missions. Mission computerized financial and personnel data are often sent to Washington in hard copy form and reentered manually into Washington computers because systems are not compatible.

STAFF LEVELS

Of USAID's total personnel, 3% are political appointees. This includes 9 PAS positions, 14 Schedule C positions, and 110 Administratively Designated positions.

This section will address the full-time Foreign Service and civil service component of the 4700 total personnel. In 1988, there were 3061 permanent,

full-time employees at USAID (not including 108 International Development Interns), a reduction of 12% since 1981. Approximately 56% of this total are Foreign Service Officers; the remainder are civil service.

Of these 3061 personnel, only 468 (15%) are listed in science and technology areas. Not all of these 15% have S&T backgrounds or do S&T work. Functional data are very difficult to disaggregate. As of September 1988, when personnel designations are combined into functional categories, 53% of personnel were involved in Management and Administration, 19% in Development Support, 15% in S&T Programs, and 13% in Non-S&T Programs.

Table 2 contains full data by staff category. Before looking within the S&T cadre, several items are of note.

First, while the S&T program staff is larger than program staff for non S&T areas, only about a quarter of the total full time staff is engaged directly in actual programming of any type (S&T and non-S&T combined). Contractors carry out this function.

The majority of staff (over 70%) manage, plan, and analyze. These last two categories, program analysts and program managers, consume 441 staff positions, or one for every 2 persons actually designing and implementing programs (S&T plus non-S&T).

This is again evident when the "management/administration" grouping is disaggregated. While total direct hire staff has declined by 8% in the last five years, the number of contract managers has increased by 8% and the number of lawyers by 16%. Auditing/Inspection positions have increased by 14%, although only 87% are FS/GS filled. Over the last five years, S&T sectors had the largest staff decrease in percentage terms, and the analysis and management categories had the smallest decrease.

If all of the staff functions (called "backstops") are rank ordered by number of personnel, 40% of the entire direct hire contingent are accounted for by only the top four functions, none of which are project implementation related. Within sector staffs, agriculture and capital projects/development loans (although USAID no longer makes development loans) account for half of all staff. Tables 3 and 4 contain detailed data.

SUBSTANTIVE AREAS

Within Science and Technology (S&T), personnel are heavily skewed toward agriculture, which accounts for half of all S&T slots: as of September 1988, 48% of slots were in agriculture, 26% in health (including nutrition and

TABLE 2. USAID FULL TIME EMPLOYEES: FOREIGN SERVICE AND CIVIL SERVICE

| | 1984 # | 1988 # | % Change | % of 1988 Authorized Positions |
|-----------------------------------|-------------|-------------|-------------|--------------------------------|
| S&T Sectors | | | | |
| Agriculture | 245 | 224 | (9) | 104 |
| Energy/Nat Resources | - | 10 | | 125 |
| Health, Med, Pop | 144 | 124 | (14) | 99 |
| Education | 106 | 76 | (28) | 89 |
| Physical/Soc Sci | 48 | 34 | (29) | 89 |
| Total | 543 | 468 | (14) | |
| Non-S&T Sectors | | | | |
| Housing, Urban | 37 | 38 | 3 | 95 |
| Business, Industry | 64 | 79 | 23 | 84 |
| Public Administration | 1 | - | (100) | - |
| Social Services | 13 | 12 | (8) | 120 |
| Community/Soc Devt | 48 | - | | - |
| Capital Projects | 214 | 195 | (9) | 90 |
| Rural Devt | 33 | 22 | (33) | 116 |
| Food For Peace | 33 | 38 | 15 | 106 |
| Total | 443 | 384 | (13) | |
| Development Support | | | | |
| Program Analysis | 355 | 332 | (6) | 99 |
| Program Management | 122 | 109 | (11) | 101 |
| Economist | 90 | 84 | (7) | 88 |
| Engineering | 73 | 61 | (16) | 120 |
| Total | 640 | 586 | (8) | |
| Management/ Administration | | | | |
| Audit/Inspection | 133 | 130 | (2) | 87 |
| Administrative Mgmt | 329 | 303 | (8) | 97 |
| Executive Personnel | 204 | 199 | (2) | 102 |
| Financial Mgmt | 198 | 199 | 1 | 88 |
| Legal | 55 | 64 | 16 | 97 |
| Secretarial/Clerical | 412 | 339 | (18) | 90 |
| General Services | 36 | 22 | (39) | 147 |
| Admin Subprofessional | 286 | 238 | (20) | 105 |
| Procurement | 61 | 39 | (36) | 98 |
| Contract Management | 78 | 84 | 8 | 90 |
| Printers/Drivers | 12 | 6 | (50) | 600 |
| Total | 1804 | 1623 | (10) | |
| Grand Total | 3330 | 3061 | (8) | |
| Development Interns | 116 | 120 | | |

TABLE 3. FS AND GS LEVELS RANK-ORDERED BY SIZE

| <u>Backstop Category</u> | <u>Number</u> |
|---------------------------------|----------------------|
| Secretarial/Clerical | 339 |
| Program Analysts | 332 |
| Administrative Mgmt | 303 |
| Administrative Subprofessional | 238 |
| Agricultural Officer | 224 |
| Executive Personnel | 199 |
| Financial Management | 199 |
| Capital Projects | 195 |
| Audit/Inspection | 130 |
| Health, Medicine, Population | 124 |
| Program Management | 109 |
| Contract Management | 84 |
| Economist | 84 |
| Business, Industry, Priv Ent | 79 |
| Education | 76 |
| Legal | 64 |
| Engineering | 61 |
| Food For Peace | 38 |
| Housing, Urban | 38 |
| Physical & Social Scientists | 34 |
| Rural Development | 22 |
| General Services | 22 |
| Social Services | 12 |
| Energy/Natural Resources | 10 |
| Printers/Drivers | 6 |

TABLE 4. SECTORAL RANK-ORDER BY SIZE

| RANK | S&T SECTORS | NON-S&T | SUPPORT | ADMINISTRATIVE |
|-------------|------------------------|--------------------|------------------|-----------------------|
| 1 | | | | Sec/Clerical |
| 2 | | | Prog Analyst | |
| 3 | | | | Admin/Mgmt |
| 4 | | | | Admin/Subprof |
| 5 | Agriculture | | | |
| 6 | | | | Exec Pers |
| 7 | | | | Financial Mgmt |
| 8 | | Capital Proj | | |
| 9 | | | | Audit/Inspect |
| 10 | Health/Pop | | | |
| 11 | | | Prog Mgmt | |
| 12 | | | | Contract Mgmt |
| 13 | | | Economists | |
| 14 | | Business | | |
| 15 | Education | | | |
| 16 | | | | Legal |
| 17 | | | Engineering | |
| 18 | | Food/Peace | | |
| 19 | | Housing | | |
| 20 | Phys/Soc Sci | | | |
| 21 | | Rural Devt | | |
| 22 | | | | Gen Svcs |
| 23 | | | Soc Svcs | |
| 24 | Energy/Nat Res | | | |
| 25 | | | Printers/Drivers | |

population), 16% in education, 7% in the physical and social sciences, and 2% in energy and natural resources.

The key questions are not only staff allocation decisions within S&T, but also the relationship between staff levels and program financing. Are agricultural staffing levels being maintained while program disbursement declines? Are the staffing levels reflective of, or contradictory to, program directions?

STAFFING ALLOCATIONS AND PROGRAM RESOURCES

Two sets of data are available to begin to compare staff allocation to resource patterns. The first assesses allocations within the S&T Bureau itself; the second assesses S&T specific expenditures across the Agency. Neither is a full financial match of payroll to sector expenditures as the current computer system cannot provide that crossover.

Table 5 contains S&T Bureau data. It should be noted that USAID budget financing is of two types, operating year budgets (OYB) and buy-ins. Operating year budgets are those funds expressly allocated to a particular unit for its own programs. "Buy-ins" are program funds which are not part of the Bureau itself. They are Mission or Region funds which are added to the Bureau's own project budgets. They are useful for illustrating level-of-effort in terms of programs, but of questionable utility in assessing staff performance since an outside buy-in does not require anything approaching the staff intensity of effort of a staff-initiated project. Thus, the OYB ratios are most indicative of the staff-to-programming pattern.

The mere presence of differences in ratios is not striking. One would expect such differences between sectors. But the orders of magnitude involved do seem striking.

The lowest dollar/staff ratio is found in Rural and Institutional Development ("Program Development" is really a support function, not a programming area). This category also has the greatest deviation of staff percentage compared to budget. Agriculture, the single largest S&T foreign service staffing area, also is below the programming mean. Data are not available to disaggregate commodities from other budget components and thus refine the S&T level of effort for similar types of staff functions.

Although the Bureau Budget is skewed in favor of the population program, the content of that program (large dollar procurement of family planning products) allows high staff output in terms of program dollars managed.

**TABLE 5. SCIENCE AND TECHNOLOGY BUREAU PROGRAM
AND STAFF LEVELS/FY 1989**

| Office | % Budget | % Staff* | PGM/Staff OYB (\$000) | PGM/Staff incl Buy-in (\$000) |
|----------------|--------------|--------------|--------------------------|-------------------------------------|
| | a | b | c | d |
| Education | 2.0 | 4.7 | 495.5 | 1,428.3 |
| Health | 28.0 | 15.4 | 2,107.3 | 2,203.2 |
| Population | 41.0 | 19.7 | 2,394.0 | 3,143.6 |
| Program Devt | 0.7 | 9.4 | 86.4 | 139.2 |
| Agriculture | 12.0 | 14.1 | 971.2 | 962.6 |
| Nutrition | 3.5 | 6.4 | 631.6 | 712.1 |
| Energy | 3.7 | 3.8 | 1,111.1 | 1,362.3 |
| Forestry | 2.0 | 6.0 | 375.3 | 476.5 |
| Rural/Inst Dev | 3.2 | 12.4 | 295.5 | 618.7 |
| Rsch/Univ | 3.3 | 8.1 | 468.1 | 450.5 |
| Total | 100.0 | 100.0 | 1,143.5 | 1,412.7 |

SOURCE: FY1990 Congressional Presentation, in Morss/1989

*Direct Hire, FS plus GS; includes all on-board staff who encumber a position even if detailed to other agencies or programs.

Table 6 contains data for all S&T project and research OYB allocations for FY 1989. Data includes both the Development Assistance (DA) account and all projectized Economic Support Fund (ESF) funding. Again, there is a clear difference in terms of levels of resources managed by S&T sector staff.

TABLE 6. SCIENCE AND TECHNOLOGY SPECIFIC ALLOCATIONS

| | Total (\$000) | FS/GS Staff (no.) | S&T/Staff \$000 |
|--------------------|------------------|----------------------|--------------------|
| Agriculture | 133,677 | 224 | 596.8 |
| Education | 21,170 | 76 | 278.5 |
| Energy/Environment | 32,997 | 10 | 3269.7 |
| Health/Pop/Nutrn | 107,333 | 124 | 864.6 |

SOURCE: PPC Database

Energy/Environment has the largest S&T dollar management burden, and education the least. The energy/environment burden of over \$3.2 Million in S&T-specific expenditures per staff is six times that of agriculture, hinting at a possible mismatch between staff allocations and S&T level of effort.

SKILL AREAS

In addition to knowing staff levels and how staffing patterns match up against programming dollars, it is important to examine staff skills. This is an key measure of the ability of USAID's S&T capability in terms of emerging diversity in problems of development. While no comprehensive data are immediately available for the entire Agency, three examples illustrate the problem with the nature of USAID staff skills.

In agriculture, a skill analysis has been completed for the Asia/Near East Bureau (Meyer/1989). The analysis indicated that, of the agricultural officers in the Foreign Service (Agency-wide), 82% had advanced degrees (25% Doctorates), but only 12% of these had been awarded in the 1980s.

Moreover, the areas of academic specialization represented by these degrees provide support to a program designed to increase the yields of basic food crops, the historic USAID emphasis. However, specializations relevant to new policy environments (data collection, private sector roles, environmental assessments, laws and rules for agricultural adjustment to free markets, etc.) are lacking. Linkages with the private sector, including agribusiness, were found to be "practically nonexistent." Again, the answer has been to turn to outside contracting for these forward-looking skills.

In environment, despite the growing importance of the issue across S&T sectors, the Agency is not recruiting new employees with skills in Natural Resources Management. Environment is not handled as a sector. Rather, it is often managed inter-sectorally, with programming coming from committees involving energy, population, water, agriculture, etc.

In health, among the 103 foreign service officers agency-wide, there are only 6 physicians. Of the non-doctoral level staff (17% have M.D.s or Ph.D.s), only half have degrees in public health. (Informal Survey/1989) Thus, staffing totals by S&T sector may overstate the skills represented.

Of course, keeping professional skills timely can reduce the importance of the initial educational degree. USAID offers a variety of training and education

services to its staff. Among these are "State of the Arts" courses which each sector can tailor to its needs and which are meant to keep staff skills current.

From FY 1987 through FY 1989, a total of less than 3% of training budgets were spent on such seminars by the following S&T sectors: agriculture, health, population, natural resources, environment, human resources and rural development (Table 7). (James Brady et al/1989). Most spent less than 1% of available training funds on state-of-the-art seminars. The majority of training funds are spent on language (25.01%) and management and project implementation (23.08%) training.

TABLE 7. BUDGET ESTIMATES FOR STATE OF THE ARTS (SOTA) COURSES, FY 1987-89

| | FY 1987 | FY1988 | FY 1989 | TOTAL | % of 3 Years PM/TD BUDGETS |
|----------------------------------------|------------------|------------------|------------------|-------------------|-------------------------------------|
| FIELD: | | | | | |
| Agriculture/Food | 46,000 | 23,682 | 53,300 | 122,982 | 1.13 % |
| Health/Population | 13,500 | 56,828 | 34,000 | 104,328 | 0.96 % |
| Natural Resources & Environment | 0 | 33,932 | 20,000 | 53,932 | 0.50 % |
| Human Resources & Rural Development | 18,000 | 25,000 | 0 | 43,000 | 0.39 % |
| Subtotal: | 77,500 | 139,442 | 107,300 | 324,242 | 2.98 % |
| TOTAL PM/TD BUDGET: | 3,380,093 | 3,513,000 | 4,000,000 | 10,893,093 | 100.00 % |

NOTES:

1. These estimates are derived from PM/TD annual budgets.
2. Some 1988/89 rural development workshops are planned under auspices of the Development Studies Program (DSP).

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GREYING OF THE AGENCY

No comprehensive data are immediately available regarding the average age of Agency personnel, although these data are present in the RAMPS system. Several, admittedly isolated, data from specific sectors indicate a possible problem.

In the Health, Medical and Population backstop, for example, 70% of the foreign service staff will be eligible for retirement within the next ten years. (Informal Survey/1989)

Of agriculture officers, only 7% are under 36 years of age (the bulk of these being International Development Interns), and about 40% would be eligible to retire in the next five years. The majority of agricultural officers are between 36 and 45 years of age, providing a stable core of personnel (and a likelihood of continued agriculture sector priority). There appears, however, to be little succession planning at younger ages. (Meyer/1988)

Energy and natural resources officers are younger, with only 30% eligible for retirement by 1995.

LEADERSHIP

There are two key leadership issues currently facing USAID. First, many existing S&T leadership positions are currently vacant. These include the Assistant Administrator for S&T, the Director of the Office of Health, and the Director of the Office of Education. The nature of these appointments, whether they represent state-of-the-art science, will send an important message to S&T staff throughout the Agency.

Second, there is a perception among technical staff at USAID that promotion to management positions comes only after rotation out of technical slots. Thus, qualified technical staff seek position reassignment to project advisory positions (project development or program management staffs) in order to be positioned for future promotion. No Agency-wide examination of the accuracy of this perception is available.

Examination of technical specialists in agriculture, however, indicates that, in terms of both frequency of promotion and time-in-class between promotions, technical staff compare favorably with the rest of the Foreign Service.

(Meyer/1988) There is thus ample opportunity for technical personnel to achieve management promotions from technical slots.

HUMAN RESOURCES PLANNING

Many of the problems of S&T personnel in USAID appear to relate directly to the lack of a human resources planning system in the Agency. Technical personnel are hired because a slot becomes open and a budget is available. If that slot is in agriculture, an agricultural specialist is hired. The relationship between that open slot and the future programming directions of the Agency or its Bureaus is often not examined fully. If four engineer slots are open, four engineers are hired, whether or not there are program plans to build infrastructure. If programs are not in place, Bureaus place them in planning or analysis functions.

A similar link relates the lack of planning to the loss of positions in the Agency. There are few management tools in place to monitor productivity or use of time. Without these, there is no method for justifying staff positions against operating budgets or allocations. (Morss/1989)

The Office of Management and Budget (OMB) places FTE (full time equivalent) ceilings on government agencies based on the previous year's FTE usage. But, without human resources planning and personnel use systems, hiring freezes are often imposed by agencies on themselves for fear of exceeding the OMB ceiling.

As result of the lack of a human resources planning and management system, the Agency has lost 500 FTE workyears in this way in the last several years. (Morss/1989) USAID was given a cut because, without accurate personnel planning, it did not use the staff positions that OMB had allocated to it. That failure was not an intentional down-sizing by USAID, but rather a failure of human resources data.

Some effort is currently underway within USAID to rectify this situation, but the road is long. The personnel data system itself (RAMPS) is 20 years old. It's computer language is currently being updated, but it will still lack congruence with the financial system and with the many mission systems.

PROCESS

Over the years, many analysts have pointed out the problems with and flaws in the project process at USAID. There have been, however, no clear, agreed upon solutions.

SUMMARY

An overview of the current situation for science and technology leads to four preliminary hypotheses:

1. The S&T-specific portfolio represents about half of all Development Assistance account expenditures by USAID, but reflects little sectoral change over time.
2. There is no clear process for determining the Agency's priorities among S&T sectors, nor for determining the timing and importance of new initiatives in emerging program areas.
3. Projects derive from a plethora of sources, often not from a formal project initiation process, and take lengthy amounts of time to develop.
4. Contractors increasingly dominate the project process and the contractor community displays significant market concentration, with resultant limits on access to the broader S&T community.

WHAT IS AN S&T PROJECT?

Science and technology project activities take three forms at USAID. First, free-standing research projects (e.g., the malaria vaccine) are financed to support basic scientific research.

Second, research or technology transfer can also be a component of a project whose overall goal is not S&T. An example is the India Women and Development Project. Along with efforts to expand the provision of social services to impoverished women, the project contains a component for training

women in the technological aspects of irrigated agriculture and irrigation systems maintenance. (India CDSS/1988)

Third, entire projects are designed around a single S&T problem or group of problems. These projects have no standard definition and can take many forms. An example is the Science & Technology for Development Project in Thailand. This \$49 Million effort (USAID's portion is \$35 Million) is aimed at bringing about increased interaction between Thailand's public S&T institutions and its agricultural/industrial business sectors. The goal is to see that research and development (R&D) efforts of the former are more closely related to creating opportunities for the latter. Project expenditures are targeted at improving research quality control, fellowships for graduate training, grants for research projects, and commodities procurement for research institutions. (Project Implementation Report/1988)

REVIEW OF S&T PROJECT PORTFOLIO

There is no conscious balancing of risk among a set of projects, within a sector or within a country, as would be the case in a financial portfolio. Rather, "portfolio" refers to a gathering of pieces of work, in this case projects, each of which represents a certain dollar commitment. The term will be used in this latter sense in this paper.

It is difficult to determine how much money USAID spends on S&T, or how that money is divided between even such gross categories as training, technical assistance and commodities procurement.

A best estimate of total expenditures is that about half the total DA account (net of overhead) is expended on S&T. This would include direct project budgeting, mission buy-ins to central projects, and contributions to multilateral efforts such as the Consultative Group on International Agricultural Research (CGIAR).

Prior to 1989, it has even been impossible to determine USAID's level of S&T funding for direct bilateral projects, since there was no way to break project budgets down by component. Thus, for example, an agriculture project that both tested new irrigation technology and financed fertilizer imports could not be disaggregated to separate expenditures by those components.

Recently, the PPC Bureau has begun to disaggregate project line-item budgets by substantive component. This activity is being applied, however, only to data from FY 1989 and forward. No retrospective financial data on projects are available.

Using this method, Tables 8 and 9 contain detailed estimates of S&T project expenditures for FY 1989 - FY 1991. These data represent both central bureaus and mission submissions, and are presented by region, bureau and sector. The data should be taken as estimates only and should not be taken as definitive. Conclusions should be made with caution.

TABLE 8. AID S&T EXPENDITURE BY BUREAU (\$000)*

| Bureau | FY1989 | FY1990 | FY1991 |
|--------------------|----------------|----------------|----------------|
| Asia/Near East | 70,334 | 71,354 | 77,298 |
| Latin Am/Caribbean | 30,204 | 32,064 | 27,902 |
| Africa | 66,161 | 61,562 | 52,675 |
| Sci Advisor | 14,988 | 14,990 | 9,990 |
| S&T Bureau | 105,643 | 99,189 | 100,150 |
| Worldwide | 29,645 | 30,147 | 31,026 |
| TOTAL | 316,975 | 309,306 | 299,041 |

* Data are estimates representing both mission submissions and central bureau budgets. All figures represent all DA monies and projectized ESF.

The total S&T-specific project portfolio for USAID is targeted to decline from \$316 Million in FY 1989 to \$299 Million in FY 1991. This is a decline of about 5%. The budget remains just under a billion dollars in direct S&T project expenditures over three fiscal years. Over half of these expenditures are accounted for by only two bureaus, Asia/Near East (in part because of the large Egypt program) and the S&T Bureau itself. Table 10 contains data by region.

The Latin America/Caribbean (LAC) region (which includes money expended in the Caribbean Basin Initiative) would seem to be particularly under-programmed in science and technology relative to its size and sophistication. This is true certainly relative to the levels in Africa which has double the LAC S&T expenditures.

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TABLE 9. AID S&T EXPENDITURE BY SECTOR (\$000)*

| Sector | FY1989 | FY1990 | FY1991 |
|---------------------------|----------------|----------------|----------------|
| Agriculture | 133,677 | 138,734 | 112,641 |
| Education | 21,170 | 13,667 | 30,194 |
| Environment | 28,799 | 20,069 | 20,818 |
| Energy | 3,898 | 4,229 | 4,560 |
| Health | 62,998 | 66,468 | 62,947 |
| Private Enterprise | 9,694 | 7,277 | 10,667 |
| Population | 44,335 | 40,716 | 39,673 |
| Other | 12,414 | 18,146 | 7,844 |

* Data are estimates representing both mission submissions and central bureau budgets. All figures represent all DA monies and projectized ESF.

PRIORITIES WITHIN SCIENCE AND TECHNOLOGY

Patterns within S&T sectors show health and population as the leaders in S&T expenditures within USAID. Table 11 contains sectoral breakdowns. (Full data is contained in Tables 8 and 9.)

How monies are being spent or what problems are being addressed within particular S&T sectors cannot be determined in any aggregate sense.

**TABLE 10. SCIENCE AND TECHNOLOGY PROJECT ESTIMATES
BY REGION FY 1989-1991**

| Bureau | Total \$000 | % Total AID S&T Expenditure |
|---------------------|------------------------|--------------------------------------------|
| Asia/Near East | 218,986 | 24% |
| Latin America/Carib | 90,176 | 10% |
| Africa | 180,398 | 19% |
| Science Advisor | 26,468 | 3% |
| S&T Bureau | 304,982 | 33% |
| Worldwide | 90,818 | 10% |
| TOTAL | 925,322 | 100% |

SOURCE: PPC Data

**TABLE 11. PERCENT OF OYB ALLOCATED FOR SCIENCE AND
TECHNOLOGY FY 1989-91**

| Sector | FY 89 | FY 90 | FY 91 |
|--------------------|--------------|--------------|--------------|
| Agriculture | 19% | 19% | 13% |
| Education | 8% | 5% | 10% |
| Environment | 11% | 8% | 10% |
| Energy | 7% | 6% | 8% |
| Health | 21% | 22% | 21% |
| Population | 23% | 19% | 20% |
| Private Enterprise | 2% | 1% | 2% |

SHORT TERM OPERATIONS: THE PROJECT PROCESS.

Projects at USAID originate in many different places and from many different quarters. Where and how to spend money is an amorphous decision influenced by field missions, Washington technical staff, Washington generalist managers, and the consulting firms which carry out technical analyses, design projects, evaluate projects and generally set the data "reality" for policy decisions.

Within USAID, these various sources of project ideas and outlets for funds are coordinated by "Sector Councils" for each sector (health, agriculture, etc.). Each council, chaired by the relevant S&T Bureau officer, provides a forum for sharing new initiatives and findings among the technical personnel of the S&T Bureau and the regional bureaus.

In the end, however, the disparity of viewpoints often results in radically different perceptions of a project's actual utility. In 1988, for example, a survey was undertaken of S&T Washington managers and field missions to determine the relative utility of 35 centrally-funded S&T contracts. The rankings were completely divergent. For example, the vector biology and vector borne disease control project was ranked number 24 by Washington managers, but as either first or second priority by field missions.

There exists a formal project process through which major expenditures of funds must pass (small expenditures can be disbursed through a variety of mechanisms). This process is designed to ensure widespread project review and approval, to open the proposed project to a competitive intellectual review within the agency, and to ensure competition within the contracting community. There are numerous problems within the project process as well as with the ability to bypass the process entirely. Those outlined here relate to the S&T issue of access to expertise and state-of-the-art thinking.

The project papers upon which competitive bid awards are made basically specify the entire project design as well as the details of the skills to be required of individuals implementing the project. Competition, then, is less on how to solve a problem, than on the qualifications of the individuals offered to implement the solution already specified in the paper.

This process does not force creative technical thinking from new, outside experts. Indeed, the reward process can foster the opposite. The structure of points awarded to proposals for purposes of comparison and judgment is usually dominated by points for the qualifications of the individual nominees and proposing firms. USAID experience nearly always is specified as a requirement, both for individuals and for organizations.

The project process, problem-ridden though it is, at least does subject activities to wide review within the Agency. That clearance and review, however, can be circumvented. Two examples will suffice.

Over a two year period (FY 1987 - FY 1988), USAID's S&T Bureau obligated over \$3.8 Million for field trials for a malaria vaccine without an approved project paper. The draft, unapproved paper against which the money was being obligated envisioned a \$23 Million expenditure to develop, maintain and staff a new field testing site in Papua, New Guinea. The site, however, was for a vaccine that does not exist and may not exist for another 5 to 10 years. It was proposed even though suitable sites already exist in the domestic S&T infrastructure in many places in the developing world, most notably in Kenya and Indonesia. The expenditures and the proposed paper were being pursued on the basis of recommendations of the firms/groups already being financed by the S&T malaria account.

Objections to the expenditures by PPC had no effect. Funds continued to be obligated even as objections and concerns were being raised by PPC and the regional bureaus. (The problem is not limited to S&T at USAID: see *The New York Times*/September 28 article about NASA contracting.)

The project process can also be circumvented by two other pressures: the need to move money by the end of a fiscal year and the need to meet small business or 8-A requirements. As with most other Federal government agencies, USAID is funded by one-year budgets. USAID does not have "no year money" even for research, as do some other Federal agencies. Money that is not committed by the end of the fiscal year is lost. Thus, when large amounts of money are still available at the end of a fiscal year, there is considerable pressure to move them into the commitment column. When this can be done with a minority contractor, both the fiscal and the Grey Amendment requirements are met.

In fiscal 1987, for example, faced with excess funds at the end of the fiscal year, USAID awarded a non-competitive \$15 Million contract to an 8-A firm for a project in Indonesia. The contract was awarded on the last day of the firm's 8-A eligibility.

Multiple points of entry do help to increase the likelihood that new ideas will be investigated, especially since smaller amounts of support can be obtained fairly easily by finding a sympathetic bureaucratic ear. The diversity of entry points does work in favor of early creativity. Too much structure might discourage such early investigation.

On the other hand, getting such ideas into the formal project process becomes difficult because of the domination of that process by vested interests. When other than disinterested parties are doing both project design and project evaluation, it is not surprising that projects reflect existing interests and capabilities.

The lack of a broad reach of USAID staff into the non-contract scientific community (be that unaffiliated universities or private corporations) for design, evaluation and policy advice at the line-operating level may limit the options that are pursued in S&T projects. There is no careful study of the nature of external USAID advisory boards, the breadth of their membership, their meeting schedules, or the effects of their recommendations.

SHORT TERM OPERATIONS: CONTRACTORS

In Fiscal 1987, a total of 5906 contracts were in force at AID, with a total value of over \$3.6 Billion. (Ballantine/1988) Table 12 provides details by region. Over a three year contracting period, the top twenty winning firms (in dollar amount of contracts won) did not change significantly. The identity of the winning firms was virtually the same each year.

TABLE 12. CONTRACTS IN FORCE: OCTOBER 1, 1986 - SEPTEMBER 30, 1987

| Region | Countries (no.) | Contracts (no.) | Amount |
|---------------|--------------------|--------------------|------------------------|
| Worldwide | — | 816 | \$1,574,675,508 |
| Asia | 18 | 1129 | 426,774,983 |
| Near East | 17 | 318 | 434,158,694 |
| Europe | 6 | 14 | 13,618,744 |
| Africa | 47 | 880 | 561,672,966 |
| United States | — | 874 | 124,989,802 |
| TOTAL | 116 | 5906 | \$3,625,326,540 |

SOURCE: Office of Procurement, "Current Technical Service Contracts and Grants Active during the Period October 1, 1986 through September 30, 1987."

In the health sector from 1980 to 1986, there were no new successful competitors for major USAID competitive-bid contracts. Since then, there has been only one new winner.

As regards private voluntary organizations (PVO) (many of which are funded to work locally in the developing world), data from 1986 indicates similar

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concentration. Of the 177 PVOs registered with USAID, a third received no grants at all. The top three PVOs received 53% of total PVO office funding, and the top 10 PVOs received 72% of PVO office funding.

Again, this market concentration in both the profit and non-profit sectors, together with nature of the project bidding process (bodies not solutions) creates limited reach for S&T into audiences with new ideas and fresh perspectives both on problems and on solutions.

LONG-TERM STRATEGIES

There is really no long-term S&T planning process at USAID. Such a process is difficult to initiate and sustain in any meaningful way given the role of Congressional earmarking in determining the level and direction of USAID programming. The Child Survival Program, for example, was not an USAID-initiated priority developed on the basis of careful long-term data review. Rather, it was imposed on the Agency by Congress. The degree to which Congress micro-manages program substance in USAID provides both an organizational and a motivational disincentive for long-range S&T planning.

There is also no long-term S&T policy at USAID upon which to base planning. Several technology transfer policy papers have been written over the last five years; none has been issued. (Morss & Ruhm/1988)

A third barrier to long-term planning is the problem of maintaining accurate and timely information about existing operations between the many field missions and Washington headquarters. What is true of personnel is nearly equally true of substance. Information available in Washington seldom matches that from the field.

For example, the S&T Bureau has established a health data base which is intended to track expenditures and programs for the entire Agency in health, population and nutrition. The data base was created to track priorities at the time of its creation, i.e., oral rehydration technology, family planning and immunization. The data entered into the system about field activities is entered from Washington based on field surveys. These surveys ask missions to estimate percentages of activity and expenditures according to a series of line items (child survival, women in development, etc.) Comparison in Latin America between the data base estimate of resources spent on malaria and field resources actually expended revealed orders of magnitude differences, with Washington showing multiples of actual spending. Thus, Washington's impression that it was fully

vested in malaria control in Latin America was markedly different from the field data.

The answer, of course, is not simply more paper for more reporting. Arguably, the amounts of paper required at the mission level already choke productivity. Nevertheless, a solution linking field reality to long-term USAID program planning for new issues and trends is needed.

RELATIONSHIP TO OVERALL FEDERAL GOVERNMENT

Informal consultations between USAID S&T staff and the rest of the Federal government take place on an episodic basis. Yet, the potential interrelationship between USAID's activities and those of other Federal agencies is large. In the context of a programming overhaul of the Thailand USAID portfolio, a survey was carried out, in Washington and in the Bangkok, of the total U.S. government presence in Bangkok and its interrelationship to USAID. The USAID Mission diagram (Figure 2 on page 3-29) of the field presence illustrates the multiplicity of points of contact as well as the overlapping areas of interest between USAID and some of these agencies.

Table 13 contains a listing of the Federal agencies expressing significant interest or activity in Thailand during the USAID survey.

It should also be noted that USAID's relationship with other Federal agencies often is more than simply an exchange of professional or bureaucratic views. USAID itself can be a source of budget support to other agencies. In the Thailand survey, between FY 1986 and FY 1988, USAID/Bangkok expended \$3.3 Million of its funds directly on other U.S. government agencies. The major Federal partners were the Department of Agriculture, the Centers for Disease Control, and the TVA, with minor roles for the Department of Energy, the Census Bureau, and the Department of Commerce.

PERFORMANCE

Given the diversity of projects, it is difficult to generalize about overall project performance. This section will summarize the data available and supplement it with case-specific examples of performance.

HOW IS S&T PROJECT MONEY SPENT?

There are no comprehensive disbursement data available for USAID's S&T activities. It is common for USAID project money to be de-obligated from problem projects and re-obligated to other activities, or for disbursement schedules to be extended. No overall assessment of this type is available for S&T.

A number of in-country audits have been carried out using the SARS (Sector Assistance Reporting System) methodology to track financial recipients against project purpose. These indicate that the vast majority of USAID's ultimate resource transfer is in the form of government support.

Even in Thailand, one of the strongest and most promising developing countries in the USAID portfolio, 92.2% of the USAID expenditures in FY 1988 were to government budgets. Only .03% of expenditures were directed at indigenous private enterprise recipients, even though many of the USAID/Thailand projects were nominally targeted at the private sector. (Monk/1989)

In the previously described Science and Technology for Development project, USAID expended \$1,554,000 in 1988, of which \$2,000 went to the private sector. (Monk/1989)

A study of over 30 USAID missions in Africa found that only 3% of aggregate expenditures were disbursed directly to indigenous private enterprises for purposes of local private development, including humanitarian and social sectors. Nearly all of these disbursements were concentrated in a few large projects. (KMA/1988)

Much of USAID's effort in the last 30 years has been for training, to improve the human resources of the developing world. Over the years, USAID has been consistent in focusing on training in the agricultural, health and education sectors. (Selected Training Data/1988) Indeed, at the graduate level, USAID supports some 20% of all foreign students studying agriculture in the U.S.

USAID remains a relatively small actor in the human resources development picture of support for foreign students, providing support for only 1.5% of foreign students studying in the U.S. (Table 14). USAID's Office of Training estimates that about 80% of the foreign students on official (private or government) educational scholarships in the U.S. return to their home country upon completion of their coursework.

TABLE 13. THAILAND SURVEY U.S. GOVERNMENT INVENTORY

| Agency | Areas of Interest | Field |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Peace Corps | Forestry, agriculture, nutrition, filariasis control, fisheries, community high schools, 4-H, land reform, malaria control, natural resources mgmt | Yes How Many? |
| Department of State | | |
| 1. Refugee/Migration Affairs | Refugee resettlement in Thailand, ODP from Vietnam, refugee protection/monitoring | Yes |
| 2. Narcotics Asst Unit | Narcotics law enforcement, crop control, abuse prevention | Yes |
| Department of Defense | | |
| 1. Reutilization & Mktg Office | Disposal of excess property | Yes |
| 2. Research Institute for Med Sci | Conducts medical research & development, esp re malaria, dengue, diarrheal diseases | Yes |
| Department of Commerce | | |
| 1. Foreign Commercial Service | Counsel U.S. business on potential for exports to Thailand; conduct trade missions to Thailand; assess trade opportunities, publish and distribute; agent distributor service; conferences; lesser role in investment opportunities, with particular attn to IPR and other laws/regulations | Yes |
| Export-Import Bank | Provides concessional credit for projects increase U.S. exports to Thailand. Areas of emphasis are computers, power, telecommunications, cement and tinning plants | No |

TABLE 13., continued

| Agency | Areas of Interest | Field |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Overseas Private Investment Corp | Provides insurance against political risk to U.S. investors; conducts conferences and invest. missions to encourage expanded U.S. investment data and counseling to U.S. business | No |
| 1. Geological Survey | All three USGS divisions (Water Resources, Geological, Mapping) have provided technical asst to Thailand via AID and other donors, esp UNDP. Also provides regular training (esp in water) via its training facility in Denver. All services financed via donors; no internal resources. Some market-based services, esp. remote sensing and cartographics. | No |
| 2. Bureau/Reclamation | TA, training and services for Applied Atmospheric Resources Research Program | No |
| Department of Transportation | | |
| 1. Office of Int'l Transp & Trade | TA and design asst with all aspects of transportation infrastructure; particularly active in Southern Africa & Latin America | No |
| 2. Fed Highway Admin | TA in all aspects of highway design, construction and admin; locates individuals with particular expertise in state highway authorities; assists U.S. firms bidding on foreign projects by sending letter committing FHA to work on project if U.S. bid is selected | No |
| Department of Labor | | |
| 1. Office/IO | U.S. rep to ILO and OECD committees | No |
| 2. Office/Int'l Economic Affairs | Analyzes U.S. labor impact of international trade and economic development; participates in trade negotiations | No |

TABLE 13., continued

| Agency | Areas of Interest | Field |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 3. Office of Foreign Relations | Tracks labor data viz Labor Attaches, provides TA on training and data, operates exchange and research programs, monitors and analyzes worker rights, esp in Thailand child labor and working conditions | Yes |
| Department of Health and Human Services | | |
| CDC | Monitors medical screening of refugees | Yes |
| Department of Agriculture | | |
| 1. ERS | Thailand as export market for U.S. products | No |
| 2. Soil Conserv. Svc | Administers several professional exchange agreements | No |
| 3. APHIS | TA on animal health; standards for animal products and animal disease surveillance | No |
| 4. Forest Service | S&T RSSA to support AID programs re forestry and environmental concerns; administers scientific exchanges | No |
| 5. Foreign Ag Svc | Monitoring export market | No |
| 6. IFDC | Provides TA and advice on fertilizer marketing and investments | Yes |
| 7. Int'l Training Div | Promotion of high-value agric commodities in non-competitive fields; limited training | No |
| 8. Int'l Cooperation & Planning Division | Funds a program in S&T with Thai Ministry of Agriculture | No |
| 9. Int'l Research Div | Works with AID in Agric Technology Transfer project | No |

TABLE 13., continued

| Agency | Areas of Interest | Field |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Foreign Broadcast Information Service | Monitors public media for political and economic developments | Yes |
| Department of the Treasury | | |
| 1. Secret Service | Provides protection to President and Vice President | Yes |
| 2. Office of Developing Nations Finance | ? | |
| Department of Energy | | |
| Office of Int'l Affairs | Working with Commerce, TDP and AID to develop advanced coal technology project; develop Thai energy sector while increasing U.S. exports | No |
| Environmental Protection Agency | | |
| Office of Int'l Aff | TA, training, seminars on all aspects of environmental issues | No |
| Trade and Development Program | Funds or finances feasibility studies, consultancies, and other planning services for projects that may lead to export of U.S. goods and services; in Thailand, major sector is energy; also transportation, environment, and information technology | No |

ABILITY TO MEET OBJECTIVES

The official point of responsibility for evaluation in USAID is the Center for Development Information and Evaluation (CDIE). Most CDIE evaluations are really literature reviews of USAID's own project documents; CDIE can only do field evaluations if invited to do so by the mission.

USAID spends less than two-tenths of one percent of its budget per year on evaluations. About 85% of CDIE's work is on project evaluation. Little work is done on trends or development questions, and thus CDIE's efforts do not

provide a base for strategic planning or funding allocation decisions. (Morss & Morss/1988)

Two sets of evaluations provide some guidance.

TABLE 14. STUDENT SPONSORSHIP IN 1983/1984

| Primary Source of Funds | No. Foreign Students (000) | % |
|-------------------------------|----------------------------|------|
| Personal/Family | 224.23 | 66.2 |
| Home Govt/University | 40.7 | 12.0 |
| U.S. College/University | 39.3 | 11.6 |
| Foreign Private Sponsor | 10.2 | 3.0 |
| U.S. Government (non-AID) | 2.1 | .6 |
| Agency for International Devt | 5.0 | 1.5 |
| Current Employment | 7.1 | 2.1 |
| U.S. Private | 6.4 | 1.9 |
| Other | 3.7 | 1.1 |
| Total | 338.9 | |

In 1987, CDIE carried out a 62-country assessment of USAID-supported health projects with particular reference to their sustainability. Since no ex post facto evaluations had been done for the projects, the study focused on determining whether or not processes directed at ensuring financial sustainability of project structures and/or benefits were in place by project end.

Of the 62 projects, 53% were unsustainable (a third because they had totally failed during the life of the project and two-thirds because sustaining procedures were not in place at project end). Another 20% were only "partially sustained" (i.e., only portions of the project were likely to continue to provide benefits), and the remaining 27% were judged fully sustained. (Lieberson & Miller/1989)

At the country level, CDIE has carried out lengthy field studies of two countries, Guatemala and Honduras, where USAID has been present for over 30 years. The focus was on water supply, health, nutrition and population programs. The best sustained efforts were capital investments in water supply and sanitation and projects for technical training (e.g., nurses). The CDIE Honduras study lists three conclusions, two (and possibly three) of which are revealing of the attitude toward performance:

1. USAID should not expect that all project outputs will be sustained, nor that projects will be sustained with domestic funds alone;
2. USAID should emphasize project effectiveness, but not make effectiveness an overriding concern;
3. The characteristics of project finance are not related to the likelihood of sustainability. (Honduras/1988)

GRADUATION

In a number of countries across the developing world, economic growth and living standard progress are beginning to coalesce. Growth is increasingly sustainable and poverty levels are receding to a point where the domestic economic engine can reasonably be expected to begin to fuel solutions to any remaining social problems.

When this sustainable progress occurs, USAID is faced with the need to develop new ways of thinking about its relationship to what have come to be called "advanced developing countries" (ADCs). Poverty alleviation is no longer the issue; nor is basic economic or budget support. Yet, these countries still seek U.S. expertise, for technical, policy, and planning problems.

In the past, USAID has "graduated" such countries relatively abruptly, by simply closing out its programs over a short period and departing the country. The departure from Korea or from Turkey is a case in point. Sometimes the reasons for the departure proved justified (e.g., Korea); sometimes not (e.g., Tunisia, which USAID has prepared to "graduate" several times only to have plans interrupted by economic collapse).

Currently, several parts of USAID are re-examining not the justification for graduation but rather the process needed for smooth disengagement from ADC institutions, while leaving in place the deep roots of American cooperation and philosophies which decades of USAID's presence have nurtured.

This re-examination is particularly relevant for S&T. Many of the bridge programs in ADCs have a base in local desire for continued assistance with and access to the S&T capacity of the United States. Two models of ADC disengagement are emerging.

In the Latin American/ Caribbean (LAC) Bureau, USAID's presence in an ADC continues, but without a fully staffed mission. Rather, one individual is placed in the country with a limited budget (e.g., \$1 Million) and given fairly free rein to pursue interesting areas of cooperation in technology, policy reform and participant training. The hope is that small amounts of U.S. money, if aggressively placed, would leverage additional finance from the ADC government

and other donors. The USAID grants are usually made to individuals or private organizations (usually not-for-profit) for research, training, or experimental projects.

The LAC strategy did not reflect a particular ADC planning process. Rather, it emerged from an immediate, unforeseen need to re-enter some Latin American countries after USAID programs had already been closed (e.g., Mexico). It was not a function of forward planning, but rather reconciled the need to re-enter countries with OMB limits on operating budgets.

The Asia/Near East (ANE) Bureau has been luckier in that it has begun to plan ahead for the emergence of ADCs. It is beginning to cast its ADC relationships in terms of mutual economic interest, i.e., the increasing economic and international market links between the U.S. and an ADC based on the ADC's economic strength, growing export orientation and social progress. The emerging ANE strategy (still in draft) is to look toward full USAID mission closure over a fixed period of time, but to emphasize leaving in place private mechanisms for continued access of ADCs to U.S. expertise. Interim activities would emphasize economic strengthening and pluralization, but projects would be dominated by local management rather than external consultants.

SUMMARY OF PROBLEMS, OPPORTUNITIES AND IMPLICATIONS

Clearly, there are both substantive and managerial dimensions to the S&T problem in development administration. Five central issues appear critical

First, staffing is a serious problem. Staffing patterns do not match emerging issues. Human resources planning is weak, and succession planning virtually non-existent. There is little skill upgrading based on some vision of the future. Yet, there remains a core of dedicated, committed professionals at USAID. Enabling their contribution to the Agency's future S&T directions is critical. The central starting points for improvement are a vastly improved management information system for personnel and a sophisticated human resources planning system.

Second, the inability to reliably track financial information by S&T sectors and use it to plan future directions and levels of effort is a critical weakness.

Third, there is no rigorous internal system for selecting priorities. Lack of aggressive, empirically verifiable priorities is tied to the barrier of Congressional earmarking. The link between U.S. priority setting and developing country perception can also be weak. Overarching Washington dictates for all

countries, in turn, can lead to programming which does not match country specifics or needs. Often, this programming bears no relationship to developing country priorities. A survey of Ministers of Health in 1989 revealed that only 10% of responding ministers ranked child health programs as their top priority for the future. (Raymond 1989). The top priority was finance and management. Indeed, the most impassioned speech on the need for new skills and approaches to health care finance at the 1989 World Health Assembly was given not by an advanced developing country, but by the Minister of Health of The Gambia.

Fourth, there is little long-range thinking. This, together with the lack of aggressive priority setting and weakness in detailed financial profiles as well as Congressional insistence on demonstrating immediate results from expenditures, keeps much of USAID's attention on near-term project design and implementation. The trends and needs of tomorrow, those just over the development horizon, are rarely given consistent intellectual attention.

Fifth, USAID lacks sophisticated systems for tracking performance. The monitoring and evaluation process is not closely tied to the project design process, and is often seen as adversarial rather than as a normal part of project implementation and data tracking, from the very inception of a project.

In sum, weaknesses in staff skills, process and performance, together with micromanagement by Congress and the OMB, seem to have led us to forget what business we are in. Everything we know tells us that development is a difficult business, a business where no single intervention will make the crucial difference between poverty and progress. Development is hard work. It means redirecting whole institutions and economies toward self-generating, self-sustaining economic and social progress.

The S&T role in USAID lies therein. S&T should not be a shortcut; it should find and define its role in that long, hard road toward enabling developing countries to become international partners of the United States in the mutual interests of economic growth and social progress.

That requires competent, creative staff; an organizational structure that enables rather than frustrates their creativity; a process which gives rise to projects which are both demonstrably productive in the developing world and conscious of their accountability to the U.S. taxpayer; and continuous assessment and redirection on the basis of objective knowledge of results.

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USAID: ORGANIZATIONAL UPDATE

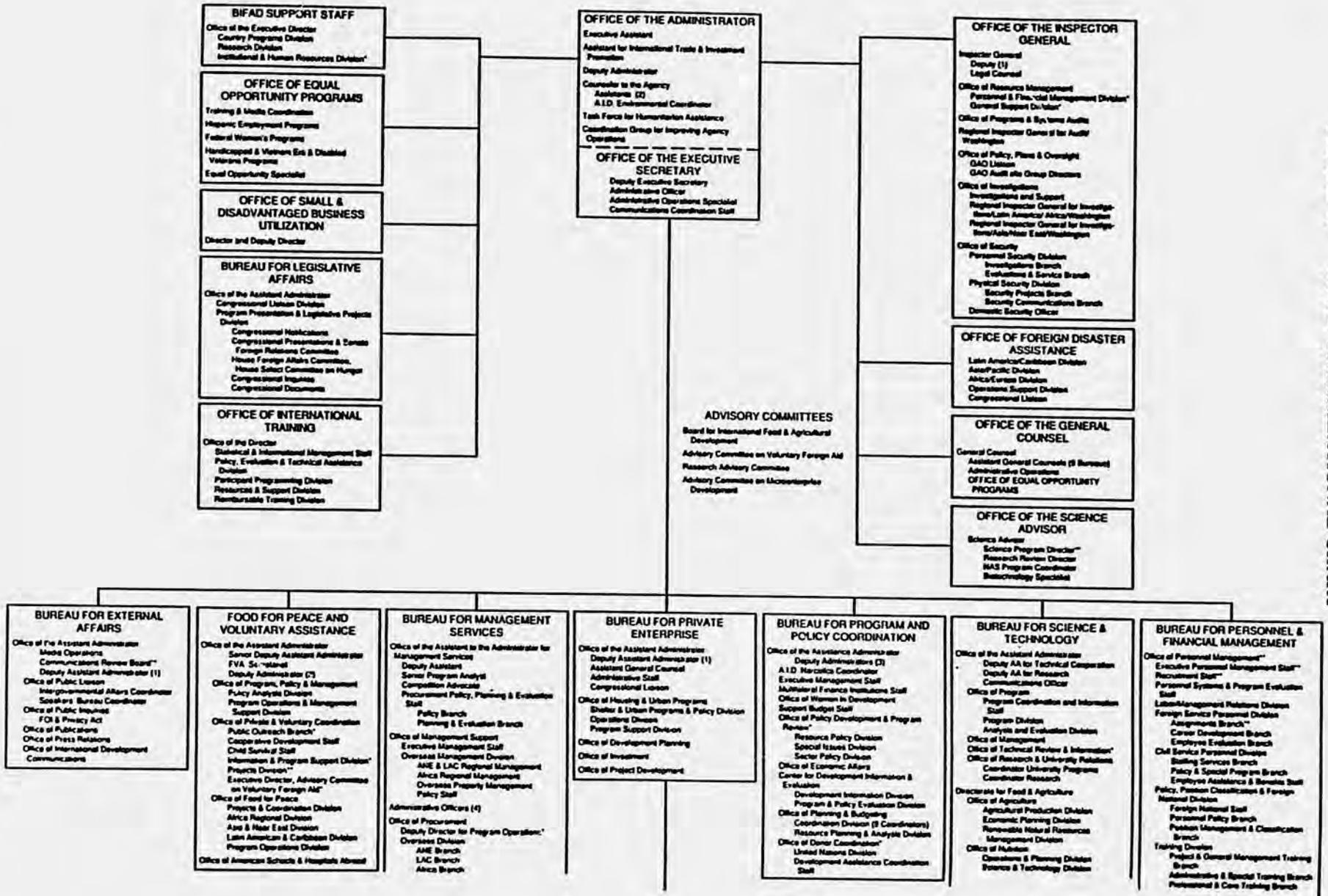
Susan Raymond

This paper was prepared for the October 1990 meeting of the Task Force on Development Organizations of the Carnegie Commission on Science, Technology, and Government, in New York City.

This report is intended to build on the October 18, 1989 paper regarding "Science and Technology at USAID", written for the Carnegie Commission working group meeting on Science and Technology (S&T) for Development. A copy of that initial paper has been distributed to the current Task Force on Development Organizations, and appears as Report 3 in this collection of background papers. The issues addressed here are in direct response to specific requests of working group participants for additional information or analysis.

In brief review, the 1989 paper contained data describing the overall S&T staffing pattern at USAID and compared trends in the S&T staff levels to that of other functions in the organization. The paper also reviewed the process of S&T project development from various perspectives, including the issue of market concentration among private contractors and private voluntary organizations who provide USAID with project design and implementation services.

FIGURE 1. USAID ORGANIZATIONAL CHART



Handwritten initials or mark.

AID/W Projects Division
 Control Operations Branch
 Management Services Branch
 Health and Population Branch
 Food & Agriculture Branch
 Resources Branch
Procurement Support Division
 Overhead, Special Goods & Close out Branch
 Support Services Branch
Commodity Support Division
 Monitoring & Eval
 Technical Support Branch
 Overseas Branch
 Procurement Branch
 Transportation Division
Office of Management Operations
 Policy and Analysis Division
 Policy Branch
 Records Management Branch
 Resource Management Division
 Real Property Management Branch
 Personal Property Management Branch
 Administrative Purchasing Branch
 Travel & Transportation Management Division
 Support Branch
 Transportation & Storage Branch
 Custom Travel Network
 Communications & Program Management Division
 Telecommunications Branch**
 Mail & Distribution Branch
 Publications Branch
Office of Information Resources Management**
 Special Projects Staff
 Planning & Evaluation Division
 Mission & Project Services Division
 Technical Support Division
 Automation Support Division
 AID/W Services Division
 Systems Management Division

Directorate for Energy, Environment & Natural Resources**
 Office of Forestry, Environment & Natural Resources**
 Office of Energy
Directorate for Human Resources
 Office of Education
 Associate Director for Development Education Systems
 Associate Director for Educational Technology & Communication
Office of Rural & Institutional Development**
 Regional & Rural Development Division
 Development Administration Division
 Rural Institutions Division
 Small Enterprises & Employment Division
Directorate for Health**
 Communicable Disease Division*
 Health Services Division
 Water Supply & Sanitation Division
 Research Division
Directorate for Population
 Operations Coordination Staff
 Population Policy Development Division
 Research Division
 Family Planning Services Division
 Information & Training Division
 Commodity & Program Support Division

Office of Financial Management
 Controller
 Executive Management Staff
 Deputy Controller for Financial Policy & Systems
 Financial Policy & Systems Division
 ADW Accounting & Control System Staff
 Assistant Controller for Field Operations
 Cash Management & Payment Division**
 Document Control Branch
 Letter of Credit Branch
 Contracts/Grant/Letter of Commitment Payment Branch*
 Miscellaneous Payments Branch
 Funds Control Staff
 Overseas Project Accounting Division
 Payroll Division
 Payroll Processing Branch*
 Accounting Branch - Retirement
 Systems Management Branch*
 Labor Management Division
 Debt Rescheduling Staff
 Guaranty Program Branch
 Accounting & Reports Branch
 Loan Services Branch
 Control Accounting & Reporting Division*
 Central Accounting & Records Branch*
 ADW Cash & Allowment Control Branch
 Expenditure Analysis Branch
 Accounting Division
 Letters of Commitment Staff
 ADW Project/Non-Project Branch
 AID/Cooperating Estimate Branch
 Accounting Services Branch

BUREAU FOR AFRICA
 Office of the Assistant Administrator**
 Deputy Assistant Administrator (2)
 Assistant General Counsel
 Congressional Liaison
 Office of Management
 Human Resources Management Division
 Management/Information Systems
 Resources Division
 Commodity Staff
 Commodity Market Development & Implementation Staff
 Office of Development Planning
 Program Analysis & Budget Division
 Policy Analysis & Research Division
 Policy Planning & Evaluation Division
 Office of Project Development
 Coordination for Minority & Small Business
 Implementation & Program Support Division
 Sahel & West Africa Projects Division
 Central & Coastal West Africa Projects Division
 Eastern Africa Projects Division**
 Southern Africa Projects Division
 Office of Technical Resources
 Program & Regional Operations Staff
 Agriculture & Natural Resources Division
 Field Support Branch
 Planning & Analysis Branch
 Regional Resources Branch
 Education & Human Resources Division
 Health, Population & Nutrition Division

Office of Eastern Africa Affairs
 Sudan/Somalia/Ethiopia/Djibouti Desk
 Kenya Desk
 Tanzania/Uganda Desk
 Rwanda/Burundi Desk
 Indian Ocean States Desk
 Office of Central & Coastal West Africa Affairs
 Cameroon/CAE/Equatorial Guinea/Gabon/Sao Tome/Principe Desk
 Sierra Leone/Liberia/Cote d'Ivoire/Nigeria
 ENTWITE Fund Desk
 Leone Desk
 Zaire-Congo Desk
 Guinea/Togo/Benin/Ghana/Bissau Desk
 Office of Sahel & West Africa Affairs**
 Chad/Mali/Niger/Gambia/Burkina Faso Desk
 Senegal/Mali/Niger-Cote d'Ivoire Desk
 Sahel Regional Desk
 Office of Southern Africa Affairs
 South Africa/Mozambique/Angola/Namibia
 Zimbabwe
 Angola
 Botswana/Lesotho/Swaziland
 Zimbabwe/Zambia/Malawi-Southern Africa Regional Program

35 Missions
 2 Regional Offices

BUREAU FOR ASIA, NEAR EAST & EUROPE
 Office of the Assistant Administrator
 Deputy Assistant Administrator (2)
 Communications Control
 Congressional Liaison
 Assistant General Counsel
 Executive Management Staff
 Private Sector Development Staff
 Office of Alignment Affairs
 Office of Development Planning
 Economic Analysis Division
 Evaluation Division
 Finance Division
 Policy & Program Guidance Staff
 Office of Technical Resources
 Agriculture & Rural Devt Division
 Research, Social & Analysis Staff
 Agriculture Programs - Asia Branch*
 Agriculture Programs - Near East Branch
 Population, Health & Nutrition Division
 Energy & Natural Resources Division
 Human Resources Division
 PVO Liaison Officer
 Office of Project Development
 Program Coordination & Support Staff
 East Asia Division
 South Asia Division
 Middle East Division
 Mediterranean/Near East Division
 Engineering Division
 Office of South Asian Affairs
 India Desk
 Sri Lanka/ Nepal/ Maldives Desk*
 Pakistan Desk
 Bangladesh Desk
 Office of East Asian Affairs
 Philippines Desk*
 Thailand/ASEAN Desk
 Burma/South Pacific Desk
 Indonesia Desk
 Office of Egypt & European Affairs
 Egypt Desk
 East Europe Staff
 Office of Middle East & North African Affairs
 Turkey/Morocco/Algeria Desk
 Yemen/Oman Desk
 Jordan/West Bank/Gaza Desk
 Lebanon Desk

18 Missions
 1 Regional Program

BUREAU FOR LATIN AMERICA AND THE CARIBBEAN
 Office of the Assistant Administrator
 Deputy Assistant Administrator (1)
 Congressional Liaison
 Assistant General Counsel
 Executive Management Staff
 Controller Staff
 Democratic Initiatives Staff
 Private Sector Activities Staff
 Office of Development Programs
 Development Programs Division
 Program Analysis & Budget Division
 Economic Analysis Division
 Evaluation, Social Development & Food Aid Division
 Office of Development Resources
 Project Support Staff
 Environment & Energy Staff
 South America Finance Division
 Central America Finance Division
 Caribbean Finance Division
 Education/Human Resources Division
 Rural Development Division
 Health/Population/Information Division
 Office of South American & Mexican Affairs
 Bolivia Desk
 Colombia/Ecuador/Chile Desk
 Paraguay/Uruguay/Argentina Desk
 Office of Caribbean Affairs
 Assistant Director/Dominican Republic
 Grenada/Eastern Caribbean Islands Desk
 Haiti/Guinea/Suriname Desk
 Jamaica Desk
 Haiti Desk
 Office of Central American & Panamanian Affairs
 Assistant Director Regional Programs/Caribbean
 El Salvador Desk
 Costa Rica/Panama Desk
 Guatemala Desk
 Honduras Desk
 ROCAF Desk

18 Missions
 1 Regional Office

* Vacant
 ** Acting

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This paper builds on these two issues, as follows:

- 1. It expands personnel and organizational data to include the distribution of personnel between USAID/Washington and the field missions, as well as among the various operating and support bureaus in Washington;**
- 2. It provides comparable market concentration data for university contractors.**

Figure 1 is a fully developed organizational chart for USAID ¹, showing organizational detail within both operating and support Bureaus.

ORGANIZATION AND PERSONNEL

REVIEW OF PREVIOUS DATA

Overall, there have been consistent staff reductions in USAID over the last ten years. Total staff has declined by 12%. Disaggregated by function, however, there has been growth in management and oversight functions (16% growth in lawyers and 8% in contract managers) alongside the decline in technical personnel.

Indeed, in the last five years, S&T sectors had the largest staff decrease in percentage terms in the Agency. This does not, however, mean a decline in available personnel, as contractors are often hired to perform these staff functions. Because these contract personnel are paid via a contract with their home firm not via payroll, there is no accurate central count of how many staff functions are carried out by contract personnel.

The majority of USAID staff (over 70%) are engaged planning and management functions. There is one planner/manager for every two project design/implementation personnel. Ranked by size of contingent, of the top four

¹Earlier this month, the Private Enterprise Bureau (PRE) and the Asia/Near East Bureau (ANE) were reorganized. All Asia operations (except for countries financed with security assistance monies) were moved to the PRE Bureau, now titled Asia & Private Enterprise Bureau (APRE). The Philippines, Pakistan and all Southeast Asia programs remained in the former ANE Bureau, which also assumed responsibility for all East Europe programming and was renamed the East Europe and Near East Bureau (ENE). These changes are not reflected on the attached organization chart as full re-organization details were not available. Approximately 35 staff positions are being transferred to APRE from ENE. A subsequent increase of 15 staff positions has been proposed for ENE to accommodate the staffing needs for new East Europe programming, but these plans are not yet firm.

personnel categories (comprising 40% of USAID's staff) none are technical in nature or directly responsible for project implementation.

Within S&T, the largest contingent of technical officers is in Agriculture (48%), followed by Health/Population (26%), Education (16%), Physical and Social Sciences (7%), and Energy and Natural Resources (2%). These personnel contingents do not match well to the level of project expenditure by sector, either within the S&T Bureau itself or overall in USAID. With the largest staff, the agriculture sector moves considerably less project money per staff member than does health/population or energy/environment.

DISTRIBUTION BY UNIT AND LOCATION

Figure 2 contains a consolidated organization chart for USAID (not including the reorganization described in Footnote 1) showing the distribution of personnel positions ("slots")² among Bureaus. The chart also shows the distribution of slots between Washington and the USAID field missions. Data are current as of August 31, 1990.³

Approximately two-thirds of USAID's personnel slots are located in Washington, and a third in field missions in the developing world.

Washington

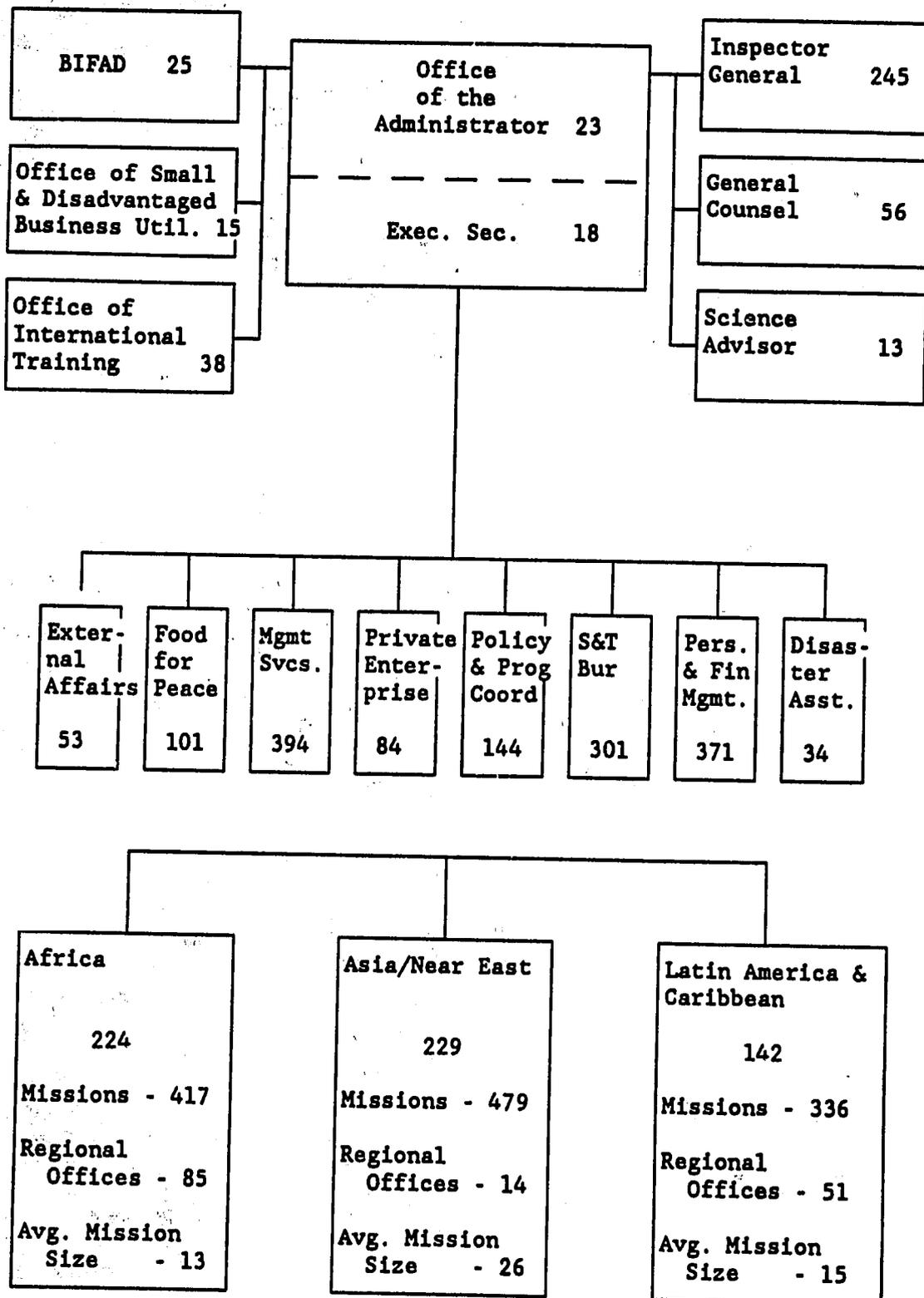
In Washington, half of all personnel slots are in management support Bureaus. Approximately a quarter of the slots are in central technical bureaus (e.g., S&T, Disaster Assistance, etc.) not affiliated with field missions. The remaining quarter are in Bureaus with direct responsibility for technical oversight of activities in field missions located in developing countries themselves. As indicated in Figure 2, the staff ratio between these line operating Bureaus and their field mission ranges from 1:2 to 1:3 persons.

In Washington, the two largest Bureaus are Management Services (394 slots) and Personnel and Financial Management (371 slots). The S&T Bureau ranks third in size (300 slots), followed by the Inspector General's Office (245).

²Since there is regular rotation between field assignments and Washington as well as within Washington assignments, there are often temporarily vacant slots. It is the slots, not the personnel, which are the more permanent feature of organizational distribution. Hence the chart shows slots not people. Data regarding percentage of slots filled as of October 1, 1990 are available.

³Data calculated from "Staffing Pattern", October 31, 1990, United States International Development Cooperation Agency.

FIGURE 2. DISTRIBUTION OF STAFF SLOTS*



*Food for Peace total does not include 2 slots in Rome; PPC total does not include a total of 7 slots in Paris and Rome. Of this total, 156 are foreign service officers and 145 government service officers.

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Detailed data are available regarding numbers of slots within various offices and management levels in the Bureaus themselves.

In addition to Washington and field mission slots, there are approximately 300 slots on "the complement". These are staff (both Foreign Service and Government Service) who are temporarily without a functional position. An individual is placed on the complement for a variety of reasons including training (e.g., language training before assignment) or illness. The complement also contains personnel who are being rotated back to Washington without an agreed upon assignment or for whom a position of sufficient grade is not available.

Field Missions

Outside of Washington, the largest field contingent of USAID is in Africa (assuming a split of field personnel when Asia operations are separated from those of the Near East). Average field mission size is between 12 and 26 persons, although the range is great (8 slots in Zambia and 107 in Egypt). It should be recalled also that this average refers only to U.S. direct hire personnel. It does not include Foreign Service Nationals (local personnel hired to fill technical or administrative needs) nor U.S. contract personnel hired to assist field staff. As noted in the 1989 paper, there is no simple mechanism for determining the total personnel size of USAID field missions.

As noted earlier, only a third of USAID's staff slots are located in the developing world. Of course, the critical question for S&T relates to the actual location of technical staff. While the Washington/field distribution of staff may itself hint at a broader management problem for USAID, its implications are deeper if the tendency is replicated in S&T staff allocations.

The staffs of USAID missions are dominantly made up of managers, general project development officers (skilled at project design), and program officers and analysts (skilled at more general development trend analysis, including economics). Table 1 displays the average mission make up by USAID region.

While the missions appear to be dominated by generalist and managerial staffs, S&T sector officers do seem to comprise a reasonable cadre of staff in the average mission. Does that contingent, however, represent a significant portion of all of USAID's S&T staff capability?

The impression depends on where one looks. Certainly, if viewed in terms of the operating Bureaus to which the missions are attached, the field enjoys the use of the vast majority of the technical S&T staff slots available to the

operating Bureaus. As indicated in Table 2, with a few exceptions, 70% to 80% of S&T slots in USAID's operations are located in the field.

**TABLE 1. MISSION PERSONNEL DISTRIBUTION
(% PROFESSIONAL STAFF)***

| | S&T Sector Spec. | General Project Officers | Program Officers | Management | Other |
|----------------|------------------------|--------------------------------|---------------------|------------|-------|
| Africa | 23% | 14% | 14% | 44% | 5% |
| Latin America | 24% | 19% | 11% | 36% | 10% |
| Asia/Near East | 30% | 16% | 12% | 33% | 9% |

* Includes International Development Interns; excludes secretarial and clerical staff.

TABLE 2. FIELD S&T SLOTS AS % OF TOTAL BUREAU S&T SLOTS

| | Agric | Hlth/Pop | Educ | Nat. Res/ Environ | H ² O/ Engineering |
|----------------|-------|----------|------|----------------------|----------------------------------|
| Africa | 80% | 83% | 58% | 0% | 94% |
| Latin America | 90% | 80% | 70% | 60% | n/a |
| Asia/Near East | 81% | 81% | 73% | 66% | 90% |

However, if one views the problem in terms of overall S&T resources in USAID, the picture is somewhat different. The S&T Bureau, which does not

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staff field missions, controls 75 health/population professional staff slots and 12 health specialist consultant slots, all in Washington. That is more than twice the health/population field slots in all of the Africa region. Indeed, it is only 9 slots less than all health/population field slots of all operating Bureaus. Similarly, the S&T Bureau controls 22 professional staff slots in energy and natural resources, three times the field positions in these areas.

Thus, the S&T function appears quite field oriented relative to the line operating Bureaus of USAID. Yet, the size of the Washington-based S&T staff in other parts of the Agency indicates that, in some areas, technical capabilities rest firmly on the banks of the Potomac.

A NOTE ON THE RELATIONSHIP BETWEEN PEOPLE AND ORGANIZATION

As in any complex organization with a personnel system based on seniority and grade, the personnel system can be an important factor in how USAID is organized. In order to be promoted, for example, an individual must have supervised a specified number of personnel. If a section of the organization provides too few such managerial slots for the numbers of persons scheduled to move upward in grade, then the promotion system is stymied and staff gravitate away from Bureaus with narrow promotion opportunities and toward those Bureaus which can provide an upward position, perhaps irrespective of technical or geographical background.

The rationale for the structure of the organization, both the number and the size of organizational units, is driven, then, at least in part by the personnel system. While ideal management theory might argue for consolidation of many of the offices and functions shown on the detailed chart of USAID's organization in Figure 1, the need for sufficient slots at particular management levels to allow sufficient promotion may drive in the opposite direction.

PROJECT PROCESS

The 1989 paper on S&T at USAID contained market concentration data for private contractors and for private voluntary organizations doing business with USAID. The point was made that, although many outside organizations are peripherally involved with USAID, the vast majority of actual project activity is concentrated in a relatively small percentage of organizations. This, in turn,

raised a questions as to whether the foreign assistance program was casting a sufficiently wide net in seeking outside expertise and opinion in the actual development and conduct of its S&T programs.

Data for S&T contracting to U.S. universities was compiled from the Office of Procurement for Fiscal Year 1988.⁴ Table 3 provides a detailed summary of the data.

Three-quarters of the dollar value of grants and contracts with U.S. universities was for services in science and technology. The remainder was for work in such areas as anthropology, foreign government management and foreign affairs. The largest single area of university relationships, measured either in terms of numbers of contracts (61%) or in terms of contract value (40%) was in the agriculture sector. The most striking divergence is in the population sector, which accounted for only 3% of university grants/contracts but for 31% of the total dollar value of awards.

In terms of market concentration for S&T grants/contracts only, a pattern similar to that of private contractors and of private voluntary organizations can be seen. A total of 78 U.S. universities received S&T grants/contracts for work with USAID in Fiscal 1988. The largest 12, however, (15% of the university total) controlled 66% of the contract value. Approximately 53% of the 78 universities were involved in \$1 Million or less of USAID activities.

⁴Current Technical Service Contracts and Grants Active During the Period October 1, 1987 Through September 30, 1988," Washington, D.C.: U.S. International Development Cooperation Agency, Agency for International Development, Office of Procurement, Procurement Support Division.

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TABLE 3. UNIVERSITY TA GRANTS/CONTRACTS SUMMARY, FISCAL YEAR 1988

1. Total University Relationship

| | |
|-----------------------------------------------------------------------------|---------------|
| a. Number U.S. Universities with Grants/Contracts | 95 |
| b. Number of University Grants/Contracts | 317 |
| c. Total Value of All U.S. University Grants/Contracts | \$603,916,700 |
| d. Universities as % Total AID Contracts | 5% |
| e. University Grant/Contract Value as % Total Value of AID Grants/Contracts | 14% |

2. University S&T Relationship

| | |
|--------------------------------------------------------|---------------------------------------------------------|
| a. Number U.S. Universities with S&T Grants/Contracts | 78 |
| b. Number of U.S. University S&T Grants/Contracts | 246 |
| c. Total Value of U.S. University S&T Grants/Contracts | \$444,835,200 |
| d. S&T As % University Relationship | 82% of Universities 78% of Contracts 74% of Value |

3. S&T Grant/Contract Size

- a. Average Size Overall - \$1,808,273 per contract
- b. Average Size for Largest Winner - \$12,172,470 (Hopkins)
- c. Largest Grant/Contract - \$44,028,400 (Hopkins/Population)
- d. Smallest Grant/Contract - \$400

4. Sectoral Concentration

| a. Sector | \$ Amt | % Total Contract \$ | No. of Contracts | % Total Contracts |
|-------------------------------------------|---------------|---------------------|------------------|-------------------|
| Agriculture | \$176,263,800 | 40% | 150 | 61% |
| Health/Nutrn/ H ² O | 93,447,500 | 21% | 50 | 20% |
| Population Environment/ Natural Res | 140,003,000 | 31% | 10 | 3% |
| Industry | 19,811,100 | 4% | 31 | 13% |
| Education | 106,000 | .02% | 1 | .4% |
| | 15,203,800 | 3% | 4 | 2% |

TABLE 3., continued

b. Average Contract Size by Sector

| | |
|--------------------------------|-------------|
| Agriculture | \$1,175,092 |
| Health, Nutr, H ² O | 1,868,950 |
| Population | 14,000,300 |
| Environment/Natural Res | 639,067 |
| Industry | 106,000 |
| Education | 3,800,950 |
| Overall AID FY88 Average | 719,599 |

c. Distribution of Contract Value By Sector

| Sector | Number of Universities with Total Contractual/Grant Value | | |
|-------------|--------------------------------------------------------------|---------------|---------------|
| | ≤\$1,000,000 | \$1-5,000,000 | >\$5,000,0000 |
| Agriculture | 34 | 8 | 14 |
| Health etc | 9 | 5 | 6 |
| Population | 2 | 2 | 2 |
| Environment | 13 | 2 | 2 |
| Industry | 1 | 0 | 0 |
| Education | 0 | 3 | 1 |

5. Recipient Market Concentration (S&T Sectors Only)

a. Top Twelve University Winners (Dominant Sectors)

| Name | Total \$ | |
|--------------------------------|---------------|-----------|
| 1. Johns Hopkins University | \$121,724,700 | (Pop) |
| 2. University of Hawaii | 25,911,800 | (Ag/Hlth) |
| 3. Eastern Virginia Med School | 19,690,000 | (Pop) |
| 4. UC/Davis | 18,678,700 | (Ag) |
| 5. North Carolina State Univ | 15,504,100 | (Ag) |
| 6. University of Illinois | 14,996,300 | (Ag) |
| 7. Columbia University | 14,521,900 | (Hlth) |
| 8. University of Nebraska | 14,412,800 | (Ag) |
| 9. University of Georgia | 12,328,200 | (Ag) |
| 10. UC Berkeley | 11,999,300 | (Hlth) |
| 11. University of Florida | 11,035,000 | (Ag) |
| 12. Georgetown University | 11,938,500 | (Pop) |

TABLE 3., continued

b. Top Twelve Concentration

- Total Contract/Grant Value - \$291,938,500
- 15% of the Universities receiving any S&T money control 66% of the resources

c. Further re Concentration

Total S&T Recipient Market Concentration

| Total Amount Received Per School | No. of Schools | % S&T Schools |
|-------------------------------------|----------------|---------------|
| \$100,000 | 11 | 14% |
| \$101,000 - \$500,000 | 20 | 26% |
| \$500,001 - \$1,000,000 | 10 | 13% |
| \$1,000,001 - \$5,000,000 | 11 | 14% |
| \$5,000,001 - \$10,000,000 | 13 | 16% |
| \$10,000,001 | 13 | 16% |

53% of the schools receive \$1,000,000 or less in contracts/grants.

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**DESIGNING AND IMPLEMENTING A MULTIAGENCY PROJECT:
THE VACCINE PROGRAM IN INDIA**

Susan Raymond

This paper was prepared for the October 1990 meeting of the Task Force on Development Organizations of the Carnegie Commission on Science, Technology, and Government, in New York City.

The story of the Vaccine Action Program (VAP) in India, and the associated Vaccine and Immunodiagnostic Development Project (VIDX) project, the latter financed by the United States Agency for International Development (USAID), provides an illustrative case of Federal government cooperation in science and technology (S&T) for development. The initiative for the activity came not from USAID but from the U.S. Public Health Service (USPHS) S&T representative in Delhi. Thus, the case is more revealing in that its origins do not rest in the normal USAID project process. Yet, as will be seen, it ultimately became entangled in that process.

The origins of VAP, the process by which federal agencies became involved, and the uncertain future which it faces illustrate both the potentials and problems of shared federal government roles in S&T for development. The case also illustrates the benefits and the pitfalls associated with government agency management of government agency sponsored projects. Finally, the case underlines the degree to which sophisticated S&T activities in development settings can require extensive amounts of time to come to fruition. In this case,

over five years elapsed between the first discussion of vaccine research needs and the actual flow of dollars for the first research grants.

THE SETTING

The context within which VAP was created is important in understanding its rationale. It provides a lesson that, as Federal government participation broadens to include several agencies, "S&T for development" initiatives do not always emerge merely, or even dominantly, from development concerns.

In the early 1980s, the United States and the Soviet Union were engaged in a struggle for influence in India. While this affected a number of spheres and relationships, science was among the points of contention. Real differences of opinion divided Indian bureaucracies as to the importance and desirability of accessing U.S. technology, with those favoring closer technological ties with the Soviet Union urging slower U.S. cooperation.

Structured links between Indian and U.S. scientists already existed. For example, in the 1980s, an average of 127 Indian post-doctoral scientists were present on the campus of the National Institutes of Health (NIH) in Bethesda, Maryland, second only to those from Japan. As a vehicle for encouraging and expanding such cooperation with the United States, the U.S. and India in 1979 created the U.S.-India Sub-Commission for Science and Technology. This Sub-Commission was to serve as a governmental bridge for scientists from each country to access scientific findings of the other, and to initiate joint research activities. The Commission spanned a range of disciplines including health, the latter via the Health, Medicine and Life Sciences Working Group of the Commission.

The United States in the early 1980s was attempting to use science as a positive mechanism to weave a web of closer relations between India and the U.S. But Indian-U.S. science relations regularly became entangled in security issues, as access to such technologies as the supercomputer raised the specter of possible weapons proliferation. Thus, opportunities for scientific cooperation without security implications were highly valued by both sides as non-controversial vehicles for collaboration.

In this atmosphere of debate and Soviet competition, decisions within the Indian government were difficult to get. Scientific cooperation objectives of the United States were moving slowly, if at all, and controversy was beginning to dominate the agenda. The State Department objective, then, was to find a way

to move science cooperation forward and to publicly present a positive achievement toward that end. An opportunity to do the latter was seen to be the meeting between President Ronald Reagan and Prime Minister Rajiv Gandhi in 1985. In this high-level environment, the announcement of a significant step toward closer collaboration would draw positive attention in both countries. The question was, what to showcase?

VACCINE ACTION PROGRAM: THE INITIAL CONCEPT

Two simultaneous paths converged in the ultimate VAP/VIDX activity, one pursued by the Public Health Service (PHS) via its science advisor at the U.S. Embassy¹, and one pursued independently by USAID.

Figure 1 provides a time line of events and decisions surrounding the VAP/VIDX effort.

THE PUBLIC HEALTH SERVICE

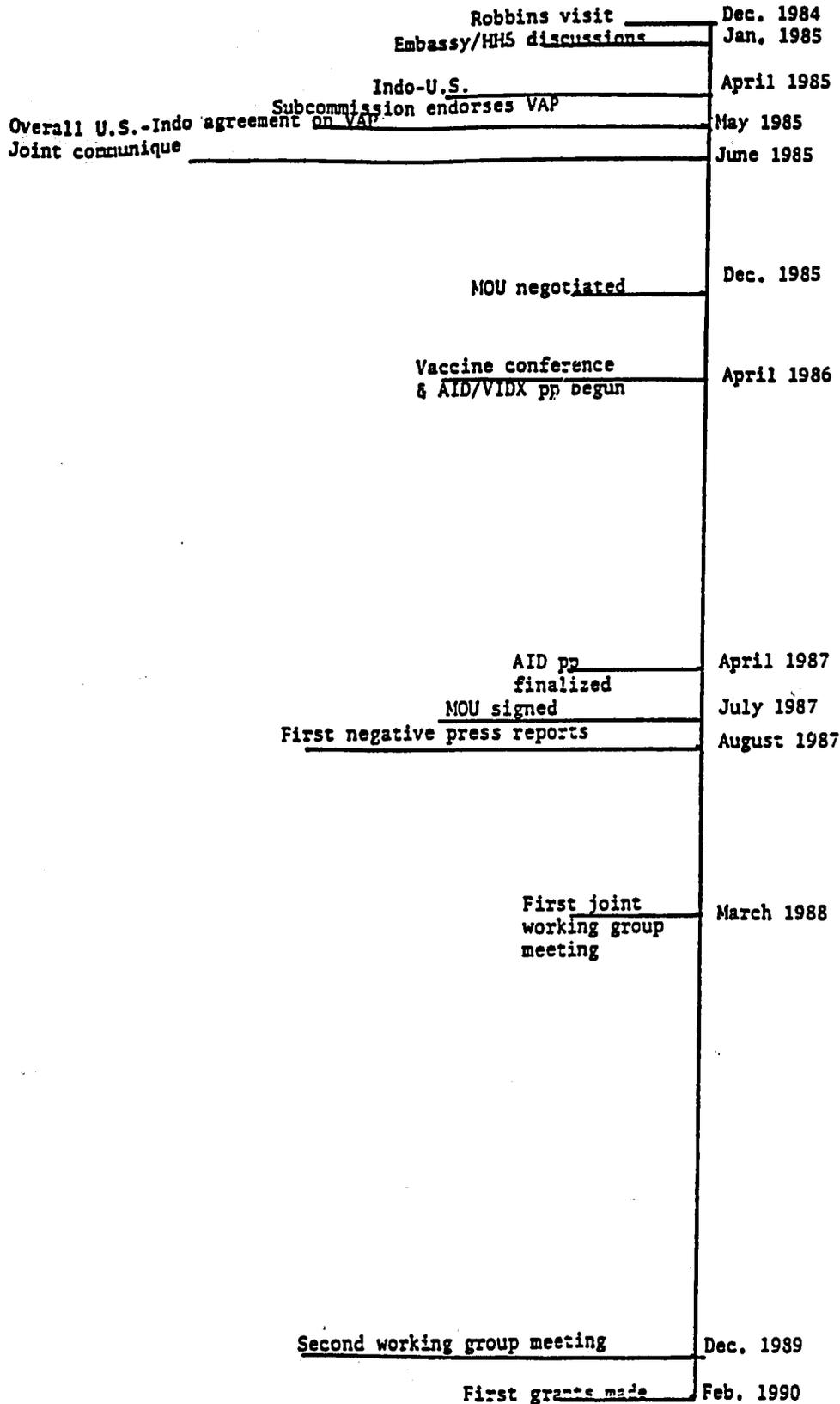
At the U.S. Embassy, considerable effort was going into developing possible areas for scientific cooperation. The critical participants were Ahmed Meer, the science counselor, and Philip Shambra, posted from the U.S. Public Health Service (PHS) to oversee medical and health science cooperation. In late 1984 and early 1985, visits to India by Dr. Fred Robbins of the Institute of Medicine (as part of an ongoing program of Nobel Laureate visits to India) and Dr. George Curlin of the PHS, then with the Office of International Health of the Department of Health and Human Services, prompted discussion of health care in general and vaccines in particular.

Robbins was particularly struck by the high rabies incidence and mortality in India and the need for a rabies vaccine. His discussion of this particular need was the trigger for subsequent Embassy interest in vaccine linkages.

For his part, Curlin was to become a key actor in bringing Federal agencies and the Indian Government together. He not only knew the ins and outs of the PHS, he had also worked at USAID, both in Washington and in the

¹The health and medical science advisor in Delhi is the last of a diplomatic breed. Advisors used to be stationed also in Paris, Buenos Aires and Tokyo. The original rationale was to provide outreach to scientists in those countries to encourage links to U.S. counterparts. Now the State Department fields science attaches, and the specific medical science advisors are no longer considered necessary.

FIGURE 1. TIME LINE



USAID/Delhi mission. Moreover, he had worked at the Cholera Research Laboratory with Indian counterparts, and so could quickly identify the individuals in the various agencies who might be interested in the project idea.

Breakthroughs in biotechnology had stimulated renewed interest in vaccine development, and thus vaccine development had dominated the discussions of the Subcommittee's medical working group. Aware of both the technical innovations and the Working Group's deliberations, Curlin suggested that vaccines might be useful undertaking. It was also felt that the Indian Government would be receptive since cooperative vaccine development would not carry with it such an emphasis on Indian poverty, a subject of some sensitivity, as did the traditional development assistance areas of food and nutrition.

Shambra saw this opportunity as one which could draw together multiple pre-existing health science relationships, could create closer India-U.S. cooperation, could work in a relatively non-controversial area (child health), could be sufficiently attractive to serve as a public demonstration of close U.S.-India relations, and, thereby, could speed up existing interests and activities. There was some perception of urgency if the vaccine link was to be made since both the Soviet Union and France were discussing with India the initiation of vaccine research relationships.

On this preliminary basis, a series of events were set in motion. In 1985, Dr. Curlin happened by chance to be in Geneva at the same time as Dr. Ramalingaswami, Executive Director of the Indian Medical Research Council, the most respected medical research organization in India. Dr. Ramalingaswami was well known in international development circles and was to become a key player in the evolution of Vaccine Action Program.

Curlin broached the vaccine program idea with Ramalingaswami and emphasized that it was to be a true collaboration of scientific partners, not a traditional, philanthropic development assistance program. Ramalingaswami responded positively. He returned to India to build support in the Indian Government. Curlin, anticipating the Indo-U.S. S&T Subcommittee meeting scheduled for April 1985 and looking toward the June 1985 Gandhi visit, immediately assembled a planning group at the National Institutes of Health comprised of the key Indian and American actors to agree on the outlines of a VAP effort.

Meanwhile, Curlin also proceeded to develop a concept paper for a "Vaccine Action Program". The concept paper developed by PHS and USAID/Delhi outlined an initiative which would cover the full breadth of vaccine availability in India, encompassing basic research, production, and immunization. The VAP overall thus has the following components:

1. **Research and development on new and improved vaccines**
 - collaborative research on high priority vaccines
 - basic research leading to development of prototype vaccines for diseases of importance to India
 - research on improved manufacturing technology
2. **Development of rapid diagnostics technology**
3. **Clinical and population-based research**
4. **Research on vaccine delivery issues**
5. **Vaccine production and quality control**

A hurried series of meetings resulted in Indian-U.S. agreement on the Program. In April 1985, the Indo-U.S. Subcommittee on S&T endorsed the development of a bilateral Vaccine Action Program. Between April and June, U.S. and Indian officials worked to develop the overall structure and content of the Program. Involved from the U.S. side were NIH, the Centers for Disease Control (CDC), the Food and Drug Administration (FDA), and USAID/Washington. Indian participation was limited to the Indian Medical Research Council. The Ministry of Health was not involved at this point.

Because the overall cooperative vaccine effort was working toward an announcement by President Reagan and Prime Minister Gandhi, the Office of Science and Technology Policy (OSTP) of the White House became involved. OSTP wanted to ensure that lines of authority were clear within the U.S. Government. It was thus agreed that USAID/Washington would accept responsibility for chairmanship of the bilateral committee of the Program and that PHS would have responsibility for day-to-day management of the technical program.

In June of 1985, support for the VAP was announced in the official joint communique of Prime Minister Gandhi's state visit. Immediately following the announcement, a draft Memorandum of Understanding (MOU) was circulated for clearance within the U.S. and shared with Indian principals. From the U.S. side, principals involved were staff of USAID/India, the Office of International Health of the Department of Health and Human Services (DHHS), and the U.S. Embassy Science Office. The Indian representatives came from the Indian Council of Medical Research, the Ministry of Health and Family Welfare, and the Department of Biotechnology of the Ministry of Science and Technology.

Thus far, the cooperative effort had moved rapidly, with less than a year having elapsed between initial discussion and the draft MOU. At this point, however, the process began to slow.

In December of 1985, the negotiated MOU was cleared by the U.S.

Government, but the Government of India delayed approval. Exact reasons for the delay are unclear. India finally designated the Department of Biotechnology as the responsible Indian lead agency, and approved the MOU in July of 1987, nearly a year and a half after the U.S. approval. The MOU was signed on July 9, 1987 by the U.S. Ambassador and the Secretary of the Department of Biotechnology of the Indian Government.

The way was cleared for action. The problem, of course, was that, whatever the official agreement to cooperate, the Public Health Service had limited resources to put behind such a venture. PHS did control a rupee fund in India which reflected sales of PL480 surplus foods. In addition, the Indian Government could contribute rupees toward the activity. But dollar-denominated assistance was necessary to pay the costs of U.S. participants, travel of Indian participants, meetings, materials, and Indian participation in U.S. institutions.

PHS had no such funds. It does not even have authorization for such expenditures. The logical partner was USAID.

AGENCY FOR INTERNATIONAL DEVELOPMENT

In the early 1980s, USAID was annually committing approximately \$80 Million per year to development programming in India. The assistance program was focused on agriculture (including irrigation), population, and health. In addition, the U.S. development presence was bolstered by a \$100 Million Food-for-Peace program of grain sales which generated local currency for development programs. At that time, there was no anticipation that funding levels would be significantly reduced, as, in fact, they subsequently were. Project development for the future, then, was proceeding along normal USAID routine and new project opportunities were being examined.

USAID in India had been involved historically in rural health and primary health care. Funding cycles were such that the mid-1980s provided an opportunity for new programming in health. Thus, the Delhi USAID mission was examining possible new project initiatives at about the same time as PHS was honing in on the vaccine program, although the two efforts were entirely separate. It should be noted that, for purposes of its health and population programming, USAID's primary Indian counterpart was the Ministry of Health. In contrast, the VAP lead agency, the Department of Biotechnology, was part of the Ministry of Science and Technology. Thus, USAID's Indian counterparts and those of the PHS were different, and one did not necessarily know of nor approve the plans of the other.

USAID/Delhi's program options at this time were heavily influenced by its need to respond to the Child Survival Program established in Washington which placed child survival (particularly oral rehydration therapy and immunization) at the pinnacle of priorities of the Agency's health sector. In Delhi, initial thought was given by USAID to pursuing the immunization component of the Child Survival Program.

At that time, most vaccines used in India were imported entailing significant foreign exchange expenditures. About the only local source of high quality vaccine was the Puna Serum Institute, a private venture. Quality in the only other public production center, the Hafkin Institute in Bombay supported by the Soviet Union, was falling. A third option, the Central Drug Research Institute in Lucknow which carried out quality testing for vaccines, did produce some vaccines but was located on a mountaintop and could not be enlarged to expand production. USAID was working with NIH and that laboratory, however, to determine how quality testing could be improved. Thus, there was some USAID/Delhi experience in working with NIH scientists.

In sum, USAID, together with the Ministry of Health, was considering adding some type of immunization project to its portfolio in the early 1980s, perhaps focused on production of measles and polio vaccines, improved quality control and expanded local immunization programs.

INTERESTS MERGE

Much of what happens in the field in development assistance is driven by personal relationships. It so happened that the USAID Health Officer in New Delhi at the time, Dr. Rogers Beasley, was a friend of Philip Shambra's predecessor. In Shambra's transition, then, Beasley became acquainted with Shambra and heard his ideas about S&T collaboration in general and vaccines in particular. Beasley was receptive to the VAP idea since it fit into the Mission's programming needs and budget timing, and since USAID/Delhi was already working with NIH on quality issues.

Because the VAP project was seen as drawing together U.S. Government and Indian Government cooperation, there was no discussion or anticipation of soliciting (or needing, given USAID's size at the time) outside foundation or private money to finance VAP.

PROJECT VIABILITY

USAID mission officers were predisposed to cooperate with PHS in the vaccine initiative. The USAID Mission Director, Owen Cylkie, was particularly supportive, and, indeed, has a reputation for being interested in innovative programming. Others at the mission saw the vaccine opportunity and, based on some exposure to NIH, were comfortable with a project containing a significant level of technical research. Beasley notes that "NIH, PHS and the State Department had a vision that fit together well with the Mission's needs and priorities. USAID/Delhi had been going at immunization on a piecemeal basis, but the others had a singular vision (the VAP) into which the pieces could fit."

Having decided to support the VAP option, the Mission then notified Washington of the parameters of a new project in cooperation with PHS.

In order to participate, USAID decided to finance a project which would contribute to part of VAP's goals but would be more narrowly cast. Although other forms of transferring resources to developing countries are available to USAID (e.g., direct cash transfers, commodities support, etc.), the use of projects (with financial expenditures tied to specific actions or outputs) is by far the most common assistance mechanism.

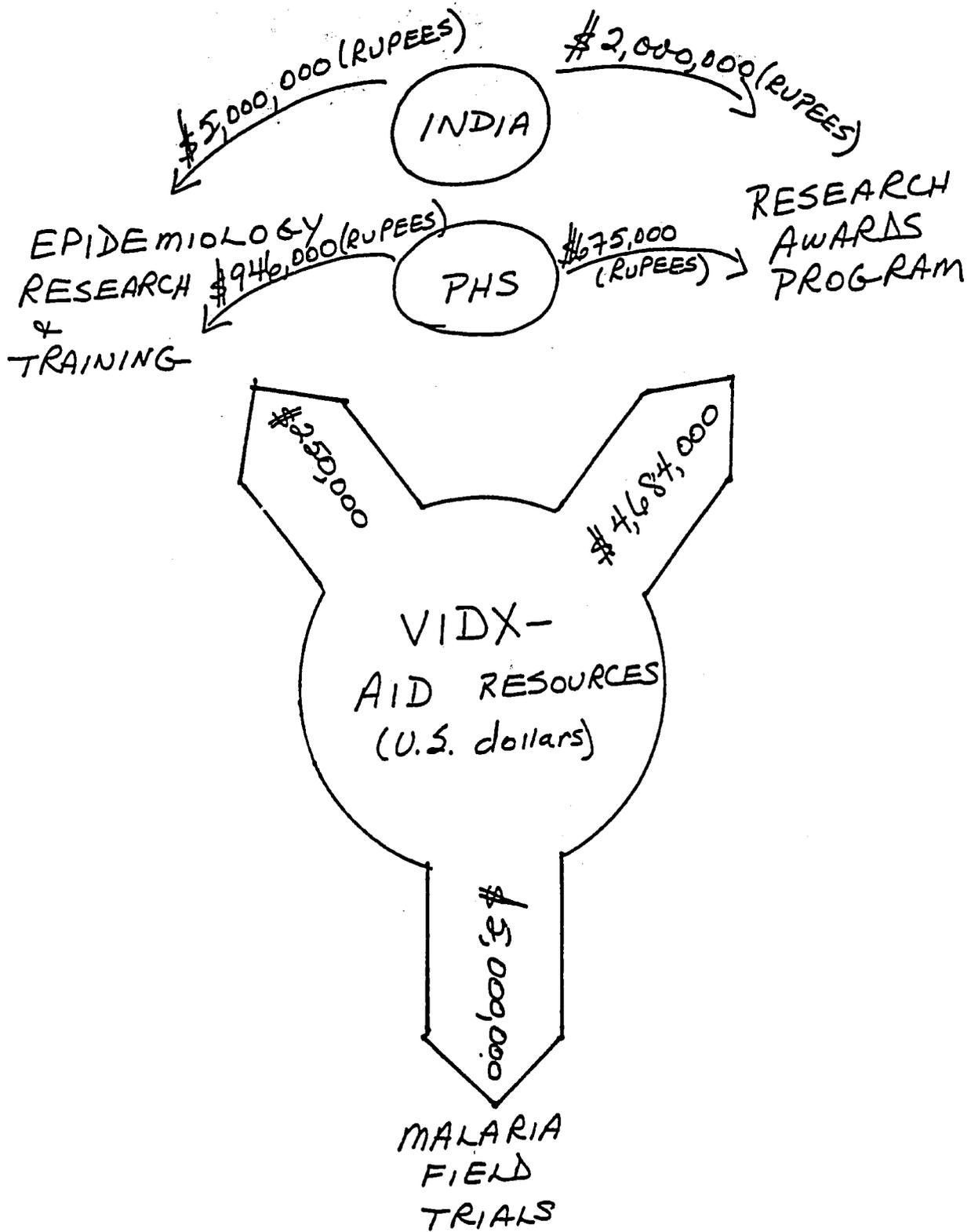
"Projectizing" USAID's support involved a series of steps, all in response to USAID's own internal bureaucratic requirements. These steps represented the normal pathway followed by an internally generated USAID project. Thus, as a vehicle for its own participation, USAID created the Vaccine and Immunodiagnostic Development Project (VIDX).

The VIDX Project Paper (PP) was developed by George Curlin of the Fogerty Center at NIH and Diane Swaine, then with USAID/New Delhi. The technical work for VIDX, then, reflected PHS/NIH skills and the efforts of the field mission, not those of USAID's S&T Bureau per se. The elapsed time between initial PP development and final project approval was one year, a relatively quick turn-around time for an USAID project.

The PP specified a project focused on three aspects of the VAP, research awards, support for epidemiology training and research, and (because USAID was in need of trial sites for its malaria vaccine candidates financed by a separate project) malaria field trials.

Figure 2 provides a summary of the components, actors and money involved.

FIGURE 2. VAP/VIDX: INTERACTIONS OF PARTICIPANTS AND FINANCING



The Project had three components:

- (1) a research awards program for bench, clinical and field research to develop new and improved vaccines and rapid diagnostic technologies. Protocols were to be jointly developed and carried out by Indian and U.S. collaborators.**
- (2) Phase III malaria field trials of vaccine candidates permitting natural mosquito challenge to support USAID's \$45 Million malaria research project separately managed by the Agency's S&T Bureau.**
- (3) establishment of a Center for Epidemiology Research and Training at the Tuberculosis Research Center in India controlled by the Indian Medical Research Council.**

It will be recalled that the VAP program was far-reaching and involved a much greater range of concerns than contained in the VIDX project. The problem in translating breadth of VAP into the specificity of VIDX involved a combination of the more narrow USAID program emphasis (action-oriented child survival) and its normal linkage to the Indian Ministry of Health.

Because USAID is a bilateral institution, its counterpart is normally a national government entity. In health, this had traditionally been the Ministry of Public Health, not the Indian Medical Research Council nor the Ministry of Science and Technology. The Ministry of Health, of course, had broader concerns than the VAP, and, indeed, was less taken with the research aspects of VAP than the immediate problems of vaccine delivery systems. Moreover, the designation of the Ministry of Science and Technology as the VAP counterpart may have introduced a certain institutional rivalry with the Ministry of Health in determining the content of an USAID support project. Thus, the development and approval of VIDX was complicated. Given these factors, the ability to get Ministry of Health concurrence was simpler for a more limited set of components than for a more ambitious, all-encompassing whole run by a non-Ministry of Health Indian Government entity.

Not all the complications were in India, however. While the USAID Mission in Delhi subscribed to the technical analysis, USAID/Washington did not at all share the vision. While the Asia/Near East Bureau was supportive, opposition in Washington was particularly intense in USAID's S&T Bureau. USAID/Washington wanted a classical child survival project with oral rehydration salts distribution and an immunization campaign. The S&T Bureau had been

clear about this simplicity in its Child Survival instructions to the field Missions. Biomedical research collaboration fell far outside the boundaries of those instructions. Furthermore, USAID/Washington staff included only a limited number of scientists and few physicians. Most were in field positions.

Technical discussions of the need for and viability of the project within the health priorities of India and the S&T diplomatic setting were strained. From the perspective of PHS and the field, Washington was having difficulty understanding what the PHS scientists were saying about the nature of the India vaccine problem and about a solution based on research and vaccine development rather than more traditional mass immunization programs.

Indeed, the issues paper about the project which reflected Washington's concerns reveals this tension. The key first issue involved the relationship between the vaccine project and child survival, holding that concern with such areas as hepatitis and malaria did not impact on child mortality. Other issues revealed confusion over the nature and process of peer review, as well as complete confusion over the meaning of the term "protocol". In discussions with Washington, Mission personnel were also told to leave out such terms as "epidemiology" which no one would understand.

But the debate was about more than technical merits. In a traditional USAID project, USAID has considerable control over project management, even if actual implementation is carried out by a contractor. The very existence of a contract makes implementation answerable to USAID. In the case of the VIDX project, however, USAID money was not matched with USAID control. The technical board would be USAID-chaired, but would be dominated by Indian and U.S. scientists and NIH, with participation by other Federal agencies. The role of U.S. secretariat would be assigned to OIH/DHHS.

For its part, DHHS anticipated its role as being a partner with USAID, not a contractor to it; no VIDX funds were allocated to reimburse DHHS staff time or overhead. For its part, NIH would run the grants program and make technical decisions about research, not USAID. In effect, except for Board chairmanship, USAID/Washington was to be cast as the funder of the activity, but the manager of only administrative paper. It was a role with which USAID/Washington was not totally comfortable. In part this was because USAID itself had significant technical experience in India. Indeed, its field experience was deeper than anywhere in DHHS. Moreover, whatever the administrative or bureaucratic division of technical responsibility, it would be USAID, not NIH, DHHS or the Indian Government that would be held accountable to Congress for the details of project expenditures and the results flowing therefrom. With a marginal

managerial or supervisory role, this left AID vulnerable in the event of problems or failures.

The ultimate project approved was budgeted at \$18.621 Million, with 39% financed in rupees by India, 9% by PHS in rupees, and the remaining 52% financed by USAID in U.S. dollars, including the buy-in from the USAID/Washington S&T Bureau specifically for malaria vaccine testing.

Distribution of financial flows over Project activities is summarized in Table 1. To date and although VAP anticipated a broad vaccine program, the VIDX grant is the only operating content of VAP.

TABLE 1. DISTRIBUTION OF FINANCIAL FLOWS OVER PROJECT ACTIVITIES

| | \$ ('000) | % of Line Item Funding | | |
|--------------------|-----------|------------------------|-----|-------|
| | | AID | PHS | India |
| Research Awards | 7,359 | 64% | 9% | 27% |
| Ctr for Epidemiol. | 6,162 | 4% | 15% | 81% |
| Malaria Trials | 5,000 | 100% | - | - |
| Evaluation | 100 | 100% | - | - |

THE ROUGH ROAD TO PROJECT IMPLEMENTATION

Although the VAP had been announced in June of 1985, a U.S. MOU approval obtained in December 1985, an Indian MOU approval and signature in July 1987, and an USAID Project approved in April 1987, the inaugural meeting of the Joint Working Group of the VAP did not take place until March 1988, three years after the first PHS discussions in Delhi. On the U.S. side, the Working Group included broad U.S. Government participation, USAID, FDA, PHS, NIH, CDC, and the U.S. Embassy and State Department.

Once the VAP was announced and the VIDX Project paperwork had been initiated within the USAID process, two critical problems were thrown in the path of the effort.

In August 1987, immediately after the joint signature of the MOU, a series of articles highly critical of the VAP was launched in the Indian Press. In essence, the opposition argument was that the VAP represented an effort by the United States to test dangerous vaccines on the Indian population and to manufacture and sell in India vaccines that would not be approved for use in the U.S., all to the profit of U.S. multinational corporations. The press hinted that the U.S. was interested in the findings for purposes of developing biological warfare tools. This accusation had periodically been made by the Indian Communist Party since 1974 and had been applied to a number of development initiatives including mosquito eradication campaigns supported by the U.S. A similar biological warfare controversy had forced the closing of several development activities in the 1970s.

The initial accusations against VAP were picked up by all of the English language press in India, spread to Hindi publications, and eventually received coverage in international science journals. The Government of India, assisted by the U.S. Science counselor and the PHS, mounted a vigorous defense. The defense of the program in Parliament ultimately quieted the uproar, but only after over a year of controversy.

A second point of delay involved the fine print in the MOU. The MOU was critical to both VAP and VIDX since it both authorized the Program and was specified by USAID as a condition precedent of the VIDX Project. The reasons behind the delay in signature on the part of India are not clear, although they probably have to do with developing a consensus in the GOI over close involvement with the U.S. as well as with a lack of a sense of urgency in the Ministry of Health. However, one critical aspect of the MOU continues to represent a barrier to the Project, and may prove its undoing.

The MOU specifies that no aspect of the Program will begin until the two sides have agreed on the text of Annex 2 regarding intellectual property rights (IPR). In the mid-1980s, no one involved with the VAP thought that such a clause would present a barrier to implementation. Times changed. The annex was never developed. Drafts by the U.S. have been rejected by the Indian Government which itself has offered no alternatives. Meanwhile the subject of IPR has risen to the top of the U.S. agenda with India, with the VAP/VIDX activity in clear jeopardy.

The Office of the Special Trade Representative established a policy in 1987 specifying that U.S. assistance of support for S&T projects in India be held in abeyance until an overall IPR agreement was reached with the Indian Government. Since the IPR Annex of the MOU was not completed, this left the VAP/VIDX effort vulnerable to cancellation. VAP did not have sufficient IPR

protection, in the view of the Special Trade Representative, nor was it appropriate to negotiate a specific IPR annex for the MOU outside of the overall IPR negotiations between the two governments.

The PHS/USAID position is that the VAP agreement predates the sanctions of the Special Trade Representative and should not be grandfathered into the U.S. IPR negotiations. The PHS/USAID view is that it thus can appropriately be carried forward and its IPR aspects negotiated separately from the overall U.S. Government debate with India.

CURRENT STATUS

The first meeting of the Joint Working Group of VAP, another condition precedent to VIDX, was held in March of 1988; the second in December of 1989. The first research grant money flowed in February 1990. The slow progress appears to be a function of the lack of Indian experience with research grant review using NIH guidelines.

The grants process for VAP is now a formal part of the NIH grant review process, and VAP/VIDX grants have to conform to NIH research proposal criteria so that they are legitimately reviewed. Thus far, nine research grants have been made.

There has been no disbursement at all in either the epidemiology or the malaria component of the VIDX project.

There has been preliminary discussion of a VIDX II follow-on project. Two barriers stand in the way, however. The first is the still-unresolved IPR issue. The Joint Working Group at its meeting of August 1990 moved that USAID and DHHS request the Special Trade Representative to authorize these two agencies to negotiate a separate IPR agreement with India for purposes of the VAP. Whether or not STR will change its previous position upon such a request is unclear.

The second barrier is the changing nature of the USAID relationship with India. USAID has reduced its program in India by 75%. The annual program now totals less than \$20 Million (the majority of which is taken up with meeting the costs of existing activities). The programmatic emphasis is now on the commercialization of technology, working in closest partnership with the private research and business sectors, not with government entities such as the Medical Research Council. It is not clear that continuation of VIDX or vaccine research

will be considered a priority in a reduced program, particularly if it raises controversial IPR issues.

SOME LESSONS LEARNED

The current VAP/VIDX effort, although facing an uncertain future, is generally considered to be a positive force in scientific cooperation. One can draw a variety of lessons on Federal Government coordination from its experience.

1. Positive technical S&T relationships across the U.S. Government are possible in support of development.
2. A science presence in the field can be critical in identifying the opportunities for S&T/Development relationships that serve both U.S. and local interests.
3. Technical literacy at USAID/Washington is important if Federal government relationships are to proceed smoothly; it is equally important if central policy is to be responsive to the problems seen first hand in the field. As S&T projects become more complex, the prerequisite skills of USAID staff may no longer be rural living experiences in developing countries, but may more importantly be well-honed scientific competency.
4. Overly generalized solutions identified by central offices may hamstring S&T opportunities seen in the field.
5. Development assistance is by nature a difficult business to be in. Good projects are hard to find, and even good projects can be sidetracked by the vagaries of events. No matter how valid the scientific base, project design must be far-sighted, anticipating problems in a wide range of areas, most of which (e.g., public relations or the law) may not have scientific bases.
6. Successfully allocating development funding for S&T projects is not the same as successfully spending it. The VIDX Project

remains under-disbursed, with two of its three components inactive.

7. S&T project development has been exceedingly lengthy. The time span to operations is not, however, necessarily a function of USAID's project process. Of the five-year elapsed time in VAP/VIDX, only one year is accounted for by the USAID project paperwork.
8. Long-term spending can be critical to S&T for development. But, any areas of S&T cooperation which might involve policy controversy will be vulnerable in terms of long-term spending. There are more development assistance opportunities than there are dollars. The opportunity costs of controversy are high and can eliminate otherwise productive projects.

SCIENCE AND TECHNOLOGY FOR DEVELOPMENT: LESSONS FROM EXPERIENCE IN DEVELOPMENT ASSISTANCE OUTSIDE THE UNITED STATES

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INTRODUCTION

In the ten years since the topic of science, technology and development was last subject to searching reexamination in the United States, the map of development and development assistance has been transformed. The Pacific Rim has exploded, Latin America and Africa have nearly collapsed, the OPEC bubble has been pricked, commodity exporters are in serious trouble, China has briefly flowered, and the USSR and Eastern Europe have been recognized to be (in their civilian domestic economies) in some ways another group of less developed countries.

On the donor side, Japan and Italy have emerged as the big new players, European donors continue much as ever, while the United States has sharply curtailed its role outside of a few favored countries in strategic locations. The great private foundations have for the most part not undertaken to pioneer new ideas in development assistance, leaving the development assistance agencies themselves with the double task of both trying out new ideas and implementing them on a large scale.

Technology has played an important role in this reshaping of the development map. The success of the "Gang of Four" (Korea, Taiwan, Singapore, Hong Kong), now being emulated by the rest of the Pacific Rim, is largely due to a "fast learner" strategy based on the ability to absorb and master imported technology. This strategy in turn owed its success, not only to explicit provisions for the building of scientific and technological capacity, but also to economic policies that encouraged the growth of export-oriented private industry. The example set by these countries has forced countries which once looked to protection and government regulation as the keys to development, to face up to the need to encourage private industry if they are to compete internationally and are not to stagnate or decline.

Here, as elsewhere, the impact of technology depends on a host of economic, political, and institutional forces which are difficult to assess even when technology is advancing at a relatively modest pace. Technology assessment becomes much more difficult against the background of the revolutionary changes in informatics, biotechnology, materials, communications, and manufacturing technology that have changed the structure of whole industries in the space of a few years.

These new technologies open new possibilities for resolving hitherto intractable problems in traditional development sectors: birth control, disease control, isolation from sources of information, to cite a few examples. But for most developing countries, now even more than in the 1970s, scientific and technological development is like catching a rapidly moving train before it rolls over you.

In the light of these revolutionary changes, the structure of development assistance in science and technology has been remarkably stable. To be sure, there have been a few changes in sectoral priorities in response to changing conditions (and in a few cases, to belated recognition of long-standing problems). Environment is in, energy is on hold. But the traditional priorities of the development community are for the most part still intact: agriculture, infrastructure, health and population, basic education. Major changes in technology have been absorbed only insofar as they impact directly on these traditional sectors, especially agriculture and health. Even environment has been treated more as a crisis than as an area for scientific study and technological advance. Telecommunications remain a stepchild, while computers have been addressed mainly in the context of agency management and project administration. The perilous state of universities and other issues related to higher level manpower still receive relatively little attention.

To be sure, agriculture, health and infrastructure are still problems worthy

of major attention, especially in the African and other poor countries which are the focus of development assistance. On the other hand, one may reasonably ask whether the momentum of existing programs and the structure of decision making have precluded development assistance agencies and other policy makers from responding to the challenges and opportunities created by scientific and technological change.

The most difficult of these challenges is posed by the complex issues surrounding innovation and industrial competitiveness, in both advanced and less advanced developing countries. To deal with these issues requires simultaneous attention to economic policy, industrial policy and structure, capital markets, and the relations between government and industry, in addition to specific attention to human resource, technology forecasting, research, technical services, and the relations between universities, laboratories, and their clientele in the productive sector.

These contentious but critical issues have been on the back burners of the development assistance agenda for at least a decade. They have gained new prominence, not only because of the success of the "Gang of Four", but also because of the realization that the exploitation of the new technological developments will take the form of new products, services and processes commercialized by private industry.

GOALS OF THIS PAPER

This paper will reflect on the 40-odd years of experience of bilateral and multilateral agencies outside the United States, will place the United States' efforts in international perspective, will describe approaches to scientific and technological issues and programs that may have useful lessons for the structure of the U.S. Government's policy-making and program management, and will identify gaps and structural deficiencies that make it difficult to deal with science and technology issues.

The nature of this document, particularly its brevity, requires quick impressions, overgeneralizations and oversimplifications. For all of these, the forbearance of the reader is solicited. Quantitative justification for the observations made is also notably absent. Statistics are often not kept in a manner that would facilitate review of the issues under discussion.

As a first approach to this work, two exercises were carried out. The first was a set of quick reviews of bilateral and multilateral programs, in order to learn

how they incorporated scientific and technological concerns into their decision making processes. The second reversed the telescope, and examined what kind of decision making apparatus would be required to consider the issues surrounding each of a series of proposals, which might arguably make sense as development assistance initiatives for the 1990s. Each of these exercises is described in turn.

A QUICK REVIEW OF SOME EXISTING BILATERAL AND MULTILATERAL PROGRAMS

In order to get a quick impression of how technological issues are handled in multilateral and non-U.S. bilateral development assistance agencies, reviews of the following programs were done:

- (1) The World Bank
- (2) International Development Research Center (IDRC)
- (3) Canadian International Development Agency (CIDA)
- (4) Japanese International Cooperation Agency
- (5) Japanese Overseas Economic Cooperation Fund (OECF)
- (6) World Health Organization (WHO) Tropical Diseases Research Program
- (7) WHO Program of Research Related to Human Reproduction
- (8) United Nations Children's Fund (UNICEF) Programs related to Maternal and Child Health

These programs were chosen for review because they illustrate the role of one of the major new actors on the development assistance stage (Japan), the potential role of the multilateral financial institutions (World Bank), and the conduct of donor relations with less developed country (LDC) researchers (WHO and IDRC) and with private industry (WHO). A summary of the policy-making

procedures of the Consultative Group on International Agricultural Research (CGIAR), which is arguably the most important research initiative relevant to the scientific and technological problems of the LDCs, will also be prepared.

Briefly, both Japanese (OECD) and Canadian (CIDA) bilateral assistance provide capital assistance for development projects which finance the application of conventional technology. The Japanese committed some \$6 Billion in capital and technical assistance in 1988; the Canadians, about \$2 Billion. In these agencies, technology is a matter of project design rather than agency or country strategy, and is provided by private consultants, construction companies, or equipment suppliers, with some review by staff engineers or short-term experts engaged by the agency. Building of technological capacity within the LDC is carried out through provision of experts (technical assistance) as part of the project.

IDRC, in contrast, is a research funding agency with an international board, an experienced and dedicated staff, and an excellent reputation for responsiveness to the wishes of local researchers. Its major purpose is to build research capability in developing countries. Perhaps as a consequence, it has not been as effective in seeing to the commercialization of the results of successful projects. It also has relatively little contact with CIDA, whose priorities are in rather different directions.

The Research Programs Related to Human Reproduction (HRP) and Tropical Diseases (TDR) of the World Health Organization (WHO) finance mission-oriented, state-of-the-art research on biotechnological problems of critical importance to LDCs. These programs are managed by the scientists themselves, through a system of scientific working groups that use business-like management techniques, yet are at the same time insulated from political pressures from inside and outside WHO. The members of the working groups are chosen by WHO staff, who themselves are experienced experts in the field and have the respect of both industry and academia. Experts from industry are readily available, and cooperation with industry relatively problem-free, in large part because neither TDR or HPR operates in commercially attractive areas, TDR being involved in diseases of poor people and HRP being linked to the legal and political complications of human reproduction.

The operations of the World Bank involve such a large sum of money (\$21 Billion of commitments of the Bank and IDA in 1989) that even the relatively small sums it devotes to science and technology have a major impact. These chiefly take the form of loans in support of national systems of agricultural research and to science and technology education at the high school level. The Bank has on a few occasions devoted major staff and financial resources to

projects to build scientific and technological capability in Brazil and China, and supported pioneering programs in industrial technology in India, Korea and elsewhere, using a mix of policy reform and direct support to industrial research and technical services. The Bank also mobilized financial and technical support to the CGIAR, the TDR, and the HRP, and has carried out research and testing of low-cost technologies, e.g. for feeder road construction, handpumps, and sanitation.

CONCLUSIONS

Of the organizations surveyed, several have attained considerable degrees of success. IDRC has supported a great deal of worthwhile small-scale research endeavors in LDCs, with notable sensitivity to the needs as seen and expressed by the researchers themselves. The World Health Organization has marshalled the talents of world-class medical researchers to fight diseases of hundreds of millions of people who are themselves powerless to attract the scientific and technological resources they need. The World Bank has effectively promoted research, technology transfer, and institution building in cases where large sums of money were needed, where a close integration of economic and technological programs and policies were required, or where a broad international overview was needed of the scientific and technological problems common to a sector.

Other organizations worth examining include the Swedish SAREC, a smaller version of IDRC; the Third World Academy of Sciences; the International Telecommunications Union and World Meteorological Organization of the United Nations (UN); Appropriate Technology International; Science for the People, a Geneva-based non-governmental organization which promotes the transfer of low-cost technology to LDCs; the various spin-offs of the Intermediate Technology Development Group; the UN Fund for Science, Technology and Development and the Global Programs of the UN Development Program (UNDP); and the specialized programs of the United Nations most directly concerned with science and technology, UNESCO and UNIDO. A survey of LDC-based non-governmental organizations active in science and technology would also be useful.

In each case, the examination should be carefully focused on lessons for the United States in its reexamination of its own organization and decision-making. In most cases, a field trip would not be necessary, as knowledgeable sources can be located in the United States or by overseas telephone.

The obvious importance of technology to the explosive growth of the

Pacific Rim countries has led to insistent demands by other Asian countries, and by countries in other regions as well, for assistance in national technology policy and in the firm-level management of technology. Although both Japanese bilateral aid and the World Bank have responded to individual requests -- the Bank's record here is of particular interest and originality -- neither has devoted the resources that would be necessary to develop a consistent policy or approach. More generally, no development assistance agency has fully come to terms with the changes wrought by the new role of technology in the development of the more advanced developing countries, and (we would argue) in the less advanced countries as well.

A THOUGHT-EXPERIMENT: PROBING FOR GAPS IN THE DECISION-MAKING STRUCTURE

As a second exercise to probe for possible gaps in the decision-making structure of development assistance agencies, we posed a series of proposals for new programs and policies in development assistance, which address major priority areas in science, technology and development. The aim was not so much to promote the particular proposals--though anyone is free to promote them if they are deemed worthwhile--but rather to use them as "thought experiments" to explore the decision making structure of development assistance agencies.

For each such proposal, the following questions were posed:

- (1) What existing entity is at present equipped, or alternatively could equip itself, to finance and/or carry out such a program?
- (2) What existing entity is at present set up to consider whether such a program would make sense: i.e., whether the problem really exists, whether it has a serious claim on resources, what is the broader situation of which it is a part, whether the proposal would be the most effective to deal with the situation (or indeed, would be effective at all), and if not, what would be a more effective approach?

To repeat, the focus was not on the merits of the proposal, but the purpose was rather to see what kind of entity would be needed to consider the issues it raised, and to execute the program if it passed the appropriate tests.

The following propositions were considered:

- (1) New organizations are needed, on the model of the CGIAR, to deal with research problems of global scale in areas such as the environment.**
- (2) A major effort is needed to restore the collapsed universities of Africa and Latin America.**
- (3) A world-wide network of user-oriented technological information services is needed to assist small and medium sized enterprises in LDCs to refine the requirements for information and then to link them to sources of information and technology in the advanced countries.**
- (4) A mechanism is needed to finance the development and commercialization of "orphan" technologies that would be of great benefit to developing countries but that would not be privately profitable due to various imperfections (e.g. improved rickshaws).**
- (5) Research is needed on alternative strategies for building a competitive, export-oriented software or information processing industry.**
- (6) A technical assistance effort is needed to build networks of researchers in neglected, multi-disciplinary areas of basic and applied science, such as bombay ecology, traffic safety.**
- (7) The development assistance agencies should systematically seek to raise the level of popular awareness in developing countries of the economic policy issues surrounding competitiveness and market-oriented technological development.**
- (8) A technical assistance effort is needed to assist the countries of Eastern Europe to realign their scientific and technological infrastructure to meet the needs of a market-oriented economy.**

- (9) A major effort is needed to encourage technological innovation in rural areas of Africa and Latin America.

The organizational implications of each of these proposals will now be reviewed in turn.

- (1) New organizations are needed, on the model of the CGIAR, to deal with research problems of global scale in areas such as the environment.

Conceiving and promoting a global research program of applied research of the scale comparable to the CGIAR and TDR is a major effort that would require a combination of detailed understanding of development, ability to assess the prospects of research which will not only be technically successful but will also produce practical results whose implementation will have the desired impact, and ability to convince the development community and its various political and financial constituencies of the validity of the proposal. Implementing such a proposal requires ability to build institutions and manage research in an international development environment.

While the second is not easy, the first of these tasks is by far the more difficult. First of all, there is no forum at which overall scientific and technological priorities for developing countries (or for particular regions) can be discussed with decision makers of development assistance agencies. The scientific advisers or program managers of these agencies do not even meet regularly for this purpose with each other, let alone with knowledgeable outside experts. (An excellent informal forum for inter-agency consultation along these lines was convened by the OECD Development Assistance Committee during the 1970s, but was unfortunately allowed to lapse).

As is evident from the concluding chapter of Warren Baum's book, *Partners Against Hunger*, any proposal for a global research effort of this magnitude must have a compelling urgency that will induce donors in the public sector (and this time, in the private sector as well) to give priority to a new undertaking that will not be under their direct control, and will compete with their regular program at a time of constrained resources. To justify such a program would require a clear and careful statement of objectives, sufficient to demonstrate that the problem is of overriding importance, that it requires research which cannot be broken up into sectorally or geographically distinct pieces but requires a truly global approach, with all the attendant institutional complications,

and that the proposed approach offers clear prospects for a successful outcome.

While it is common for free-wheeling scientific advisory groups to call for research programs of this magnitude, organizations which command the staff and financial resources to design programs of this magnitude have shied away from doing so. There are good practical reasons for this. For one thing, the international community does not seem to have the stomach for another big go. For another, most scientific and technological problems, even big ones, do not lend themselves to large unified multilateral programs.

But to come to this conclusion in any particular case requires a considerable expenditure in analysis. For example, after lengthy staffwork, the Bank is in the process of concluding that the environmental problems of the Mediterranean Sea are not really regional in scope, but are the sum of a large number of local problems (urban sanitation, agricultural runoff, watershed management, etc.), of a kind familiar to development professionals. It is probable that of every five or ten problems subjected to such an analysis, one or two would pass the test. But these would be truly global problems of the highest importance.

At a minimum, there needs to be a constance effort to identify world-wide or global problems to which it is likely that science and technology have an importance contribution, to decide the form that contribution would best take -- research, development, information dissemination, technology transfer, or even a change in economic or trade policy in developed or developing countries -- and to analyze the best way to bring the necessary resources to bear on the problem so as to achieve a practical result, and to plan the best way to mobilize the necessary financial, institutional and human resources.

This involves a major analytic effort by development professionals. On the other hand, it is not a purely technocratic job. On the contrary, even at this analytic stage, it requires a substantial effort at consensus building and "root-binding," so that the final result commands a wide constituency. Even so, all this is just the beginning. Now comes the job of convincing the development community that the new effort is worth the political and financial costs, and of raising the necessary core funding, recruiting a nucleus staff, and launching the new institution.

The nearest approach to this process in any technologically oriented development institution is the work of the Technical Advisory Committee (TAC) of the CGIAR. Not only does the TAC maintain a constant effort to identify aspects of agricultural research which need an integrated, global approach. It also has the capability of outlining and recommending a specific program to meet that need. The CGIAR then has the mandate and the power to assign

responsibility to one of its members to design and implement that program.

For example, shortly after the establishment of the CGIAR, the TAC articulated the widely held view that High-Yielding Varieties of wheat and rice did not provide much help to farmers in rain-fed areas, where most poor farmers are located. Within five years, an International Center for Research on the Semi-Arid Tropics (ICRISTAT) had been planned and designed, a location found and the institution built, staffed and launched as part of the CGIAR system. Few if any entities in the development assistance community could have matched this performance.

An interesting model, taken from a collaboration between two multilateral organizations outside the development community, is the Joint Scientific Committee (JSC) jointly organized by the International Council of Scientific Unions (ICSU) and the World Meteorological Organization (WMO) of the United Nations. The WMO is an intergovernmental, multilateral organization in which governments are represented by their respective Weather Services. This means that most proposals approved by the WMO do not require a vote of specific resources: the members have within it their power to implement the WMO's recommendations within their own resources once they have agreed to do so. ICSU provides the JSC, and through it the World Climate Program, with access to the world research community.

The JSC is responsible for the design and supervision of the global climatological experiments of the World Climate Program—projects involving dozens of ships and satellites from as many countries and costing hundreds of millions of dollars. Yet the JSC controls no resources of its own. Its only specific power is the mandate to review proposed international experiments on climate, and to accept or reject them as part of the World Climate Program. Yet its decision has on occasion been enough to induce proud sovereign states (India, USSR) to abandon cherished plans, some with geopolitical significance.

The duly constituted source of broad-gauge, high-level scientific and technological advice to the UN system is the Advisory Committee on Science and Technology (ACAST). This committee is an exercise in frustration. It generally consists of excellent scientists and technologists drawn from all parts of the world. In brief, ACAST presents a classic example of a high-level advisory committee with none of the prerequisites for effectiveness. It has no mandate, no specific clientele, no resources, and a weak secretariat. Its recommendations inevitably lack specificity and operational relevance, and have never been taken seriously by decision makers in bilateral or multilateral development assistance agencies.

- (2) A major effort is needed to restore the collapsed universities and other scientific and technological infrastructure of Africa and Latin America.

To implement such a decision would clearly require large sums of money, large amounts of technical assistance, and the kind of staying power that USAID displayed when it supported university development in India, Latin America and Africa. Thus the subject could only be part of the operating program of a well-heeled agency like a multilateral development bank of Japanese bilateral aid. But foundations and less well-endowed bilaterals could bite off a piece of it: say a particular country or a particular discipline.

To consider such a decision seriously would require a change in the priority afforded towards higher education in most of the development community, which in turn would require a change in attitude towards the formation of high-level human resources. The university graduate will be, after all, the architects and operators of the system which will some day pull Africa and Latin America out of their present morass.

There are signs of a change in thinking in this direction in the World Bank, USAID and elsewhere. But it cuts against the long-established priority of basic education, which is enshrined in policy papers and staffing patterns. Multi-disciplinary research on the role of human resources in technological development will help.

- (3) A world-wide network of user-oriented technological information services is needed to assist small and medium sized enterprises in LDCs to refine the requirements for information and then to link them to sources of information and technology in the advanced countries.
- (4) A mechanism is needed to finance the development and commercialization of "orphan" technologies that would be of great benefit to developing countries but that would not be privately profitable due to various market imperfections (e.g. improved rickshaws).

The promotion of "orphan" technology falls between a number of stools. Many programs aimed at promoting innovation seek to overcome general market imperfections, such as lack of entrepreneurship, market information and venture

capital, leaving it to the private sector to identify the particular innovation which will reward commercialization. Others work exclusively through government agencies, such as agricultural research laboratories and extension services.

The problem with these approaches is that some innovations are well known in one part of the world and not in others (e.g., many agricultural machines and devices for off-road transport), while others require research, development, engineering or testing that cannot readily be carried out in a developing country.

To promote the commercialization of an "orphan" technology requires an organization with an experienced technical staff, operating funds, and confidence in its governance and sources of finance of its competence to work with private industry. Examples are scattered but fairly numerous: various non-governmental organizations active in renewable energy devices; in "appropriate technology," the Intermediate Technology Development Group and Science for the People, both non-governmental organizations; the World Bank-UNDP programs of testing handpumps and solar photovoltaic pumps; and in the health sector, the WHO research programs reviewed earlier.

Existing development assistance agencies are for the most part reluctant to try to pick out technologies that are of widespread potential importance but are unlikely to be commercialized without outside intervention, rationalizing that this is the job of private industry. Foundations and non-governmental organizations are more likely to recognize the imperfections of the market in this area, but have been reluctant to assume the needed quasi-commercial role.

- (5) Research is needed on alternative strategies for building a competitive, export-oriented software or information processing industry.

This undertaking lends itself to the capabilities of consulting firms in developed countries (with the assistance of collaborators from LDCs), and is well within the reach of any of a number of development assistance agencies, once they have decided it is important. It does, however, require a shift in focus on the part of development assistance agencies away from traditional development sectors and indeed away from traditional notions of LDC comparative advantage.

- (6) A technical assistance effort is needed to build networks of researchers in neglected, multi-disciplinary fields of mission oriented basic and applied science related to development problems, such as seismology, volcanology, biome ecology and traffic safety.

The nurturing of basic, multi-disciplinary research competence is a long-range, labor-intensive job best suited to the NSF, to UNESCO, or perhaps the Third World Academy. Of these, the Third World Academy is probably best-suited to take the leadership in identifying certain fields as being in special need of build-up because of their long-term relevance. In particular, NSF has drastically reduced its international program, and UNESCO is struggling to reestablish its legitimacy and is likely to take its signals from the scientific community as it exists rather than point out areas where it is weak.

- (7) The development assistance agencies should systematically seek to raise the level of popular awareness in developing countries of the economic policy issues surrounding competitiveness and market-oriented technological development.

The justification for this proposal lies in the fact that existing training efforts have by now reached most of the professional technocrats in LDCs, and their efforts are stymied by economic illiteracy among the political elite and the general public. Public dialogue on economic issues in developing countries, even in countries, with an active academic community and a free press, is generally of mediocre professional quality and isolated from world currents in economics and allied professions.

This task of raising the level of this public discussion is particularly well suited to collaboration between USAID and USIA (the United States Information Agency). It lends itself to visiting lectureships by distinguished experts, and to general efforts to improve the dialogue between Americans and locals. It also lends itself to collaboration between American and local universities and mass media in the production of educational materials. The collaboration of the Economic Development Institute of the World Bank would also be appropriate.

- (8) A technical assistance effort is needed to assist the countries of Eastern Europe to realign their scientific and technological infrastructure to meet the needs of a market-oriented economy.

Once the policy decision is made that this action is in the U.S. interest, this task is suited to a cooperation between the World Bank, the National Academy of Sciences, and cooperating universities. (In the meantime, the World Bank is likely to tackle it alone.)

- (9) A major effort is needed to encourage technological innovation in rural areas of Africa and Latin America.

This proposal would require a major effort to work with small industry in rural areas in otherwise depressed economies. The best vehicle for doing so is likely to be locally-based non-governmental organizations, but many of these lack the necessary experience in dealing with private industry. Here the experiences, both positive and negative, of Appropriate Technology International (ATI) are likely to be among the most important and instructive. ATI has a track record of pioneering projects in the field (some successful, some not), excellent relations with Congress, generally favorable operational evaluations, and constant management friction at home, both internally and with USAID. It has recently attracted important funding from overseas and will be expanding its operations.

NEXT STEPS

It is important that the Commission's reexamination of the U.S. role in science, technology and development in the light of a changed world situation be conducted from the fullest international perspective. Further studies that should be considered include:

- (a) To seek out ideas for how governmental and non-governmental development assistance efforts are carried out in other parts of the world;
- (b) To review the scientific and technological aspects of development assistance in well-established sectors of development activity; and

- (c) To assess the challenges and opportunities afforded by new and prospective developments in science and technology, and suggest organizational mechanisms that might allow them to be fully integrated into the development assistance effort.

To these ends, the following studies might be considered as possible next steps:

- (1) Brief surveys of the scientific and technological work being undertaken by European bilateral agencies, especially those of Italy, Sweden, Germany, France and Holland.
- (2) A critical survey of the support to science and technology by the World Bank and the regional development banks, and the institutional obstacles to their assuming a fuller role, including possible vehicles for constructive U.S. intervention.
- (3) A survey of collaborations between private industrial firms and governmental and non-governmental development assistance agencies for the purpose of developing and commercializing products and processes, suited to developing countries, based on innovative technology, with the purpose of identifying policy, organizational and operational issues.
- (4) An examination of the possibilities for new economic activity in the less advanced developing countries opened up by new technology, especially in biotechnology, telecommunications, and information (software and information transfer), the steps that need to be taken to promote these activities, the possible role of development assistance, and the institutional obstacles to their assuming such a role.
- (5) An examination of the needs of developing countries for scientific and technological capability related to the environment, the role of development assistance agencies in promoting the building of this capability, and the institutional obstacles to their taking on such a role.

- (6) An examination of existing programs for assisting science and technology (broadly construed to include scientific and technological infrastructure, human resources, research and innovation), in Africa and Latin America, and the potential for further assistance within the present economic climate.

CONCLUDING REMARKS

The effort of development assistance agencies to harness the resources of science and technology for development is fragmented and lacking in coherence, even when judged by the standards applicable to a complicated, all-encompassing and imprecise subject. There is no shortage of institutional actors: in the U.S., the UN, the developed and the developing countries. Many are doing good work in their areas of their responsibility. Others (most notably UNESCO) are seeking to recover their lost integrity.

But they are middle-aged and rather set in their ways, faced with static or declining resource, and in no mood to respond to a changing world situation with radical new initiatives. What is worse, there is no structure for serious, operationally oriented strategic thinking on science and technology for development, either in the U.S. or on the international scene.

True, money is short. But there is usually money for good, doable ideas. New donors (today the Japanese and the Italians, tomorrow who knows) enter the field looking for ideas they can support while their own nationals are learning the ropes. Old institutions become rejuvenated and reopen their minds.

Within the U.S., there is no coherent overall policy regarding development, and (since IDCA went into suspended animation) no agency to coordinate the various agencies of the government having an interest in the subject. Given the lack of a domestic constituency and the extraordinary diversity of the interests involved, a unified approach is probably beyond reach. Perhaps a useful second-best solution would be to provide adequate advice concerning the scientific and technological aspects of development to the officials of the Department of the Treasury concerned with multilateral development banks. At the very least, it should be possible to provide an intra-governmental forum where the various government agencies could at least air their views and exchange programmatic information.

At the international level, there is a similar lack of a forum for serious exchange of strategic views regarding science and technology for development. Here we offer two specific suggestions.

First, there is a need for a forum in which the scientific advisers of the various development agencies can meet to discuss overall priorities, to identify gaps in the overall effort, and to bring each other up to date regarding the latest developments, both in the technological aspects of development and in their respective programs.

Second, there is a need for an advisory structure, to be convened by the development agencies, provided with an adequate secretariat and with an agenda proposed by the agencies themselves, with the mandate to offer specific, operationally useful suggestions regarding new and existing policies and programs for the application of science and technology to development.

**SCIENTIFIC AND TECHNOLOGICAL DECISION-MAKING AT THE
WORLD BANK**

Charles Weiss

This paper was prepared for the workshop on "International Development: Organizing to Harness the Potential of the Science and Technology Community", held at The Carter Center, Atlanta, Georgia, 29-30 October 1989.

The World Bank is a multilateral project lending institution that makes loans to the governments of 125-odd developing countries ranging in per capita income from Ethiopia (\$130/year in 1987 dollars) to Portugal (\$2800/year). All members of the World Bank are members of the International Monetary Fund, and thus must submit themselves to certain international economic and financial requirements. Virtually all non-communist countries are members of the Bank, plus China, Hungary, Yugoslavia, Poland, Rumania, Laos, and Cambodia. (Viet Nam is a member, but does not borrow.)

The World Bank lent \$21.3 Billion for about 220 development projects in developing countries in the fiscal year ending June 30, 1989. It finances projects in agriculture, transport, energy, telecommunications, industry, industrial finance, water supply and sanitation, low-cost urban shelter, population control, education, health and environment. An affiliate, the International Finance Corporation, made \$1.7 Billion in the same period in equity and loan investments in private companies in developing countries. Since about two-thirds of the Bank's lending is for projects (the balance being for "structural adjustment"), and the Bank on

average finances about one-third of project costs, its technical judgments influence, perhaps \$40 Billion of investments each year.

The tremendous scope and scale of its activities make the Bank one of the most important supporters of scientific and technological activities in the developing world, despite the fact that it is not a scientific and technological institution in the conventional sense. For example, the Bank lent \$1.6 Billion for agricultural research up to 1984, and \$350 Million for scientific and technological education between 1982-84. A \$200 Million loan to China in the mid 1980s re-equipped 26 Chinese universities destroyed by the Cultural Revolution, and was followed by other operations of comparable size and scope for agricultural research and higher education in that country.

FINANCING AND STRUCTURE OF THE WORLD BANK

Founded after World War II as a conservative, Cold War-oriented financial institution intent on preserving its AAA bond rating, the Bank expanded greatly in the 1970s and reoriented its lending program to emphasize loans to alleviate poverty, an orientation that spread to many bilateral agencies. In the 1980s, the Bank responded to the global debt crisis with a program of "structural adjustment" loans designed to make it more palatable for its borrowers to open their economies and adopt necessary economic reforms. It has also responded to major political pressures by greatly expanding the size and scope of its environmental work.

The Bank borrows money on the capital markets of the world, including difficult to penetrate markets like Japan and Kuwait. Its bonds are rated AAA, just below IBM and AT&T, because its member governments have agreed to guarantee its credit. The Bank thus gives poor countries access to money at an interest rate they could never obtain on their own, and allows them to use it to finance projects that would otherwise never obtain international finance—e.g., to finance irrigation for the benefit of poor farmers.

The Bank charges a positive spread for its loans, and makes a large profit every year—\$1.1 Billion in the fiscal year ending June 30, 1989. The current rate of interest is 7.74%. The Bank's administrative budget is paid for by the proceeds of its loans. This means that the bank does not cost the U.S. taxpayer any money directly. The only economic cost is the opportunity cost of the "paid-in", or equity capital (currently \$116 Billion), on which all member governments have agreed to forego dividends, and the contingent liability connected with the

guarantee of Bank bonds in case of default. (At present, \$5 Billion of the Bank's outstanding loans, \$3.3 Billion owed by nine countries, are in non-accrual status).

In addition to loans at "Bank" interest rates, an affiliate of the Bank, the International Development Association (IDA), lends to the poorest developing countries at highly concessional rates: no interest, 10 years of grace, 50 years to repay. These funds are grants from the developed country members. \$5 Billion were lent at this rate during the last fiscal year. To be eligible for IDA loans, a country must have a per capita GNP less than \$940. This currently corresponds to that of Jamaica.

The Bank is governed by a Board representing its 150-odd member governments. The Board of Governors meets annually, but a resident Board of Executive Directors meets semi-weekly to pass on all loans and major policies. Voting is in proportion to IMF quotas, so that voting control is in the hands of the richest and most powerful countries, who also provide most of the funds. This is undemocratic, but avoids the situation, common in the UN, where voting control is separate from financial responsibility.

Most governments are represented by the Ministries of Finance. As a result, the Board tends to look on the Bank mainly as a vehicle for transferring financial rather than technical resources. It brings little expertise on issues bearing on the content of projects, and tends to focus on economic and financial issues.

WORLD BANK STAFF

The President of the Bank is by invariable tradition a U.S. citizen and is in effect appointed by the President, with normally perfunctory approval by the Board. The present incumbent is Mr. Barber Conable, a retired Congressman.

The Bank has a staff of 4100 professionals, who are well paid by the standards of both the UN and the US federal government. 90% of these are based in Washington. Of these, 780 are economists and 810 are other technical specialists (agronomist, urban planner, etc.). The latter typically come to the Bank in mid-career, often with senior experience in their own countries.

Economics is the dominant intellectual discipline in the Bank, in the sense that policy issues are generally framed in economic terms and other disciplines must explain themselves in concepts that are acceptable to economists, so that the Bank is sometimes slow to recognize the importance of an issue; however, its

staff work is thorough, and occasionally pioneering in the application of economic concepts.

Recruitment and promotion at the Bank are on merit. There are no nationality quotas, although there is a modest (and not very effective) degree of "affirmative action" in favor of women and the under-represented nationalities (but not of minorities). In general, the U.S presence in the Bank is about 20-25%: in staff representation, financial contribution, and voting power.

WORLD BANK PROJECTS

Bank-financed projects are "executed" (i.e. administered) by agencies of the borrowing government, not by UN specialized agencies (as is usually the case with the UN Development Program) and not by consulting firms (as is sometimes the case with USAID and other bilateral assistance agencies). In principle, the borrowing country "prepares" (i.e. designs and proposes) the project and submits it to the Bank for its appraisal.

In practice, Bank staff is actively involved in the design of the project, so much so that the design of a project in a less advanced developing country is often virtually a joint undertaking. Bank staff regularly visit the countries for which they are responsible, and have access to senior decision makers. Their advice carries weight, not only because of the Bank's considerable experience in development matters, and its status as one of the few sources of disinterested policy advice to developing countries, but also because of the fact that it is linked to a great deal of money ("When you're rich they think you really know...," *Fiddler on the Roof*).

Since Bank-financed projects include many of a typical developing country's most important investments, and may influence important national economic policies, this give Bank working-level staff the potential of considerable influence with technical decision-makers in developing countries. On the other hand, the ultimate decision is the country's, and enough alternative sources of finance are usually available so that a country does not have to accept the Bank's advice if it doesn't want it.

As a practical matter, a government is likely to select those projects for Bank financing in which it wants the kind of advice the Bank is likely to provide. Since governments are closely divided over most important policy issues, technocrats anticipating that the Bank will favor their side in an internal debate

buttress their position by proposing the Bank as a source of finance and technical assistance.

The preparation of a Bank project takes into account not only the equipment, personnel, and institutions that will be required for a project's success, but also the policy changes that may be necessary. These may cover such fundamental matters as interest rates, administered prices, and tariffs. Project preparation may be preceded or accompanied by a considerable amount of broad-based techno-economic analysis known as "sector work."

Once project preparation is completed, the Bank appraises projects submitted to it for financing, using techniques of economic analysis that ask whether the proposed project is a wise use of the country's resources. This appraisal goes well beyond assessing the profitability of the project from the point of view of the project entity (e.g., the electricity utility company in an energy project). Inputs and outputs are valued at "shadow prices" that represent their "real" cost to the economy, rather than at market prices, and such "distortions" and "transfer payments" as artificial exchange rates, administered prices, tariffs and taxes are ignored in this analysis. Environmental and social impact is also assessed.

In the early stages of project design, the Bank fields missions composed of more or less equal parts staff and consultants. Bank staff organize these missions, recruit their members, and draw up their terms of reference. This function is never delegated to a consulting firm, as is often the case with USAID. As a result, the Bank's cost-effectiveness in the use of consultants is much greater than is usual in the U.S. Government.

In principle, Bank staff are not supposed to favor consultants from any one country. On the other hand, recently a number of countries have created so-called trust funds which pay the costs of consultants from that country. Since consultant funds come from the Bank's administrative budget and are very limited in quantity, Bank staff are under considerable and increasing pressure to use these funds and hence consultants from the countries that provide them.

In the latter stages of project design and during its execution, technical assistance (e.g., services of consultants for detailed feasibility or design studies or for management contracts) is often provided free by bilateral development assistance agencies. This can bias procurement specifications towards those that are usual in the country of the consultant.

Once the project is approved, it is executed by the government and progress is regularly reviewed by "supervision" missions of Bank staff and consultants. Procurement for equipment and construction services is by a rigorously enforced system of international competitive bidding. A bilateral

agency may finance part of the same project by "parallel financing", a complicated system which does allow tied aid (i.e., aid in which some or all of the equipment is required to come from the country providing the money).

Most projects funded by the World Bank use conventional technology which has been well tested elsewhere. Indeed, although there is no formal policy to this effect, most Bank staff would argue that a developing country is no place to test an unproven technology unless there is no alternative. (An exception is made for agricultural varieties adapted to local conditions, and for "appropriate technologies" like improved latrines or hand pumps.)

This means that the technological aspect of the design of most projects consists of assuring the technology most appropriate to project conditions, and of designing a program of technical assistance and training to assure the building of the institutions needed to carry out the project. In many but by no means most projects, an effort is made to include a research component in support of the objectives of the project.

Bank project staff normally rely on their own scientific and technological judgement, augmented by in-house expertise and consultants they themselves hire. A few projects have made effective use of advisory committees—the Brazilian and Chinese projects mentioned below are examples—but such committees have to be paid for by the borrowing country and are usually considered an unnecessary expense.

In a relatively few cases, Bank projects have been used as vehicles to introduce innovative technologies that would not otherwise have been transferred through purely commercial channels. Some of these have been developed through research projects executed by the Bank (see below). Bank projects have pioneered in the widespread application of low-cost site-and-service technologies for low-cost shelter, and the "training and visit" approach to agricultural extension.

A relatively small minority of Bank-financed projects are directly concerned with financing innovative technology, or in building indigenous capacity to do research. The majority of these are agricultural research and extension. In a few countries, most notably China and Brazil, the Bank has supported major projects for the financing of research laboratories in universities.

More recently, the Bank has supported the establishment of funds for industrial research and venture capital for the commercialization of innovative technology. A few of these projects, most recently in India, have been made conditional on detailed changes in economic policies that were considered essential if market-oriented technological development is to flourish. Similar projects are likely to follow in Eastern Europe, were perestroika will force major

changes in the organization for science and technology.

Projects of this kind have aroused intense interest among borrowers, and requests have been received from 20-odd countries for these or similar projects. Despite some important individual staff initiatives, the Bank has moved rather slowly to respond to these requests.

SUPPORT FOR SCIENCE AND TECHNOLOGY

Some of the Bank's most important support for science and technology comes from its sponsorship of and contributions to three important international research programs:

- (1) the Consultative Group on International Agricultural Research (CGIAR), a \$200/million/year program of agricultural research co-sponsored by UN Development Program and the Food and Agricultural Organization of the United Nations;
- (2) the Program of Research and Training Related to Tropical Diseases (TDR), executed by the World Health Organization (WHO); and
- (3) the Program of Research and Training related to Human Reproduction (HRP), also executed by WHO.

These programs are treated elsewhere in this volume (see Report 9 for WHO programs).

The Bank has executed programs financed by the UN Development Program or various bilateral agencies, for a number of technologically oriented programs, including:

- (1) a research program to identify, test, and promulgate low-cost technologies for water supply and sanitation, especially improved hand pumps and latrines;
- (2) a major research program, financed by a coalition of bilateral agencies, to develop labor-intensive technologies for the construction of feeder roads;

- (3) a program to facilitate coordination of bilateral and multilateral development assistance projects in support of agricultural research in Africa;
- (4) programs to assist developing countries to develop policies and programs for energy conservation and for more effective use of renewable energy resources; and
- (5) an effort to design and propose a new consultative group to support research on fisheries.

The Bank's major problem in organizing for the management of technology in its projects is to reconcile the conflicting demands on an organization that must adapt its products to the needs of customers (governments) all over the world, yet at the same time maintain product quality and reasonable uniformity of policy and approach. This problem is complicated by the fact that the Bank must satisfy a number of constituencies, including its borrowers, government and public opinion in the developed countries who provide the money, the bond markets, and an increasing number of non-governmental interest groups, as well as the staff's own professionalism. Unlike the situation in a private business, it is not sufficient for the Bank to satisfy its customers and to show a profit at the end of the year.

REORGANIZATION

The Bank's operational staff underwent a wrenching reorganization in 1985, which made major changes in its approach to the management of technology. Under the old organization, quality control was the responsibility of a large central staff of advisers, who were organized into departments covering each major sector in which the Bank was active. These advisers include many of the Bank's most experienced economists and technologists, who were responsible for writing policy papers, for training staff, for providing practical advice to staff on the conduct of specialized, difficult or innovative projects, and for insuring that different parts of the Bank were approaching the same problems in more or less the same way and were aware of each other's experiences.

This advisory staff reviewed each project and had the power to force major changes in project design. It also kept in touch with experts outside the

Bank, and in this way kept themselves and their colleagues up to date with the latest developments in their field. Being themselves expert in the field, they were normally able to network their way to the information required, without the need for an external formal advisory apparatus. Formal committees of external advisors were reserved for occasional major policy reviews, or for reorienting fields thought to be seriously off track. An Office of Science and Technology, headed by the Science and Technology Adviser, provided a focal point for scientific and technological issues and initiatives cutting across sectors or in areas not covered by the sectoral departments.

The flip side of this strong central technical staff was a tendency to excessive and cumbersome review, and a tendency on the part of the operating staff to succumb to the pressures to "get the loans out" and to rely on the advisers for quality control. In response to these concerns, the central advisory committee was drastically reduced in the reorganization. Quality control was lodged in the operating staff. In keeping with the new emphasis on policy-based structural adjustment lending, many of the senior technical staff were encouraged to retire, and the Office of Science and Technology was abolished.

In 1988, the Bank again appointed a Senior Advisor on Science and Technology, this time reporting to the Vice President for Policy. The first priority has been the environment, which is an area of management interest. At the same time, the Bank's Strategic Planning Unit, which by coincidence is headed by a distinguished expert on science and technology policy, has sought to restore the broad field of science and technology to the Bank's strategic agenda.

CONCLUSION

Despite the impressive track record of the Bank in supporting science and technology, its accomplishments in this area fall far short of its potential. The cutting edge of Bank activity has been elsewhere throughout the 1980s. There is no general policy regarding the Bank's view of how best to assist the development of a country's scientific and technological capability and little high-level encouragement to the staff to do so. On the other hand, there are signs of stirrings within the Bank and there is some chance that this situation may change.

8
**SCIENTIFIC AND TECHNOLOGICAL DECISION-MAKING IN
JAPANESE BILATERAL ASSISTANCE**

Edgar C. Harrell

This paper was prepared for the workshop on "International Development: Organizing to Harness the Potential of the Science and Technology Community," held at The Carter Center, Atlanta, Georgia, 29-30 October 1989.

The Japanese aid program is for the most part administered by two agencies, the OECF (Overseas Economic Cooperation Fund) established in 1961 under a separate law, and JICA (Japan International Cooperation Agency) established as an agency in 1974, also under a separate law.

The OECF provides soft loans to governments under bilateral government to government agreements negotiated by Japan's Ministry of Foreign Affairs and equity and soft loans to Japanese corporations or investment companies working on projects in developing countries. In FY 1987 (April 1, 1987 - March 31, 1988) its commitments were \$5.1 Billion and its disbursements were \$3.9 Billion.

JICA administers most of Japan's grant financial and technical cooperation programs with developing countries which include experts and survey teams, trainees, equipment, volunteers and scholarships. Its budget is retained by the Ministry of Foreign Affairs. JICA also administers Japan's emigration program. JICA's budget in fiscal year 1987 was \$765 Million and its disbursements in calendar year 1987 were \$670 Million. This represented 62.8% of Japan's technical assistance as defined by DAC (Development Assistance Committee).

The balance of \$397 Million consists of equipment, scientific cooperation and scholarships provided by line ministries and agencies and not administered by JICA. Japan's total ODA in calendar year 1987 was \$7.45 Billion of which \$3.0 Billion was bilateral loans (net of repayment), \$2.2 Billion bilateral grant and technical assistance, \$0.4 Billion contributions to multilateral organizations, and \$1.8 Billion capital subscriptions to multilateral organizations. This represents 0.31% of Japan's gross national product (GNP).

OVERSEAS ECONOMIC COOPERATION FUND

The OECF has a staff of 275 which includes 20-25 engineers or other technical people. It starts and completes approximately 65 projects per year under bilateral agreements with foreign governments. OECF has thirteen regional offices; the largest are in Bangkok and Jakarta. These offices are not staffed with technical people. About 50% of the projects financed by OECF originate from feasibility studies financed by JICA. Increasingly, OECF is co-financing projects with other donor agencies, principally the World Bank. Co-financing now accounts for 10-20% of OECF commitments to foreign governments and includes both structural adjustment and commodity loans. In addition, the OECF in 1988 provided an engineering service loan to the Philippines for use in several projects. Heretofore OECF engineering service loans were project specific. A co-financing division was established in OECF in 1987, an economic analysis department in 1988 and an environmental division will be established in 1989. In September 1989, the Administration Management Agency of the Japanese Government recommended that the OECF initiate medium term plans by country, increase its administrative efficiency, speed up its implementation of projects, pay more attention to follow-up on completed projects, increase its engineering staff and add more representative offices and officers abroad.

The OECF has no specially stated long term strategy. The bulk of its loans go to Asia (82%). By sectors, transportation accounted for 25.7% of accumulated loan commitments as of March 31, 1988, followed by electric power and gas (24.2%), commodity loans (17.1%) and mining and manufacturing (10.8%). Loans and equity to corporations and investment companies accounted for \$126 Million of \$5.1 Billion commitments in FY 1987 and are concentrated in mining and manufacturing (50.6%), agriculture and fisheries (26.9%), and transportation (5.5%). The Japanese feel strongly that improved infrastructure is the essential prerequisite for social and economic development, and the OECF

is the principal Japanese government institution for financing infrastructure in developing countries.

The OECF has no particular strategy or lending priorities for science and technology. Programs are initiated by governments in developing countries through discussion with the Japanese Foreign Ministry, or by multilateral organizations seeking co-financing from Japan or to a much lesser degree Japanese corporations seeking loans or equity participation from the OECF. Conventional technology is embodied in practically every one of the OECF financed infrastructure projects. The major internal review of technological (and environmental) issues is done in the normal project development and review cycle. AN OECF engineer participates in the appraisal of a proposed project for which a feasibility study is required, and also in the review of tender documents, selection of contractors and monitoring of the progress of project implementation. The principal engineering and technical work is done by firms hired by the developing countries' governments or its implementing agencies as consultants to the project. The firms are normally Japanese companies or are joint ventures between a Japanese and a local company and are paid for by the OECF as part of its loan.

The OECF has financed projects directly related to technology transfer, e.g., export industry modernization including consulting services on technology, engineering services and education facilities expansion which could include equipment for research. In more advanced developing countries, specifically, Korea, OECF has financed equipment where the technology, by developing country standards, may be more advanced, such as for private hospitals for the Genetic Engineering Center, Korean Chemical Laboratory, Korean Mechanical Laboratory and Korean Electronics and Communications Laboratory, but this is the exception rather than the norm in OECF loans. OECF principally finances infrastructure projects using conventional technology.

The OECF established a research division in 1968 which occasionally does studies on technology issues, e.g., "Technology Transfer and Sustainability," and is putting increased emphasis on environmental concerns, including setting guidelines for each project and undertaking environmental assessments. In October 1988, the OECF established the position of Environmental Advisor within its Technical Appraisal Department. In administering this new emphasis on the environment the question is whether the main burden falls on the implementing agency in the recipient country or whether OECF (and JICA) should take a more proactive role particularly during the feasibility study stage of the project development cycle. The current trend within the OECF is to be more proactive and review environmental issues at the feasibility stage, which is

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primarily a JICA and implementing agency responsibility. A formal mechanism already exists for better coordination with JICA on issues such as environment in the Overseas Economic Investigation Liaison meetings which OECF started in 1983 with the Institute of Development Economics and JETRO (Japan External Trade Organization). JICA joined this group in 1987.

JAPAN INTERNATIONAL COOPERATION AGENCY

JICA thinks that human resource development and technology transfer are essential parts of development. JICA can participate in any field of technology transfer, but the prevailing philosophy of Japanese aid administrators is that advanced technology, principally large-scale manufacturing technology, resides primarily in the private sector and should be managed by the private sector and not by public institutions such as JICA.

However, every program financed by JICA involves some technology transfer, be it sending Japanese experts to developing countries, financing technology cooperation centers, or training people from the aid recipient countries in Japan or elsewhere. Technically trained people participate in all of JICA financed missions and in many of the 200 or more project feasibility and development studies it conducts each year. Many of these technically trained people are from universities or other government agencies and about half are recruited from the private sector. In 1983, JICA established the Institute for International Cooperation to recruit and train Japanese experts, including those with engineering and technical backgrounds, for overseas work. It is in this Institute that JICA studies such issues as technology transfer. JICA expects this institute will be the center of development information among Japanese aid organizations.

The Japanese aid program has financed over 23,000 experts abroad since 1953 and has financed the training of over 74,000 people from developing countries in Japan. Manufacturing and agriculture have been the two principal sectors of training; public health and agriculture have been the principal areas for Japanese experts. Project feasibility studies are included under the experts program.

The third large program of JICA is the financing of equipment and material. About half of the Japanese assistance for training and equipment and material is provided agencies other than JICA. Apart from these three categories, JICA finances integrated technical cooperation programs which include project

planning and implementation, training, equipment and experts as well as grant for construction of facilities. In 1987, this program covered 64 centers, primarily for upgrading engineers and skilled workers, cooperation in research, cooperation in production techniques, and vocational training. In addition, JICA finances integrated program centers in the area of Health and Medicine (43 in FY 1987), Population and Family Planning (10 in FY 1987), Agriculture, Forestry and Fisheries (78 in FY 1987) and Industrial Development (25 in FY 1987). JICA administers Japan's Overseas Cooperative Volunteers program which supplied 2,654 volunteers in 1987, and small programs of extending long term loans to Japanese companies for experimental projects that are not deemed commercially valuable, such as cultivation of new crops in developing countries.

JICA has a staff of 1000 of whom 10-15% have technical and engineering backgrounds. JICA has 40 professional engineers, environmentalists and other specialists at the Institute for International Cooperation who are expected to undertake research on development and to be assigned to projects overseas. JICA itself has no position categories designated engineers, scientists, or environmentalists; it fills its needs for such technically trained experts through recruitment by the Institute for International Cooperation or through temporary assignments from other governmental agencies or universities or the private sector. Until a few years ago, JICA could only pay direct costs, but in order to attract more qualified people, JICA is trying to pay indirect costs as well.

JICA does not undertake scientific research on its own, and finances no basic scientific research as does the Agency for International Development of the U.S. However, with the establishment of the Institute for International Cooperation, JICA started to do research on development in a systematic manner. It has cooperated with universities and government institutes in developing countries and with Japanese universities and research institutes by organizing advisory and or supervisory committees to help on specific research programs on development issues. To disseminate results of its research, JICA began in 1985 to issue on a quarterly basis a research and technical magazine on development.

In December 1988, JICA commissioned a group of experts to do a sectoral study on the environment as a development assistance priority. The environmental group concluded that JICA needed to do more in the environmental area and to improve its cooperation with the OECF. Environmental issues will be given more emphasis in Japanese aid programs in the future. JICA established an environmental office in 1989.

One problem JICA has is that trainees it sponsors, in contrast to those sponsored by the Ministry of Education, are not eligible for degrees from Japanese universities. The Ministry of Foreign Affairs has commissioned a

feasibility on establishing a "Development University" in Japan which would not only offer degrees to foreign students sponsored by JICA but also would undertake basic and applied scientific research. Appropriate technology and perhaps basic research on technology will be given more emphasis in Japanese aid programs in the future.

THREE TECHNICAL PROGRAMS OF THE WORLD HEALTH ORGANIZATION

David Mosher

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INTRODUCTION

This paper reviews three successful development assistance programs of the World Health Organization (WHO) in health: the WHO Program of Training and Research Related to Tropical Diseases (TDR), the WHO Program of Training and Research Related to Human Reproduction (HRP), and the UNICEF program of assistance to maternal health and child survival. We examine how each program uses technology to achieve its goals, how technical advice is given and acted on, and how the institutional setting for each program makes this success possible.

Four fundamental factors make these programs successful: they are able to attract top technical people from outside the organization to work on the program at a low cost, they allow these experts to run the programs, and they have good ties to industry which facilitate exchange of information and provides

research, development and manufacturing support. These first three factors depend on the fourth: the organizations that run the programs have respected, technically competent staff.

THE TROPICAL DISEASES PROGRAM

In 1977, the World Health Organization created the Special Program for Research and Training in Tropical Diseases (TDR) to intensify research on tropical diseases endemic in the poorest regions of the world. This program has two objectives: to develop tools needed to control tropical diseases, and to strengthen biomedical research capabilities in those countries where the diseases are endemic.

For a disease to be addressed by the program, it had to meet three criteria: the disease was a major public health problem, adequate tools to control the disease were unavailable, and it appeared that some basic research could help solve the problem. The initial diseases selected were malaria, schistosomiasis (snail fever), filariasis (including river blindness and elephantiasis), the trypanosomiasis (African sleeping sickness and Chagas' disease), leprosy, and leishmaniasis.

TDR activities are designed to develop practical tools for solving the problems of these diseases. These activities include developing new drugs, modifying existing drugs, searching for vaccines, and developing diagnostic tools.

One of the keys to TDR's success has been that the managerial decisions are made by the scientists themselves, rather than by the WHO staff. Research activities are managed and carried out by multi-disciplinary groups of scientists called Scientific Working Groups (SWGs). These SWGs are composed of the scientists working on the program, and manage the various programs in a business-like, results-oriented manner.

TDR relies heavily on scientists from industry, academia and the health profession to form these working groups. There are SWGs for each of the six specific diseases and several for trans-disease issues. The SWGs are administered by WHO, and annual technical oversight is provided by the Scientific and Technical Advisory Committee, which is composed of 15 to 18 members with expertise in a wide range of scientific disciplines.

Advisory Committee findings are reported to the three cosponsors: the UNDP, the World Bank, and the World Health Organization. Overall management of the program is done by the Joint Coordinating Board, whose 30

members represent the top 12 contributing countries, 12 governments who are directly affected by the diseases, the three cosponsors, and three representatives from countries selected by the Board itself.

An SWG is composed of all the scientists involved in planning or research in the group's activities. The group is self-governing. A sub-group called the Steering Committee defines objectives, develops strategic plans for research and evaluates the progress of the group. Membership to the Steering Committee also rotates.

There is good collaboration between the SWGs and the WHO because the WHO staff are scientists who are professional peers of the working group members. Likewise, because of their own technical expertise, WHO staff are able to contact leading experts world-wide as peers and recruit them for the Scientific Working Groups.

There is strict peer review for any research proposal considered by the SWGs. This helps ensure that the program and the WHO secretariat remain insulated from political influence.

TDR depends on maintaining good contacts with industry for developing and manufacturing drugs and diagnostic tools. It is often difficult to get pharmaceutical companies to work on TDR problems because there is no profit incentive: the need for drugs and vaccines to fight these diseases is located in parts of the world where there is very little money to pay for them, and hence little market demand.

For this reason, when companies do take up TDR projects, they tend to treat them as work *pro bono publico* where the profit motive is not paramount. For example, when Hoffman LaRoche developed mefloquine, a malaria control drug that was effective against chloroquine-resistant malaria, it agreed to TDR's request to limit marketing of the drug to only those areas where the chloroquine-resistant malaria was found. This reduced the possibility of developing malaria strains resistant to the new drug, but also reduced the company's revenues.

In another example, ivermectin, a filaria control drug originally developed for use in cattle, was demonstrated to be effective in humans. The Merck Company agreed to develop the drug for humans at no cost, in part because of the profits the drug was already generating in the livestock markets. Ivermectin is now donated by Merck and distributed free-of-charge in Africa for the prevention of river blindness.

TDR has good ties with industry because the WHO staff and SWG members are top experts and because the SWGs often include members from industry. In short, industry respects TDR and WHO because they are competent and do good work.

THE HUMAN REPRODUCTION PROGRAM

The Human Reproduction Program (HRP), sponsored by the United Nations Development Program (UNDP), WHO and the International Planned Parenthood Federation, has two objectives: developing new methods for fertility control and building institutions in developing countries to improve reproductive health. Fertility control efforts are focused in two areas: contraception and infertility (a problem in some African areas). Reproductive health is broadly construed to include family planning, safe motherhood, child survival, and prevention of sexually-transmitted diseases (with the exclusion of AIDS, which is covered under a different fund).

The research in HRP is managed by a system much like that of the Tropical Diseases Research Program. In fact, HRP pre-dates TDR and was the model on which TDR was developed. Overall management is done by a board whose members represent the 3 co-sponsors, 11 bilateral aid agencies, and 14 of the Ministers of Health from developing countries with research programs.

Each subject of research has its own task force, which is analogous to the Scientific Working Group in TDR. Each task force is the sum of all the scientists involved in that aspect of the program, and is self-managed by a steering committee. Again as in TDR, it is the scientists themselves who manage the research, not the WHO staff.

The Human Reproduction Program has difficulty getting pharmaceutical companies involved in the program, but for different reasons than TDR. Human reproduction technology can provide large profits because if the research is successful, there are lucrative potential markets in the industrialized countries. However, there are also large compensating downside risks: specifically the large liability risks associated with a drug designed to be taken for prolonged periods by large numbers of healthy women; and the possibility of boycott by groups opposed to abortion, not only of the possible birth control agent but also of other products produced by the company.

Once a company agrees to work with the program, it is subject to strict restrictions on marketing. The company must agree to sell any products developed under the program to the public sector in developing countries at very low markups, typically 5% to 10% in an industry accustomed to huge markups. Furthermore, if the new technology belongs to the company, but it does not proceed with development and marketing, then WHO can sub-license the technology to other companies, as if the original company had abandoned its rights to it.

WHO has developed its marketing expertise on its own. Its own lawyers, having learned by trial and error, have developed HRP's stringent marketing requirements.

The HRP has several major technical accomplishments. It has developed prostaglandin, an oral abortifacient (an agent that induces abortion). Prostaglandin is much more convenient and less invasive than standard methods, so women like it, but the drug has had a restrained response from doctors and other health workers because of its side effects. However, recent research has shown that when this drug is combined with the French oral abortifacient, IU-46, the resulting combination is more effective and has fewer side-effects than either drug alone.

The HRP program has also developed an improved monthly injectable birth control drug for women, and a vaginal ring that gradually releases contraceptive agent over a period of three months.

Again, the keys to the success of this program are that WHO staff can attract top scientific experts to join the task forces and that it then lets the scientists manage themselves. This is possible only because of the technical competence of the WHO staff and their consequent ability to deal with leading experts as peers.

UNICEF

UNICEF is the operational body of the United Nations for child survival and development, particularly child health and welfare. Unlike the TDR and HRP programs described above, UNICEF does not have its own technical staff or scientific task forces to solve specific technical problems. Rather, it relies on WHO for technical advice and support.

UNICEF has a Scientific Advisor to the Director-General of the Fund, whose responsibilities are to keep abreast of the latest scientific developments, and to guide researchers around the world about UNICEF's needs. The scientific advisor watches the horizon for developments that should be included in the program. For example, in the near future, there is likely to be a Hepatitis B vaccine that can be administered at birth. In the areas in Asia where the disease is endemic (and in which congenital hepatitis B predisposes toward cancer of the liver at the age of 30 or 40), UNICEF will then be able to add the vaccine to its list of recommended post-birth inoculations. It helps to know about this type of development in advance so that the organization can develop an implementation plan.

The advisor can also guide researchers to develop technologies that meet UNICEF needs. For example, the standard measles vaccine in the West is administered 18 months after birth, but UNICEF needs a vaccine that can be given at birth. The science advisor has successfully encouraged research in this area.

A new UNICEF program will involve local universities in developing countries in tests of new scientific approaches to childhood diseases and in helping to develop and demonstrate these techniques.

UNICEF is trying to tackle other problems related to its mandate, such as diarrhea control, breast feeding, and health literacy. To solve these problems, UNICEF relies on WHO staff and expert technical consultants who are well known to its staff.

THE INSTITUTIONAL SETTING

The institutional setting of each of these programs affects the decision-making process, and ultimately the success of the program. How do the programs make decisions that require scientific and technical input? How do they involve the scientific and technical communities? How do they keep the decisions honest in the face of political pressures? The answers to these questions are examined below.

The TDR and HRP programs let the scientists themselves in the task forces make decisions about the most effective and fruitful research strategies. The results of these efforts can be implemented well by the WHO staff for two reasons: their own technical expertise allows them to understand the technology and their experience in the developing world gives them insights into how best to apply the technology. Additionally, because the WHO staff is expert, it can interact with the task forces as peers rather than as administrators, creating a collegial rather than adversarial relationship. This encourages free exchange of ideas and information between the participants.

Again, because of the WHO staff's own technical competence, and its reputation for doing good work, it can attract top technical people from the scientific and medical communities, industry, and government. WHO's prestige and influence gives it the power to get these people for expenses only, and their management system allows these experts the freedom to solve problems as they see fit.

Both TDR and HRP keep themselves well insulated from political pressures. One of the principal reasons that they are able to do this is that, if a problem arises, the programs get backing from the top. The president of the World Health Organization will back the program by writing a personal letter to the World Bank or a company president, or will deal with governments or churches or grass roots groups on sensitive issues. In addition, the programs are able to avoid typical agency pressures because they are interagency programs, and no one agency can move to subvert them.

UNICEF, which relies on WHO and its programs for technical advice, is a direct beneficiary of the institutional structures that make WHO effective. Through its regular staff and its scientific advisor, UNICEF is able to incorporate technical input into its programs.

CONCLUSION

The institutional factors that have made the TDR and HRP successful in dealing with scientific and technical input may be applicable in other settings. The key factors are to attract top people for advice and to have a staff with technical competence of their own that can act on that advice. To attract top people, the organization must develop some prestige and technical competence of its own, the work to be done by scientists must be seen as professionally rewarding, and the experts must be allowed some autonomy in solving problems. The Staff Working Group system provides a structure which insulates programs from both agency and external pressures and allows the scientists to pursue their work with minimal interference, and at the same time forces them to confront the managerial and administrative issues that must be faced if the TDR and HRP programs are to achieve practical results.

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LESSONS FROM EIGHT "REFORM COMMISSIONS" ON THE ORGANIZATION OF SCIENCE AND TECHNOLOGY IN U.S. BILATERAL DEVELOPMENT ASSISTANCE

Charles Weiss

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SUMMARY

Research, innovation, and the technical quality of projects are frequently regarded in USAID as the special concern of the central technical bureau, now known as the Bureau for Science and Technology. Over the years, these aspects of bilateral development assistance have received only intermittent support from USAID's chief executive officer and have never dominated the agency culture.

In contrast, experience in private industry has clearly shown that if quality and innovation are key elements of corporate strategy, they must be a central preoccupation of the entire company organization from top to bottom. The chief executive must set the tone, and must insure that the overall organization, procedures, and staff incentives reflect this commitment.

The management problems of science and technology in USAID have much in common with those of a private corporation which is not pressed by its

competition to improve quality or to develop new products. USAID staff incentives and career structure emphasize skill on processing project proposals through a series of time-consuming central reviews intended to assure compliance with centrally dictated policies and constraints, and to ensure that money is spent quickly on projects that have already been approved. The central technical bureau of USAID and its strong regional bureaus consider themselves bureaucratic rivals, rather than cooperating sources of support to the activities of the country missions. For this reason, they have not developed the smooth and rapid exchange of information and intense collaboration that would be needed for innovation and responsiveness to new challenges. Even strong support by the Administrator to his chief technical officer can only begin to overcome the obstacles to innovation that are inherent in such a culture.

The reason for this top-down management style lies in the politics of foreign aid, which are in turn driven by the distrust for overseas development assistance shared by virtually the entire political spectrum. This distrust results in a profusion of conflicting objectives and a degree of scrutiny second only to that imposed on the Department of Defense (33 objectives, 75 priorities, and 288 separate reporting requirements, according to the Hamilton Report!). It also results in intricate constraints on procurement and contracting, as well as numerous earmarks limiting what funds can be spent for what purpose, many designed to protect political or commercial interests unrelated to development assistance.

The management of science and technology in USAID is further complicated by the fact that its main political constituency within the Congress lies in the land-grant colleges, which have done the bulk of the agency's work in science and technology and deserve credit for much of its success in this area. Indeed, the land-grant colleges are a major constituency for the bilateral development assistance effort as a whole. This fact accentuates the tendency to identify science and technology with the sectors, such as agriculture and health, in which these universities are active, and to neglect the possibilities for involving the private sector, including both firms and voluntary organizations, in scientific and technological activities.

Acute dissatisfaction with U.S. bilateral development assistance has led successive administrations to establish broadly based commissions to review the mandate and operations of U.S. bilateral development assistance. These "reform commissions" have frequently recommended major changes in the USAID organizations (see Annexes 1 and 2). These recommendations have been successfully opposed by Congressmen who want only one agency to deal with, and by USAID managers who want undivided authority and responsibility.

These commissions have repeatedly called for the establishment of independent agencies or foundations, more or less modelled on the National Science Foundation, to carry out technical assistance and research on problems of science and technology for development. Experience in Canada and Sweden shows that such a foundation would at least provide for sustained support to science and technology within an organization which is staffed and organized for this purpose. On the other hand, it would be a "second-best solution" to the problem of the overall management of science and technology in USAID, since it would set up an independent agency which would be at best loosely connected to the main activities of USAID.

INTRODUCTION

The history of American bilateral assistance to developing countries is one of continuous deep dissatisfaction, and of repeated efforts to bring new perspectives to bear in hopes of remedying what was seen as a deeply flawed effort. In the 43 years since the first major announcement of U.S. development assistance, the Point Four message of President Truman, no less than eight major reports have reexamined the basis for U.S. bilateral assistance, usually recommending major philosophical changes and organizational reforms intended to equip the aid effort to meet urgent new developmental and/or political challenges.

The conclusions and recommendations of these reform commissions were sometimes adopted directly, but more often exerted their influence indirectly and over a period of time. To read the forty year collection of these reports in historical sequence, one after another, is to realize the persistence of the combined managerial and political difficulties that are inherent in development assistance, whatever the political climate.

At the request of the Development Task Force of the Carnegie Commission on Science, Technology, and Government, I have reviewed each of these reports in an effort to gain insights into the problems of improving the effectiveness of U.S. bilateral aid in applying science and technology to the problems of developing countries. I have also interviewed several of the major participants in the commissioning and the preparation of the reports, or in the implementation of subsequent organizational changes.

A list of the documents reviewed is attached to this report as Annex 3. I am grateful to each of the many people who assisted me in understanding the

context of the documents under review, and in particular to Norma Ayers and Mary Nelson of USAID for their help in the considerable job of locating and assembling the necessary documents.

The discussions of science and technology in this paper, reflecting those within USAID, tend to neglect many of the broader issues that do not emerge from the political constituencies in the U.S. for science and technology for development or from research or development projects in the sectors in which USAID is active. As a result, many of the topics that loom large in studies of science and technology policy in other contexts receive only brief mention here. These include such critical topics as higher education in science and technology, the role of private industry in the promotion of innovation, the financing of technological innovation, and general support to basic science. Indeed, the entire subject of industrial technology development, perhaps the most critical problem facing the developing countries of Asia, receives little mention.

Since the focus of this paper is less on the historic impact of the various reports at the time they were issued, but rather on the lessons to be learned for today, it does not give a detailed account of their origin, the degree to which their recommendations were implemented, or the exact sequence of causality between the report and what actually happened. Instead, it presents a selective summary of the history of the American bilateral development assistance effort, focusing on those aspects which are most important for the application of science and technology to development problems. An annex summarizes the key provisions of each of the major commissions and committees, relating them to their historical context but stressing their approach to the generic problems confronting the U.S. aid effort.

A SELECTIVE HISTORY OF U.S. BILATERAL ASSISTANCE

The transfer of industrial technology to Western Europe and Japan played a critical role in the Marshall Plan. At the insistence of the U.S., thousands of European and Asian managers and technicians toured American factories throughout the 1950s, taking photographs and obtaining technical information freely from their American counterparts. For many of the visitors, it was their first inkling of how far American technology had advanced compared to the pre-war European technology with which they were familiar. American technical teams made extended visits to European plants, offering advice on improved

technology and management methods, and a variety of services were offered to improve productivity in overseas plants. Now largely forgotten, this technical assistance was at least as important in the renaissance of Europe and Japan as were the large sums expended in direct financial assistance.

The Marshall Plan also included large sums for development assistance in Greece, Turkey, (Nationalist) China, and other areas. Later legislation extended these programs to Korea, Indonesia, Thailand, and other LDCs. The Economic Cooperation Administration that administered the Marshall Plan, later renamed the Mutual Security Agency and the International Cooperation Administration, continued to administer capital assistance to LDCs throughout the 1950s.

A major expansion of the scope of U.S. bilateral aid came in 1947, when President Truman announced the Point Four program, a long-range program of technical assistance to bring American know-how to bear on the problems of the LDCs. The Presidential message announcing this program clearly assumed that the U.S. had the know-how to solve the problems of development, and that the major requirement was for technical assistance in the use of well-known technology. Capital assistance was excluded from the Point Four programs, and a new agency, the Technical Cooperation Administration, set up to administer them.

The Technical Cooperation Administration had a strong technical central staff, based in Washington, that was the main locus of technical expertise in the agency. Most of these staff were on temporary appointments, it being assumed that development assistance was a self-liquidating task. This central staff was the major source of project ideas, had ultimate authority over the hiring of technical staff throughout the agency and over the quality of projects administered by country missions. During this period, U.S. land-grant colleges made important contributions to building the agricultural research capabilities in India, Peru, Ethiopia and other countries.

The Mutual Security Act of 1954 recodified all U.S. foreign assistance programs, and set up a unified organization to administer them. It provided for and distinguished among technical assistance, capital assistance, security assistance and investment guarantees: the categories that still constitute the major forms of U.S. development assistance. The Act established a loan fund for capital assistance, intended to substantially replace the grants that had hitherto dominated capital assistance. The PL480 program of food aid was created in the same year. In the latter part of the 1950s, technical assistance was less favored, on the grounds that it was less cost-effective than capital assistance.

The Foreign Assistance Act of 1961 was a response to the call by President Kennedy for unified administration and operation of the foreign

assistance program; unified country plans instead of a series of individual, unrelated projects; long-term planning and financing; and separation of economic from military assistance. President Kennedy's personal commitment to and involvement in foreign aid made it possible to rally a constituency that rationalized the structure and expanded the budget of the foreign assistance effort and committed it to long-term development goals.

The price of improving the responsiveness to country needs and the quality of country programming, however, was a substantial weakening of the quality and authority of the central technical staff. Henceforth the U.S. foreign assistance effort was to be firmly in the hands of generalists, whose expertise lay in their skill at relations with foreign governments and with Congress and rather than in the technical aspects of the sectors in which USAID was active. Country plans tended to emphasize the need for capital assistance and improved economic plans and policies, rather than the quality of individual projects. The decreased emphasis on staff technical capability also affected the role of the land-grant colleges, which related most easily to the technical specialists whose numbers had diminished and whose role was now in eclipse.

By the late 1960s, a series of reports from the land-grant colleges had persuasively made the case for regrouping USAID's remaining technical staff resources into a single bureau, the Technical Assistance Bureau, in the interests of maintaining a minimum critical mass of experts available for assisting the country missions and for identifying opportunities afforded by advances in technology. Actually, both the Gardner Report and the Hannah report (and later, Peterson Report as well) had made the case for the establishment of a new, independent, appropriately staffed agency, specializing in technical assistance and research. This recommendation was abandoned when Hannah, now USAID Administrator, became reluctant to dismember his agency and to lose the advantages of having all the tools of foreign assistance at his disposal, and after key Congressional leaders indicated that they preferred having one agency to deal with on matters of foreign aid.

During this period a second significant institutional innovation, the Office of Population, was created. The importance of the global population problem, later to be amply highlighted in the Peterson report, influenced the establishment of this office. The office's strong direction, clear focus, and exceptional Congressional support made it possible to exercise extraordinary powers to conduct research, field trials, and field implementation of selected approaches to population control, thus overcoming many of the bureaucratic obstacles to introducing new programs on a critical, and previously unrecognized problem.

The Vietnam War exacerbated the continuing widespread criticism of the foreign aid effort, and threatened by the end of the 1960s to destroy the consensus that had sustained this politically vulnerable effort. In an effort to restore this consensus, Congress voted in 1973 to establish "new directions," which concentrated the now much diminished U.S. bilateral aid on technical assistance intended to address directly the most pressing problems of poor people: the "basic human needs" for food, rural development, nutrition, education, and health.

The internal organization of USAID was changed to reflect the conviction, clearly spelled out in the so-called Babb report, that effective implementation of the new directions required an emphasis on "bottom-up" programming by the field missions, which were after all closest to the situation on the ground and therefore most knowledgeable about the intricate social, economic and political problems affecting poverty. The balance between research and the implementation of existing technology was shifted sharply towards the latter, on the assumption that the technology needed to implement the new policy was already available. The role of the central technical staff was changed to provide strong emphasis on technical back-up to the field missions, and its name was changed to Development Support Bureau in recognition of this change.

At the same time, the political influence of the land-grant colleges resulted in the addition of a new "Title XII" to the Foreign Assistance Act. Building on experience of the earlier "211(d)" program, Title XII provided resources with which to strengthen the capacities of U.S. universities in research on food and nutrition, and established a Board on International Food and Development to assist in the administration of these programs, and in effect to act as an internal lobby for the land-grant colleges. In 1975, economic support for countries of special political importance to the U.S. was separated from other development assistance and redesignated as the Economic Support Fund.

In 1978, a major and unsuccessful effort was mounted by the Carter Administration to persuade Congress to establish a semi-autonomous foundation devoted to research on the problems of developing countries. The Institute for Technical Cooperation (IFTC) was to be one of a constellation of development assistance organizations reporting to a new umbrella agency, the International Development Cooperation Agency. It was to have had a small staff, of whom one-third would come from LDCs, plus a corps of non-career specialists drawn from the universities and elsewhere outside the government.

The Congressional presentation prepared by the planning office for the proposed IFTC justified the proposal for a new, independent agency on the grounds that the IFTC assignment required personnel with up-to-date technical knowledge, drawn from the scientific and technological community and hired on

short-term, non-career contracts; a multi-year time frame suited to research and development projects; a flexible programming process suited to taking advantage of promising new technical developments; an evaluation system suited to the management of research and development; and close personal and professional ties among researchers in the U.S. and LDC scientific communities.

USAID would have difficulty meeting these requirements, the presentation argued, because of the operational demands on AID's experts for practical back-up to ongoing projects; the recent decline in scientific and technical specialists, and the difficulties for small LDC research institutions that would be involved in fulfilling AID contracting procedures.

The extensive lobbying effort mounted by the Carter Administration on behalf of IFTC marked the high-water mark of the effort to establish an independent agency for research and the application of technology to the problems of LDCs. The defeat of this proposal was ascribed to Congressional reluctance to establish a new agency, plus the fear that the new institute would be an unmanaged "slush fund" for contracts with the land-grant colleges. A small program of competitive grants for scientific research, run by the Office of the Scientific Advisor to USAID was established as a vestige of the IFTC proposal.

The 1980s brought substantial changes to the USAID program and organization. The Reagan Administration announced "four pillars" of development policy: policy dialogue, promotion of the private sector, transfer of appropriate technology, and institution building. On the organizational side, the Development Support Bureau was reconstituted as the Bureau of Science and Technology, and its Assistant Administrator, Dr. Nyle Brady, named as first among equals at the second rank of the managerial hierarchy of the agency.

Science and technology enjoyed unprecedented top-level support in USAID from 1981-86. The central technical functions gained increasing resources despite a shrinking non-military development assistance budget, and relations were strengthened with the land-grant colleges. Armed with the assurance of sustained management support, the Bureau was able to address new issues of global import, such as AIDS, and to undertake large, high-risk research projects, such as the development of a malaria vaccine.

After much trial and error, the Bureau also succeeded in developing bureaucratic mechanisms to strengthen its staff competence and to elicit the cooperation of the missions in the application of innovative technology, and in this way to bridge the gap between research and application in USAID projects. It upgraded its technical staff positions so as to be able to attract top technical talent, and returned to the earlier USAID practice of recruiting its senior technical staff from the universities rather than the regular staff of USAID.

The Bureau also facilitated the diffusion of the results of successful central initiatives by instituting the practice of "buy-ins," which enable mission-based field programs to participate (at their own expense) in centrally run programs. The buy-in system also enabled the missions to acquire the services of pre-screened technical experts without spending the time and trouble of following USAID contracting procedures. It also created a science and technology advisory group, which brought together the top technical people in the USAID regional bureaus and the policy staff, and augmented it with sectoral councils to coordinate the work of regional specialists in agriculture, health, etc., and to help keep them in touch with the latest developments in their fields.

Despite these innovations, introducing science and technology into country programs remains an uphill struggle. It proved difficult to overcome the career incentives and political pressures to push programs which will show quick expenditures and immediate results. The USAID regional bureaus regarded the central Science and Technology Bureau as a rival for a shrinking development assistance budget, and used their considerable bureaucratic and political power to block many of its initiatives.

A second major innovation of the Reagan years was the establishment of the Bureau for Private Enterprise to put into practice the Administration's conviction that private enterprise was the key to development. At first an alien implant in an agency traditionally occupied with supporting projects executed by government agencies, the Bureau succeeded within a few years in influencing country programs throughout the agency. The work of the Bureau for Private Enterprise focused mainly on the strengthening of financial intermediaries during the 1980s, so as to increase the efficiency of staff time and to spread the risks over a number of investments.

For this reason, science and technology played little part in the work of the Bureau. On the other hand, the Bureau did undertake a few experiments that showed the potential of using the private sector to promote technological advance for the benefit of LDCs. Chief among these was the promotion of a limited partnership for research and development (under U.S. tax laws) to promote a pig vaccine for LDCs, and a path-breaking project in India which provided venture capital for the commercialization of new technology. Both of these were staff initiatives.

In principle, the Bureau for Science and Technology and the Bureau for Private Enterprise represented complementary approaches to the application of science and technology to LDC problems. One might have hoped for the development of joint efforts to bridge the gap between the academic research of the land-grant colleges and the commercialization of technology in private firms.

In the atmosphere of the early and mid-1980s, however, this hope was premature. Each of the two bureaus had an immediate problem of establishing itself within an alien bureaucratic culture, and each responded to a very different political constituency. As a result, the two bureaus were distant bureaucratic rivals.

By the second term of the Reagan Administration, dissatisfaction with USAID and its work was widespread on all parts of the political spectrum, and on both ends of Pennsylvania Avenue. In 1986, the new Administrator of USAID, Mr. Alan Woods, commissioned a major report, modeled on the World Development Report issued annually by the World Bank, intended to provide the intellectual basis for a new approach to development assistance and a thoroughgoing reorganization and reorientation of USAID. While the report was being prepared, Woods was diagnosed with a terminal cancer. The Woods Report was published without any discussion of its organizational implications, and died with him.

Meanwhile in Congress, the House Committee on Foreign Affairs was addressing the same problem from a pragmatic point of view. The Hamilton Report recommended new foreign assistance legislation specifying four major objectives to replace the earlier profusion: economic growth, environmental sustainability, poverty alleviation, and pluralism. These, it argued, would encompass existing, narrower objectives like biodiversity and women in development. The report recommended that AID be granted much more flexibility in implementing the new legislation: fewer conditions, restrictions, directives and earmarks. Reporting requirements were to be reduced, functional accounts eliminated, and funds appropriated on a "no-year" basis to eliminate end-of-fiscal-year pressures to obligate funds quickly.

On the organizational side, the Report recommended a new Economic Cooperation Agency to replace USAID: decentralized, staffed with talented personnel, and operating through a simplified procurement system and a collaborative approach to development assistance. It recommended extensive collaboration with private voluntary organizations, universities, and regional foundations specializing in grass-roots development, as well as efforts to seek cooperative relationships with the advanced developing countries.

The new legislation proposed by the Hamilton Committee failed to pass in the last Congress.

The new team of the Bush Administration is still making its presence felt. Early signs, however, do not indicate any special commitment to science and technology as an element of its approach to development assistance. For example, the new restatement of the AID mission does not mention science, and mentions technology only as a subsidiary element of technical assistance.

A THOUGHT-EXPERIMENT: AN AID-LIKE PRIVATE CORPORATION

As can be seen from the above account, the history of science and technology in U.S. bilateral development assistance is driven mainly by Congressional and bureaucratic politics, rather than any grand strategic analysis of the role of science and technology in the developing countries or of the organizational requirements for managing science and technology in a development assistance agency.

In an effort to bring a somewhat different perspective to the vexing intricacies of the history, politics and organization of AID, we beg the reader's indulgence for a digression: a brief excursion into the problem of technology management in a hypothetical private, diversified world-wide service company, designed to resemble AID as much as possible. The purpose of this thought-experiment is not to suggest that development assistance would be better suited to execution by a private corporation than by a public agency like USAID, but rather to identify the management problems inherent in the aid effort whatever the circumstances, and thus to be able to distinguish the special effects of the politics of development assistance in the U.S.

Imagine then, if you will, Aidlike Services, Inc., a decentralized, multi-billion dollar consulting company, based in the United States, with a diverse range of project management and consulting services linked to financial products, which it sells all over the developing world. Imagine that the services provided by this firm require extensive discussions with the local government, and sometimes require modifications of politically sensitive policy before sales can be consummated and the project can be effectively implemented.

Imagine further that the company's strategy demands that it tailor its products closely to market requirements in each country, that it carry out a substantial portion of its activities through specialized contractors rather than through its own staff, and that it offer as part of its service the build-up of the capabilities of its clients for project planning and execution. Finally, imagine that the company's competitive position depends on constant research and innovation, but that the resources devoted to these activities must be constantly balanced against those needed to assure the competent choice and execution of well-known technology.

Our hypothetical company would probably organize itself in ways that resemble certain aspects of USAID, but would differ from USAID in instructive ways. It would set up marketing and project execution branches in each country in which it operates, coordinated by a geographically based organization. It

would also need some kind of centrally or regionally based technical staff to back-stop each of its products, to whom local staff could turn for trouble-shooting or detailed information and technical back-up, as well as a research staff to invent, develop and promote major innovations within the company and to turn them into new lines of business. In USAID, these would be analogous to the country missions, the regional bureaus, and the central technical staff in its various incarnations.

The management problems inherent in this corporate set-up are sufficiently similar to those of USAID to highlight some of the sources of inherent tension within the organization. Indeed, as we shall see, the management of information and of career incentives required to keep Aidlike Services, Inc., responsive to customer demand and to technological developments, would challenge even the most sophisticated corporate management, even without the extra requirements placed on a publicly funded development assistance organization.

Consider, first, the major questions of operational organization which must be faced by any global entity. The primary responsibility for marketing the company's products would no doubt lie with the staff resident in the country. They would be given substantial freedom to satisfy the requirements of local customers, subject to company policies and guidelines and to strict limits on spending and approval of projects. But it would be difficult for each country to maintain a staff that was expert in each of the company's product lines.

For this reason, the regionally based technical back-up staff would be a bridge between headquarters and the country offices, with responsibilities for both technical back-up and quality control. The management of Aidlike Services would need to ensure that the regional bureaus regard themselves as supporting services to the country marketing teams and facilitators of communication regarding technology and markets between them and corporate headquarters, and not as independent power bases.

The organization and location of the back-up technical staff presents a potential source of friction within the organization. What should be its primary administrative and geographic location: in the regional bureaus, or at headquarters? Should its role be purely advisory, as a service to the country marketing organizations? Or should it have ultimate responsibility for quality control, such as authority to approve major proposals to clients and major consulting products before they are submitted in final form? What authority should it have over hiring and performance evaluation of technically trained staff in the country offices?

These questions are straightforward compared to the strategic questions concerning research and innovation. What proportion of the company's technical

and financial resources should go for research on entirely new products and markets, how much for improvement of existing products, and how much for quality control and technical back-up of products being produced?

In many corporations, the pressures of day-to-day commercial life (and the tyranny of the quarterly earnings statement) force top management to neglect issues of long term strategy—of which research and new product development is one of the most important—in favor of more immediate problems. This means that research and development may be inadequately funded, or more commonly, that the research and development function is insufficiently integrated into overall corporate strategy, with the result that insufficient resources are devoted to the launching of new products or lines of business and to the integration of successful ones into the company's regular product line.

But the problems of innovation go well beyond the amounts of money allocated to research budgets.* The career path of most company personnel is focused on the immediate task of producing, marketing, selling and supporting the company's existing product line, nowadays most likely under severe competitive pressure. To promote an innovation under these circumstances requires not only a strong product champion, but also strong support from middle management responsible for the innovation.

What is more, if new products are to combine knowledge of markets, up-to-date technology, and practical possibilities under field conditions, there must be close mutual understanding and two-way communication between the marketing staff in the field, the technical back-up staff, and the research and innovation staff, despite the fact that these report to three different organizations. This is best accomplished by ensuring that company staff rotate among all three organizations during the course of their careers, in order to assure informal networks of communication and a shared company point of view.

Behind this system is the encouragement of a "yes culture" that encourages freedom to experiment and to innovate, and which sets up procedures to ensure that it is harder to block an idea than to try one out. The prospective innovator should be encouraged to try out his ideas, and to test them against increasingly stringent criteria as they come closer to practical application. Guiding this process should be mentors who have already experienced the hard knocks of getting a new idea to work under field conditions, and know how "to recognize a dead horse early." Finally, careful provisions should be made to reintegrate the promoters of an innovation that failed back into the company, without penalty and with full recognition for a good try.

*This section owes a great deal of its force to a conversation with Jordan Baruch.

This pattern is likely to obtain only if top management has been careful to establish an organization and a set of staff incentives to assure the overall spirit of quality and innovation within the company. The enthusiastic support to quality and innovation must begin with the chief executive himself, and be firmly impressed on middle management. If instead they are seen as the special hobby horses of the vice-presidents for research and engineering, the in-house innovator will be bucking a company culture which emphasizes pressure to "ship the product" regardless of quality, and will face organizational obstacles at every critical step.

The problems of establishing and maintaining a corporate culture congenial to innovation are sufficient to tax the management resources of even the best managed private corporation. Indeed, the literature of industrial innovation is replete with the history of companies that have gone bankrupt or missed extraordinary commercial opportunities because of management failures in these areas. One need only cite the failure of several manufacturers of mechanical cash registers to give adequate backing to divisions which were exploring the potential of the "new-fangled" electronic technology, or to the failure of the Xerox Corporation to exploit the potential of the windows-based personal computer which its own laboratories had invented.

TECHNOLOGY MANAGEMENT AND POLITICS IN THE ADMINISTRATION OF DEVELOPMENT ASSISTANCE

Readers familiar with the controversies over the management of the American development assistance effort will recognize that many of the problems of USAID have parallels in those of Aidlike Services, Inc., and are thus intrinsic to the problems of a globally differentiated, world-wide service organization, whether under public or private auspices. Indeed, there are few if any private service organizations with anything close to USAID's combination of geographic and product diversity, and its willingness to make substantial changes in its product to meet the needs of local markets. The discussion to this point should therefore be sufficient to convince the reader that, even leaving politics aside, the management of technology in USAID presents a formidable challenge.

But development assistance includes three additional factors which complicate its management problems far beyond those faced by any private firm. First of all, a private company's basic objective is to make a profit and to leave behind a satisfied customer. To be sure, it seeks to do so by selling a product

that will provide value-added to the customer. But in the end, if the customer pays, pronounces itself satisfied, and comes back for more, neither the management nor its board of directors will ask whether the customer's "real needs" have been met, or whether its own government's foreign policy objectives have been achieved.

In contrast, the operational objectives of a development assistance agency are vastly more complicated than those of a company. It is not enough for USAID to design and carry out a country strategy and a series of projects that will be accepted and carried out by the recipient country. The project must also contribute measurably to the development of the country, and do so in such a way that it furthers the interests of American foreign policy in that country.

Second and at least equally important, the relations of USAID working staff with its "top management" in the executive branch and with its "Board of Directors," namely the U.S. Congress, are vastly more complicated than the admittedly complex politics that obtain at the higher levels of large corporations.

The politics of foreign aid are driven by the distrust for overseas development assistance shared by virtually the entire political spectrum. This distrust results in a degree of scrutiny (288 separate reporting requirements, according to the Hamilton Report!) second only to that imposed on the Department of Defense, and an intricate set of intersecting constraints on procurement and contracting that greatly complicate the implementation of development projects of all kinds. Added to this are the numerous earmarks and other artificial limits on what funds can be spent for what purpose (many designed to protect domestic political or commercial interests unrelated to development assistance), and the frequent examples of direct political interference in hiring, procurement, contracting, and program and project design.

As a further result of this distrust, the political constituency for foreign aid rests on a coalition of special interests. Each of these feels free to press its own agenda, which is typically a projection onto foreign countries of its domestic concerns: some commercial, some humanitarian, some ideological. The result of this process is that the objectives imposed on USAID by Congress are vastly more complicated than even those that would be unavoidable under even a manageable definition of development. Over the years, objective has been piled upon objective—so much so that the Hamilton Report refers to no less than 33 objectives and 75 priorities to which USAID projects must be addressed.

These constraints force USAID to adopt a top-down management style that is inimical to the kind of lateral communication that is essential to an innovative global organization such as was sketched above for Aidlike Services, Inc. Elaborate reporting requirements and frequent changes of objective imply a large

staff devoted to reporting and liaison, together with elaborate checks to insure that the latest directives are being carried out. The resulting bureaucratic culture inhibits not only innovation, but also the effective execution of projects based on established methods. Small wonder that each successive "reform report" has called for a new organization, with clearly stated objectives and free from excessive reporting requirements, to carry out whatever function it saw as its special concern!

Thirdly, the major political support for scientific and technological research on development problems comes, not from the competitive pressures that affect a commercial concern (which are of course absent from a government organization) or even from the elan of the management and technical staff of the organization itself (as obtain in some commercial organizations even when they are not beset by competitive pressures), but rather from the U.S. land-grant colleges. Indeed, support from the land-grant colleges has been a major source of political strength for the entire aid appropriation, not just for science and technology.

On the other hand, the fact that support to science and technology in AID is in a real sense beholden to the universities tends to restrict the definition of science and technology within the organization to subjects that are explored in universities, especially to agriculture, health, and more recently, energy and environment.

The problem lies not so much in the choice of these subjects, which are arguably the most important areas for the application of science and technology to development problems, especially those affecting poor people. Rather, the fact that research projects executed in universities have sometimes tended to isolate them from the practical concerns of USAID field staff. This situation is mirrored in the isolation of the independent research foundations that form part of the Canadian and Swedish aid efforts from the mainstream of these countries' bilateral assistance programs, and probably contributed to the distrust of university research expressed in the Babb Report.

What is more, the modes of technology diffusion that come most naturally to USAID are those most congenial to the university: the government extension service and the public health service being the most obvious examples. The role of private industry—which in most circumstances is by far the most effective diffuser of new technology—has been effectively exploited in only a few cases.

There is reason to hope that this problem need not be as serious as it has been in the past. First of all, there been efforts in some of USAID's traditional sectors—especially health and population—to use the resources of private industry through programs of so-called "social marketing." Second and more

fundamentally, the newer biotechnology for health and agriculture is so clearly suited to exploitation by private industry that the traditional arms-length relationship between industry and the university in the U.S. is being rapidly modified, a movement that will inevitably affect the attitude of USAID through its relations with the land-grant colleges.

LESSONS LEARNED FROM THE REFORM COMMISSIONS

The earlier discussion of the management of technology in Aidlike Services, Inc., shows clearly that innovation is a function, not of a central technical staff, but of the entire organization. From the perspective of a technologically innovative company in private industry, then, the organizational problems of USAID in dealing with science and technology are similar to those of a company in which the chief executive officer (and by extension, the board of directors) is focused on finance and marketing.

As a consequence, the chief engineer and/or vice president of research and development (in USAID, the Assistant Administrator in charge of the central technical bureau) must wage an uphill struggle on behalf of project quality, research and innovation within the organization. Whatever his skill as a marketer within his own organization, he is still bucking the organizational culture and the career incentives of its staff even if he has the full bureaucratic support of the chief executive officer.

This emphasis on country programming and resource transfer (the AID equivalent of marketing and finance) that was at the heart of the organizational reforms at the beginning of the Kennedy Administration, may well have been a necessary corrective to the profusion of uncoordinated capital and technical assistance projects of the 1950s. It was necessary at that time to establish the principle that both capital transfer and technical assistance should be part of a country program (read: a marketing strategy) for each country in which USAID was active.

The strategies that controlled the USAID program in any particular country tended to be drawn up by generalists who were more familiar with the country than with the technical aspects of projects, and to stress the need for correct economic policies and capital transfers to build physical infrastructure, rather than technical assistance. To insure responsiveness to country needs, the country team, rather than the central technical staff, became the final arbiter of project quality. The technical staff that had been built up for the administration of technical assistance projects was sharply reduced in number and in influence.

Since the 1950s, the status of technically trained staff within the agency has declined still further, first because of the vicissitudes of the central bureau in which most of them were employed, and more recently because of the increasing reliance on contractors for the substantive work of the agency, and the consequent change in the duties of the "direct-hire" employee from project implementation expert to program promoter and contract manager. Because of the way USAID personnel statistics are kept, it is difficult to track the variations in the number of USAID technical staff over the years. But it is clear that the technical staff never again regained the dominance it had once enjoyed.

As the composition of the USAID staff shifted more decisively from technical specialists to generalists, it has become more and more difficult to launch a new idea for the exploitation of science and technology in country programs. The reason for this is rooted in the relations between the country missions, the regional bureaus, and the central technical bureau. Within the organization, the logical client for the central technical or research bureau is the country organization or mission. They are the ones closest to the ultimate customer (or in the case of the aid agency, the aid recipient), and are presumably in the best position to judge the practical value of the proposed innovation or research project. But in the line organization of the company, the missions are responsible to the geographically organized (regional) organization.

In an organization with strong regional organizations, especially when these have no special interest in technology and are preoccupied with short-term performance, this tends to set up a rivalry between the regional bureaus and the central technical organization in which the natural advantage lies with the regional organization. This appears to be the case in USAID, the more so because its regional management is frequently well connected with the Department of State and with higher levels of government, and is sometimes even strong enough to operate almost independently of the top agency leadership.

In principle, the balance between research and technical back-up to day-to-day operations represents management's allocation of resources between the hope for future innovation and the need for trouble-shooting and quality control of existing production. This is a function of how satisfied the management is with existing ways of doing things, and how rapidly it expects technology to be changing. It also reflects its confidence in the technical staff of the organization to understand the practical problems of the business and to produce innovative solutions that will help increase efficiency in meeting its objectives in time to do any good.

Within USAID, the issue of research vs technical back-up to missions became most acute at the time of the Babb Report, which did not disguise its

distrust for university researchers or for central staffs with their own agendas. The latter were presumed to be unresponsive to the needs of the field and the requirements of the "new directions" towards "basic human needs."

I do not pretend to judge whether these judgements were accurate at the time the Babb report was written. There may well have been reasons to believe that at least in the first instance, technology was available to address the most manifest problems of the poorest people in the developing countries, and to stress the need for responsiveness to the insights of field staff who were closest to the problem. But for the longer run, there surely is now and was at the time no shortage of fruitful research topics whose solutions would make USAID more effective at meeting basic human needs, and hence there was no inherent long-term conflict between the new directions and the research activities of USAID.

Viewed from the perspective of the management of technology in our hypothetical corporation, the repeated proposal by independent commissions for an autonomous agency, free from political pressure to transfer resources and with a small, professional staff of technically trained people, solves one set of problems and creates another. The primary recommendation for such a foundation is that it would create a new organization, committed to a collaborative relationship with the developing countries and dedicated to research, innovation, and institution building: tasks that do not fit in well with the prevailing institutional culture or the career incentives of USAID staff. This indeed has been the experience of the Swedish and Canadian efforts mentioned earlier.

The problems with an independent foundation are the same as those that beset the campus-like research laboratories that were set up by U.S. corporations during the 1960s and intended to be far from the hurly-burly of corporate life. How is a physically isolated and largely self-sufficient technical organization to integrate its work with the larger organization it is supposed to serve? In the case of AID, this isolation is further complicated by the fact that the political support for research on development related problems is likely to come from universities, who themselves are likely to favor research of a more academic cast.

The accomplishments of the Bureau of Science and Technology under the Reagan Administrations show both the potential and the limitations of the present organization of USAID for the application of science and technology to development problems. Here after all was a strong Senior Assistant Administrator for Science and Technology with eight years of tenure and 6-8 years of strong support from the Administrator.

In the end, however, the strong regional organization of USAID, combined with a career structure that rewards contributions to short-term

programmatic goals rather than long-term development goals, set severe limits on what could be accomplished even under these optimal circumstances. What is more, the recent changes at AID have demonstrated the intrinsic limitations of the ability of any organization to apply science and technology to its work, if it is not under strong pressures to sustain a strong commitment to high technical quality and a steady stream of technological innovation. Recent USAID administrators have not stressed the importance of long-term investments in science and technology, and have allowed to lapse many of the organizational innovations that were essential to the promotion of science and technology within the organization.

This return of the pendulum will inevitably give rise to renewed calls for an independent foundation for technical assistance and research. True, it is a "second-best" solution compared to an aid organization devoted to project quality and innovation. In the real world, it may be the best organizational solution with a realistic hope of being put into effect.

For better or for worse, however, the fate of the IFTC proposal—which after all came at a time when political support for development assistance was much higher than it is now—combined with the failure of the Hamilton Report to promote acceptance of new legislation to rationalize the foreign aid effort, does not raise hopes that the administrative situation of AID or its science and technology effort is likely to improve any time soon.

As a final note, perhaps the most difficult political problem faced by the reform commissions lay not with USAID, but in the overall coordination of the many agencies involved in government policy and programs involving developing countries. These include Treasury, State, the Overseas Private Investment Corporation, the Export-Import Bank, the U.S. Trade Representative, the Trade and Development Program (TDP), and many more.

The coordination of these many diverse programs has preoccupied the reform commissions as far back as the Peterson Report. The most ambitious effort to establish a coordinating mechanism was the establishment of the International Development Cooperation Administration under the Carter Administration. Originally intended to oversee the operations of all the agencies concerned with development, IDCA was scaled back to include only AID, OPIC, the new TDP, and the proposed IFTC. Treasury rebuffed the attempt to assert jurisdiction over the World Bank and the other international financial institutions, U.S. policy towards which is arguably the most important U.S. contribution towards development assistance.

A somewhat similar fate awaited efforts to coordinate military assistance with economic assistance to countries of geopolitical importance and straight development assistance unencumbered with direct strategic considerations. When

a political consensus existed in favor of development assistance, its sponsors sought to distinguish clearly between budgets for development and security assistance in order that security assistance to geopolitically important countries would not be "counted" against the more idealistically motivated budget for development assistance to countries of no particular strategic importance.

The Carlucci Commission, by contrast, accepted the new situation of the 1980s, in which security assistance was frankly acknowledged to be dominant. The Carlucci Commission therefore proposed that there be a clear connection between the two so that development assistance motivated by security considerations would also be clearly oriented to development ends.

To the officials responsible for the administration of the various programs of military and strategic/developmental assistance, however, the problem lies in the geopolitical imperative to dispense far more in military and economic aid than many geopolitically important countries can profitably absorb for developmentally useful undertakings. Since these types of funds are by far the most rapidly growing part of the assistance budget, the inevitable failures in administration in these countries cast a cloud over the entire development assistance effort.

IDCA never really asserted its authority over its supposed subordinate organizations, and the attempt at coordination was quietly abandoned under the Reagan Administration. IDCA itself survives today as an empty shell.

Of the documents under review, the one most reflecting the view of the insider is the Hamilton report of 1989. After reading it, it is hard for the reader to avoid the conclusion that the AID legislation, and hence the modus operandi of the agency, has become so cluttered with redundant objectives, burdensome reporting requirements, and all-encompassing geographic and functional earmarks that it is a wonder anything at all can be accomplished.

Given the fact that the agency is tied in knots by these external factors, it is easy to be sympathetic to the Woods Report's call for a radical reshaping of future official assistance. What is difficult to judge is whether the old approach could work if it were to be given a chance—or whether a new approach, even if conceptually correct, has any chance of succeeding in such an operating system.

In other words, is a new approach needed in order to clarify and implement a whole new concept of development assistance—or is it simply necessary to clear away the administrative underbrush, restore at least a substantial proportion of the AID staff to its proper role as project implementers and technical experts, and give science and technology its place in the sun?

ANNEX 1. CHRONOLOGICAL TABLE OF "REFORM REPORTS" AND USAID REORGANIZATIONS

| YEAR | PRESIDENT | "REFORM REPORTS" | CHANGES IN AID ORGANIZATION | AGENCY ADMINISTRATOR |
|------|------------|------------------------|-----------------------------|----------------------|
| 1944 | | | | |
| 1945 | Truman | | | |
| 1946 | | | | |
| 1947 | | Point Four | | |
| 1948 | | | ECA Formed | Paul Hoffman |
| 1949 | | | | |
| 1950 | | | TCA formed | * (see note below) |
| 1951 | | | MSA formed | |
| 1952 | | | | |
| 1953 | Eisenhower | | FCA | Harold Stassen |
| 1954 | | | | |
| 1955 | | | ICA, PL 480 | John Hollister |
| 1956 | | | | |
| 1957 | | | | James Smith |
| 1958 | | | | |
| 1959 | | | | James Riddleberger |
| 1960 | | | | |
| 1961 | Kennedy | | AID formed | Henry Labouisse |
| 1962 | | | | Fowler Hamilton |
| 1963 | Johnson | | | David Bell |
| 1964 | | Gardner | | |
| 1965 | | | | |
| 1966 | | | | William Gaud |
| 1967 | | | | |
| 1968 | | | | |
| 1969 | Nixon | Hannah Peterson | TAB formed | John Hannah |
| 1970 | | | | |
| 1971 | | | | |
| 1972 | | | | |
| 1973 | | | | Daniel Parker |
| 1974 | Ford | | | |
| 1975 | | | | |
| 1976 | | | | |
| 1977 | Carter | Babb | DSB | John Gilligan |
| 1978 | | Snuckler | | |
| 1979 | | | IFTC Proposals | Douglas Bennett |
| 1980 | | | | |
| 1981 | Reagan | | | Peter McPherson |
| 1982 | | | | |
| 1983 | | Carlucci | | |
| 1984 | | | | |
| 1985 | | | | |
| 1986 | | | | |
| 1987 | | | | Allan Woods |
| 1988 | | (Pocantico Proposal) | | |
| 1989 | Bush | Woods/Hamilton/Phoenix | | |
| 1990 | | | | Ronald Roskins |

| | TCA | ECA/MSA |
|------|-----------------|------------------|
| 1950 | Henry Bennett | William Foster |
| 1951 | Stanley Andrews | Averill Harriman |
| 1952 | | |
| 1953 | | Harold Stassen |

- ECA - Economic Cooperation Administration (Marshall Plan) folded into MSA, 1951
- TCA - Technical Cooperation Administration
- MSA - Mutual Security Agency
- AID - Agency for International Development
- FOA - Foreign Operations Administration: formed from MSA and TCA, 1953
- ICA - International Cooperation Administration

ANNEX 2. A SUMMARY OF THE REPORTS OF THE "REFORM COMMISSIONS"

This annex summarizes the main organizational recommendations of the reports which have exerted major influence over US bilateral development assistance. As in the main text of this paper, the emphasis is not exclusively on their specific influence on subsequent organizational changes, but also on their approach to the problems that beset the aid effort in any political climate.

THE GARDNER REPORT, 1964

"The notion that a federal agency can let its direct-hire staff deteriorate and get all of its talent on contract is a dangerous delusion."

The Gardner Report was written by John Gardner, President of the Carnegie Corporation, with the assistance of a task force and staff support from Education and World Affairs. The Report was written against the background of the declining technical capabilities of the AID staff and the decreasing emphasis on technical assistance and research that was characteristic of the later Eisenhower years and the Kennedy Administration.

From the perspective of 25 years, the report's most enduring passage is its eloquent statement of the requirements for effective collaboration between a government agency and a university: that there be an internal nucleus within the government agency of first-class technical people who can deal with the universities on terms of professional equality; that the relationship between government and university be defined in such a way as to preserve each party's freedom of action in those functions which it must perform unimpeded; and that the relationship be defined in such a way as to allow each party to gain added strength from its participation.

The Gardner Report was the first prominent expression of many of the complaints about US bilateral development assistance that would become familiar: the short-term horizon built into the AID project cycle, leading to pressure for quick results and early termination of long-term projects; the overly detailed and burdensome contracting and budgeting procedures inappropriate to broadly defined, long-term collaborative relationships.

Its recommendation of a semi-autonomous "government institute" for long-term technical assistance and applied research anticipated many aspects of the

later IFTC proposal: an independent director and board (reporting, in this case, to the AID administrator), and a separate career and personnel evaluation system. The report also recommended that AID invest in the universities as a long-term resource, over and above their compensation for specific services, a recommendation that was eventually implemented in the so-called "211(d)" and "Title XII" programs.

THE HANNAH REPORT, 1969

Funded by a grant from the Kellogg Foundation to the National Association of Land Grant Colleges and Universities, the Hannah Report is written from the point of view of the universities, and sets forth the things that need to be done in order to strengthen their contribution to the development effort: long-term commitments to allow long-term staffing; grants to replace contracts to the universities to allow them more independence and flexibility in task definition and implementation; explicit encouragement and support to feeding the international experience into curricula and course syllabi; and greater attention to evaluation of performance.

Like the Gardner Report, the Hannah Report recommended greater attention to technical assistance, institution building, and the relations between government and university. It likewise recommended that aid be separated from the "day-to-day crises of the Department of State," and that a new agency "with a small, professional staff" be established for technical assistance, institution building, research, and the strengthening of the competence of US institutions to do development work.

THE PETERSON REPORT, 1970

"If you want foreign aid to come to an early end, just recommend more of the same."

— Henry Kissinger

The Peterson Report was written against a background of increasing public distaste for foreign aid due to the Vietnam War. It was prepared by a blue-ribbon commission composed entirely of outside experts, which deliberately kept the AID staff at arm's length throughout the process. It was given explicit instructions by an indifferent Nixon Administration to come up with new recommendations, in view of the decreasing political support for foreign aid.

The Peterson Report recommended that capital and technical assistance again be separated, as they had been during the Eisenhower Administration, and that AID be split into two new agencies, a bilateral international development bank, and an International Development Institute for technical assistance and research. The latter would be an independent agency, patterned on the National Science Foundation, with its own director and board of trustees.

The report also recommended that technical assistance be greatly expanded (from \$400 to \$1,000 million); that much greater emphasis be put on measures to control the world population problem; that responsibility for capital transfer be transferred to the multilateral development banks, and greater reliance on private rather than governmental channels of technical assistance (universities, scientific organizations, private voluntary organizations, and private firms). It further recommended that the reforms of 1961 which created AID be essentially reversed through the separation of military and security assistance, the establishment of a Bilateral International Development Bank to administer the bilateral lending program, and the formation of an cabinet-level "International Development Council" to coordinate foreign aid and relate it to foreign policy.

The Peterson recommendations were forwarded to Congress after a delay of over a year, and were given only lukewarm Administration support during the subsequent hearings. The Commission's report has been used by the Murphy Commission to illustrate the hazards of the outside blue-ribbon commission that does not elicit the support and advice of the insiders who will eventually be expected to implement its recommendations.

THE BABB REPORT, 1977

"There should be predominant emphasis on field programming and project work, as this is the essence of the business of AID."

The Babb Report was an internal AID document setting forth a rationale and plan for a reorganization intended to equip AID for the implementation of the "new directions" policy and thereby to build the basis for increased public and Congressional support. It criticized the existing structure, in which the regional bureaus are the key decision makers, as unresponsive to the new directions mandate. It evinced considerable distrust of the universities, stating that their research was sometimes overly academic, and that they were sometimes reduced to mere "body-shoppers" (i.e., more or less mechanical suppliers of experts from a previously prepared roster).

The Babb Report called for a thoroughgoing decentralization of management style, so that decisions were made close to the point of maximum information, top management left free for policy-making, and staff allowed to increase their professionalism. Policy and strategy formulation, program and project responsibility, and the delivery and management of resources, were all expected to flow from the field mission in the LDC to the Regional Bureau and from there to the Agency.

The Babb Report therefore recommended that field staff be increased, that direct authority over program and projects be delegated to mission directors, and that Washington staff be judged on their contribution to the needs of the field. The Regional Bureaus were conceived as the "front-line point of contact with the field," with active involvement in project management, planning, programming and budgeting.

Consistent with this "bottom-up" approach, regional bureaus were to be more nearly technically self-sufficient, and the size of the central technical staff was to be severely constrained so that it would not be big enough "to go off on its own agenda." The central bureau was redesigned to stress common functions which support field operations. The report concedes that such a model might make technical staff hard to recruit, might make technical standards in project design more difficult to achieve, and might leave too few central technicians to influence top management.

The central technical staff, now renamed the Development Support Bureau in recognition of its new function, was grudgingly assigned the responsibility to house inter-regional programs "as long as they really support field mission and regional objectives, and are fully responsive to agency guidance." The main function of the Development Support Bureau was to act as a "gate-keeper" (acquire, synthesize and disseminate information) for the agency, to backstop field missions and regional and agency staff, and to oversee research, development and training.

The Babb Report was fully implemented, and became the basis for AID's organization to implement the "new directions." In line with its emphasis on support to field work, the Babb report criticized AID-sponsored research as biased toward central rather than field needs. It did not, however, make any definite recommendations on how AID-sponsored research should be managed.

THE SMUCKLER AND GORDON REPORTS (INSTITUTE FOR TECHNICAL COOPERATION), 1979

"To become more self-reliant, developing countries need to strengthen their technological capabilities. To assist them, I am proposing a new United States foundation for technological collaboration. Through private and public foundations and through our increasing participation in United Nations conferences, we can make technical and scientific cooperation a key element in our relationship."

— President Jimmy Carter

The weakening of the Technical Assistance Bureau and the downgrading of the technical staff and the research function that followed the implementation of the Babb report led to a renewed interest in how best to revive the research functions at AID. A study by Lincoln Gordon, former Ambassador to Brazil, argued that the US was not spending enough on research and development of interest to LDCs.

Gordon identified a "tension" between "officials who emphasize effective implementation" and those concerned with the adequacy of our knowledge." Gordon argued that the trade-offs between longer and shorter-term goals are best resolved at higher levels, where broad (and presumably longer-range) foreign policy goals were more likely to have greater weight.

Gordon recommended that AID be reborn as a new agency, staffed by technically trained people on temporary appointments, with small missions serviced by a mobile technical staff, much like those of the Technical Cooperation Administration of the 1950s. He further recommended a new, independent foundation, comparable to the National Science Foundation, which would support research and development related to LDC problems.

The Gordon study was overtaken by events and never published in final form. As part of the preparation for the UN Conference on Science, Technology and Development, a speech by President Carter in Caracas in March 1978, announced the formation of an Institute for Technical Cooperation (IFTC), a semi-autonomous organization under a new umbrella organization, the International Development Cooperation Agency.

The new institute was intended to increase the efficiency of aid; to build LDC problem-solving capacity; to test "appropriate" technologies adapt them, and bring them to the stage of application; to make possible new relationships with the "middle-tier" of LDCs; to serve as a focal point for research on LDC problems carried out by US government agencies; and to engage the US private sector in meeting the needs of LDCs.

The illustrative first year program of research in the Congressional presentation for IFTC presented plans for research on increasing productivity and rural income, improving health conditions, improving population programs, improving nutrition, strengthening indigenous scientific and technological capability (through aid to science education and to national research councils), communications and information systems, energy planning and new energy supplies, environmental protection and natural resource management, and non-agricultural employment. It was also to fund expanded programs of bilateral cooperation.

THE CARLUCCI REPORT, 1983

"To achieve program integration, ... a new agency ... should be responsible ... for the integration of economic and security assistance, and [have] direct control over economic assistance and ESF [economic assistance to strategically important countries] program operations."

The Carlucci Report says that it arose from the concern of the Secretary of State that the decline in popular and legislative support for military assistance at a time when the military threats from the USSR, and the consequent need for military support to America's allies, were supposed to be increasing.

Since military and economic problems in LDCs are interwoven, especially in Africa and the Caribbean, the report recommended an integrated program of military and economic assistance for these countries. The Report further recommended support for policy reforms in these countries that would lead to economic growth and the development of open, self-sufficient and democratic societies, as well as support for human resource development, increased emphasis on science and technology-related development, and promotion of the private sector.

In light of the increased importance of military assistance, the report recommended that a new agency, the Mutual Development and Security Administration, responsible to the Secretary of State, be established to replace IDCA and to coalesce and integrate the various programs which together constitute the foreign assistance program, both economic and military. The new agency was also to take over budgetary control of development assistance, economic security funds for countries of special political importance to the US, military assistance, PL480, the World Bank and regional development banks (the

so-called international financial institutions, or IFIs), and American contributions to UN agencies.

THE HAMILTON REPORT, 1989

"Current foreign assistance legislation is cluttered with obsolete, ambiguous, and contradictory policies. It is inconsistent with US foreign policy as regards human rights, terrorism, and narcotics. It is ambiguous and obsolete."

The Hamilton Report was a major re-examination by the House of Representatives intended to lead to the enactment of new foreign aid legislation. It is written by insiders intimately familiar with the way AID really operates, and is preoccupied with making it a more effective operating organization rather than with basic philosophy or strategy.

The report begins with the finding that US bilateral development assistance is hamstrung by too many conflicting objectives, too many legislatively imposed restrictions and earmarks, and too much bureaucratic red tape. From this diagnosis it concludes that there is needed a new economic cooperation act, a restructured agency, clearly identified objectives (it recommends economic growth, environmental sustainability, poverty alleviation, and economic and political pluralism), more flexibility in the implementation of development projects, more accountability for results, and better coordination among different parts of the US aid effort.

The report continues with a succinct summary of the current state of US development assistance. The current dollar level of aid, corrected for inflation, is at 1977 levels. It has declined steadily to less than 0.3% of GNP, of which development-related support amounts to less than 40% of the total. Whereas most US aid went to Asia until 1974, aid to the Middle East now clearly predominates. 50% goes to Egypt and Israel, and 72% of the total go to eight countries: Egypt, Israel, Pakistan, Turkey, the Philippines, El Salvador, and Greece.¹

The focus of US aid has shifted, the report continues, to military assistance and flexible, fast-disbursing political/economic support to Middle East countries through the Economic Support Fund. In the absence of political

¹ As an aside, it is common knowledge in the aid community that it is difficult or well-nigh impossible to design and implement an effective development project in several of these geopolitically important countries because of the internal political situation. Yet the money is in the budget, and must be spent. What is more, some of the most difficult countries are considered the highest priority and have first claim on the best AID staff. Such is life in the aid biz.

support, the aid budget does not increase. Yet new demands are placed on it: Afghanistan, Namibia, Philippine democracy, peacekeeping forces, and UN arrears.

Current legislation, the Report continues, specifies no less than 288 reporting requirements (second only to the Department of Defense), a requirement that led to 700 Congressional notifications of project changes during a recent fiscal year. It further sets forth 33 objectives, and 75 co-equal priorities. 49% of the development funds and 98% of economic support funds are earmarked to specific countries.

The result of these intersecting encumbrances is an agency that is spread too thin, not effectively accountable, and preoccupied with process rather than substance, with plans rather than results. The system of earmarks, together with the annual appropriation cycle, actually reduces leverage over "earmarked" countries because they know they will get the money sooner or later.

The Hamilton Report therefore recommends a new foreign assistance legislation specifying four major objectives: economic growth, environmental sustainability, poverty alleviation, and pluralism. These, it argues, will encompass existing, narrower objectives like biodiversity and women in development. The report recommends that different types of assistance be clearly distinguished and that resources be allocated against broad objectives rather than sectoral functions. It further recommends results-oriented accounting system based on clearly defined objectives and responsibilities, combined with better evaluation and Congressional oversight.

Finally the Hamilton Report recommends that Congress grant the aid agency much more flexibility in implementing the new legislation: fewer conditions, restrictions, directives and earmarks. Reporting requirements should be reduced, functional accounts eliminated, and funds appropriated on a "no-year" basis to eliminate end-of-fiscal-year pressures to obligate funds quickly.

On the organizational side, the Report recommends a new Economic Cooperation Agency to replace AID: decentralized, staffed with talented personnel, and operating through simplified procurement system and collaborative approach to development assistance. It recommends extensive collaboration with private voluntary organizations, universities, and regional foundations specializing in grass-roots development. It would also seek cooperative relationships with the advanced developing countries.

The proposed legislation failed of passage in the last Congress.

THE WOODS REPORT, 1989

"The United States is no longer economically dominant as we once were, and it makes no sense to sponsor an open-ended maintenance program for the developing countries."

The Woods Report is a complement to the Hamilton Report. It is a philosophical and analytic document, patterned on the World Development Report published by the World Bank, and written by non-career AID staff committed to fundamental change in the principles underlying US development assistance.

The Woods Report begins with the statement that the experience of 45 years of development, during which few developing countries have "come on line," shows that economic growth is the result of correct economic policies which make the most of a country's human and natural resources. Foreign aid being at best a secondary contributor, the more so since it comes mixed with mixed policy motivations on the part of the donor, combined with pressure to "transfer resources" (i.e., lend or give away money). The world capital markets, a liberal trading system, multinational corporations, private voluntary organizations, US universities—all have made and can make larger contributions to development than official development assistance.

In the 21st Century, the Report argues, project-oriented aid programs will become obsolete. In any case, the main US impact on LDCs comes through our economic and trade policies, the dynamic growth of the US economy, and the foreign investment decisions of US-based corporations. The US should therefore provide catalytic assistance, designed to leverage money from private, multilateral, and other bilateral sources. It should be equipped to respond to targets of opportunity in specific countries, and to coordinate the many US government policies that have an impact on the development of LDCs.

The Woods Report makes no operational or legislative recommendations, but instead leaves the reader with seven "basic questions": (1) What is the definition of success: growth? If so, long- or short-term? (2) What are US strategic interests in the LDCs? (3) What are US humanitarian interests in the LDCs? (4) What are US economic interests in the LDCs? (5) How can we reconcile development assistance with the national sovereignty of LDCs? (6) What is the relevance of foreign aid in a time when the biggest LDC problem is foreign debt? (7) How can the US best match its foreign assistance program to the national interest?

The report concludes that the US must radically reshape its future official development assistance so as to face new realities and complement unofficial

contributions to the development process.² The Woods Report was published in an attractive format, but lost its direct operational significance to AID when the administrator who was its chief sponsor within the organization unexpectedly passed away.

THE PHOENIX GROUP REPORT, 1989

"The US foreign aid administrative structure needs a major overhaul... An AID-successor agency [should be] organized along problem-solving lines, and most AID missions overseas must be replaced by problem-solving, results-oriented binational task forces. To undertake serious reforms, Congress should scrap the obsolescent Foreign Assistance Act of 1961, and write a new law."

The Phoenix Group was a private commission consisting of former AID staff and officials of private voluntary organizations familiar with the workings of AID in the field.

Like the Hamilton Report, the Phoenix Group recommended new foreign assistance legislation on the grounds that existing law is cluttered with obsolete and redundant provisions. It recommended a two-year planning and spending cycle to allow time to plan and to eliminate the end-of-fiscal-year pressure. It recommended the formation of a Joint Congressional Committee on Foreign Assistance, and direct links between the authorization and appropriation bills.

It recommended the formation of a new Development Cooperation Agency, whose objectives would be to promote healthy and sustainable development; to promote healthy and sustainable individuals; to dissemination and use of information and scientific advance; and to help developing societies to organize themselves so that private industry can contribute to the development process.

Except in the poorest and least developed countries, AID missions would use the "servicio" concept. An integrated binational staff would plan and implement problems jointly, with costs shared between the two countries. Project implementation would be largely accomplished through private voluntary organizations, non-governmental organizations, universities, and other contractors.

²A rebuttal of the Woods Report from the point of view of traditional development assistance is found in the article by Callison entitled "Development and the National Interest" (*Foreign Service Journal*, January 1990, pp. 28-33.)

The new agency would be staffed with technical managers with expertise in project implementation, rather than the present AID staff of generalist program managers. Field staff would remain in their posts for a minimum of five years. There would be increasing reliance on LDC nationals and on private voluntary organizations. The headquarters staff of the new organization would be divided into "institutes" for natural resource management (agriculture, forestry, energy, and rural development); population, health and nutrition; human resource development; and private enterprise development. The institutes would back up field operations by the missions.

ANNEX 3. DOCUMENTS REVIEWED

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