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DIRECTORY OF SERVICES PROVIDED BY

A.I.D. BUREAU FOR TECHNICAL ASSISTANCE

A. I. D.  
HISTORICAL  
COLLECTION

A.I.D. BUREAU FOR TECHNICAL ASSISTANCE

OCTOBER 1973

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A.I.D. BUREAU FOR TECHNICAL ASSISTANCE

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\* "Key Problem Area."

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GUIDE FOR USING THIS DIRECTORY

Persons expected to find this directory useful

Anyone in A.I.D. overseas or in Washington who needs to confer with a specialist or obtain written information on the technical aspects of a development problem, program, or project in these sectors:

- |                            |                        |
|----------------------------|------------------------|
| Agriculture                | Nutrition              |
| Development Administration | Science and Technology |
| Education                  | Urban Development      |
| Health                     |                        |

In short, anyone who would benefit from finding out quickly what resources are available in the A.I.D. Bureau for Technical Assistance and what services the bureau provides.

What the directory tells about specialists

The directory lists, by area of specialization, certain A.I.D. direct-hire technicians and the private individuals and institutions with which the Bureau for Technical Assistance (AID/TA) has contractual arrangements. They invite technical assistance questions. Their technical assistance services are ordinarily available, usually through AID/TA, wherever needed in A.I.D. on a short-term basis.

The A.I.D. specialists listed in the directory are principally those in the Bureau for Technical Assistance (AID/TA). In some subsectors, a few specialists in other parts of AID/W and in USAID's are added for illustrative purposes, but no attempt has been made to list all AID specialists in a particular field.

What the directory tells about technical information

The directory describes AID/TA projects, including General Technical Services, Central Research, and U.S. Institutional Development (Sec. 211(d)). An index to those projects appears immediately after these guideline notes. The project descriptions include the name and office of project managers, who welcome questions about the projects.

The directory also lists projects funded by bureaus other than AID/TA and briefly mentions pertinent policies, priorities, conferences, committees, and technological developments. It presents selected references and, in the final pages of the directory, tells how to obtain them.

## Role of the Technical Assistance Bureau

The first section of the directory defines the mission of the Bureau for Technical Assistance. It describes the Bureau's function in problem identification, the ways in which it promotes research, how it assembles other information on technical assistance, its services to overseas USAID's, and its review of certain projects of other bureaus.

## How the directory is arranged

First by sector. Then by "key problem area" or other sub-sector. Thirdly, each subsector is divided into ten parts as follows:

- |                               |                               |
|-------------------------------|-------------------------------|
| a. Significance of Subsector  | f. TAB Projects               |
| b. A.I.D. Specialists         | g. Other A.I.D. Projects      |
| c. Consultants to A.I.D.      | h. Policies and Priorities    |
| d. Institutional Resources    | i. Technological Developments |
| e. Conferences and Committees | j. Selected References        |

What abbreviations are used for frequently cited A.I.D. references  
(Most or all of these documents should be available in Washington Bureaus and field Missions. For details and how to obtain copies, see pages beginning Z-7)

AG	Agriculture "Gray Book"	IR	Institutional Resources
AY	Agriculture "Yellow Book"	IT	Instructional Technology
CH	Clearing House News	MD	Memory Documents
CN	controller project report	MT	Modern Technologies
CP	Congressional Presentation	NP	Non-Profit Organizations
CR	Central Research Projects	PR	Program in Research
DD	Development Digest	RA	Roster of Agriculturists
EC	Education Cooperation	RR	Research Results
ES	Education Strategy	RS	Research Supplement
HI	Health Issues	TG	TAGS
HN	Health and Nutrition	VF	Voluntary Foreign Aid
IG	Institutional Grants	VT	Village Technology Handbook

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Drafted and edited by Allan F. Matthews, under the general guidance of David G. Mathiasen, Associate Assistant Administrator, Office of Program and Methodology, Bureau for Technical Assistance. Other TAB offices collaborated by contributing updating and other improvements. Edna A. Shields and Beverly Van Trump assisted. Partly because this is an initial effort to produce a useful directory, comments to help improve possible future issues would be appreciated.

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## MISSION OF THE BUREAU FOR TECHNICAL ASSISTANCE

Most A.I.D. technical assistance projects originate in consultations between host governments and overseas USAID's. Justification for initiating them is thus usually in a one-country or regional context. The quality of projects can often be improved significantly by supplemental inputs based on knowledge of relevant events, fact-finding, and decision-making taking place elsewhere. World markets for exported commodities are changing; private and public research centers in many localities are finding new facts and working out improved methodologies; A.I.D. priorities are shifting; and other assisting countries and international institutions are playing an ever increasing role in development.

The task of learning what technical developments are taking place worldwide which are significant to program development, of formulating projects to fill in some knowledge gaps, and of sharing information and advice with overseas USAIDs and other AID/W bureaus are among functions of the Bureau for Technical Assistance.

The mission of the Bureau for Technical Assistance begins, as recognized in Manual Order 204.8, with (1) identification of the whole range of technical assistance problems. As a help in solving those problems, the TA Bureau (2) arranges research and development projects, (3) assembles supplementary technical information, (4) provides specialized technical assistance services to overseas USAIDs, and (5) participates in selected project reviews and evaluations.

### Problem Identification

The programming of development begins with identifying problems and setting priorities. This is often done on a country or regional basis. As the basic elements of many development problems, as well as methods of analysis, are inter-regional or worldwide in scope, however, A.I.D. is working toward global analysis. The analyses are subdivided first by sectors and then by problems or subsectors before reaching the more detailed breakdown of regions and individual countries.

"Global sector statements" are being prepared by TAB as guidelines. They identify development problems common to LDCs and set priorities on TAB research activities and selected other A.I.D. activities designed to help solve them. They are being drafted on the basis of USAID program submissions, various workshops and reports, and TAB assessments. The statements will be reviewed successively by the General Technical Services Project Review Committee (GTSC, an inter-bureau committee organized in AID/W in 1971), the Administrator, and the Administrator's Advisory Council. They will be revised periodically. Approved statements now exist in the fields of urban development, nutrition, and education and human resource development.

Until each global sector statement is prepared and approved, TAB funds for research and related matters are programmed on the basis of "key problem area" analyses. It was believed that once those problems which generally impede development were identified and then the list was reduced to a few problems in each sector where A.I.D. assistance was particularly suitable, there would be a framework against which more rational choices about project selection could be made. The rationale for "key problem areas" was described generally in two airgrams--AIDTO CIRCULAR A-1541, 7-17-70, Mobilizing U.S. Brainpower for Field Support, and AIDTO CIRCULAR A-1712, 8-7-70, Field Involvement with Key Problem Work. Staff papers on key problem areas in various sectors were prepared. The one on agriculture, for example, was transmitted as AIDTO CIRCULAR A-482, 3-5-71.

#### Research and Development

Work on development problems over the years has pointed up the need not only for off-the-shelf technical assistance services and capital investment but also for obtaining new facts about the developing societies and for working out better technologies and methodologies. Such knowledge development is undertaken by TAB through three kinds of projects--General Technical Services, Central Research and U.S. Institutional Development.

General Technical Services--Technical assistance projects involving more than one region are grouped together in TAB's General Technical Services (GTS) program. An appreciable portion of these projects supports institutions which provide services to overseas missions, e.g. TVA in fertilizers. Much of the program consists of pilot or experimental projects, the results of which are likely to have applicability in solving development problems in many LDCs. GTS projects go through an extensive process of consultation with other bureaus of A.I.D. The main channel for this is through project review by an inter-bureau GTS Committee.

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Central Research.--Central research is focussed on particular development problems or sets of related problems where research results are apt to be significant to more than one country or region. They are ordinarily implemented through contracts with private organizations or participating agency service agreements (PASA's) with other government agencies. The research is usually purposive or applied. There is special emphasis on adapting U.S. technology to the various situations in developing countries and to coordinating institutional capabilities in those countries so as to create international research networks. Central research projects are reviewed successively by the sponsoring bureau (if other than TAB), TAB, the inter-bureau Research and Institutional Grants Committee (RIGC; see M.O. TA-211.2), the Agency's external Research Advisory Committee (RAC; see M.O. TA-208.3), and the Administrator. For the use of potential contractors, A.I.D. has described the fields in which it has financed research and the procedure for submitting proposals. The publication is titled "Contract Program in Centrally Funded Research" (PR), 1972, 21 p., and is available from TA/RIG. The objectives and results of such projects are contained in two documents listed at the end of this directory among the cited A.I.D. publications; see symbols RR and RS. For a table of data on these projects, see symbol CR. Guidelines for annual evaluations of central research projects are contained in M.O. TA-1026.2.

U.S. Institutional Development.--Under Section 211(d) of the Foreign Assistance Act, TAB makes grants to U.S. institutions to strengthen their technical assistance, research, and educational capabilities in fields important to A.I.D. objectives. Such institutional projects are reviewed by the RIGC and then by the Administrator. A TAB publication lists the projects, and another publication describes the institutions; see symbols IG and IR, respectively, in the list of basic A.I.D. publications at the end of this directory. Guidelines for annual evaluations of institutional projects are contained in M.O. TA-1026.3.

#### Other Information Generation

Besides arranging for creation of new knowledge through R&D projects, TAB acquires and disseminates existing technical knowledge in various ways. Certain GTS projects support surveys, conferences, handbooks, and development management analyses. Some institutional research projects are at least in part for general support of the institutions. In addition to reporting about the research it funds itself, TAB is responsible for keeping the Agency as a whole informed in a comprehensive way of all research problems and progress, including those

involved in projects funded by the geographic bureaus and others such as the Bureau for Population and Humanitarian Assistance. Consideration is being given to joint meetings of two previously mentioned committees--Research and Institutional Grants Committee and General Technical Services Committee--to coordinate agency-wide research activities. As part of its factfinding and coordination in technical assistance, TAB maintains liaison with other government agencies, international organizations, and private professional groups. It provides guidance on technical assistance to SER/DM, particularly to help improve the Agency's "Memory Bank".

#### Services to Overseas USAIDs

TAB has assembled a staff, including foreign service technicians on rotation to AID/W, with a wide range of knowledge about problem-solving in less developed countries. It includes generalists in technical assistance across the board and specialists knowledgeable about what is going on worldwide in various sectors and what particular actions most effectively result in development. These TAB technicians are available, with the concurrence of the Regional Bureaus, for short-term duty at overseas USAIDs to recommend technical solutions to problems, to help conceptualize and define proposed new projects, and to evaluate continuing projects. To strengthen and supplement TAB's in-house capability, it has contracted with individual consultants, universities, other private organizations, and other public agencies. These also provide services to USAIDs through TAB arrangements. TAB also arranges conferences, organizes committees, reports on the progress of its projects, and prepares references.

#### Review of Projects of Other Bureaus

TAB technical offices review for technical substance, when requested, the technical assistance project proposals (PROPs) of other bureaus. TAB also participates in the annual Agency reviews of all country and regional programs. As regards ongoing technical assistance projects funded by the Regional Bureaus, TAB helps monitor them on a selective basis. TAB has particular interest in research projects addressing problems identified by TAB in global sector statements or key problem area papers. TAB is working with Regional Bureaus to establish appropriate criteria for this process.

AGRICULTURE SERVICES

1. AGRICULTURE IN GENERAL

(a) The Agriculture Sector

Agriculture is the occupation of 44 percent of the labor force in Latin America, 52 percent in the Far East (excluding Japan), 70 percent in Near East/South Asia, and 79 percent in Africa (excluding South Africa and Egypt). A.I.D. allocates more funds to agriculture than to any other sector. TAB services in agriculture are described in this directory here and in thirteen sections which follow. Each following section covers a key problem area or other sub-sector. The present section describes (in the same format) TAB services in agriculture not readily fitting into any of the thirteen subsectors. The special aspects include agribusiness, agricultural geographic areas, diversification, ecology and the environment, evaluation, home economics, information, innovation, planning, statistics, weather, and wildlife.

(b) A.I.D. Specialists

Omer J. Kelley, Director, TA/AGR-RA p. 66.  
Erven J. Long, Associate Assistant Administrator, AA/TA.  
Helen O. Armistead, Program Analyst, TA/AGR - RA p. 57.  
Dan B. Blake, Asst. Program Officer - Budget/Management,  
TA/AGR - RA p. 59.  
John B. Cordaro, Chief, Program Division, TA/AGR - RA p. 60.  
Milo L. Cox, Associate Director for Field Review and  
Evaluation, TA/AGR - RA p. 61.  
Carrol F. Deyoe, Special Assistant (FAO Liaison),  
TA/AGR - RA p. 62.

Hattie S. Dulaney, Asst. Program Officer - Data Control, TA/AGR - RA p. 63.  
Ryland L. Holmes, Assistant Chief and Program Operations Officer, Program Division, TA/AGR p. 65.  
Ruth W. Lancetti, Agriculture Information Officer, TA/AGR p. 67.  
Gerald F. Horne, Deputy Director, TA/DA, specialist in planning, evaluation, and management systems.

(c) Consultants to A.I.D.

Orville George Bentley, Dean, College of Agriculture, University of Illinois - RA p. 68.  
Alex B. Daspit, formerly Policy Advisor, War on Hunger, A.I.D. - RA p. 69.  
Ursula H. Duffus, formerly Foreign Service Officer, American Embassy, Rome, now consultant on UN and FAO - RA p. 70.  
John N. Efferson, Vice-Chancellor of Agriculture, Louisiana State University - RA p. 71.  
Ralph E. Hansen, Formerly Director, USAID/Somalia - RA p. 72.  
C. C. Murray, formerly Dean, College of Agriculture, University of Georgia - RA p. 73.  
Joseph L. Ranft, formerly Associate Editor, Civic Education Service, Inc. - RA p. 74.  
Lyll E. Peterson, formerly in administrative positions in Latin America with A.I.D. and Rockefeller American Institute Association - RA p. 75.  
Howard B. Sprague, formerly Agricultural Staff Officer, National Academy of Sciences, and Chairman, Plant Sciences Division, Pennsylvania State University - RA p. 76.

(d) Institutional Resources (specialty in parentheses)

India (with activities in other countries to utilize residual grant funds)  
University of Illinois (crop disease) - IR p. 18, IG p. 1.  
Kansas State University (grain storage, handling, and utilization) - IR p. 21, IG p. 1.  
University of Missouri (crop breeding) - IR p. 23, IG p. 1.  
Ohio State University (soil and water) - IR p. 25, IG p. 1.  
Pennsylvania State College (seed) - IR p. 27, IG p. 1.  
University of Tennessee (agricultural economics and rural sociology) - IR p. 29, IG p. 1.

West Africa, Francophone  
University of Michigan (policy and development) -  
IR - P. 99, IG p. 6.

Non-profit organizations:

Agricultural Development Council. Purpose is to increase competence in economic and human problems of agricultural development. Arranges fellowships, research grants, and seminars CH May 1972. NP p. 16.  
American Home Economics Association. Educational and scientific organization of home economists. Publishes reports and offers scholarships to women from overseas. CH May 1972.  
International Committee for the Anthropology of Food and Food Habits. Established in Paris an information center on food habits. CH May 1972.  
Tropical Products Institute, British Ministry of Overseas Development. Provides advisory and informational services to developing countries on all aspects of tropical products, including research, storage, processing and training. CH May 1972.  
American Freedom from Hunger Foundation. VF p. 3, 9. NP p. 37.  
Near East Foundation, VF p. 6, 13. NP p. 357.  
Meals for Millions Foundation, VF p. 5, 13. NP p. 314.  
Agricultural Missions. NP p. 17.  
Farmers and World Affairs, Inc. NP p. 184.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-2813, conducted a seminar on the Role of the International Agri-Business Firm in Agricultural Development, on May 23-24, 1972 at the University of Iowa.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Agribusiness Planning and Development. Proposed project. Worldwide. Obligation span: FY 1973-75. Life-of-project cost estimate: \$165,000. Purpose: To institutionalize

a capacity to develop LDC agribusiness entities in the cereal-oilseed subsector. The research, training, and technical assistance skills of on-going AID contractors would be combined with private sector skills and inputs to yield agribusiness system development. Outputs: Checklist of factors crucial for agribusiness development, integrated task force of private sector and AID contractors, and identification of agribusiness opportunities. Proposed contractor: Kansas State U. Project manager: J. Urano, TA/AGR.

Agricultural Technical Support (Technical Literature).  
Ref.: AG p. 54. Has become a part of a non-sector project, Technical Support, Including Field Services Fund, 931-11-999-003.

Project Cross-reference

Agricultural Management. See section D-2-f.

U.S. INSTITUTIONAL DEVELOPMENT (Sec. 211(d))

Agricultural Development in India, 931-11-130-103 to 109 (except 105.) \$1,200,000 obligated 5-31-68. Largely phased out. Ref: IR p. 17-32.

(g) Other A.I.D. Projects

Bolivia: Rural Development, CP-LA p. 87, 89.  
Chile: Agricultural Sector, CP-LA p. 107.  
Colombia: Agricultural Sector, CP-LA p. 114.  
Costa Rica: Agricultural Sector Development, CP-LA p. 26.  
Guyana: Agricultural Sector Improvement, CP-LA p. 191.  
Haiti: Agricultural Development Support, CP-LA p. 180.  
Rural Development, CP-LA p. 185.  
Honduras: Agricultural Productivity, CP-LA p. 55.  
Rural Sector Development, CP-LA p. 57.

- Nicaragua: Agricultural Sector Loan, CP-LA p. 69.  
 Paraguay: Agricultural Productivity and Institutional Development, CP-LA p. 137.  
 Peru: Agricultural Development and Operations, CP-LA p. 147.  
 Central Am. Reg.: Agribusiness Development, CP-LA p. 17.  
                   Agricultural Planning, CP-LA p. 19.  
                   Agricultural Diversification, CP-LA p. 26.  
 Afghanistan: National Agriculture Development, CP-ASIA p. 51.  
                   Helmand Arghandah Valley Regional Dev., CP-ASIA p. 51.  
 Bangladesh: Agricultural Inputs, CP-ASIA p. 68.  
                   Rural Development, CP-ASIA p. 68.  
 India: Agricultural Production Promotion, CP-ASIA p. 75.  
           Increased Agricultural Inputs, CP-ASIA p. 75.  
 Indonesia: Assistance to Agriculture, CP-ASIA p. 107.  
 Korea: Agriculture Planning, CP-ASIA p. 126.  
           Agricultural Development, CP-ASIA p. 124.  
 Laos: Agricultural Development, CP-IC p. 66.  
 Pakistan: Agricultural Sector, CP-ASIA p. 87.  
 Philippines: Agricultural Services, CP-ASIA p. 136.  
 Thailand: Agricultural Development, CP-SA p. 11.  
 S.E. Asia Reg.: Mekong Pioneer Projects Dev., CP-IC p. 83.  
 Spain: Agricultural Projects, CP-SA p. 49.  
 Ethiopia: Ada District Development, CP-AFR p. 20,22.  
           Rural Agricultural Development, CP-AFR p. 24.  
           Agricultural Sector Loan, CP-AFR p. 27.  
           Agriculture Advisory Services, CP-AFR p. 21.  
 Morocco: Agricultural Sector, CP-AFR p. 73.  
 Sudan: Agricultural Experimentation and Training, CP-AFR p. 90  
 Tunisia: Integrated Agricultural Development, CP-AFR p. 118.  
           Agricultural Sector Loan, CP-AFR p. 122.  
           Agricultural Production and Research, CP-AFR p. 115.  
 S. Afr. Reg.: Thaba Boisiu (Lesotho) Rural Dev., CP-AFR p. 174.  
                   Shiselweni (Swaziland) Dry Land Farming, CP-AFR p. 178.

(h) Policies and Priorities

- The War on Hunger: Guidelines for Planning and Programming  
 AID Assistance in Agricultural and Related Sectors,  
 M.C. 1612.10, Dec. 6, 1966, 15 p.  
 Technical Support by the U.S. Department of Agriculture,  
 M.C. 1612.10.4, April 2, 1970, 10 p.

(i) Technological Developments

- Village Technology Handbook (VT) entries:  
 earth borer for post holes - p. 248-249  
 home food storage devices - p. 257-276.  
 solar water heater - p. 321-322.  
 stoves - p. 330-339.

Modern Technologies periodical (MT) entries:

- agro-industrial complex sites 72-1 p. 52.
- science, technology, and development in agriculture  
72-3 p. 108.
- sensor agricultural resource surveys 72-4 p. 74.
- technological change in agriculture 72-4 p. 102.

(j) Selected References

- Cited A.I.D. publications AG, AY, and RA (see section Z).
- Homemaking Handbook, U.S. Department of Agriculture and  
TA/AGR, 1971, 237 p.
- Homemaking Around the World, TA/AGR.
- Besterman, T., Agriculture--A Bibliography of Bibliographies,  
Rowman & Littlefield, Totowa, N.J., 1971, 302 p.
- Garman, Willard H., "Agricultural Production in Relation  
to the Environment", TAB Technical Series Paper No. 7,  
1972, 8 p.
- Mosher, Arthur T., Getting Agriculture Moving, Praeger,  
New York, 1966, 191 p.
- National Planning Association, Development Digest:  
"Agriculture Planning", Oct. 1962 p. 60-69, Oct. 1965 p. 79-106.  
"Farmers and Innovation", Jan. 1969, p. 3-44.
- Rechcigl, Miloslav, Jr., Man, Food and Nutrition. Strategies  
and Technical Measures for Alleviating the World Food  
Problem, CRC Press, Cleveland, 1973.
- Schultz, T.W., Economic Growth and Agriculture, McGraw-Hill,  
New York, 1968.
- Thorbecke, E. (ed.), The Role of Agriculture in Economic  
Development, National Bureau of Economic Research,  
New York, 1970, 480 p.
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agricultural engineering and on environment -- MD Vol. 1,  
No. 2, p. 3.
- Wharton, Clifton R. (ed.), Subsistence Agriculture and  
Economic Development, Aldine Pub. Co., Chicago, 1969,  
481 p.
- World Bank, "Agriculture--Sector Working Paper", 1972,  
83 p.

2. AGRICULTURAL ECONOMICS

(a) Significance of Key Problem Area/Subsector

A key problem is the lack in less developed countries of sufficient agricultural economics capability, particularly in sector analysis. This accounts in part for the slow response of much LDC agriculture to produce more food, increase employment, and to achieve more equitable income distribution effects, and improve the quality of rural life. A.I.D. collaboration with LDCs in sector analysis, with emphasis on rural areas, and in training agricultural economists can lead to better selection of investment, research, and training priorities and more efficient choices in crop patterns, alternative technologies, and marketing systems.

BEST AVAILABLE DOCUMENT

(b) A.I.D. Specialists

Douglas D. Caton, Senior Agricultural Specialist and Acting Chief, Agricultural Economics and Sector Planning Division, TA/AGR-RA p. 49.  
John B. Cordaro, Chief, Program Division, TA/AGR-RA p. 60.  
Erven J. Long, Associate Assistant Administrator, AA/TA.  
James K. McDermott, Director, TA/RIG.  
Delbert T. Myren, Assistant Director for Planning and Utilization, TA/RIG.  
Fred L. Mann, Agricultural Economist, TA/AGR-RA p. 51.  
Samuel Daines, Agricultural Economist, ARA/LA/DR.  
Antonio Gayoso, Agricultural Economist, AFR/DS.  
Francis C. Jones, Food and Agriculture Officer, USAID/Korea.  
Robert E. Laubis, Agricultural Economist, LA/DR  
Jiryis S. Oweis, Agricultural Economist, AFR/DP.  
David L. Peacock, Agricultural Economist, USAID/Colombia.  
Fletcher E. Riggs, Asst. Director for Agriculture, USAID/Thailand.

(c) Consultants to A.I.D.

Melvin C. Blase, Assoc. Prof., Dept. Agr. Economics, University of Missouri-RA p. 52.  
Arthur J. Coutu, formerly Chief, Agricultural Economics and Sector Planning Division, TA/AGR-RA p. 50.  
John N. Efferson, Vice-Chancellor of Agriculture, Louisiana State University-RA p. 71.  
J. Edwin Faris, Head, Dept. of Agr. Economics, Virginia Polytechnic Institute-RA p. 16.  
Melvin L. Upchurch, Professor of Agricultural Economics, University of Florida-RA p. 53.

(d) Institutional Resources

Cornell University - IR p. 2, IG p. 5, RA p. 54.  
Iowa State University - IR p. 5, IG p. 5 and 13, RA p. 54.  
Michigan State University - IR p. 7, IG p. 5, RA p. 55.  
University of Minnesota - IR p. 11, IG p. 5, RA p. 55.  
Southern University - IR p. 15, IG p. 10, RA p. 56.  
Virginia State College - IR p. 16, IG p. 10, RA p. 56.

(e) Conferences and Committees

The Agricultural Development Council (ADC), as part of its Research and Training Network under project number 140-887 (contract AID/csd-2813), conducted the following research-oriented seminars and workshops:

Agricultural Sector Analysis, May 16-17, 1971 (Iowa State U.), Dec. 1, 1971 (ADC/N.Y.), Feb. 28-29, 1972 (Purdue U.), May 1-3, 1972 (Washington, D.C.), Nov. 1-3, 1972 (Washington, D.C.).

International Trade, May 6-7, 1971 (North Carolina State U.), May 24, 1971 (Chicago, Ill.), Sept. 23, 1971 (ADC/N.Y.).

Low-Income Farmer Development Strategies, Sept. 13-15, 1971 (Ohio State U.).

Agricultural Research Priorities, Jan. 17-18, 1972 (ADC/N.Y.).

Others on water, rural education, rural sociology, marketing, credit, forestry, and agri-business listed in appropriate subsector of this directory.

The council also conducted the following teaching and training-oriented seminars and workshops:

Interrelationship Between Population, Employment, and Economic Growth, May 26-27, 1971 (U. of Kentucky), Dec. 2-3, 1971 (ADC/N.Y.).

Production Incentives, Oct. 13-15, 1971 (Kansas State U.), April 17-19, 1972 (Food Research Institute, Stanford U.), June 21, 1972 (U. of Wisconsin).

Others on land policy and agricultural administration listed in appropriate subsector of this directory.

(F) TAB ProjectsGENERAL TECHNICAL SERVICES

International Agricultural Economics Seminars, 931-11-140-887. Worldwide. Obligation Span: FY 1970-75. Life-of-project cost estimate: \$811,000. Purpose: To link U.S. and foreign agricultural economists in a research network to concentrate on development problems. Outputs: Workshops, seminars, courses, reviews, and definition of problem areas. PA 5-26-70. Contractor: Agricultural Development Council, Inc. Contract AID/csd-2813. Project Manager: D.D. Caton, TA/AGR. Ref.: AY p. 9.

Joint FAO/U.S. Training Program on the 1970 World Census of Agriculture, 931-11-190-830. Worldwide. Obligation span: FY 1967-71. Life-of-project cost: \$273,000. Purpose: To provide as requested by LDCs a US/FAO training program in agricultural statistics and agricultural census techniques. Outputs: Trained agricultural census takers, a 1970 World Census of Agriculture, and improved LDC agricultural statistical services. Contractor: U.S. Bureau of the Census. PASA WOH(CA)4-69. Project Manager: D.D. Caton, TA/AGR. Ref.: AG p. 53.

#### CENTRAL RESEARCH

Analysis of Capital Formation and Technological Innovation at the Farm Level in LDCs, 931-17-140-506. Major country: Brazil. Obligation span: FY 1969-74. Life-of-project cost estimate: \$1,706,000. Purpose: To analyze how capital is formed and used at the farm level and the relation of technological innovation. Outputs: Insights on accelerating developmental capital formation and increasing farm incomes. Contractor: Ohio State U. Contract: AID/csd-2501. Project Manager: D. D. Caton, TA/AGR. Ref.: RR p. 21. AY p. 10. AG p. 45. CR p. 3.

The Impact of New Technology on Rural Employment and Income, 931-17-140-523. Major countries: India and Thailand. Obligation span: FY 1970-73. Life-of-project cost estimate: \$733,000. Purpose: Purpose: To analyze the effects of high-yielding grains and other new technologies on income growth and distribution, particularly as they affect small farms. Outputs: Better understanding of the secondary effects of the "green revolution", and training of technicians in relevant analytical procedures. Contractor: Cornell U. Contract: AID/csd-2805. Project Manager: D. D. Caton, TA/AGR. Ref.: RR p. 18. AY p. 11. AG p. 43. CR p. 3.

Adapting and Testing of Agricultural Simulation Model to Sector Analysis, 931-17-140-536. Major countries: Korea and Nigeria. Obligation span: FY 1971-76. Life-of-project cost estimate: \$1,346,000. Purpose: To test the superiority of computerized systems analysis over intuitive procedures in development planning. In particular, to introduce economic and social data into a computer to construct country models and then test the effects on development of simulated changes

in budget allocations, manpower utilization, price changes, introduction of new technologies, etc. Outputs: Development of models showing how to better allocate resources among programs and projects to accelerate development. Adaptation of model methodology from one country to another country. Contractor: Michigan State U. Contract: AID/csd-1557/2975. Project Manager: D. D. Caton, TA/AGR. Ref.: RS p. 5. AY p. 12. CR p. 4.

Agricultural Diversification and Trade, 931-17-190-533. Major countries: El Salvador, Guatemala, Philippines. May be subdivided into separate projects. Obligation span: FY 1971-76. Life-of-project cost estimate: \$1,025,000. Purpose: To study agricultural commodity costs, supply responses, domestic demand, and export opportunities. Outputs: Subsector analysis techniques and analyses of actual responses to specific production innovations and market opportunities. Contractors and contracts: Central America--North Carolina State U., AID/csd-3632. Philippines--USDA Economic Research Service. PASA RA (AJ) 13-71. Project Manager: D. D. Caton, TA/AGR. Ref.: RS p. 6. AY p. 14. CR p. 4.

Rural Employment in Tropical Africa: A Network Approach, 931-17-190-543. Major countries: Ethiopia, Nigeria, Sierra Leone. Obligation span: FY 1971-76. Life-of-project cost estimate: \$1,708,000. Purpose: To develop a framework showing the effect of macro economic policies on labor absorption in agriculture and the alternative labor-using systems of production and marketing. Outputs: Partial equilibrium model for analyzing employment issues, and "network construct" methodology. Contractor: Michigan State U. contract: AID/csd-3306/3625. Project Manager: D. D. Caton, TA/AGR. Ref.: RS p. 4. AY p. 13. CR p. 3.

Improvement of Economic Planning and Agricultural Development. Major Country: Thailand. Obligation span: FY 1973-77. Life-of-project cost estimate: \$789,000. Purpose: To construct national economic models which simultaneously consider investment alternatives. Outputs: Model of Thai economy, analytical programs, and training of sector analysts. Contractor: Iowa State U. Project. Manager: D.D. Caton, TA/AGR.

Economic Analysis of Policy and Technical Change in Agricultural Production in Developing Countries. Proposed project. Major country: Brazil. Obligation span: FY 1973. Life-of-project cost estimate: \$263,000. Purpose: To measure the effects of policy and technical changes in the agricultural sector on output, income, employment, consumption, foreign exchange earnings, and resource allocation. Outputs: Improved simulation models for sector analysis and training of specialists. Contractor: Purdue U. Project Manager: D.D. Caton, TA/AGR.

Completed projects:

- Rural Development Analysis (Agricultural Sector Planning Models). Ref.: RR p. 18. AG p. 41.
- Factor Analysis for Accelerating Agricultural Productivity in LDCs (Mexico). Ref.: RR p. 19. AG p. 40.
- Analysis of Factors Associated with Differences and Changes in Agricultural Production in LDCs. Ref.: RR p. 19. AG p. 39.
- Diffusion of Innovations in Rural Societies. Ref.: RR p. 20. AG p. 42.
- Analysis of Agricultural Capital Formation and Utilization in LDCs. Ref.: RR p. 21. AG p. 44.
- Agricultural Prices in Economic Development, Their Role, Function, and Operation. Ref.: RR p. 22. AG p. 46.
- Analysis of Demand Prospects for Agricultural Exports of LDCs. Ref.: RR p. 23. AG p. 47.
- Study Conference on Means to Increase Agricultural Productivity in Underdeveloped Countries. Ref.: RR p. 24.
- Mapping of Research Requirements for the Food-for-Peace Program. Ref.: RR p. 24.
- Growth and Development Effects of Food Aid Shipments Under Food-for-Peace Act of 1966. Ref.: RR p. 107.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

International Economics. Worldwide. Obligation span: FY 1970 (work span FY 1971-75). Life-of-projects cost estimate: \$2,440,000. Four related projects: 931-11-140-122, University of Minnesota, AID/csd-2815, \$800,000, technical change and development, labor markets, commodity markets, and trade. 931-11-140-123, Michigan State University, AID/csd-2826, \$625,000, sector analysis-simulation, employment generation, trade diversification, and marketing systems. 931-11-140-124, Iowa State University,

AID/csd-2824, \$775,000, sector analysis and planning, employment and income distribution, land and water resource use, and interrelationships between agriculture and overall economic development. 931-11-140-125, Cornell University, AID/csd-2823, \$240,000, international agricultural trade, market structure and development, and sector analysis-employment. Project manager: D. D. Caton, TA/AGR. Ref.: IR p. 1-15.

Assistance to Low-Income Farms and Small Business, 931-11-140-139. Worldwide. Obligation span: FY 1972 (work span FY 1972-77). Life-of-project cost estimate: \$500,000. Grantee: Virginia State College. Grant AID/csd-3415. Project manager: D. D. Caton, TA/AGR. Ref.: IR p. 16.

Countering Rural Unemployment and Underemployment, 931-11-140-140. Worldwide. Obligation span: FY 1972 (work span FY 1972-77). Life-of-project cost estimate: \$500,000. Grantee: Southern University. Grant AID/csd-3414. Project manager: D. D. Caton, TA/AGR. Ref.: IR p. 15.

(g) Other A.I.D. Projects

Brazil: Agricultural Econ. Res. and Analysis, CP-LA p. 100.  
Nicaragua: Agricultural Planning and Stat. Services, CP-LA p. 65.  
Jordan: Agricultural Economics and Planning, CP-ASIA p. 37.  
Ethiopia: Agricultural Sector Planning, CP-AFR p. 25.  
Ghana: National Agriculture Planning, CP-AFR p. 36.  
Kenya: Agricultural Planning, CP-AFR p. 49.  
Rural Development, CP-AFR p. 49.  
Liberia: Agriculture Program Development, CP-AFR p. 59.  
Nigeria: Agricultural Economics and Marketing, CP-AFR p. 79.  
Tanzania: Agriculture Planning, CP-AFR p. 105.  
Tunisia: Agricultural Economic Research and Planning, CP-AFR p. 116.  
Zaire: Agricultural Economics Dev., CP-AFR p. 134.

(h) No entry.

(i) No entry.

(j) Selected References (including contractors)

Agricultural Development Council, The Research and Training Network, Annual Progress Report, July 1, 1971--June 30, 1972, 12 p.  
Coutu, A. J., Agricultural Sectoral Analysis and A.I.D., preliminary paper presented at Ames, Iowa, May 1971.  
Eicher, Carl, et al., Employment Generation in African Agriculture, Institute of International Agriculture Research Report No. 9, 1970, 66 p.  
Jensen, H., and Coutu, A. J., Towards an Understanding of Sector Analysis, preliminary paper, Aug. 1972.

- AID/TAB/AGR, Selected Bibliography (on agricultural sector planning), 1972, 7 p.
- AID/SER/DM/ARC, Capital Formation and Agricultural Technology, Agriculture Bibliography No. 7, in preparation.
- Boserup, Ester, The Conditions of Agricultural Growth -- The Economics of Agrarian Change under Population Pressure, George Allen & Unwin, London, 1965.
- Clark, Colin, and Haswell, M. R., The Economics of Subsistence Agriculture, MacMillan/St. Martin's Press, New York, 1966 (2nd ed.), 216 p.
- Mellor, John W., The Economics of Agricultural Development, Cornell Univ. Press, Ithaca, New York., 1966, 403 p.
- National Planning Association, Development Digest: "Employment in Agriculture", Jan. 1971, p. 77-124.
- Rice, E. B., and Glaesner, E., Agricultural Sector Studies--An Evaluation of AID's Recent Experience, A/AID, 1972.

3. AGRICULTURAL RESEARCH(a) Significance of Key Problem Area/Subsector

Optimizing agricultural development requires not only greater and better managed production efforts but also a continuing flow of new technology. Such technology improves production, processing, distribution, and utilization of the whole range of commodities. It results from research, part of which must be done in and by the less developed countries. This requires a strengthening of developing country capability to conduct agricultural research. A major element of the effort is establishment of worldwide "research networks" which propose to link all institutions having similar activities and goals. They facilitate interchange of information and research results, and permit a coordinated approach to research on specific commodities or problems. The objective is specific networks for each well-defined objective, e.g., increased production of rice.

(b) A.I.D. Specialists

Guy G. Baird, Deputy Director for Research, TA/AGR-RA p. 58.  
 Nels M. Konnerup, Livestock Disease Specialist, TA/AGR-RA p. 10.  
 Samuel C. Litzenberger, Chief, Food Crop Production Division,  
 TA/AGR-RA p. 3.  
 Carl F. Sierk, Chief, Livestock Production Division, TA/AGR-RA p. 12.

(c) Consultants to A.I.D.

M. B. Russel, Chief of Party, University of Illinois team in India, Specialist in soil management.  
 Howard B. Sprague, formerly Agricultural Staff Officer, National Academy of Sciences, and Chairman, Plant Sciences Division, Pennsylvania State Univ. - RA p. 76.

(d) Institutional Resources

## Nonprofit organizations:

International Center of Tropical Agriculture (CIAT). NP p. 818.  
 International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)  
 International Institute of Tropical Agriculture (IITA). NP p. 571.  
 International Maize and Wheat Improvement Center (CIMMYT). NP p. 884.  
 International Potato Center (CIP)  
 International Rice Research Institute (IRRI). NP p. 688.

(e) Conferences and Committees

A workshop on agricultural research systems in South and Southeast Asia was sponsored by the Agricultural Development Council at New Delhi in 1971. Proceedings were published.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

International Maize and Wheat Improvement Center, Mexico  
931-11-110-840. Location: Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) in Mexico City. Field work worldwide. Obligation span: FY 1969-75. Life-of-project cost estimate: \$7,499,000. Purpose: To help CIMMYT's efforts to increase production of maize, wheat, sorghum, and triticale in food deficit countries. Outputs: CIMMYT development of additional high-yield strains of maize, wheat, and triticale with broad adaptability and disease resistance, system of data retrieval and interpretation serving maize and wheat specialists, and trained LDC agronomists. PROP 5-11-72. Contractor: CIMMYT, which is also supported by Rockefeller and Ford Foundations. Contract: AID/csd-3384 and 2973. Project manager: G. B. Baird, TA/AGR. Ref: AY p. 1. AG p. 16.

Crops Research Institute for the Semi-Arid Tropics (ICRISAT),  
931-11-110-972. Miscellaneous obligating document 312. 8611. Hyderabad, India, with worldwide collaboration. Obligation span: FY 1972-76. Life-of-project cost estimate: \$4,135,000. Purpose: To develop improved varieties of sorghum, millet, chick peas, pigeon peas, and other plant crops. Outputs: Extension of research network, distribution of experimental germplasm, and placement of trained technicians in key LDC positions. Interim PA 3-6-72. Ford Foundation and IBRD participation. Project manager: G. B. Baird, TA/AGR.

International Potato Center, 931-11-110-973. Location: La Molina, Peru, with worldwide collaboration. Obligation span: FY 1972-76. Life-of-project cost estimate \$1,475,000. Purpose: To assist in establishing an international potato research center, and to support potato research and training. Outputs: International research network, improved potato strains, and A.I.D. support replaced by foundations, multi-donor agencies, and others. PA 4-5-72. Contractor: North Carolina State U. Contract: AID/csd-3286. Project manager: G. B. Baird, TA/AGR. Ref: AY p. 2.

International Rice Research Institute, 931-11-130-826.  
 Location, Los Banos, Philippines, with worldwide collaboration.  
 Obligation span: FY 1968-75. Life-of-project cost estimate  
 \$2,810,000. Purpose: Collaborate in providing current and  
 capital requirements of International Rice Research Institute  
 (IRRI) enabling it to develop rice production technology  
 needed by LDC's and to assist LDC's to strengthen their own  
 research capability. Outputs: High-yielding rice varieties  
 with increased disease and insect resistance and improved  
 grain quality. Production technology package. Training  
 LDC rice scientists. Contracts AID/ea-107 and nesa-303.  
 Project manager: G. B. Baird, TA/AGR. Ref.: AG p. 15.

Plant and Seed Materials, 931-11-130-828. Worldwide. Obliga-  
 tion span: 1955-76. Life-of-project cost estimate: \$1,860,000.  
 Purpose: Supply LDC's as requested with selected plant and  
 seed materials and related technical assistance. Outputs:  
 Extension and modification of USDA system for collecting,  
 screening, and supplying selected plant and seed material for  
 improved nutrition and crop diversification. Response capa-  
 bility for providing advice/training on plant introduction  
 systems. Linkages between USDA and international organizations  
 and national systems. Contractor: Agricultural Research  
 Service, U.S. Department of Agriculture. PASA RA(AJ) 2-69.  
 Project manager: A. R. Downie. Ref.: AG p. 13.

### Completed Project

International Center for Tropical Agriculture (CIAT),  
 Colombia, 931-11-190-865. Ref.: AG p. 17.

### g) Other A.I.D. Projects

Brazil: Agricultural Research, CP-LA p. 97.  
 LA Reg.: International Tropical Ag Center (CIAT), CP-LA p. 216.  
 India: Rice Research Improvement, CP-ASIA p. 76.  
 Indonesia: Agricultural Research, CP-ASIA p. 109.  
 Jordan: Wheat Research and Production, CP-SA p. 36.  
       Vegetable Research and Production, CP-SA p. 43.  
 Korea: Agricultural Research, CP-ASIA p. 128.  
 Nepal: Foodgrain Technology, CP-ASIA p. 91.  
 Pakistan: Agricultural Research, CP-ASIA p. 83.  
 Philippines: Agricultural Research, CP-ASIA p. 145.  
 Asia Reg.: Asian Vegetable Research and Dev. Center, CP-ASIA p. 39.  
 Morocco: Assistance to Agricultural Research, CP-AFR p. 69.

Sudan: Agricultural Diversification and Research, CP-AFR p. 91.  
Tanzania: Agricultural Research, CP-AFR p. 100.  
C&W Af. Reg.: Major Cereals Research - West Africa, CP-AFR p. 144.  
E Afr Reg.: East African Food Crop Research, CP-AFR p. 165.  
                  Major Cereals & Legume Improvement, CP-AFR p. 164.  
Afr Reg.: North Africa Cereals Improvement, CP-AFR p. 188.

(h) Policies and Priorities

Support in agriculture research centers on international networks of researchers and users of research and on strengthening the research capability of individual developing countries. Priority is accorded to the fields of greatest need as viewed by the less developed countries. For example, the rice research network reflects the priority need for improved technology for that crop.

(i) Technological Developments

Modern Technologies periodical (MT) entries:

agricultural research priorities in Africa 72-3, p. 83.  
agricultural research in Ghana 72-4 p. 101.

(j) Selected References

Arnon, I., Organization and Administration of Agricultural Research, Elsevier Publishing Co., Amsterdam, 1968, 342 p.  
Fishel, Walter L. (ed.), Resource Allocation in Agricultural Research, University of Minnesota Press, Minneapolis, 1971, 391 p.  
McMeekan, C. P., "What Kind of Agricultural Research?", Finance and Development (World Bank Group), June 1965, p. 71-78.  
Moseman, Albert H., "Building Agricultural Research Systems in the Developing Nations," Agricultural Development Council, Inc., New York, 1970, 137 p.  
Moseman, A. H., Baird, Guy B., et al., "Agricultural Research in Pakistan", report of the Second Joint Pakistan-American Team, Islamabad, 1973, 82 p.  
National Planning Association, Development Digest: "Agricultural Research", July 1971, p. 3-44.

4. CROP PRODUCTION

(a) Significance of Key Problem Area/Subsector

Although part of better nutrition will come from livestock products and fortification of foods, the source of most food calories and nutritious elements will continue to be crops. Thus decreasing hunger and improving nutrition depends foremost on raising the quantity and quality of crops produced and eaten. An important part of this effort is raising the protein content of crops and increasing the utilization of the meal byproduct left during extraction of vegetable oil from various seed crops.

(b) A.I.D. Specialists

Russell Derosiers, Crop Production Specialist, TA/AGR-RA p. 1.  
Andrew R. Downie, Crop Production Specialist, TA/AGR-RA p. 2.  
Samuel C. Litzenberger, Chief, Food Crop Production Division,  
TA/AGR-RA p. 3.

George K. Parman, Food Processing Specialist, TA/AGR-RA p-4.  
James A. Urano, Chief, Agricultural Inputs Division, TA/AGR-  
RA p. 26.

James Edwin Hawes, rice technologist, Regional Rural Development  
Officer, LA/DR/RD-RA p. 45.

Charles A. Breitenbach, Regional Rural Development Officer,  
LA/DR.

Miloslav Rechcigl, Jr., Nutrition Advisor and Assistant Director  
for Operations, TA/RIG.

(c) Consultants to A.I.D. (consultancies pending)

Llewellyn Humphrey, genetics and plant breeding, formerly Agronomy  
Advisor, USAID/Turkey-RA p.5.

Darell E. McCloud, Chairman, Department of Agronomy, University  
of Florida-RA p.6.

George F. Sprague, formerly Leader, Corn and Sorghum Investigations,  
Department of Agriculture, Beltsville, Md.-RA p.7.

Arnold J. Ullstrup, Professor of Plant Pathology, Purdue University-  
RA p. 8.

(d) Institutional Resources

Universities of Illinois, Missouri, and Puerto Rico, and Purdue  
and Texas A&M Universities-RA p.9.

(e) Conferences and Committees

Interdepartmental Committee on Radiation and Preservation of Food. Chaired by U.S. Department of Commerce.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Seed Program and Industry Development, 931-11-130-203. Major countries: Colombia, Costa Rica, Ecuador, Honduras, Panama, Paraguay, Peru, Indonesia, Philippines, Thailand, Morocco, Tunisia, Zaire. Obligation span: FY 1958-77. Life-of-project cost estimate: \$1,698,000. Purpose: To increase LDC capabilities to supply their farmers' needs for improved seed. Outputs: Development of equipment and facilities for seed testing, processing, packaging, and storage, assessment of agriculture-government-industry linkages in seed operations, training of specialists and administrators, and publications. PROP 3-2-72. Contractor: Miss. State U. Contract: AID/csd-2976, AID/CM/ta-C-73-74. Project manager: A. R. Downie, TA/AGR. Ref: AY p. 27. AG p. 12.

Plant and Seed Materials, 931-11-130-828. Major countries: 8 in LA, 11 in Asia, 7 in Africa. Obligation span: FY 1955-76. Life-of-project cost estimate \$1,588,000. Purpose: To provide plant breeders with experimental quantities of improved seed and vegetative stocks so they can develop disease-and insect-resistant high yielding varieties with broad adaptation. Outputs: Adaptation of USDA system for distributing plant and seed material, establishment of international and national linkages, training of specialist, and advisory services to LDCs. PROP 2-28-72. Contractor: USDA Agricultural Research Service, Beltsville, Md. PASA TA(AJ)2-69. Project manager: A. R. Downie, TA/AGR. Ref: AY p. 28. AG p. 13.

Computerized Agricultural Research Information System (CARIS), 931-11-130-974. Major countries are fourteen in West Africa: Dahomey, Gambia, Ghana, Guinea, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo, and Upper Volta. Obligation span: FY 1972. Life-of-project cost: \$15,000. Purpose: To provide partial support to a pilot project in computerization of data to develop methodologies for collection, organization, storage, retrieval, and distribution of information on agricultural research performed or in progress. Outputs: Inventories of research, researchers, and research institutions. Communication, coordination, and assessments of institutional capabilities in area covered. FAO and other donors participating. PROP 4-5-72. FAO/csd-3639. Project manager: R. Holmes, TA/AGR.

Technical Assistance Food Grain Drying, 931-11-190-786. Major countries: Bolivia, Brazil, Colombia, Ecuador, El Salvador, Guatemala, Honduras, India, Jordan, Pakistan, Vietnam, Mali, Morocco, Niger, Senegal, Upper Volta. Obligation span: FY 1968-77. Life-of-project cost estimate: \$1,177,000. Purpose: To reduce losses of food grain weight and quality between field and consumer through technical assistance in drying, storage, and marketing, and training of LDC technicians. PROP 2-2-72. Contractor: Kansas State U. Contract: AID/csd-1588. Project manager: W. H. Garman, TA/AGR. Ref: AY p. 29. AG p. 14.

Development and Utilization of Soybeans, 931-11-190-929. Worldwide. Obligation span: FY 1971-73. Life-of-project cost \$166,000. Purpose: To develop production and utilization of improved varieties of food soybeans without complicated processing. To demonstrate the Illinois method for rapidly processing soybeans for human food. Outputs: Greater production of new soybean varieties, and wider use of the Illinois method of soybean processing for human food. PA 4-19-71. Contractor: University of Illinois. Contract: AID/csd-3292. Project manager: R. Desrosiers, TA/AGR. Ref: AY p. 3.

Completed Project:

Textbook on Natural Fiber Crops. Ref: AG p. 11. (Book not yet published.)

Project Cross-References:

Asian Agricultural College and University Seminar. See 7-f.  
 Technical Assistance in Food Marketing. See 10-f.  
 Increased Fish Production Through Improved Fish Culture in LDCs.  
 See 14-f.  
 Joint FAO/US Training Program in the 1970 World Census of Agriculture. See 1-f.  
 Fertilizer Technical Assistance. See 8-f.  
 Pest Management and Related Environmental Protection. See 8-f.

CENTRAL RESEARCH

Improved Grain Legume (Pulse) Production, 931-17-130-029. Major countries: Puerto Rico (for LA) and Iran (for Near East). Obligation span: FY 1963-74. Life-of-project cost estimate: \$3,676,000. Purpose: To increase yields and quality of legumes (beans and peas) through breeding disease-and-insect-resistant varieties with wide adaptation and improvement of agronomic practices. Outputs: Distribution of improved varieties of legumes (20 to 25 percent protein), training of technicians, and advisory service. Contractor: USDA Agricultural Research Service, Beltsville, Md. PASA RA (AJ)3-00. Project manager: A. R. Downie, TA/AGR. Ref: RR p. 3. AY p. 5. AG p.5. CR p. 1.

Improvement of Protein Quality in Sorghum, 931-17-130-452. Major countries: LA, India, Indonesia, Pakistan, Philippines, Thailand, Vietnam, Africa. Obligation span: FY 1966-76. Life-of-project cost estimate: \$2,142,000. Purpose: To improve varieties of sorghum by developing strains with improved protein quality and content. Outputs:

Distribution of high-protein varieties of sorghum, training of technicians, and advisory services. Contractor: Purdue U. Contract: AID/csd-1175. Project manager: R. Desrosiers, TA/AGR. Ref: RR p. 4. AY p. 7. AG p.2. CR p.1.

Improvement of Nutritional Quality of Wheat, 931-17-130-471. Major countries: Argentina, Brazil, Chile, Costa Rica Paraguay, Peru, India Iraq, Korea, Philippines, Thailand, Algeria, Nigeria. Obligation span: FY 1966-77. Life-of-project cost estimate: \$2,184,000. Purpose: To develop high-protein wheats with high yielding varieties. Outputs: Distribution of improved varieties of wheat, training of technicians, and advisory services. Contractor: U of Nebraska. Contract: AID/csd-1208. Project manager: R. Desrosiers, TA/AGR. Ref: RR p. 5. AY p.6. AG p. 4. CR p. 1.

Improvement of Protein Quality in Maize, 931-17-130-524. Major countries: Brazil, Colombia (CIAT), Mexico (CIMMYT), Nigeria. Obligation span: FY 1971-76. Life-of-project cost estimate: \$1,409,000. Purpose: To develop high-protein corns of superior quality with high yielding and good-keeping qualities. Outputs: Distribution of improved varieties of maize, training of technicians, and advisory services. Contractor: Purdue U. Contract: AID/csd-2809. Project manager: R. Desrosiers, TA/AGR. Ref: RR p. 6. AY p. 8. AG p.7. CR p. 3.

High-Yield Sorghum Cultivars. Proposed project. Worldwide. Obligation span: FY 1973-78. Life-of-project cost estimate: \$1,190,000. Purpose: To make available to LDCs high-yielding broadly-adapted varieties of sorghum with resistance to disease and related insects. Outputs: Development of high-yielding sorghum varieties, international research linkages, and training of technicians. Contractors: Universities of Nebraska, Puerto Rico, and Texas. Project manager: R. Desrosiers, TA/AGR.

Development of Improved Varieties of Soybean, 931-17-130-560. World-wide. Obligation span: FY 1973-78. Life-of-project cost estimate: \$1,450,000. Purpose: To develop improved varieties of soybeans adaptable to the tropics. Outputs: Selection of superior soybean cultivars, international research linkages, and training of technicians. Contractor: U of Illinois. Contract: AID/CM-ta-c-73-19. Project manager: G. K. Parman, TA/AGR.

Improvement of the Nutritive Quality and Productivity of Barley for the Semiarid Regions. Proposed project. Worldwide, especially North Africa and Middle East. Obligation span: FY 1974-77. Life-of-project cost estimate: \$1,250,000. Purpose: Develop barleys of superior protein content and quality, high yield, and improved agronomic characteristics for the semiarid regions of the world. Outputs: High-yielding, disease-and insect-resistant barleys of optimum nutritional quality adapted to semiarid regions released to LDCs. Breeding selection, and agronomic and nutrition research in progress. Scientists of LDCs trained in barley research. Proposed contractor: Montana State University. Project manager: R. Desrosiers, TA/AGR.

Completed Projects:

- Development and Use of Improved Varieties of the Major Cereal Crops of Africa. Ref.: RR p. 3. AG p. 1.  
 Preparation of a Plan for Orientation of Research on Cassava. Ref.: RR p. 6. AG p. 6.  
 Technical and Economic Factors Associated with Establishment of Seed Industry in the LDCs. Ref.: RR p. 8. AG p. 9.  
 Development of a Process for the Preparation of Coconut Protein Products for Use in Foods. Ref.: AG p. 10.

Project Cross-References:

- Agricultural Equipment Development. See 11-f.  
 Control of Weeds in LDCs. See 8-f.  
 Diseases of Grain Legumes. See 8-f.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

Tropical Soybean Improvement. Proposed project. Grant of \$1,000,000. Institutions: Universities of Illinois and Puerto Rico. Project manager: G. K. Parman, TA/AGR. Ref.: IR p. 18-20, 55-56.

(g) Other A.I.D. Projects

- Dominican Rep.: Agricultural Production, CP-LA p. 172.  
 Guyana: Rice Modernization Project, CP-LA p. 189.  
 Nicaragua: Basic Corn Production, CP-LA p. 63.  
 Pakistan: Seed Potato Multiplication, CP-ASIA p. 82.  
 Turkey: Cereals Production, CP-ASIA p. 18.  
 Vietnam: Crop Production, CP-IC p. 12.  
 Yemen: Sorghum Production, CP-ASIA p. 28.  
 Ethiopia: Pulses Seeds Production and Marketing, CP-AFR p. 23.  
 Ghana: Grains Development, CP-AFR p. 37.  
 Kenya: Crop and Livestock, CP-AFR p. 49.  
 Nigeria: Rice/Maize Production, CP-AFR p. 81.  
 Tanzania: Seed Multiplication and Distribution, CP-AFR p. 101.  
 C. and W. of Reg.: West Africa Rice Production and Marketing, CP-AFR, p. 146.  
                   Grain Production, Marketing, and Stabilization, CP-AFR, p-148.  
                   Chad Sategui-Deressia Rice Irrigation, CP-AFR p. 152.

(h) No entry.

(i) Technological Development

The Village Technology Handbook (VT) tells how to make a seed cleaner (p. 227-228) and grain dryer (p. 229-231)

Modern Technologies periodical (MT) entries:

edible oil production, Pakistan 72-4, p. 102.

radiation of fruits and vegetables, bibliography 72-4, p. 104.

seed processing and handling 72-3, p. 84.

(j) Selected References

TA/AGR Agriculture Technology for Developing Countries, Technical Series Paper:

No. 3. Breeding Food Crops for Improved Protein Quality, 1971, 5 p.

No. 5. Food Grain Legumes, as a Major Means of Combating Malnutrition in LDCs, 1971, 16 p.

No. 6. Oil Seed Production in the Tropics and Sub-Tropics, 1972, 68 p.

No. 8. Crop Production - Key Problem Area, 1972.

Caton, Douglas D., "Research - The Seed for Agricultural Progress", A.I.D. War on Hunger, June 1969, p. 4-5.

Dempsey, James, Natural Vegetable Fibers, to be published by Univ. of Florida Press, Sponsored by TA/AGR.

Handbook of Tropical and Subtropical Horticulture, TA/AGR. Macmillan, New York, 1972 (3rd ed.), 637 p.

Hutchinson, M. T., Roster of Food Crop Specialist of the World, Feb. 1973, p. 240, TA/AGR.

Kips, M.S., Production of Field Crops, McGraw-Hill, New York, 1970 (6th ed.), 790 p.

Litzenberger, Samuel C., "Increasing Food Production with Emphasis on High Protein Crops", December 1972, 23 p.

Mississippi State University, "Seed Processing and Handling", 1968, NTIS No. PB-206 805.

SER/DM/ARC Agriculture Bibliographies:

No. 1, Wheat Production Programs, 1969, 12 p.

No. 2, Rice Production Programs, 1969, 19 p.

Thompson, Homer C., and Kelly, William C., Vegetable Crops, University of Georgia, "A Literature Review and Research Recommendation on Casava", 1972, 325 p. Sponsored by TA/AGR.

5. WATER AND SOIL(a) Significance of Key Problem Area/Subsector

More productive results from currently farmed land and the bringing into use of unutilized land depend heavily on knowing more about the properties and good management of water and soil. The knowledge gap is particularly serious as regards the agronomic characteristics of tropical soils, including highly-leached soils in the rain forest and alkali-saturated soils of semi-arid regions. Water control is needed to reduce flooding, waterlogging of soils, salinization, and water shortages.

(b) A.I.D. Specialists

Donald Plucknett, Chief, Soil and Water Management Division, TA/AGR.  
 A. Alvin Bishop, Water Management Specialist, TA/AGR - RA p. 32.  
 Tejjpal S. Gill, Soils Specialist, TA/AGR-RA p. 33.  
 Omer J. Kelley, Director, TA/AGR-RA p. 66.  
 John L. Malcolm, Soils Specialist, TA/AGR - RA p. 34.  
 Stephen Krashevski, TA/RIG.

(c) Consultants to A.I.D.

T. G. Arscott, Prof. of Tropical Agriculture, Ohio State University-RA p. 35.  
 Alvin D. Ayers, formerly Chief, Soil and Water Management Division, TA/AGR-RA p. 36.  
 Paul W. Bedard, formerly Deputy Chief, Rural Development Division, USAID/Korea-RA p. 37.  
 V. T. Chow, Prof. of Hydraulic Engineering, University of Illinois-RA p. 38.  
 Don Davis, formerly Chief, East Asia Technical Services, AID/W, specializations include water conservation and irrigation development-RA p. 14.  
 William W. Donnan, formerly Administrator, Soil and Water Conservation and Resources Division (for five Western states) U. S. Department of Agriculture-RA p. 7.  
 Philip G. Hubbard, Vice Provost and Dean of Academic Affairs, Prof. of Mechanics and Hydraulics, University of Iowa - RA p. 40.  
 Jack Keller, Prof. of Irrigation Engineering, Utah State University, and President, Keller Engineering-RA p. 41.  
 Dean F. Peterson, Vice President for Research, Utah State University-RA p. 42.  
 Norman J. Rosenberg, Prof. of Agr. Climatology, University of Nebraska, specialist in soils physics-RA p. 43.  
 M.B. Russell, Director, Physics Agriculture, Experiment Station, University of Illinois-RA p. 44.

Ernest T. Smeardon, Prof. and Chm., Agr. Engineering  
Dept., University of Florida-RA p.45.  
Rudolph Ulrich, soil scientist, formerly with USDA Soil  
Conservation Service-RA p. 46.  
Cornelius H. M. van Bavel, Prof. of Soil Science and Biology,  
Texas A&M University-RA p. 47.

(d) Institutional Resources (specialty in parentheses) RA p. 48.

Water

University of Arizona (watershed management) - IR p. 34,  
IG p. 3.  
Colorado State University (delivery and removal systems)-IR  
p. 37, IG p. 3.  
Utah State University (on-farm water management)-IR p. 40,  
IG p. 3.

Tropical Soils

Cornell University (practical farm systems)- IR p. 46, IG p. 5.  
University of Hawaii (biology and Mineralogy- IR p. 48, IG p.7.  
North Carolina State University (soil fertility)- IR p. 51,  
IG p. 7.  
Prairie View Agricultural and Mechanical College (savannah  
prairie ecology)- IR p. 53, IG p. 5.  
University of Puerto Rico (conservation and protection)- IR  
p. 53, IG p. 7.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-  
2813, conducted workshops on water resource development on  
August 23-25, 1971 (Colorado State Univ.) and December 6-8,  
1971 (Univ. of Arizona).

(f) TAB ProjectsCENTRAL RESEARCH

Water Management in Asia, 931-17-120-489. Major Countries: Pakistan and Vietnam. Obligation span: FY 1968-78. Life-of-project cost estimate: \$3,152,000. Purpose: To carry out research designed to increase food production of the arid and sub-humid lands of the Near East-South Asia region through improvement of water management practices. Outputs: Solutions to land preparation and on-farm water management problems, optimization of delivery of water to farms, and remedy for drainage and salinity problems. Contractor: Colorado State University. Contract: AID/csd-2162. Project specialist, AA. Bishop, TA/AGR. Project manager, A.A. Bishop, TA/AGR. Ref.: RR p. 11, AY p. 16, AG p. 26. CR p. 2.

Water Management Research in Latin America, 931-17-120-480.

Major countries: Bolivia, Brazil, Chile, Colombia, Ecuador, El Salvador, Panama. Obligation span: FY 1968-78. Life-of-project cost estimate: \$3,426,000.

Purpose: To assist LDC's in solving their on-farm water management problems, partly by adaptive research using existing knowledge and also by developing LDC capability to conduct research. Outputs: Solutions to on-farm irrigation, drainage, and salinity problems. Contractor: Utah State U. Contract: AID/csd-2167, 2459. Project manager: In transition, TA/AGR. Ref.: RR p. 11, AY p. 16. AG p. 26. CR p. 2.

Soil Fertility Requirements to Attain Efficient Productivity in the Humid Tropics, 931-17-120-505. Major country: Brazil. Obligation span: FY 1969-75. Life-of-project cost estimate: \$1,677,000. Purpose: To determine factors limiting plant growth on acid tropical soils not now cultivated and to devise systems permitting their profitable use. Outputs: Field and laboratory studies of nutrient losses, clays analysis, and correlation of soils of Puerto Rico and other tropical soils. Contractor: Cornell U. Contract: AID/csd-2490. Project specialist: In transition, TA/AGR. Project manager: J. L. Malcolm, TA/AGR. Ref.: RR p. 8. AY p. 18. AG p. 20. CR p. 2.

Agro-Economic Research on Tropical Soils, 931-17-120-525.

Major countries: Brazil, Costa Rica, Guatemala, Peru. Obligation span: FY 1970-76. Life-of-project cost estimate: \$1,498,000. Purpose: To develop methodology for prescribing fertilizer and crop management practices in relation to soil analyses and crop response data. Outputs: Collation of soil fertility and yield data in Latin America, analytical models relating soil variables, crops, and cost data, experiments to fill in gaps, and research linkages. Contractor: North Carolina State U. Contract: AID/csd-2806. Project manager: J. L. Malcolm, TA/AGR. Ref.: RR p. 10. AY p. 17. AG p. 23. CR p. 3.

Soil Families of the Tropics and Their Relationships to Crop Production and Land Capabilities. Proposed project. Worldwide. Obligation span: FY 1974-78. Life-of-project cost estimate: \$1,017,000. Purpose: To determine the transferability of soil management technology from one tropical region to another for increased crop production. Outputs: Information transferability system developed, land capability and crop yield data correlated, and crop production performance on Hawaiian soils related to potential production elsewhere. Contractor: U. of Hawaii. Project manager: T.S. Gill, TA/AGR.

Dryland Moisture Conservation. Proposed project. Worldwide. Obligation span: FY 1973-77. Life-of-project cost estimate: \$2,200,000. Purpose: To develop and test improved methods of collecting and conserving natural precipitation and of optimizing rain-fed agriculture. Outputs: Research results on moisture conservation, criteria for moisture management, trained technicians, and recommended policies and action programs. Contractor not yet selected. Project manager: J. L. Malcolm, TA/AGR.

#### Completed Projects:

Nutrient Soils of Latin America. Ref.: RR p. 10. AG p. 19.  
Project transferred to Bureau for Latin America and designated contract LA-646.  
Determination of Research Needs of Soils of the Tropics.  
Ref.: RR p. 9. AG p. 22.  
History and Current Status of Arid Lands Research in the U.S. Ref.: RR p. 11.  
Technical Services for Soil Salinity. Ref.: CN-TC p. 281.

#### Project Cross-References

Tailoring Fertilizer for Rice. See B-8-f.  
Improved Fertilizers for Developing Countries. See B-8-f.

#### U.S. INSTITUTIONAL DEVELOPMENT (SEC.211(d))

Water Resources for Agricultural Production. Worldwide. Obligation span: FY 1969 (work span FY 1970-74). Life-of-projects cost estimate: \$1,850,000. Three related projects: 931-11-120-114, University of Arizona, AID/csd-2457, \$350,000, watershed management and systems analysis. 931-11-120-115, Colorado State University, AID/csd-2460, \$750,000, water

delivery and removal systems and related institutional development. 931-11-120-116, Utah State University, AID/csd-2459, \$750,000, on-farm water management for increasing food production. Project manager, D. Plucknett, TA/AGR. Ref.: IR p. 33-43.

Tropical Soils. Worldwide. Obligation span: FY 1970-71 (work span FY 1971-75). Life-of-projects cost estimate: \$2,500,000. Five related projects \$500,000 each: (931-11-120-126, Prairie View A&M College, AID/csd-2836, soil fertility problems under savanna-prairie ecology.) (931-11-120-127, Cornell University, AID/csd-2834, cultural systems for soils of the tropics.) (931-11-120-128, University of Puerto Rico, AID/csd-2945, conservation and protection of soils of the tropics.) (931-11-120-129, University of Hawaii, AID/csd-2833, biology and mineralogy of tropical soils.) (931-11-120-130, North Carolina State University, AID/csd-2835, soil fertility relating plant nutrition to physical and chemical properties of tropical soils.) Project manager: D. Plucknett, TA/AGR. Ref.: IR p. 45-56.

(g) Other A.I.D. Projects

Guatemala: Soil and Site Conservation, CP-LA p. 47.  
 LA Regional: Soil Fertility, CP-LA p. 212.  
 Afghanistan: Land Reclamation, CP-ASIA p. 22.  
 India: Soil and Water Management, CP-ASIA p. 75.  
 Jordan: East Ghor Development, CP-SA p. 35, 44.  
       Extension of Irrigation Facilities, CP-SA p. 45.  
 Korea: Irrigation Facilities, CP-ASIA, p. 128.  
 Pakistan: Salinity Control-Reclamation, CP-ASIA p. 82.  
 Thailand: Agricultural Water Utilization, CP-SA p. 10.  
 Turkey: On-Farm Water Development, CP-ASIA p. 19.  
       Irrigated Agriculture, CP-ASIA p. 22.  
 Vietnam: Irrigation Assistance, CP-IC p. 15.  
       Rural Water Development, CP-IC p. 51.  
 Morocco: Irrigation, CP-SA p. 67.  
       K.R.C. Water Supply, CP-SA p. 67.  
 Afr Reg.: Soil and Crop Management, CP-AFR p. 190.

(i) Technological Development

The Village Technology Handbook (VT), as regards irrigation and drainage, tells how to make earth-moving implements (p. 185-210), a siphon tube (p. 211), and concrete tile systems (p. 212-226).

Modern Technologies periodical (MT) entries:

- agricultural runoff, bibliography 72-4 p. 96.  
 canal lining, rubber 72-1 p. 72.  
 desalination bibliography 72-2 p. 6  
 desalted water for irrigation 72-2 p. 116.  
 flood control, agricultural 72-2 p. 64.  
 irrigation canal controls 72-3 p. 76.  
 irrigation - Mekong Valley 72-3 p. 117.  
 land and water - Bangladesh 72-1 p. 63.  
 reservoir slopes 72-2 p. 67.  
 subsurface irrigation 72-4 p. 96.  
 utility of non-urban water 72-3 p. 81.  
 water harvesting system 72-1 p. 71.  
 water measurement 72-2 p. 114.  
 water quality management in arid areas 72-2 p. 115.  
 water requirement forecasting 72-2 p. 114.  
  
 water salvage in semi-arid regions 72-4 p. 93.  
 water technology advances 72-3 p. 77.  
 Inflatable small dams - technical and economic information  
 available from Firestone Tire & Rubber Co., Akron, Ohio.

(j) Selected References

- TA/AGR, "Improving Farm Production in Tropical and  
 Subtropical Regions of Limited Rainfall", Technical  
 Series Paper No. 4., 1971, 25 p.
- "Desert Encroachment on Arable Lands: Significance Causes, and  
 Control", No. TA/OST 72-10.
- "Techniques for Assessing Hydrological Potentials in Developing  
 Countries" (in draft), No. TA/OST 72-14.
- Baver, L.D., Soil Physics, John Wiley, New York, 1956 (3rd ed.),  
 489 p.
- Central Treaty Organization, "Symposium on Hydrology and Water  
 Resources", 1966, NTIS No. PB-206 539.
- Central Treaty Organization, "Seminar on Evaluation of Water  
 Resources with Scarce Data", 1969, NTIS no. PB-206 701.
- Donahue, Roy I., Soils - An Introduction to Soils and Plant Growth,  
 Prentice-Hall, Englewood Cliffs, N.J., 1965, 363 p.
- Framji K. K., and Mahajan, I. K., Irrigation and Drainage in the  
 World - A Global Review, International Commission on Irrigation  
 and Drainage, New Delhi, 1969 (2nd ed.), 2 vol., 1344 p.
- Hagen, Robert M.; Haise, Howard R.; and Edminister, Talcott W.,  
Irrigation of Agricultural Lands, American Society of Agronomy,  
 Madison, Wisconsin, 1967, 1180 p.

- Kaiser Engineers, "A Manual on Water Desalination", 1967  
NTIS No. PB-206 549 and PB-206 550.
- Mahmood, Khalid, Bibliography with Annotations on Water  
Diverson, Conveyance and Application for Irrigation and  
Drainage, Colorado State U. - MD, vol. 1, No. 2, p. 3.
- National Academy of Sciences "East Pakistan Land and Water  
Development as Related to Agriculture", 1971, NTIS No.  
PB-203 328.
- National Academy of Sciences, Soils of the Humid Tropics,  
Washington, 1972, 219 p. (paper), sponsored by TA/AGR.
- Russell, E. Walter, Soil Conditions and Plant Growth,  
John Wiley, New York, 1961 (9th ed.), 688 p.
- Taylor, George C., Jr., "Techniques for Assessing Water  
Resource Potentials in the Developing Countries", U. S.  
Geological Survey, 1971, NTIS No. PB-207 192.

## 6. LIVESTOCK

(a) Significance of Key Problem Area/Subsector

Raising the living levels of farm families depends partly on expansion of higher value products such as livestock. Livestock expansion also will help meet nutritional needs. Ruminant livestock could permit economic use of vast land areas not used for other purposes. In the humid tropics where soil leaching and erosion are major problems, continuous farming systems call for putting land to pasture as a part of cropping rotations. Such pastures will enable a larger role for livestock. As countries become more prosperous, the demand for livestock products increases faster than for most other foods.

(b) A.I.D. Specialists

- Michael N. Galli, Special Assistant to the Director, TA/AGR - RA p. 64.  
 Nels M. Konnerup, Livestock Disease Specialist, TA/AGR - RA p. 10.  
 Carl F. Sierk, Chief, Livestock Production Division, TA/AGR - RA p. 12.  
 C. Edmund Shuart, Livestock Specialist, TA/AGR - RA p. 11.  
 Frank H. Madden, Veterinarian, TA/AGR.  
 Miloslav Rechcigl, Jr., Nutrition Advisor and Assistant Director, TA/RIG.

(c) Consultants to A.I.D.

- Tony J. Cunha, Chairman, Animal Science Dept., University of Florida - RA p. 13.  
 Don Davis, formerly Chief, A.I.D. East Asia Technical Services - RA p. 14.  
 Edsko J. Dyksterhuis, formerly Professor, Texas A&M - RA p. 15.  
 J. Edwin Faris, Head, Department of Agricultural Economics, Virginia Polytechnic Institute - RA p. 16.  
 Robert P. Hanson, Prof., Dept. of Veterinary Science, University of Wisconsin - RA p. 17.  
 William R. Hinshaw, consultant in animal science to U.S. Army, Dept. of Health, Education and Welfare, National Academy of Sciences, National Research Council - RA p. 18.  
 Robert E. McDowell, Prof. of International Animal Science, Cornell University - RA p. 19.  
 William R. Pritchard, Dean, School of Veterinary Medicine, University of California - RA p. 20.  
 Weldon B. Robinson, formerly Chief, Division of Behavioral Research, Denver Wildlife Center, U.S. Department of the Interior - RA p. 21.

Charles J. York, Assoc. Prof. of Comparative Pathology and  
Director, Division of Animal Research, Medical School,  
University of California San Diego - RA p. 22.

(d) Institutional Resources

Purdue University, Texas A&M University, Tuskegee Institute,  
and University of Florida - RA p. 23.

Non-profit organizations:

Heifer Project. NP p. 230. VF p. 5, 9, 13, 23.

Dairy Society International. NP p. 153.

(e) Conferences and Committees

Committee on Foreign Animal Diseases, U.S. Animal Health  
Assoc.

NAS/NRC Committee on Animal Health.

(f) TAB Projects

CENTRAL RESEARCH

Sterility Method of Tsetse Fly Control, 931-17-130-030. Major  
country: Tanzania. Obligation span: FY 1963-76. Life-of-  
project cost estimate: \$2,423,000. Purpose: To conduct  
research on mass rearing and releasing of sterile male tsetse  
flies--vector of trypanosomiasis--to determine feasibility of  
control or eradication of the tsetse fly. Outputs: Techniques  
for mass rearing and sterilization of male tsetse flies, for  
optimal release patterns, and for controlling parasites in  
host animals without affecting reared insects. Contractor:  
USDA Agricultural Research Service. PASA RA (AJ) 1-00. Project  
specialist: N. M. Konnerup, TA/AGR. Ref.: RR p. 13. AY p. 21.  
AG p. 29. CR p. 4.

Hemoprotozoal Diseases of Food-Producing Livestock, 931-17-130-475.  
Major country: Colombia. Obligation span: FY 1968-76. Life-of-  
project cost estimate: \$2,313,000. Purpose: To develop a prac-  
tical immunizing agent against blood parasites (hemoprotozoa) and  
means for controlling the infectious process before the onset of  
debility. Outputs: Strains of microorganisms identified, new  
vectors identified, antigens developed and applied, veterinary  
training, and hemotropic diseases identified. Contractor:  
Texas A&M U. Contract: AID/csd-1947. Project manager: N. M.  
Konnerup, TA/AGR. Ref.: RR p. 14. AY p. 20. AG p. 30. CR p. 2.

Cattle Feeding Systems and Nutrition in the Tropics, 931-17-130-514.  
Major countries: LA, with planned extension to Southeast Asia and  
Africa. Obligation span: FY 1969-74. Life-of-project cost  
estimate: \$719,000. Purpose To identify the nutritive value of  
feed and forage as a base for improving animal nutrition through  
better range management and ration formulas. Outputs: Manual  
for feed range analysis, data collection, development and processing  
of forms in computer system, and training of technicians.  
Contractor: U. of Florida. Contract: AID/csd-2498. Project  
manager: C.E. Shuart, TA/AGR. Ref.: RR p. 7. AY p. 22.  
AG p. 8. CR p. 3.

Research and Technical Assistance on Ruminant Animal Production in LDCs. Proposed project. Obligation span: FY 1973-81. Life-of-project cost estimate: \$2,437,000. Purpose: To develop systems for producing animal protein in regions not suitable for crop production. Outputs: Identification of animal production bottlenecks, including socio-economic and cultural inhibitors. Breeding systems based on native and/or exotic breeds. Projections of meat consumption and production/consumption cost functions. Project manager: C.E. Shuart, TA/AGR.

Completed Project

Laboratory and Field Testing of a Newly Developed Foot-and-Mouth Disease Vaccine for Potency, Viability and Immunity Duration. Ref.: RR p. 15. AG p. 31.

Project Cross-Reference

Control of Vertebrate Pests (Rats, Bats, and Noxious Birds)  
See B-8-f.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

Ruminant Animal Agriculture in the LDCs. Worldwide Obligation span: FY 1972 (work span FY 1973-77). Life-of-projects cost estimate: \$1,750,000. Four related projects: 931-11-130-141, Tuskegee Institute, AID/csd-3676, \$500,000, delivery systems for livestock production in wet and dry tropics. 931-11-130-142, Purdue University, AID/csd-3683, \$250,000, system analysis of tropical livestock production. 931-11-130-143, Texas A&M University, AID/csd-3675, \$500,000, improved breeding and disease control of tropical livestock. 931-11-130-144, Florida State University, AID/csd-3684, \$500,000, nutrition programs for ruminant livestock. Project manager: M. Galli, TA/AGR. Ref.: IG p. 11.

Management of Natural Forage Resources. Proposed project. Worldwide. Obligation span: FY 1974 (work span FY 1974-78). Life-of-project cost estimate: \$500,000. Purpose: Strengthen an institutional capacity for teaching, research, and technical assistance on management and production of natural forages. Outputs: Multi-disciplinary system for developing and sharing expertise on natural forages. Grantee to be selected. Project manager: C. F. Sierk, TA/AGR.

(g) Other A.I.D. Projects

Colombia: Slaughterhouse Expansion, CP-LA p. 114.  
Vietnam: Animal Production, CP-IC p. 13.  
SE Asia Reg.: Regional Livestock Dev., CP-IC p. 85.  
Yemen: Poultry Production, CP-LA p. 29.  
Ethiopia: Borana Pilot Range Dev., CP-AFR p. 21.  
Kenya: National Range and Ranch Dev., CP-AFR p. 50  
Livestock Development, CP-AFR p. 52.  
Range Development, CP-AFR p. 49.  
Tanzania: Masai Livestock and Range Management, CP-AFR p. 102.  
Livestock Development Support, CP-AFR p. 106.  
Tsetse Fly Eradication, CP-AFR p. 98.

- Tunisia: Accelerated Livestock Production, CP-AFR p. 117.  
 Uganda: Livestock Development, CP-AFR p. 126.  
           Ankole-Masaka Ranching Scheme, CP-AFR p. 126  
           Livestock Production and Marketing, CP-AFR p. 127.  
 C. and W.Af. Reg.: Mali Livestock Production, CP-AFR p. 147.  
                     Livestock Marketing and Production (Entente  
                     Area), CP-AFR p. 149.  
                     Central Africa Livestock, CP-AFR p. 151.  
                     Entente Livestock, CP-AFR p. 157.  
                     Central Veterinary Lab. (Mali), CP-AFR p. 143.  
                     West Africa Regional Poultry, CP-AFR p. 144.  
                     Regional Livestock Research Laboratory, CP-AFR p. 144.  
 S.Afr. Reg.: Botswana Range Management and Livestock Dev., CP-AFR  
                     p. 173.  
 Afr. Reg.: International Livestock Development Institute, CP-AFR  
                     p. 189.  
                     Rinderpest Eradication, CP-AFR p. 186.

(h) No entry.

(i) Technological Developments

The Village Technology Handbook (VT) describes how to build a poultry brooder (p. 241-244) and a bamboo poultry house (p. 245-246) and how to provide silage for dairy cows (p. 250-254).

The Modern Technologies Periodical (MT) cites a report on animal diseases in Africa - issue 72-3 p. 83.

(j) Selected References

TA/AGR, Agricultural Technology for Developing Countries, Technical Series Papers:

No. 1. Improved Forages for Tropical and Sub-Tropical Regions, as Feed for Ruminant Livestock, 1971, 10 p.

No. 2. Guidelines for Improving Livestock Production on Range Lands, 1971, 25 p.

Vocational Guide in Poultry Management, TA/AGR

"CENTO Seminar on Veterinary Investigational and Diagnostic Methods", Central Treaty Organization, Ankara, 1971, 108 p. (Available from American Embassy Ankara).

Poultry Development Programs, SER/DM/ARC Agriculture Bibliography

No. 3, 1969, 14 p.

Byerly, Theodore C., Livestock and Livestock Products, Prentice-Hall, Englewood Cliffs, N.J., 1964, 422 p.

- Englewood Cliffs, N.J., 1964, 422p.
- Davis, Richard F., Modern Dairy Cattle Management, Prentice-Hall, Englewood Cliffs, N.J., 1962, 264 p.
- Esmay, Merle L., Principles of Animal Environment, Avi Publishing Co., Westport, Conn., 1969, 325 p.
- Galloway, Joseph H., Farm Animal Health and Disease Control, Lea & Febiger, Philadelphia, 1972, 373 p.
- Krider, J.L., and Carroll, W.E., Swine Production, McGraw-Hill, New York, 1971 (4th ed.), 528 p.
- Lush, Jay L., Animal Breeding Plans, Iowa State Univ. Press, Ames, Iowa, 1945 (3rd ed.), 443 p.
- Maynard, Leonard A., and Loosli, John K., Animal Nutrition, McGraw-Hill, New York, 1951 (6th ed.), 613 p.
- National Academy of Sciences, Basic Problems and Techniques in Range Research, Washington, 1962, 341 p.
- National Planning Association, Development Digest: "Livestock" April 1972, p. 45-82.
- Neumann, A. L., and Snapp, Roscoe R., Beef Cattle, John Wiley, New York, 1969 (6th ed.), 767 p.
- Valentine, J. F., Range Development and Improvements, Brigham Young Univ. Press. Provo. Utah, 1972, 516 p.
- Williamson, G., and Payne, W.J.A., An Introduction to Animal Husbandry in the Tropics, Longmans, Green & Co., London, 1965 (2nd ed.), 447 p.
- Winters, Laurence M., Animal Breeding, John Wiley, New York, 1954 (5th ed.), 420 p.

7. AGRICULTURAL MANPOWER

(a) Significance of Subsector

Progress in agriculture depends on the availability and quality of technical management specialists in each branch of the sector. Application of new production techniques, introduction of new seed varieties, and diversification of crops and livestock production requires new technical expertise. Expanded research programs increase the demand for qualified agricultural scientists. While advancement has been made in training people to meet these needs, there are still major manpower shortages in most countries.

(b) A.I.D. Specialists

Milo L. Cox, Deputy Director, TA/AGR, RA p. 61.  
Omer J. Kelley, Director, TA/AGR.  
Jack Koteen, Director, Ta/DA  
Charles A. Breitenbach, LA/DR.  
Nathaniel Farris, SER/IT.  
Frank Schwenke, SER/IT.

(c) Consultants to A.I.D.

Alvin D. Ayers, formerly Chief, Soil and Water Management Division, TA/AGR - RA p. 36.  
C. C. Murray, formerly Dean and Coordinator, College of Agriculture, University of Georgia - RA p. 73.  
Frank Parker, formerly Food and Agriculture Officer, USAID/India and Assistant Director-General of FAO - RA p. 30.

(d) Institutional Resources

Florida State University (educational technology) - IR p. 114, IG p. 7.  
Nonprofit organizations:  
Allahabad Agricultural Institute. NP p. 20.  
American Farm School. NP p. 34.  
National 4-H Club Foundation of America. NP p. 350.

(e) Conferences and Committees

The Agriculture Development Council, under contract AID/csd-2813, conducted a workshop on rural education on October 21-22, 1971, at its New York headquarters.

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Asian Agricultural College and University Seminar, 931-11-190-873.  
Major countries: India, Indonesia, Japan, Malaysia, Philippines, and Thailand. Obligation span: FY 1970-73. Life-of-project cost estimate: \$78,000. Purpose: Traveling seminars of Asian educators to visit agricultural universities in several countries of the region to exchange ideas on institution building. Outputs: First seminar during three weeks of 1970 to be followed by others. Broadening of perspectives among participants. Contractor: North Carolina State U. Contract: AID/csd-2576. Project manager: J. Urano, TA/AGR. Ref.: AG p. 51.

CENTRAL RESEARCHCompleted Projects

Analytical Study of A.I.D./University Programs in Agricultural Education and Research. Ref.: RR p. 27. AG p. 50.  
CIC-AID 1969 Summer Workshop on Agricultural College and University Development. Ref.: AG p. 52.

(g) Other A.I.D. Projects

Brazil: Agricultural Education, CP-IA p. 99.  
Colombia: Agricultural Education, CP-IA p. 115.  
Paraguay: Vocational Agriculture Education, CP-IA 140.  
LA Regional: Castelar Graduate School, CP-IA p. 212.  
Afghanistan: Agriculture Education, CP-ASIA p. 51.  
India: Agricultural Universities Development, CP-ASIA p. 75.  
Indonesia: Higher Agricultural Education, CP-ASIA p. 110.  
Nepal: Institute of Agriculture and Animal Science, CP-ASIA p. 97.  
Agriculture Education Planning, CP-ASIA p. 91.  
Vietnam: Agricultural Education, CP-IC p. 51.  
Ghana: Faculty of Agriculture, CP-AFR p. 49.  
Kenya: Higher Agricultural Education, CP-AFR p. 49.  
Univ. of Nairobi Vet. Faculty, CP-AFR p. 49.

- Nigeria: Faculty of Agriculture, Univ. of Ife, CP-AFR p. 80.  
Ahmadu Bello Univ., Faculty of Vet. Medicine, CP-AFR p. 82  
Faculty of Agriculture, Ahmadu Bello Univ., CP-AFR p. 79.
- Tanzania: Manpower Development of Agriculture, CP-AFR p. 104.
- Tunisia: Chott Maria Agriculture School, CP-AFR p. 114.
- Uganda: Graduate Agriculture Faculty, CP-AFR p. 127.
- C. and W. Af. Reg.: Federal Advanced School of Agriculture, CP-AFR p. 155.  
Regional Center for Agriculture Sciences, CP-AFR p. 145.
- E. Afr. Reg.: Nairobi Vet Faculty, CP-AFR p. 164.

(h) No entry.

(i) No entry.

(j) Selected References

Committee on Institutional Cooperation, "Building Institutions to Serve Agriculture", Purdue Univ. Press, Lafayette, Ind., 1968, 236 p.

Resource Book for Rural Universities, sponsored by A.I.D.

Legal Base for Rural Universities, sponsored by A.I.D.

Partners in Development -- An Analysis of A.I.D. -- University Relations, sponsored by A.I.D.

Blase, Melvin G. (ed.), Institutions in Agricultural Development, Iowa State Univ. Press, Ames Iowa, 1971, 247 p.

Kellogg, Charles E., and Knapp, David C., The College of Agriculture: Science in Public Service, McGraw-Hill, New York, 1966.

Naik, K. C., and Sankaram A., A History of Agricultural Universities, Oxford & Ibh Publishing Co., New Delhi, India, 1972, 296 p.

8. FERTILIZER AND PEST/DISEASE CONTROL

(1) Significance of Subsector

Improved seeds can substantially improve farm yields usually only if accompanied by greater use of agricultural chemicals. Thus appropriate fertilizers compensate for soil deficiencies, and pesticides control destructive insects and other animals. Control of crop and livestock diseases has a major bearing on the amount of farm output which actually becomes available for marketing.

(b) A.I.D. Specialists

Channing J. Frederickson, Specialist-Pest Control, TA/AGR - RA p. 24.

Willard H. Garman, Fertilizer and Agricultural Chemicals Specialist, TA/AGR - RA p. 25.

James Urano, Chief, Agricultural Inputs Division, TA/AGR - RA p. 26.

(c) Consultants to A.I.D.

Kenneth Horner, formerly Commodity Industrial Specialist (Fertilizers), Dept. of Commerce - RA p. 28.

Frank Parker, formerly Assistant Director-General, FAO, and later Senior Agricultural Officer, A.I.D. - RA p. 30.

(d) Institutional Resources

University of Minnesota

University of California, pest management and pesticides - RA p. 31.

Nonprofit organization:

Cooperative Fertilizers International - NP p. 144.

(e) Conference and Committees

Federal Working Group on Pest Management  
Fertilizer Procurement Policy Committee, SER/PROC  
Industry Fertilizer Advisory Committee, M.O. TA-209.1, July 1,  
1970, 1 p.  
Pesticide Panel, convened by Univ. of California

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Fertilizer Technical Assistance, 931-11-190-832. Major countries: Argentina, Brazil, Colombia, Costa Rica, Guatemala, Guyana, Peru, Venezuela, India, Indonesia, Taiwan, Thailand, Turkey, Vietnam, Ghana, Nigeria. Obligation span: FY 1966-77. Life-of-project cost estimate: \$3,181,000. Purpose: To provide LDCs, USAIDs and AID/W with comprehensive services related to fertilizers, including technical and economic problem solving in mining, processing, marketing, utilization, and management. Outputs: Feasibility studies, market reports, trained LDC technicians, research on processes and handling, and training manuals. PROP 11-11-70. Contractor: Tennessee Valley Authority. PASA TA(OA) 6-69. Project Manager: W. H. Garman, TA/AGR. Ref.: AY 26. AG p. 24.

Pest Management and Related Environmental Protection, 931-11-190-733. Worldwide. Obligation span: FY 1971-73. Life-of-project cost estimate: \$1,388,000. Purpose: To appraise major pest and disease problems, devise remedial responses to those problems, and identify the relationships between pests, crops, and the environment. Outputs: Strategies for selected countries to reduce crop losses from pests. Guidelines for safeguarding the environment during utilization of pesticides. PA 6-3-71. Contractor: University of California, Berkeley. Contract: AID/csd-3296. Project Manager: C. J. Frederickson, TA/AGR, Ref.: AY p. 23.

Completed Projects

Manual on Control of Plant and Animal Pests. Ref.: AG p. 32.  
Pest Control, 931-11-130-736. Ref.: CN-TC p. 281.

Textbook on Neotropical Phytopathology. Ref.: AG p. 33.

CENTRAL RESEARCH

Control of Weeds in LDCs, 931-17-130-463. Major countries: Ecuador, El Salvador, and Panama, with planned expansion in LA and East Asia. Obligation span: FY 1966-76. Life-of-project cost estimate: \$2,768,000. Purpose: To find simple, effective, and economical methods of controlling weeds in LDCs and thus to increase production of food crops. Outputs: Identification of weed problems by species, development of weed control methods, initiate programs for weed control in selected countries, and establishment of information retrieval systems on weed identification and control. Contractor: Oregon State U. Contract: AID/csd-1442. Project manager: C.J. Frederickson, RR p. 12. AY p. 25. AG p. 27. CR p. 1.

Control of Vertebrate Pests (Rats, Bats, and Noxious Birds), 931-17-190-473. Major countries: Bolivia, Brazil, Colombia, Philippines, E. Africa. Obligation span: FY 1967-76. Life-of-project cost estimate: \$4,370,000. Purpose: To find methods for controlling rodents, vampire bats, and noxious birds that are safe, effective, economical, and adaptable to conditions in LDCs. Outputs: Measurement of losses due to vertebrate pests, ecological studies of their habits, tests on new pesticides, sterilants, and attractants for control, training of technicians, and establishment of laboratory animal colonies. Contractor: Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior. PASA RA (ID) 1-67. Project specialist: N. Konnerup, TA/AGR. Project manager: C. E. Shuart, TA/AGR. Ref.: RR p.14. AY p.24. AG p. 28. CR p.2.

Tailoring Fertilizers for Rice, 931-17-190-494. Major countries: Colombia, Peru, Ceylon, India, Philippines, Thailand, Nigeria, U.S. Obligation span: FY 1969-73. Life-of-project cost estimate: \$467,000. Purpose: To develop new easily-handled fertilizers which will increase production and economic return from land planted to rice. Outputs: Rice fertilizer to match specific soil and water management conditions, lower-cost production methods, inclusion of micronutrients, and evaluation of fertilizer characteristics, rates and timing of application, and limitations in a variety of soils and climates. Contractor: Tennessee Valley Authority. PASA RA (QA) 5-69. Project manager: J. L. Malcolm, TA/AGR. Ref.: RR p. 9 AY p. 19. AG p. 21. CR p. 2.

Improvement of Tropical Production of Beans and Cowpeas through Disease and Insect Control, 931-17-130-562. Worldwide. Obligation span: FY 1973-77. Life-of-project cost estimate: \$1,750,000. Purpose: To investigate the nature, distribution, and control of diseases which limit production of the major grain legumes in the tropics. Outputs: Development of

disease control methods, disease-resistant genotypes, and institutional research linkages plus training of technicians. Contractors: U.S. Department of Agriculture and Univ. of Puerto Rico. PASA RA(AJ) 3-00. Contract: AID/CM/ta-c-73-34. Project manager: R. Desrosiers, TA/AGR.

Improved Fertilizers for Developing Countries. Proposed project. Major countries: Brazil, Costa Rica, Colombia, Peru, India, Indonesia, Philippines, Thailand, Ghana, Nigeria. Obligation span: FY 1973-76. Life-of-project cost estimate: \$865,000. Purpose: To develop more efficient fertilizers for LDCs. Outputs: Reports from experiments defining limits of use of conventional fertilizers, development of new fertilizers and new production technology, and assessment of methods for introducing new fertilizers. Contractor: Tennessee Valley Authority. PASA TA(QA) 6-73. Project manager: J. L. Malcolm, TA/AGR.

(g) Other A.I.D. Projects

Central Am. Regional: Mediterranean Fruit Fly Eradication, CP-LA p. 22.  
Afghanistan: Fertilizer, CP-ASIA, p. 58.  
Fertilizer Distribution, CP-ASIA p. 50.  
Pakistan: Fertilizer, CP-ASIA p. 82,87.  
Afr Reg.: Mediterranean Fruit Fly, CP-AFR p. 186.

(h) Policies and Priorities

A.I.D. Fertilizer Policy, M.O. 1612.10.2, July 31, 1969, 4 p.  
Developments in Proper Use of Pesticides, M.C. 1612.10.3, June 16, 1969  
2 p.

(i) Technological Development

Regarding pest/disease control, the Village Technology Handbook (VT) describes how to make a bucket sprayer (p. 232-234) and a back-pack crop duster (p. 235-240).

(j) Selected References

Principles of Plant and Animal Pest Control, sponsored by AID/TA/AGR, USDA, and Rockefeller Foundation and published in six volumes by National Academy of Sciences.

- Crafts, Alden S., and Robbins, Wilfred W., Weed Control, McGraw-Hill, New York, 1962 (3rd ed.), 660 p.
- Davidson, Ralph Howard, and Peairs, Leonard Merion, Insect Pests of Farm, Garden, and Orchard, John Wiley, New York, 1966 (6th ed.), 675 p.
- De Geus, J. G., Fertilizer Guide for Tropical and Subtropical Farming, Centre d'Etude de l'Azote, Zurich, 1967, 727 p.
- Dickson, James G., Diseases of Field Crops, McGraw-Hill, 1956 (2nd ed.), 517 p.
- International Rice Research Institute, The Major Insect Pests of the Rice Plant, Johns Hopkins University Press, 1967, 729 p.
- Jenkins, W. R., and Taylor, D. P., Plant Nematology, Reinhold Publishing Co., New York, 1967, 270 p.
- Klingmar, Glenn C., Weed Control: As A Science, John Wiley, New York, 1961, 421 p.
- Metcalf, C. L., and Flint, W. P., Destructive and Useful Insects - Their Habits and Control, McGraw-Hill, New York, 1962 (4th ed.), 1087 p.
- National Academy of Sciences, Scientific Aspects of Pest Control, Washington, 1966, 470 p. (paper).
- National Academy of Sciences, Pest Control Strategies for the Future, Washington, 1972, 376 p. (paper)
- National Planning Association, Development Digest: "The Fertilizer Industry", April 1968, p. 81-124. "Pesticides", Oct. 1970, p. 43-64.
- Oldroyd, Harold, Elements of Entomology, Universe Books, New York, 1970, 312 p.
- U.S. Department of Health, Education and Welfare, Report of the Secretary's Commission on Pesticides and Their Relationship to Environmental Health, Washington, 1969, 677 p. (paper)
- Walker, John Charles, Diseases of Vegetable Crops, McGraw-Hill, New York, 1952, 529 p.
- Walker John Charles, Plant Pathology, McGraw-Hill, New York, 1969 (3rd ed.), 819 p.
- Wellman, Frederick L., Tropical American Plant Disease - Neotropical Phytopathology Problems, sponsored by AID/TA/AGR and published by Scarecrow Press, Metuchen, N.J., 1972, 989 p. See AG p. 33.
- Weed Research Manual, TA/AGR.

9. EXTENSION AND COMMUNITY DEVELOPMENT

(a) Significance of Subsector

Transformation of primitive agriculture to something more productive requires a means of persuading and enabling the traditional farmer to improve his practices. A competent extension service can tell the farmer how to acquire necessary agricultural inputs, to manage his work better, and to market his surplus effectively. Successful rural living involves not only efficient agriculture but a wide variety of intimately related conditions, particularly health, learning, and the civic and physical environment. Advisors in these fields--whether called community development specialists or something else--are essential components or supplements to the extension service.

(b) A.I.D. Specialists

Ryland Holmes, Assistant Chief and Program Operations  
Officer, Program Division, TA/AGR - RA p. 65.  
Gleason D. Rohlf, SA/TCD/AGR.  
Eino Siira, AFR/ESA.  
Madison Broadnax, Specialist in Extension Education,  
USAID/Sudan.  
James K. McDermott, TA/RIG.  
Delbert T. Myren, TA/RIG.

(c) Consultants to A.I.D.

Ralph E. Hansen, formerly A.I.D. Mission Director in Somalia -  
RA p. 72.

(d) Institutional Resources

Nonprofit organization: Community Development Foundation.  
Ref.: NP p. 137. VF p. 4, 9, 12.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-2813, conducted a workshop on rural sociology in agricultural development on December 8-10, 1971, at Denver, Colorado.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Vanguard Program Taiwan. Ref.: AG p. 18.

CENTRAL RESEARCH

Analysis of Data on Development-Related Attitudes and Behavior of a National Sample of the Turkish Peasantry. Ref.: RR p. 27.

(g) Other A.I.D. Projects

Nicaragua: Community Development, CP-LA p. 65.

Dominican Rep.: Community Development, CP-LA p. 169.

Haiti: Rural Community Development, CP-LA p. 179.

Afghanistan: Agricultural Extension Information and Training, CP-ASIA p. 52.

Ghana: Agricultural Extension and Production, CP-AFR p. 36.

Nigeria: Agricultural Extension and Production Marketing CP-AFR p. 79.

Uganda: Agriculture Extension, CP-AFR p. 127.

(h) No entry.

(i) Technologic Development

Modern Technologies periodical (MT) entries:

agricultural extension in Ghana 72-4 p. 101.

community development in Bengal, India 72-4 p. 105.

(j) Selected References

The Village Technology Handbook (Ref. VT).

Homemaking Handbook, USDA Extension Service, 1971, 237 p.  
Sponsored by AID/TA/AGR.

Guide for Village Workers, TA/AGR.

Mezirow, Jack D., Literature of Community Development - A Bibliographic Guide, A.I.D. 1963, 177 p. MD 1/2 p. 3.

Community Development Abstracts: Vol. 1 prepared for A.I.D. by Sociological Abstracts, Inc., 1964, 281 p., Vol. 2 by Alvin S. Lackey, Essay Press, Inc., New York, 1972, 322 p.

University of Minnesota, Bibliography on Planned Social Change, with Special Reference to Rural Development and Educational Development, prepared for A.I.D., 1967, 3 vol. MD 1/2 p. 3.

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- Bhattacharyya, Sudhindra Nath, Community Development - An Analysis of the Programme in India, Academic Publishers, Calcutta, 1970, 171 p.
- Cary, L. F. (ed.), Community Development As A Process, Univ. of Missouri Press, Columbia, Mo., 1970, 213 p.
- CENTO, Conference on Agricultural Extension, Ankara, 1967, 275 p.
- Inter-American Development Bank, Community Development Theory and Practice, Washington, 1967, 280 p.
- Kulp, Earl M., Rural Development Planning - Systems Analysis and Working Method, Praeger, New York, 1970, 664 p.
- Lionberger, Herbert Frederick, and Chang, H. C., Farm Information for Modernizing Agriculture - the Taiwan System, Praeger, 1970, 425 p.
- Mosher, A. T., Creating A Progressive Rural Structure, Agricultural Development Council, New York, 1969, 172 p.
- Poston, Richard Waverly, Democracy Speaks Many Tongues - Community Development Around the World, Harper & Row, New York 1962, 206 p.
- Savile, A. H., Extension in Rural Communities - A Manual for Agricultural and Home Economics Workers, Oxford Univ. Press, London, 1965, 148 p.
- Shields, James J., Jr., Education in Community Development - Its Function in Technical Assistance, Praeger, New York, 1967, 127 p.
- Weitz, Raaman, From Peasant to Farmer - A Revolutionary Strategy for Development, Columbia University Press, New York, 1971, 292 p.

10. MARKETING, COOPERATIVES, CREDIT(a) Significance of Subsector

Successful efforts to increase agricultural production will bring rewards to the farmer only insofar as what is surplus to his needs can find a market. Thus it is important to know what commodities are in demand locally and worldwide, what grading and storage practices are advantageous, and how to minimize middle-man costs. Marketing cooperatives often play a helpful role. As farmers seek to obtain necessary agricultural inputs from sources other than landlords and to pay for them without recourse to high-interest lenders, they have a crucial need for access to credit at reasonable rates of interest.

(b) A.I.D. Specialists

James Urano, Chief, Agricultural Inputs Division, TA/AGR-RA p. 26.  
Carroll F. Deyoe, Special Assistant (FAO Liaison), TA/AGR-RA p. 62.

## (c) No entry

(d) Institutional Resources

## Nonprofit organizations:

Agricultural Cooperative Development International. An organization of U.S. cooperatives which extends advisory and training services overseas under A.I.D. contracts. CH Jan. 1972. NP p. 15.

Cooperative League Fund. NP p. 145. VF p. 4, 9.

(e) Conferences and Committees

The A.I.D. spring review of a major development problem was in 1973 on Small Farm Credit. Sessions were scheduled as follows:

<u>1973</u>	<u>Location</u>	<u>Region</u>
March 7-9	San Jose, Costa Rica	Central America
March 14-16	Quito, Ecuador	South America
April 2-4	Manila, Philippines	East Asia
April 11-13	Ankara, Turkey	South & West Asia
April 18-20	Nairobi, Kenya	Eastern Africa
April 25-27	Abidjan, Ivory Coast	Western Africa

Plans for these sessions were presented in Small Farmer Credit Newsletter No. 2, Nov. 15, 1972, 20 p., available from PPC.

The Agricultural Development Council (ADC) under contract AID/csd-2813, conducted the following research-oriented workshops:

Rural Marketing, Oct. 7-9, 1971 (University of Kentucky) and April 13-15, 1972 (Food Research Institute, Stanford University).  
Agricultural Credit for Small Farmers, April 5-6, 1972, Washington, D. C.

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Technical Assistance in Food Marketing, 931-11-150-886. World-wide. Obligation span: FY 1970-72. Life-of-project cost: \$101,000. Purpose: As the "green revolution increases food production, there must be a corresponding modernization in moving the increment to market. Outputs Improved procurement, processing, and distribution facilities, and price stabilization. PA 4-28-71. Contractor: USDA Foreign Economic Development Service. PASA TA(AJ)8-70. Project manager: A.J. Coutu, TA/AGR. Ref.: AG p.49. Project terminated 9-30-71.

CENTRAL RESEARCHCompleted Projects

Analysis of Programs for the Development of Agricultural Credit Institutions and Services. Ref.: RR p. 25.  
Comparative Study of Food Marketing Systems in Latin American Countries in Early Stages of Economic Development. Ref.: RR p. 26.  
Farm Marketing Facilities and Practices in Tropical Africa. Ref.: RR p. 23. AG p. 48.

(g) Other A.I.D. Projects

- Brazil: North/Northeast Agricultural Marketing, CP-LA p. 98.  
 Dominican Rep.: Cooperative Development, CP-LA p. 169.  
 El Salvador: Agricultural Marketing and Credit, CP-LA p. 36.  
 Guatemala: Rural Credit and Cooperative Development, CP-LA p. 41, 42.  
 Honduras: Farm to Market Access Roads, CP-LA p. 53.  
           Agricultural Credit and Storage, CP-LA p. 53.  
           Basic Grain Marketing, CP-LA p. 53.  
           Cooperative Development, CP-LA p. 54.  
 Panama: Cooperative Dev. Loan Fund, CP-LA p. 79.  
 Paraguay: Credit for Agricultural Cooperatives, CP-LA p. 139.  
           Agricultural Credit, CP-LA p. 136.  
 Peru: Agricultural Credit and Storage, CP-LA p. 150.  
 Uruguay: Agricultural Credit, CP-LA p. 158.  
 Central Am. Reg.: Basic Grains Stabilization, CP-LA p. 22.  
 LA Regional: Cooperative Development, CP-LA p. 214.  
           Agricultural Credit Union Development, CP-LA p. 227.  
           Inter-American Marketing Institute, CP-LA p. 212.  
 India: Indian Farmers Fertilizer Coop. Ltd., CP-ASIA p. 74.  
 Jordan: Agricultural Credit, CP-SA p. 38.  
 Vietnam: Agricultural Credit and Agricultural Organizations  
 Ethiopia: Grain Marketing and Storage, CP-AFR p. 28.  
 Ghana: Agricultural Development Bank, CP-AFR p. 35.  
 Kenya: Agriculture Credit, CP-AFR p. 49.  
 Morocco: Assistance to Small Farmer Credit, CP-AFR p. 70.  
 Tanzania: Agriculture Marketing Development, CP-AFR p. 103.  
           Agricultural Cooperative Credit, CP-AFR p. 107.  
 Uganda: Agriculture Cooperatives, CP-AFR p. 127.  
 C. and W. of Reg.: Central African Grain Stabilization, CP-AFR p. 150.  
           Entente Grains Storage and Cereals Marketing,  
           CP-AFR p. 143.  
           West Africa Grain Stabilization, CP-AFR p. 144.  
           Livestock and Meat Marketing, CP-AFR p. 144.

(h) Policies and Priorities

- Cooperatives, Credit Unions, Savings and Loan Associations,  
 Cooperative Banks and Mutual Savings Banks, General, M.O.  
 1626.1, Dec. 30, 1965, 2 p.  
 Cooperative Institutions: Definitions and Characteristics,  
 M.O. 1626.2, Dec. 30, 1965, 12 p.

- The Organizational Framework for AID Assistance to Cooperatives,  
M.O. 1626.3, Dec. 30, 1965, 13 p.  
Cooperative Institutions: AID Planning and Implementation Guidance,  
M.O. 1626.4, Dec. 30, 1965, 6 p.  
Cooperative Institutions Program: Reports and Evaluation, M.O.  
1626.5, June 10, 1966, 8 p.

(i) No entry.

(j) Selected References

- Food Marketing in Developing Countries, SER/DM/ARC Agriculture  
Bibliography No. 6, 1971, 45 p.  
Agricultural Cooperatives (FAO) - MD 1/2 p. 3 (bibliography).  
Agricultural Credit (Ohio State Univ.) - MD 1/1 p. 2 (bibliography).  
Anschel, Kurt R.; Brannon, Russel H., and Smith, Eldon D.  
(ed.), Agricultural Cooperatives and Markets in Developing  
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Betshaw, Horace, Agricultural Credit in Economically Underdeveloped  
Countries, FAO, Rome, 1959, 255 p.  
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California Press, Berkeley, Calif. 1970, 269 p.  
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Oxford, Blackwell, 1970 (2nd ed.), 222 p.  
Farooqui, Hameed M.; Keaton, Clyde R., and Miller, Guy W.,  
Agricultural Marketing in Pakistan, Amin Book Co., Karachi,  
1958, 243 p.  
Firth, Raymond William, and Yamey, B.S. (ed.), Capital Saving  
and Credit in Peasant Societies - Studies from Asia, Oceania,  
the Caribbean and Middle America, Aldine Publishing Co.,  
Chicago, 1964, 399 p.  
National Council of Applied Economic Research, Effectiveness  
of Cooperative Credit for Agricultural Production, New Delhi,  
1972, 396 p.  
National Planning Association, Development Digest: "Cooperatives"  
Apr. 1964 p. 85-118; Jan. 1968, p. 33-52. "Credit", July 1965  
p. 89-114; Apr. 1971 p. 49-88. "Marketing and the Farmer", Oct.  
1970 p. 65-106. "Storage", July 1969, p. 87-97.  
Thorner, Daniel, Agricultural Cooperatives in India - A Field Report,  
Asia Publishing House, New York, 1964, 119 p.  
UN Food and Agriculture Organization, "New Approach to Agricultural  
Credit - Supervised Credit Combined with Cooperatives and  
Agricultural Extension", Rome, 1964, 93 p.  
U.S. Department of Agriculture, Marketing, Yearbook of Agriculture  
1954, 506 p.  
Vasthoff, Josef, Small Farm Credit and Development - Some Experiences  
in East Africa with Special Reference to Kenya, Weltforum Verlag,  
Munich, 1968, 144 p.

11. FARM EQUIPMENT(a) Significance of Subsector

Improving the productivity of peasant farmers requires more and better tools, machinery, and other equipment. As most underdeveloped countries have more labor resources than capital fund resources, however, it is important to help add new equipment in a way which conserves capital and foreign exchange and contributes to employment and wider distribution of national income. Better equipment can contribute to lowering cost of agricultural products so they can compete in world markets and earn needed foreign exchange.

(b) A.I.D. Specialists

John S. Balis, agricultural engineer, USAID/India.

(c) Consultants to A.I.D.

Judson M. Harper, Professor and Head, Department of Agricultural Engineering, Colorado State University - RA p. 27.

(d) No entry

(e) No entry

(f) TAB ProjectsCENTRAL SEARCH

Agricultural Equipment Development Research for Tropical Rice Cultivation, 931-17-130-443. Major countries: Colombia, Ceylon, India, Indonesia, Korea, Pakistan, Philippines, Taiwan, Thailand, Nigeria. Obligation span: FY 1965-75. Life-of-project cost estimate: \$1,769,000. Purpose: To develop new or improved equipment for small rice farms which will reduce fluctuations in the farm labor requirement during the growing season, permit multiple cropping of rice land, and increase the use of high-yielding varieties. Outputs: Field machines for 2-10 hectare farms, rice processing machines for farm and village use,

arrangements with manufacturers for production and marketing of machines, maintenance facilities, trained engineers and mechanics, and economic analyses of impact of equipment use. Contractor: International Rice Research Institute, Los Banos, Philippines. Contracts: AID/csd-834 and 2541. Project manager: J. Urano, TA/AGR. Ref: RR p. 5. AY p. 30. AG p. 3. CR p. 1.

Survey of Agricultural Machinery, mini-research project proposed by TA/OST for FY 1974.

(g) Other A.I.D. Project

Philippines: Equipment Pool Improvement, CP-ASIA p. 135.

(h) No entry.

(i) Technological Development

Modern Technology periodical (MT) entries:

farm machinery maintenance in tropics 72-4 p. 101.

farm tools and implements 72-3 p. 84.

mechanized rice raising in Philippines (2 reports) 72-3

(j) Selected References

Central Treaty Organization, "CENTO Travelling Seminar on Tools and Implements", 1966, NTIS No. PB-206 776. MD 1/2 p. 75.

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Johnson, Stanley, "Performance and Economics of Use of Small Equipment in Tropical Monsoon Countries": The Case of the Philippines", International Rice Research Institute (Philippines), 1968, NTIS No. PB-206 806.

Clements, Harold M., Sr., The Mechanization of Agriculture in Brazil - A Sociological Study of Menas Gerais, Univ. of Florida Press, Gainesville, Fla., 1969, 92 p.

Kline, C. K., Green, D. A. G., Donahue, Roy L., and Stout, B. A., Agricultural Mechanization in Equatorial Africa, Michigan State Univ. Press, East Lansing, Mich., 1969 (paper).

U.S. Department of Agriculture, Power to Produce, Yearbook of Agriculture 1960, Washington, 480 p.

12. LAND ADMINISTRATION(a) Significance of Subsector

Land reform causes a basic structural change in rural societies of LDCs, providing the basis for increased stability and economic opportunity among the farm population. It generally stimulates agricultural output by improving the farmers' motivation to save and to apply greater effort to produce amounts surplus to his needs. Land reform also promotes innovation and greater public capital formation. Sometimes simply ascertaining boundaries and ownership encourages greater use of agricultural land.

(b) A.I.D. Specialists

Fred L. Mann, Agricultural Economist, TA/AGR - RA p. 51.  
 Keith W. Sherper, TA/DA  
 Antonio Gayoso, AFR/DS  
 Edwin J. Cohn, PPC/PDA  
 Gerard F. Horne, Deputy Director, TA/DA  
 Jerome T. French, TA/DA  
 Barbara K. Herz, PPC/PDA  
 Edgar L. Owens, SA/TCD  
 Carl D. Koone, USAID/Nicaragua  
 Robert B. Morrow, USAID/Korea

(c) Consultant to A.I.D.

Mel Blase, University of Missouri

(d) Institutional Resources

University of Wisconsin - IR p. 65. IG p. 4.  
 Iowa State University - IR p. 5. RA p. 28. IG p. 5.  
 Michigan State University - IR p. 7. RA p. 29. IG p. 5.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-2813, conducted a workshop on teaching land policy at its New York headquarters on June 14, 1971. It arranged a conference on the same subject in Washington, D. C., on October 1, 1971.

(f) TAB Projects

CENTRAL RESEARCH

Completed Projects

Land Tenure and Reform in Puerto Rico - Ref.: RR p. 16.  
Research and Training in Land Tenure and Reform in  
Latin America - Ref.: RR p. 16. AG p. 38.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Land Tenure and Related Institutional Development, 931-11-120-111.  
Worldwide. Obligation span: FY 1969 (work span FY 1969-74).  
Life-of-project cost estimate: \$1,500,000. Grantee:  
University of Wisconsin. Grant: AID/csd-2263. Project  
manager, A. J. Coutu, TA/AGR. Ref.: IR p. 65.

(g) Other A.I.D. Projects

Philippines: Land Reform, CP-ASIA p. 138.  
Vietnam: Land Reform: CP-IC p. 16.

(h) No entry.

(i) No entry.

(j) Selected References

Land Reform, SER/DM/ARC Agriculture Bibliography No. 4,, 1970, 51p.  
Chen, Cheng, Land Reform in Taiwan, China Publishing Co.,  
Taipei, 1961, 332 p.  
Control Data Corp., "The Impact of the Land-to-the-Tiller  
Program in the Mekong Delta", prepared for AID, Dec., 1972.  
Dore, R.P., Land Reform in Japan, Oxford University Press,  
London, 1959.  
Dorner, P., Land Reform and Economic Development, Penguin  
Books, Inc., New York, N.Y.  
Dorner, P. (ed.), Land Reform in Latin America: Issues and Cases,  
Land Economics Monograph No. 3, Land Economics, 1971.  
Engineer Agency for Resources Inventories, "Land Reform in  
Vietnam: A Program to Speed Land Distribution", prepared  
for A.I.D., March 1969.

- Harbeson, John W., Nation-Building in Kenya--The Role of Land Reform, Northwestern Univ. Press, Evanston, Ill., 1972
- Kaufmann, Robert R., The Politics of Land Reform in Chile 1950-1970, Harvard Univ. Press, Cambridge, Mass., 1972, 321 p.
- Koo, Anthony C., The Role of Land Reform in Economic Development: A Case Study of Taiwan, Praeger, New York, 1968.
- National Planning Association, Development Digest: "Agrarian Reform", July 1964, p. 1-42. "Land Reform", Oct. 1966, p. 98-126, and Apr. 1970, p. 3-54. "Plantations and Agricultural Development", Jan. 1967, p. 39-60.
- Schickele, Rainer, Agrarian Revolution and Economic Progress, Praeger, New York, 1968.
- Stanford Research Institute, Land Reform in Vietnam, prepared for A.I.D., summary volume and working paper volumes, 1968.
- Timmons, John F., and Murray, William G., Land Problems and Policies. Iowa State College Press, Ames, Iowa, 1950, 298 p. U.S. Department of Agriculture, Land, Yearbook of Agriculture 1958, Washington, 605 p.
- Warriner, Doreen, Land Reform in Principle and Practice, Oxford University Press, London, 1969.
- Yang, M.M.C., Socio-Economic Results of Land Reform in Taiwan, East-West Center Press, Honolulu, 1970.

For more complete list of materials on land tenure and related subjects, contact Land Tenure Center, University of Wisconsin, Madison, Wisconsin.

13. FORESTRY(a) Significance of Subsector

Over half of the world's forest area is in the less developed countries. Properly managed, it is a renewable resource. Forest products can be used locally in greater quantities. They constitute at least one-fourth of exports in eight underdeveloped countries. Wider use is dependent on better lumbering practices and greater knowledge in world markets about tropical woods.

(b) A.I.D. Specialists

Gerard F. Horne, TA/DA

Boyd M. Witherow, forestry specialist, MO/PRM

(c) Consultant to A.I.D.

Paul W. Bedard, formerly forester, Abeliki Power & Paper Co., Ontario, forester, U.S. Forest Service; forest management advisor, USAID/Philippines; forest and watershed management advisor, USAID/Iran.

Donald Fink, president, McLean Products International, consultant on small enterprise for wood products export

(d) Institutional Resources

University of Minnesota (areas of specialization include economics of forest resource development) - RA p. 30.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-2813, conducted a research-oriented conference on forestry and economic development on March 27-28, 1972, at Washington, D.C.

(f) TAB Projects

CENTRAL RESEARCH

Project cross-reference

Use of Secondary Woods. See section G-2-f.

Complete Project

Utilization of Latin American Woods (Exploratory Study) -  
RR p. 95.

(g) Other A.I.D. Project

Honduras: Forest Management, CP-LA p. 54.

(h) No entry.

(i) Technological Development

Modern Technologies periodical (MT) entries:

chemical treatment of wood against marine borers 72-4 p. 32.  
decay resistance of Peruvian woods 72-1 p. 27.  
fire-retardant treatment of shingles 72-1 p. 28.  
forest product utilization in LA 72-3 p. 98.  
forests, CENTO countries 72-4 p. 106.  
growth acceleration of wood 72-4 p. 33.  
hardwood grading 72-2 p. 53.  
kiln design, solar 72-2 p. 53.  
lumber grading 72-2 p. 52.  
pallets from low-grade logs 72-1 p. 27.  
sensor surveys of forest resources 72-4 p. 74.  
softwood yield from small logs 72-4 p. 32.  
tropical wood properties 72-1 p. 26; 72-2 p. 52.  
veneer, wood characteristics affecting 72-1 p. 27.  
wood preservatives compared 72-4 p. 33.  
wood waste utilization 72-2 p. 54.

(j) Selected References

- Fox, Gordon D., "Forestry in Developing Countries - Potentials, Constraints, and Opportunities (Preliminary Survey)", TA/OST report 72-12, 1972, 74 p.
- Freas, A., Kukachka, B.; and Sendt, E., "Report of Survey Team: Projected AID Research Program on Improved Forest Products Utilization in Latin America", U.S. Forest Service, 1965, NTIS No. PB-206 802.
- Holscher, Clark E., "Forest Resources in Country Development", The Role of the Agency for International Development in the Field of Natural Resources Planning and Management, TA/OST 72-8, 1972, p. 39-46.
- Cobban, James L., The Traditional Use of Forests in Mainland Southeast Asia, Ohio University, Athens, Ohio, 1968
- Hughes, Bennett O., Technical Assistance in Forestry in Latin America, Latin American Science Board, 1964.
- India Committee on Natural Resources, Study on Forest Raw Materials for Pulp, Paper and Newsprint, New Delhi, 1965, 58 p.
- Klein, Morton A., The Forest Resources of Paraguay, Institute of Inter-American Affairs, Washington, 1946, 112 p.
- Marketing Research Corp of India Ltd., A Survey of India's Export Potential of Wood and Wood Products (sponsored by USAID/India), New Delhi, 1970, 4 vol.
- Richardson, Stanley Dennis, Forestry in Communist China, Johns Hopkins Press, Baltimore, 1966, 237 p.
- UN FAO, World Forest Resources, Rome, 1955, 120 p.
- UN FAO, Yearbook of Forest Products, 1969-70, Rome.
- U.S. Department of Agriculture, Trees, Yearbook of Agriculture 1949, 944 p.

14. FISHERIES(a) Significance of Subsector

Increased consumption of fish from marine and inland sources can improve diets, particularly as to essential proteins. This entails more efficient fishing and marketing, improved fish culture and conservation, further development of fish protein concentrate, and additional international agreements as to who may fish where. Some countries, such as Peru and South Korea, already export appreciable quantities of fish products, and other under-developed countries have a potential for supplying part of the growing world market. In addition to fin fish, there is an appreciable demand for lobster, shrimp, and fishmeal.

(b) A.I.D. Specialists

John B. Cordaro, TA/AGR - RA p. 60.  
 C. Edmund Schuart, TA/AGR - RA p. 11.  
 James A. Urano, TA/AGR - RA p. 26.  
 Charles A. Breitenbach, LA/DR.  
 George K. Parman, TA/AGR - RA p. 4.  
 William Littlewood, TA/OST.

(c) Consultant to A.I.D.

Donovan D. Moss, Professor of Fisheries and Assistant  
 Director, International Fisheries Program, Auburn University -  
 RA p. 29

(d) Institutional Resources (specialty in parentheses)

Auburn University (aquaculture) - IR p. 57. IG p. 6. RA p. 31.  
 University of Rhode Island (marine resources) - IR p. 60.  
 IG p. 4. RA p. 31.

## (e) No entry.

F) TAB ProjectsGENERAL TECHNICAL SERVICES

Increased Fish Production Through Improved Fish Culture in the LDCs, 931-11-180-787. Major countries: Brazil, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Bangladesh, India, Japan, Malaysia, Philippines, Taiwan, Thailand, West Central Africa. Obligation span: FY 1968-72. Life-of-project cost: \$829,000. Purpose: To increase fish production in farm ponds through research and training. Expected results: Increased fish output, farm incomes, employment, and protein consumption. PROP 5-1-72. Contractor: Auburn University. Contract: AID/csd-1581/2270. Project manager, R. Desrosiers, TA/AGR. Ref.: AY p. 4. AG p. 35.

Project cross-reference

Oceanographic Resources. See section G-2-f.

Completed projects

Fish Protein Concentrate (FPC) Market Feasibility Studies - Chile/Korea/Morocco. Ref.: AG p. 36. Project transferred to TA/N. Purchase, Inspection, and Evaluation of Fish Protein Concentrate. Ref.: AG p. 37. Project transferred to TA/N.

CENTRAL RESEARCHCompleted projects

Development of Conservation Processes for Fish Products Appropriate to Conditions in Developing Societies. Ref.: RR p. 15. AG p. 34. Project transferred to Bureau for Latin America.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

International Development and Utilization of Marine Resources, 931-11-180-113. Worldwide. Obligation span: FY 1969 (work span FY 1969-74). Life-of-project cost estimate: \$750,000. Grantee: University of Rhode Island. Grant: AID/csd-2455. Project manager: R. Desrosiers, TA/AGR. Ref.: IR p. 60.

International Aquaculture, 931-11-180-120. Worldwide. Obligation span: FY 1970 (work span FY 1971-75). Life-of-project cost estimate: \$800,000. Grantee: Auburn University. Grant: AID/csd-2780. Project manager: R. Desrosiers, TA/AGR. Ref.: IR p. 57.

(g) Other A.I.D. Projects

Philippines: Inland Fisheries, CP-ASIA p. 135.  
 Asia Reg.: Southeast Asia Fisheries, CP-ASIA p. 39.

## (h) No entry.

(i) Technological Developments

A simple process for the salting of fish is described in the Village Technology Handbook (VT, p. 277-281).

Modern Technologies periodical (MT) entries:

fish potential in Caribbean 72-3 p. 88.  
 fish protein concentrate economics 72-3 p. 91.  
 fish protein concentrate in Korea 72-3 p. 91  
 fish surveys in Colombia, Ecuador (6 reports), Panama,  
 Paraguay, Peru, and West Central Africa 72-3 p. 89, 90.  
 fisheries in the Philippines 72-3 p. 90.  
 technical assessment of mariculture 72-2 p. 107.

(j) Selected References

National Academy of Sciences, "Report of Philippines-U.S. Workshop on Fisheries and Oceanography", 1967, NTIS No. PB-203 365-U.  
 Swingle, H.S., "Inland Fisheries Progress in Thailand, 1971", Auburn University, 1972, 110 p.  
 Fisheries, SER/DM/ARC Agriculture Bibliography No. 5, 1971, 49 p.  
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- Morgan, Robert, World Sea Fisheries, Methuen, London, 1956, 307 p.
- National Planning Association, "Food from the Sea", Development Digest, Oct. 1969, p. 51-74.
- Rao, U. Shanker, From the Trawler to Table--Certain Aspects of Deep Sea Fishing in India, Dorchester Printing Works, Calcutta, 1955, 316 p.
- Tressler, Donald Kiteley, et al., Marine Products of Commerce--Their Acquisition, Handling, Biological Aspects, and the Science and Technology of Their Preparation and Preservation, Reinhold, New York, 1940, 762 p.
- UNESCO, Symposium on the Oceanography and Fisheries Resources of the Tropical Atlantic, Abidjan, 1966, Paris, 1969, 430 p.
- UN Food and Agriculture Organization, Yeabook of Fishery Statistics, Washington.

DEVELOPMENT ADMINISTRATION SERVICES

1. DEVELOPMENT ADMINISTRATION IN GENERAL

(a) Significance of Development Administration

The degree to which human talent, capital, and technology are successfully combined to achieve development goals depends on management. Neglect of management improvement is one of the greatest constraints to development. The problem is best expressed in an analytical system incorporating public, private, national, and local roles and dealing with the range of management inputs from executive decision-making to supervision of detailed field work. Development management or administration is concerned with systematic and effective planning, programming, organization, decision-making, management tools, information systems, control, evaluation, training, and consulting. Important objectives are to link professional and technical education with management education, and to link technology and management in public and private development activities.

(b) A.I.D. Specialists

Jack Koteen, Director, TA/DA  
 Gerard F. Horne, Deputy Director, TA/DA  
 E. Edward Rizzo, TA/DA  
 Joseph A. Ahern, ASIA/TECH  
 Milton L. Carr, SER/IT  
 Charles P. Edwards, PFC/IA  
 William M. Feldman, LA/DR  
 Donald L. Goodwin, SA/TCD  
 Robert R. Johnson, SA/TCD  
 Frank M. Landers, USAID/Pakistan  
 Princeton N. Lyman, Director, AFR/DS  
 Anthony J. Ormasa, SA/TCD  
 Kenneth F. Smith, USAID/Philippines  
 Bascom H. Story, IPA, Florida State University  
 Thomas W. Thorsen, Embassy/Vietnam  
 Robert J. Young, SER/IT

(c) Consultants to A.I.D.

See section E-2-c.

(d) Institutional Resources (specialty in parentheses)

Midwest Universities Consortium for International Activities, Inc. (MUCIA), comprising universities of Indiana, Illinois, Michigan State, Minnesota, and Wisconsin (institution building and technical assistance methodology) - IR p. 102, IG p. 8.  
 Southern Illinois University (Vietnam) - IR p. 104, IG p. 4.  
 Tufts University (institutional modernization) - IR p. 106, IG p. 2.  
 Nonprofit Organizations:  
 Governmental Affairs Institute  
 Institute of Public Administration NP p. 245.  
 Public Administration Service NP p. 405.

(e) Conference and Committees

See section E-2-e.

(f) TAB ProjectsCENTRAL RESEARCHCompleted projects

Appraisal of the Administration of Technical Assistance Programs with Special Reference to T.A. in Agriculture Ref.: RR p. 25.  
 Research Symposium on the Development of Administrative Capacity in Emerging Countries. Ref.: RR p. 87.

g) Other A.I.D. Projects

- Bolivia: Government Management Assistance, CP-LA p. 88.
- Brazil: Development Planning and Administration, CP-LA p. 99.  
Development Management, CP-LA p. 99.
- Colombia: Tax Administration, CP-LA p. 115.
- Ecuador: Improvement of Development Finance and Administration,  
CP-LA p. 126.
- Guatemala: Public Administration—Municipal, CP-LA p. 42.  
Tax Administration, CP-LA p. 42.
- Honduras: Public Administration, CP-LA p. 54.  
National Data Systems—Statistical Development,  
CP-LA p. 56.
- Jamaica: Reorganization of Tax Administration, CP-LA p. 198.
- Nicaragua: Municipal Planning, CP-LA p. 68.
- Paraguay: Government Management and **Organization**, CP-LA p. 136.
- Uruguay: Economic and Management Training, CP-LA p. 157.
- Caribbean Reg.: Regional Economic Development, CP-LA p. 165.
- Inter-American: Special Development Assistance Fund, CP-LA p. 232.
- LA Reg.: Regional Tax Assistance, CP-LA p. 212.
- Afghanistan: Financial Administration Improvement, CP-ASIA p. 51.  
National Development Training, CP-ASIA p. 51.  
Statistical Information System Development, CP-ASIA p. 51.
- Indonesia: General Participant Training, CP-ASIA p. 114.
- Jordan: Development Administration Training, CP-SA p. 39.
- Korea: Korea Development Institute, CP-ASIA p. 125.
- Laos: Public Administration Dev., CP-IC p. 75.
- Nepal: Administration and Management, CP-ASIA p. 91.
- Pakistan: Govt. Administrative Staff Improvement, CP-ASIA p. 83.
- Turkey: Development Administration Training, CP-ASIA p. 17.  
Management Education Development, CP-ASIA p. 20.  
Public Finance and Statistical Resources, CP-ASIA p. 21.
- Vietnam: National Inst. of Administration, CP-IC p. 27.
- Yemen: Public Sector Training, CP-ASIA p. 33.
- Ethiopia: Economic and Financial Planning, CP-AFR p. 21.  
Customs Administration, CP-AFR p. 21.
- Ghana: Economic Development Management, CP-AFR p. 40.
- Liberia: Institute of Public Administration, CP-AFR p. 61.
- Morocco: Development Planning Assistance, CP-AFR p. 72.
- Nigeria: Program Grant (Training and Technical Services),  
CP-AFR p. 83.  
Zaria Institute of Administration, Ahmadu Bello Univ.,  
CP-AFR p. 79.
- Tunisia: Management Education, CP-AFR p. 115.
- Uganda: Agriculture Administration, CP-AFR p. 127.  
Institute of Public Administration, CP-AFR p. 127.
- Zaire: Planning and Management Services, CP-AFR p. 133.
- C&W Afr Reg.: Middle Level Management Training, CP-AFR p. 145.  
Support to Regional Organizations (three projects),  
CP-AFR p. 145, 154.
- E Afr Reg.: East African Community Staffing and Management, CP-AFR p. 166.
- § Afr. Reg.: Southern Africa Development Personnel and Training,  
CP-AFR p. 177.

(h) Policies and Priorities

Public Administration Guidelines, M.O. 1612.70, Mar 14, 1967, 5 p.

(i) No entry.

(j) Selected References

SER/DM/ARC Development Administration Bibliographies:

No. 1, Administration of Agricultural Development, 1969, p. 2-7.

No. 4, Development Assistance to Schools and Institutes of Administration in Developing Countries, 1969, 7 p.

No. 5, Systems Approaches to Technical Cooperation: The Role of Development Administration, 1969, 22 p.

No. 6, Administrative Reform, 1969, 15 p.

Development Digest (ref. DD):

"Rural Administration", July 1971, p. 101-124.

"Applying Principles of Management", Jan 1966, p. 81-107.

"Improving Management in Developing Countries", April 1964, p. 1-23.

"Improving Public Administration in Developing Countries", July 1962, p. 105-110

"Public Administration for Development", Jan. 1964, p. 1-42.

International Review of Administrative Sciences (quarterly)

Jones, Garth, et al., Planning Development and Change: A Bibliography on Development Administration, East-West Center Press, Honolulu, 1970, 180 p.

United Nations, Public Administration Newsletter (approximately monthly), Public Administration Division, Department of Economic and Social Affairs, New York.

2. MANAGEMENT CAPABILITY(a) Significance of Key Problem Area/Subsector

National development programs, whether in family planning, education, agriculture, or business, often fall short of expectations because of limitations in managerial expertise. Such limitations are common in developing countries at all levels, in both public and private organizations. They are particularly evident at subnational levels of government, and especially in rural areas. This is partly a consequence of development. Managerial needs seem to grow exponentially with development, and the prevalent inadequacies are indications of growth and commitment as much as measures of unmet needs.

(b) A.I.D. Specialists

Jack Koteen, Director, TA/DA  
Gerard F. Horne, Deputy Director, TA/DA  
Kenneth L. Kornher (project management), TA/DA  
E. Edward Rizzo, TA/DA

(c) Consultants to A.I.D.

Milton Esman (institution building and development administration), Director, Center for International Studies, Cornell University.  
Donald Fink ( project management and private enterprise)  
Alma E. Hughes ( program and institutional analysis)  
William Siffin (development administration and institution building), Director, International Development Research Center, University of Indiana, formerly Director, TA/DA

(d) Institutional Resources

See sections D-1-d and D-2-f.

(e) Conferences and Committees

The Agricultural Development Council, under contract AID/csd-2813, held training-oriented conferences on Administration of Agricultural Programs on Sept. 17, 1971, at its New York headquarters and on April 4-8, 1972 at the East-West Food Institute, Hawaii.

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Agricultural Management, 931-11-720-936. Major countries: Central America, Philippines, Africa. Obligation span: FY 1971-75. Life-of-project cost estimate: \$1,290,000 - \$1,365,000. Purpose: To upgrade LDC institutions involved in public administration and private business administration of agriculture, including aspects of education, research, consultation, and professional interchange. Special attention given to commodity systems, agribusiness, rural agricultural management, and plan implementation. Outputs: Multicountry analyses and feasibility studies of commodity systems projects, surveys of management and training requirements and of institutional linkages, curricula and training materials, and bibliographies. Contractors: Governmental Affairs Institute (plan implementation), AID/csd-3630. Harvard University Business School Commodity Systems and (agribusiness), AID/csd-3153. Michigan State University (rural program management), AID/csd-3132 (terminating). Project manager: G. F. Horne, TA/DA. Ref.: CN-TO p. 215.

Modernizing Management for Development, 931-11-720-937. Major countries: Brazil and various countries in Africa. Obligation span: FY 1971-78. Life-of-project cost estimate: \$1,120,000-1,140,000. Purpose: To develop concepts and techniques for managing projects in at least two sectors and have them adopted by LDC managers and teachers. Management will include project analysis, implementation, and evaluation. Outputs: Adoption by LDC managers of systematic project management techniques, publication of case histories

of project management applications, and utilization by LDC training institutions of project-developed handbooks and other training materials. Contractor: Vanderbilt U. graduate school of management. Contract: AID/csd-3156. Project manager K. L. Kornher, TA/DA. Ref.: CN-TO p. 215.

### Cross-Reference

Agribusiness Planning and Development. See section A-1-f.

### (g) Other A.I.D. Projects

LA Reg: Agriculture Management, CP-LA p. 212.  
Nepal: Management Improvement and Training, CP-ASIA p. 91.  
Afr. Reg.: Regional Organizations Development, CP-AFR p. 187.

(h) No entry.

### (i) Technological Development

Management training, MT 72-3 p. 87.

### (j) Selected References

- Koteen, Jack, "Key Problems in Development Administration", chapter 3 in Administrative Issues in Developing Economies, edited by Kenneth J. Rothwell, Lexington Books, 1972.  
(Also available as an AID paper from TA/DA.)
- Horne, Gerard, "The Agricultural Commodity System: A Multi-purpose Tool for Managing Agricultural Development in LDC's", TA/DA Preliminary Staff Paper, 1973, 20+ p.
- Esman, Milton J., and Montgomery, John D., "Systems Approaches to Technical Cooperation. The Role of Development Administration," Governmental Affairs Institute, Washington, 1969, 86 p.
- Farrar, Curtis, "The Bureaucrat As the Manager of Development", Urban Institute, 1972, 40 p.
- Gittinger, Price, Economic Analysis of Agricultural Projects, for Economic Development Institute by Johns Hopkins Univ. Press, 1972, 221 p.
- Kulp, Earl, Basic Agricultural Program Management, for A.I.D. by Institute of Public Administration, 1973, 236 p.  
(Available with teachers manual from TA/DA.)

Mosher, Arthur, Getting Agriculture Moving, Praeger, New York, 1966, 191 p.

Siffin, William, "Development Administration in the Programme of the United States Agency for International Development", International Review of Administrative Sciences, No. 3, 1971, p. 250-253. (Also see other articles in same issue.)

United Nations, Administration of Development Programmes and Projects: Some Major Issues, ST/TAO/M/55, sales No. E.71.II.H.4, 1971, 88 p.

United Nations, Report of the Interregional Seminar on the Use of Modern Management Techniques in the Public Administration of Developing Countries, ST/TAO/M/52 and Add. 1. Sales Nos. E.71.II.H.5. and E/F/S.71.II.H.6, 2 vols., 54 p. and 127 p. (Vol. II contains technical papers.)

Note: TA/DA and its contractors have in process documents on the following subjects, some of which will be available by press time: TA/DA program brochure, commodity systems, agricultural plan implementation, organization development, project management.

E-3 LOCAL ACTION CAPABILITY(a) Significance of Key Problem Area/Subsector

Local action capability refers to the ability of groups of people to choose goals and create means that serve their common needs and interests. Problems begin with inadequate delivery systems to get resources to local people in adequate kinds and amounts at the right time. Infinitely more complicated, however, is improving the capability of local people to receive and utilize delivery resources. When the results of a project depend upon new forms of collective action by the intended beneficiaries, as is often the case, absence of the existence or creation of local action capability frustrates the aims of the effort. Yet strategies for building local action capability have seldom been worked out. For example, we do not have much systematic understanding of the circumstances in which particular kinds of cooperatives will, or will not, work.

(b) A.I.D. Specialists

Jerome T. French, TA/DA  
Princeton Lyman, AFR/DS  
Edgar Owens, ASIA/TECH  
Keith Sherper, TA/DA  
Jonathan Silverstone, PPC/PDA

(c) Consultants to A.I.D.

John Montgomery, Harvard University  
Norman Uphoff, Cornell University

(d) Institutional Resources

United Nations Research Institution for Social Development, Geneva;  
Agricultural Development Council, New York;  
Joint Research Programme on Agricultural Development Overseas,  
Overseas Development Institute, University of Reading, London.

(e) Conferences and Committees

Local Action Capability Task Force, TA/DA

A.I.D. Review of the Role of LDC Institutions and Joint Organizations as Program Intermediaries for Increasing Local Action Capability (Findings and Implications paper prepared for the review dated July 15, 1971; Summary of the A.I.D. Review dated July 30, 1971).

Agriculture Development Council Seminar of Small Farmer Development Strategies, Ohio State University, September 1971 (Conference papers).

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Local Action Guidance and Implementation Project, 931-11-720-986. In addition to an interregional contract, major countries include Kenya, Lesotho, Paraguay and Ecuador. Obligation span: FY 1973-76. Life-of-project cost estimate: \$740,000. Purpose: To assess means of increasing the local action component of rural and sectoral development programs through intermediary mechanisms and local-level LDC organizations. Outputs: Analysis of lessons learned from approximately ten local action programs, development of guidelines and materials from those analyses, and tested applications in at least three localities of the new guidelines and materials. Project manager: J. French, TA/DA.

CENTRAL RESEARCH

Local Action Capability - Research. Proposed project. Major countries to be determined. Obligation span: FY 1974-76. Life-of project cost estimate: \$250,000. Purpose: to fill data gap in knowledge requisite for effective local-action capability in rural and sectoral development programs. Outputs: Research instruments developed and applied, and monographs reporting results. Project manager: J. French, TA/DA.

(g) Other A.I.D. Projects

Bolivia: Community Development, CP-LA p. 85.  
 Ecuador: Second Cooperative Bank, CP-LA p. 125.  
 Paraguay: Agricultural Credit, CP-LA p. 135.  
 Jordan: Village Development, CP-SA p. 40.  
 Laos: Development of Rural Economy, CP-IC p. 72.  
 Philippines: Local Development, CP-ASIA p. 140.  
                   Provincial Development, CP-ASIA p. 135.  
 Vietnam: Support of Local Government, CP-IC p. 28.  
                   Support of Rural Development, CP-IC p. 46.  
                   Ethnic Minority Affairs, CP-IC p. 47.

Ethiopia: Ada District Dev., CP-AFR p. 20, 22.  
 Kenya: Rural Development (Vihiga), CP-AFR p. 49.  
 S. Afr Reg: Thaba Bosiu (Losotho) Rural Development,  
 CP-AFR p. 174.

(h) Policies and Priorities

A.I.D. Policy Determination No. 48, October 2, 1972.

## (i) No entry.

(j) Selected References

SER/DM/ARC Development Administration Bibliographies:

No. 3, Urban and Local Government Development, 1969, p. 11-15.

SER/DM/ARC Civic Participation Bibliography:

No. 1, Popular Participation in Development: Title IX,  
 1970, 15 p.

TA/DA "Local Action Key Problem Area—Work Summary and Status",  
 1973, 19 p.

A.I.D. Spring Review on Small-Farmer Credit, analytical papers,  
 1973

TA/DA, "A.I.D. Review of the Role of LDC Institutions and Joint  
 Organizations as Program Intermediaries for Increasing Local  
 Action Capability: Findings and Implications" 1971, 39 p.

TA/DA, and PPC/PME, "Summary of the A.I.D. Review of the Role of  
 LDC Institutions and Joint Organizations as Program Intermediaries  
 for Increasing Local Action Capability", 1971, 15 p.

French, Jerome T., "Participative Aspects of Community Level Programs",  
 AID/PPC, 1969.

Barraclough, Solon L., "Farmers Organizations in Planning and Implementing  
 Rural Development Programs", prepared for Rural Development in a  
 Changing World, edited by Raanan Weitz, to be published by M.I.T.  
 Press, Cambridge.

Edel, Matthew, "Community Action Programs and Agricultural Development:  
 Reflections on the Colombian Experience", September 1971.

FAO/SIDA Symposium on Agricultural Institutions  
 for Integrated Rural Development, ESR:FAO/SIDA/IRD/71 April 1971.

Gotsch, Carl H., "The Distributive Impact of Agricultural Growth: Low  
 Income Farmers and the 'System'", August 1971.

Hunter, Guy, "Methods of Rural Development", Cambridge University  
 Overseas Studies Committee Conference, Journal of Administration  
 Overseas, Oct. 1970.

Hunter, Guy, Modernizing Peasant Societies - Administration of  
 Agricultural Development, Oxford University Press, London, 1969.

Luykx, Nicholaas, "Rural Governing Institutions", chapter in  
Institutions in Agricultural Development, edited by Melvin G. Blase,  
 Iowa State University Press, Ames, 1971, p. 189-217. East-West  
 Food Institute reprint No. 1.

Tinnermeier, Ronald L., "Supervised Credit and the Small Farmers,"  
 September 1971.

Weitz, R., From Peasant to Farmer, Columbia Univ. Press, New York,  
 1971.

EDUCATION AND HUMAN RESOURCES SERVICES

1. EDUCATION AND HUMAN RESOURCES IN GENERAL

(a) The Education Sector

"Program Strategy in Education and Human Resources, FY 1973-74" (cited A.I.D. publication ES) provides the rationale for the Technical Assistance Bureau approach to the education sector. Three key problem areas are identified -- educational technology, non-formal education, and education finance and measurement. These are treated in following sections of this chapter. The present section covers education and human resources in general and manpower planning. A final section of this chapter includes education subsectors outside the key problem areas.

(b) A.I.D. Specialists

Clifford Liddle, Director, TA/EHR  
Robert W. Schmeding, Deputy Director, TA/EHR  
Christine Hugerth, TA/EHR  
James Singletary, TA/EHR  
Erven J. Long, Associate Assistant Administrator, AA/TA  
James K. McDermott, Director, TA/RIG  
Alfred Bisset, TA/PM  
Harold Freeman, Chief Education Advisor, ASIA/TECH  
Stanley Applegate, Chief Education Advisor, LA/DR  
Edwin Martin, Chief Education Advisor, AFR/DS  
Eleanor K. Green, Chief Education Advisor, SA/TCD

(c) Consultants to A.I.D.

John F. Hilliard, educational planning and university development  
Frederick Harbison, economics and human resource development  
(manpower planning)

(d) No entry.

- (e) No entry.
- (f) TAB Projects

CENTRAL RESEARCH

Completed Projects

Development of an Educational Research Center for Central America. Ref.: RR p. 76.  
 Research and Development of Aptitude Testing. Ref.: RR p. 78.  
 Research on the Process of Institution Building: Four Case Studies of Educational and Training Institutions. Ref.: RR p. 88.

(g) Other A.I.D. Projects

Bolivia: Education Admin, and Curriculum Improvement, CP-LA p. 90.  
 Brazil: Education Sector, CP-LA p. 97.  
 Chile: Educational Sector, CP-LA p. 107.  
 Colombia: Education Sector, CP-LA p. 118.  
 Dominican Rep.: Education Sector, CP-LA p. 171.  
 Ecuador: Human Resource Development, CP-LA p. 128.  
 El Salvador: Education Sector, CP-LA p. 36.  
 Jamaica: Education Sector, CP-LA p. 200.  
 Nicaragua: Education Sector Loan, CP-LA p. 63.  
 Panama: Education Sector, CP-LA p. 76.  
 Peru: Manpower and Education, CP-LA p. 148.  
       Human Resource Development, CP-LA p. 110.  
 Venezuela: Natl. Manpower Trng. and Dev., CP-LA p. 204.  
 Central Am. Reg: Regional Manpower Planning, CP-LA p. 18.  
 Korea: Education, CP-ASIA p. 124.  
 Laos: Education Development, CP-IC p. 70.  
 Nepal: Manpower Development and Training, CP-ASIA p. 91.  
 Pakistan: Functional Literacy, CP-ASIA p. 83.  
       Grants to Pakistan Educational Institutions, CP-ASIA  
       p. 86.  
 Thailand: Rural Education, CP-SA p. 15.  
       Professional Manpower Utilization, CP-SA p. 23.  
 Asia Reg: Regional Education Dev., CP-ASIA p. 45.  
 Ghana: Human Resources Dev., CP-AFR p. 35.  
 C&W Afr. Reg: West Africa Examinations Council, CP-AFR p. 145.  
 Afr. Reg.: African-American Institute-Education and Training  
       Activities, CP-AFR p. 198.

(h) Policies and Priorities

"The A.I.D. Education Program Strategy", 1973, 57 p.

"Bureau for Technical Assistance" N.O. 204.8, Aug. 23, 1971,  
p. 15-17, 7-8.

(i) No entry.

(j) Selected References

See cited references EC and ES described in Section Z.

A.I.D. Office of Education and Human Resources, Bureau for  
Technical Assistance, "Sector Statement on Education", Sept.  
1973, 45 p. and tables.

Development Digest (ref. DD):

"Ability Testing", Oct. 1972 p. 103-124.

"Human Resources Development", July 1964, p. 101-117.

"Literacy", July 1970, p. 83-98.

"Rural Education", Oct. 1970, p. 3-40.

"Student Attitudes", Oct. 1972, p. 39-65.

Alexander-Frutschi, Marian Crites, "Human Resources and Economic  
Growth--An International Annotated Bibliography on the Role of  
Education and Training in Economic and Social Development",  
Stanford Research Institute, 1963, 398 p.

Schwarz, Paul, and Krug, Stanley, Ability Testing in Developing  
Countries, Praeger, New York, 1972.

2. EDUCATIONAL TECHNOLOGY

(a) Significance of Key Problem Area/Subsector

The developing countries are faced with a demand for expansion of education at a rate beyond their resources in teachers, facilities, and funds. As there is a possibility of more effective education at less cost through new technology, educational technology has been selected as a key problem area.

The term educational technology covers (1) devices for delivering informational and educational materials, particularly the newer electronic media of television, films, radio, and computers, together with the older technologies such as textbooks and (2) methodologies, discovered and substantiated by research, for more effectively designing, carrying out, and evaluating the total process of learning and teaching.

(b) A.I.D. Specialists

Clifford H. Block, Education Officer (technology), TA/EHR  
David M. Sprague, TA/EHR  
Christine Hugerth, TA/EHR  
Annette Buckland, TA/EHR  
Stanley D. Handleman, ASIA/TECH  
Stanley Applegate, LA/DR  
Thomas W. Hazard, Jr., LA/DR

(c) Consultants to A.I.D.

Bertram Cowlan, educational technology (broadcasting)  
George Sadler, educational technology (books)

(d) Institutional Resources

Florida State University - IR p. 114.

Stanford University: Institute for Communications Research

George Washington University: Educational Policy Group

Information Center on Instructional Technology, Academy

for Educational Development, 1424 16th St., N.W.

Washington, D.C. 20036. The center, funded by TAB,

provides information and research facilities in

educational technology for visitors from developing

countries, loans and sells a film on LDC instructional

television, distributes information bulletins, a hand-

book, and newsletter, and provides a reference service

for LDC's and USAID Missions.

Bureau of the Census (computer technology), PASA TA 9-72.

(e) Conferences and Committees

A conference at Airlie House, Warranton, Va., on November 22-23, 1971 brought out the views of education technologists from eight developing countries and of U.S. experts on A.I.D. strategy in this field.

A conference was arranged by A.I.D. in March 1972 to enable two groups--those working to expand opportunities of minority groups in the United States and A.I.D. technicians--to exchange experiences and viewpoints about use of educational technologies.

A series of reviews has been undertaken in 1972-73 with U.S. experts on research priorities in educational technology, communications strategies, and educational satellite policy.

Seminars and workshops on educational technology have been organized by the Academy for Educational Development, Inc. at the INNO TECH Center in Singapore in April 1972 and in Rio de Janeiro in late 1972.

An international meeting on the use of satellites in education is planned in cooperation with the Department of Health, Education and Welfare and UNESCO, in early 1974.

A Committee on Communications Technology in Development was established by Administrator John A. Hannah in his memorandum of June 12, 1970, to Assistant Administrators and titled Implementation of Section 220. The Committee is intended to facilitate:

- coordination of policy, planning, and evaluation
- exchanges of information and experience
- keeping track of progress
- reporting to the Administrator and Congress

The chairman is Robert Schmeding, TA/EHR. The committee includes representatives of each Regional Bureau, appropriate TA Bureau offices, SER/IT, PHA, and PPC.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Analytic Services in Relating Communications Technology to Development, 931-11-690-896. Worldwide. Obligation span:

FY 1970-73. Life-of-project cost estimate: \$979,000. Purpose: To provide guidance to AID on strategy for use of communications technologies in education. Outputs: Identification of priorities for future research and development. Communications strategy approaches developed for range of human resource development objective. Educational Satellite Policy options delineated. (Illustrative cases of communications-based projects in Colombia, El Salvador. Satellite case studies of Brazil, India, Ethiopia, Canada, Alaska and Mainland U.S. Contractors: Academy for Educational Development (general), Abt Associates (research priorities), MIT (satellite and alternative systems studies), George Washington University Educational Policy Group (strategies for implementation). Contract: AID/csd-2829. Project Manager: C. H. Block, TA/EHR.

Field Support in Educational Technology. Proposed project. Worldwide. Obligation span: FY 1974-76. Life-of-project cost estimate: \$950,000 to \$1,450,000. Purpose: To provide in-depth support to USAIDs in planning innovative education projects involving educational technology. Will include out-of-school applications such as delivery systems for health and nutrition. Outputs: Establishment of an LDC/AID-oriented educational technology group at HEW. Help in design of LDC education projects representing innovative, cost-effective approaches to specific country human resource development problems. Self-instructional programs on educational technology for LDC and USAID educators. Continuation of Information Center on Educational Technology. Possible contractors: U.S. Department of Health, Education and Welfare, Academy for Educational Development, others. Project Managers: C. H. Block, Annette Buckland, Christine Hugerth, TA/EHR.

Training LDC Personnel and Software Utilization in Communication/Educational Technology. Proposed project. Worldwide. Obligation span: FY 1975-76. Life-of-project cost estimate: \$275,000. Purpose: Assess instructional resources for training LDC personnel for operational work in educational technology systems. Provide LDCs a resource guide to existing instructional materials. Outputs: Guide on institutional resources in educational technology, recommendations to A.I.D. for implementing training, and guide on available films, video tapes, radio tapes, and programmed instruction. Project manager, C. Hugerth, TA/EHR.

Conferences on Educational Uses of Communications Satellites.

Proposed project. Worldwide. Obligation span: FY 1974-75. Life-of-project cost estimate: \$75,000. Purpose: Bring together educational managers of ongoing and planned satellite projects to compare problems and approaches. Outputs: Conference in 1974 at site of Rocky Mountain experiment, with participation invited from Brazil, India, Iran, other LDCs; later conferences in LDCs; reports centering on approaches to planning and administration. Project Managers: C. H. Block, A. Buckland, TA/EHR.

Cross Reference

Analytical Service in Relating Communications Technology to Development, 931-11-690-896. See section S-3.

Completed Projects

Information Preparation and Dissemination in Educational Technology, 931-11-680-022, FY 1969-73, \$493,000, Academy for Educational Development, Inc., AID/csd-2506, CN-TO p. 164.  
 Evaluation of Educational Technology Projects (TV), 931-11-690-019, FY 1970-72, \$695,000, Academy for Educational Development, Inc., AID/csd-2175, subcontracts with specialists from Drexel University, Educational Testing Service, and Stanford University, CN-TO p. 164.  
 Educational Technology for Training Teachers of English as a Foreign Language, 931-17-690-933, FY 1962-72, \$1,460,000, English Language Services (AID/REPAS-13), American Institutes for Research (AID/csd-1555), University of Southern California (AID/csd-3157).

CENTRAL RESEARCH

Application of Radio to Teaching Elementary Mathematics, 931-11-690-569. Worldwide. Obligation span: FY 1973-76. Life-of-project cost estimate: \$1,157,000. Purpose: To determine the feasibility of a low-cost system of radio instruction. Outputs: Creation of a prototype system in one (or two) LDCs using radio and detailed feedback for complete instruction in mathematics (first four grades) with minimal classroom teacher instruction. A criterion-referenced evaluation, aimed at achieving 80 percent content mastery by 90 percent of the students. Cost-benefit analysis. Contractor: Stanford University, Institute for Mathematical Studies in the Social Sciences. Contract: CM-TA-C-73-40. Project Managers: D.M. Sprague and C. H. Block, TA/EHR.

Utilizing Non-Professionals in the Instructional Process (Peer Teaching Systems). Worldwide. Obligation span: FY 1973. Life-of-project cost estimate: \$25,000 Purpose: Evaluate new methods of group instruction, using students as teachers, supported by instructional technologies. This is a feasibility/planning study prior to a possible \$300,000 R&D project in FY 1975. Outputs: Descriptions and analysis of models now in use; suggestions for characteristics of systems having utility and practicability in LDCs; outline of R&D effort. Contractor: American Institutes for Research. Project Manager: D. M. Sprague, TA/EHR.

Audio Media Research Program: Instruction by Mass Media. Proposed project. Worldwide. Obligation span: FY 1975-78. Life-of-project cost estimate: \$1,000,000. Purpose: Extend school services by use of audio media without relying on accompanying instructional materials or skilled professionals at the receiving end. Outputs: An educational system servicing more students effectively by utilizing radio. Analyses of variables and costs. Project manager: D.M. Sprague and C. H. Block, TA/EHR.

Audio Media Research Program: Audio Media Within Non-Formal Instructional Settings. Proposed project. Worldwide. Obligation span: FY 1975-78. Life-of-project cost estimate: \$800,000. Purpose: Research variables in use of audio media in LDC non-formal education. Outputs: Findings on relative importance of variables, and prescriptions on use of audio media in development. Project managers, D.M. Sprague and C.H. Block, TA/EHR.

Completed Projects

Research on the Feasibility of Applying New Educational Media in Developing Countries, 931-17-690-445.

Ref.: RR p. 78. CN-TC p. 283.

Studies of Low Cost Instructional Technology, 931-17-690-542.

Ref.: RS p. 21. CR p. 7. CN-TO p. 165.

Evaluation of Analytical Services Relating Communication Technology to Development, 931-17-690-553.

Ref.: CR, revision of 8-31-72, p. 12. CN-TO p. 165.

Symposium on Communications Research in the Development Process, 901-11-960-916.

Ref.: RR p. 86. CN-TC p. 288.

Diffusion of Information Through Radio and Supporting Media (Pilot Project in Ecuador), 946-11-990-009

Ref.: RR p. 85. CN-TC p. 286.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Utilization of Technology in Education Programs, 931-11-690-131. Worldwide. Obligation: FY 1971 (work span FY 1971-76). Life-of-project cost estimate: \$1,000,000. Purpose: To strengthen the capability of the contractor institution to develop educational technology as applied to problems faced by LDCs. Output: Design of improved instructional systems, measurement and evaluation methods, and instructional materials. Establishment of links with LDC institutions in research, training, experimentation, and application of instructional technology. Grantee: Center for Educational Technology, Florida State University. Grant: AID/csd-2945. Project Manager: C. H. Block, TA/EHR. Ref.: IR p. 114, ES p. 18. IG p. 7.

Center for Communications in Development. Worldwide. Obligation span: FY 1974 (work span FY 1974-78). Life of project cost estimate: \$1,000,000. Purpose: Strengthen institutional competence in communication research, training, and technical assistance on the use of communications in LDC human development programs, both in formal education and in non-formal learning contexts. Outputs: Increased research competence; methodologies for field evaluation and research; more multidisciplinary attack on these problems; initiation of training programs for LDC specialists; more cost-effective approaches for providing usable information to LDC populations; especially those bypassed by traditional education; infusion of innovative thinking in this field into LDC planning. Grantee: Institute for Communication Research, Stanford University. Project Manager: C. H. Block, TA/EHR.

Multidisciplinary Application to Traditional Education Systems in Latin America (see section E-3.)

(g) Other A.I.D. Projects (\*educational technology is part of the project)

- Brazil: \*Education Sector Loan, EC p. 63. CP-LA p. 97.  
 Colombia: Educational Technology and Management, EC p. 71. CP-LA p. 118.  
           \*Education Sector Loan, EC p. 73. CP-LA p. 118.  
 Ecuador: \*Human Resources Development, CP-LA p. 128.  
 El Salvador: \*Education Development, EC p. 75. CP-LA p. 56.  
           \*Educational Reform Including ITV, EC p. 76. CP-LA p. 220.  
 Central Am. Reg.: Textbook Development, EC p. 86.  
 LA Regional: Regional Technical Aids Center, EC p. 91. CP-LA p. 220  
 Indonesia: Use and Development of Educational Materials, CP-ASIA p. 106.  
 Pakistan: Low Cost Textbook Publishing, EC p. 26. CP-ASIA p. 83.  
 Asia Regional: \*Regional Education Development, assisting the Southeast Asian Ministers of Education Organization (SEAMEO). Activities include the Regional Center for Educational Innovation and Technology (INNOTECH) in Vietnam, EC p. 16.  
 Tanzania: Educational Materials and Advisory Services, EC p. 41. CN-TO p. 79.  
 East Africa Regional: Education Research and Development, CP-AFR p. 164.  
 C&W Afr. Reg.: Regional Textbook Production Center, CP-AFR p. 145.
- Population: Training Films and Related Teaching Materials Series (csd-3304), CN-TO p. 162.  
 Training Films in Population Field (csd-3318), CN-TO p. 162.  
 Computer Assisted Training in Population Dynamics and Economics Development (csd-2937), CN-TO p. 162.  
 Development of Information, Education and Communication Base for Services in Training (csd-2977).

Inventory and Analysis of Information,  
Education and Communication Support  
(csd-2878).

Expansion of Population Program Communication  
(csd-3314).

An Automated Information System: A Pilot Study  
Latin America Regional Population Communi-  
cation Project

Latin America Regional--Information Communi-  
cation Education Program Model & Strategy

Latin America Regional--Film Trilogy

Philippines--Social Communications Center

Philippines--National Media Production Center

(h) Policies and Priorities

Sec. 220, Foreign Assistance Act, Programs for Peaceful  
Communications:

- (a) The President is authorized to use funds made available under section 212 to carry out programs of peaceful communications which make use of television and related technologies, including satellite transmissions, for educational, health, agricultural, and community development purposes in the less developed countries.
- (b) In carrying out programs in the fields of education, health, agriculture, and community development, the Agency primarily responsible for part I shall, to the extent possible, assist the developing countries with research, training, planning assistance, and project support in the use of television and related technologies, including satellite transmissions. The Agency shall make maximum use of existing satellite capabilities, including the facilities of the International Telecommunications Satellite Consortium.
- (c) In implementing activities under this section, the agency primarily responsible for part I shall coordinate closely with Federal, State, and local agencies and with nongovernmental educational, health, and agricultural institutions and associations within the United States.

Dr. John A. Hannah, May 1, 1972, in an address before the National Foreign Policy Conference for Leaders in Higher Education, Department of State Building, Washington:

"The developing countries must develop non-traditional, low-cost systems of education if they are to roll back the tide of illiteracy.... In the large areas where no schools yet exist, mass communications can provide both villagers and urban dwellers with needed skills and a kind of education that will make living for them more productive and satisfying."

Excerpts from House Foreign Affairs Committee Report on  
FY 1970 Foreign Assistance Act, November 6, 1969:

Section 220 adds a new section to the act relating to programs for peaceful communication. The objective of the new section is to emphasize specifically in the legislation the importance of assisting the less developed countries in the use of modern communication technologies, including television, for educational, health, agricultural, and community development purposes, and to encourage the establishment, within A.I.D., of a focal point for such activities. No additional funds would be required; rather, the President would be authorized to use technical assistance monies under section 202.

Rapid advances in the technology of communications, including the use of satellites, are making it feasible to bring information and instruction to peoples worldwide. By 1972, for example, the United States will provide India with use of a communications satellite for a system of "community" television which will reach even isolated villages. Other countries and regional groupings of countries are expected to seek similar assistance.

As a paramount force for international development, as historic champion of an "open" world of information and knowledge, and as world leader in communications technology, the United States has a vital interest in the beneficial utilization of electronic and other modern systems of communication--systems which are certain to have profound political, social, economic,

and cultural effects globally. While the United States has pioneered in the technology, it has done little in the equally important area of applying the technology to meet human needs.

Section 220 would be a step toward correcting the imbalance by creating within A.I.D. the capability to assist the less developed countries with research, training, planning help and pilot projects in the use of television and related technologies for development purposes. The emphasis would be on the "software" nontechnical aspects of communication systems. The new section, it should be noted, is in conformity with recommendations of the 1967 White House Task Force on Educational Television in Less Developed Countries, the 1967 President's Task Force on Communications Policy, and the House Foreign Affairs Subcommittee on National Security Policy and Scientific Developments which held 4 days of hearings on the subject earlier this year.

#### A.I.D. Priorities

AID is now primarily concentrating its attention in educational technology on two major areas: the expansion and improvement of formal schooling, particularly from grades one through nine; and an increase in the access to information and basic education of rural families and the urban poor, through non-formal (out-of-school) actions.

#### Project Selection:

A.I.D. assists the development of programs that are problem-oriented not communications-media-oriented. We intend to exploit the technology to respond to the needs of key problems rather than search for uses of available technology.

#### Relate to operations:

The most productive experimental research is often that which is closely related to a planned or operational project. For this reason, A.I.D. is in some instances making available a percentage of its sector loan funding in education for research and development activities, particularly in Latin America.

(i) No entry.

(j) Selected References

Conference on A.I.D. Priorities in Educational Development, March 22-24, 1972 (eleven papers numbered as shown):

4. TAB Working Paper on Educational Technology, C. H. Block, 63 p.
13. Utilizing Technology in Education Programs for LDCs (A.I.D. Sec. 211(d) grant to Florida State University), 16 p.
14. Ibid., Status Report, April 1972, 16 p.
15. Analytical Services in Relating Communications Technology to Development (A.I.D. Contract with Academy for Educational Development - Scope of Work), 21 p.
16. Ibid., Summary Status Report, 21 p.
17. Information Preparation and Dissemination-- Educational Broadcasting (A.I.D. Contract with the Academy for Educational Development - Scope of Work), 19 p.
18. Ibid., Summary Status Report, 16 p.
19. Evaluation of Educational TV Project (A.I.D. Contract with the Academy for Educational Development - Scope of Work), 18 p.
20. El Salvador Instructional Television Evaluation Project (By Academy for Educational Development), Summary Status Report, 10 p.
21. Effectiveness and Cost Efficiency of Instructional Technology (A.I.D. Contract with Stanford University - Scope of Work), 16 p.
22. Ibid., Television and Its Lower-Cost Alternatives, 18 p.

Report of Progress in Implementing Section 220, Foreign Assistance Act--authorizing Programs for Peaceful Communications for Development, prepared for Congress, July 20, 1972, 29 p.

Information Center on Instructional Technology, Academy for Educational Development:

- (a) "Sources of Information and Assistance on Educational Technology for Development: A Directory", Information Bulletin No. 1, 1972, 33 p. Describes organizations in five categories-- general information and technical assistance, software, hardware, professional and trade associations, and financial assistance.

(b) "Educational Reform and Instructional Television in El Salvador: Costs, Benefits, and Payoffs--A Summary of Richard E. Speagle's Report", Information Bulletin No. 2, 1972, 26 p.

(c) A motion picture film, "Classroom Television: Instrument for Educational Change", 16 mm., sound, color, 40 minutes, produced by International Cinemedia Center. Focuses on experience in Niger and El Salvador. Requests by USAIDs or country governments for loan or purchase (\$130) filled by Information Center on Instructional Technology; USAID requests should be channeled through TA/EHR.

(d) "Educational Technology and the Developing Countries--A Handbook", 1971, 173 p. (loose-leaf), published in association with the above film.

(e) Instructional Technology Report, a periodical. Reports of Stanford University research project on television and its low-cost alternatives, to be published in fall of 1973. Analyses of a television-based system for high school education (Mexico); the "radio-primaria" experiment in Mexico; data from Samoa and other comprehensive classroom TV systems; radio projects in a number of countries; comparative characteristics of a variety of media.

Reports of project on "Analytic Services Relating Communications Technology to Development" (see above) to be published in fall, 1973.

Bretz, Rudy, The Selection of Appropriate Communication Media for Instruction, Rand Corp., Santa Monica, Calif., 1971.

Chu, Godwin C., and Schramm, Wilbur, Learning from Television--What the Research Says: Institute for Communications Research, Stanford, California, 1967.

Gerlach, Vernon S., and Ely, Donald P., Teaching and Media: A Systematic Approach, Prentice-Hall, Englewood Cliffs, N. J., 1971.

- Klaus, David J., Instructional Innovation and Individualization, American Institutes for Research, Pittsburgh, 1969. (Produced under A.I.D. contract and available from TA/EHR).
- Schramm, Wilbur, Instructional Television in the Educational Reform of El Salvador, Academy for Educational Development, Information Center on Instructional Technology Information Bulletin No. 3, 1973, 89 p.
- Schramm, Wilbur; Coombs, Philip, et al., The New Media: Memo to Educational Planners and Case Studies for Planners, International Institute for Educational Planning (IIEP), 1967. (Produced under A.I.D. contract and available from TA/EHR.)
- OECD Center for Educational Research and Innovation, Educational Technology--The Design and Implementation of Learning Systems, Paris, 1971, 86 p.
- Tickton, Sidney G., et al. (ed.), To Improve Learning--An Evaluation of Instructional Technology, Commission on Instructional Technology Report to the President and to House Committee on Education and Labor, RR Bowker Co., New York, 1970, 2 vol. (including selected working papers).
- Bibliography: "Book, Textbook and Library Development", SER/DM/ARC Education and Human Resources Bibliography No. 1, 1970, 36 p.

3. NON-FORMAL EDUCATION(a) Significance of Key Problem Area/Subsector

Formal education in most developing countries is basically a transplantation of European systems. Its three basic limitations for these countries are that it is only partially relevant in subject matter for the majority of students not going to college, it does not reach those very large numbers of children and uneducated adults not attending school, and it is too expensive per pupil to permit as fast progress toward universal education as the people want. On the other hand, skills, knowledge, and attitudes do develop — outside of formal school — through experience, on-the-job training, newspapers, recreation, and cultural activities. Such non-formal education can have a high degree of relevance to individual lives, has the potential to reach nearly everyone probably at less cost, and can be improved in effectiveness. Non-formal education could benefit particularly farm and village people, and adults as well as children. It can make major use of modern communication technology — the key problem area designated E-2 in this directory.

(b) A.I.D. Specialists

Myron H. Vent, TA/EHR

(c) Consultants to A.I.D.

None

(d) Institutional Resources

University of California, Los Angeles - IR p. 111.  
Michigan State University - ES p. 31.

(e) Conferences and Committees

Conference on Non-Formal Education, TA/EHR, Washington, 12-20-72. Regional bureaus, with TA/EHR assistance, organized seminars in 1971 in Washington, Korea, Malaysia, and Nigeria on non-formal education.

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Non-Formal Education, 931-11-690-934. Worldwide. Obligation span: FY 1971-73. Life-of-project cost estimate: \$450,000. Purpose: To survey and analyze existing non-formal education activities and to provide advisory services on non-formal education to USAIDs and LDCs. Outputs: Studies of non-formal education, including history, strategies, country comparisons, learning effectiveness, economics, case studies, feasibility, administrative alternatives, and participant training. Organization of a network of institutions involved in non-formal education. Contractor: Michigan State University. Contract: AID/csd-3279. Project Manager: M. H. Vent, TA/EHR.

Field Services: Non-Formal Education, 931-11-690-996. Worldwide. Obligation span: FY 1973-75. Life-of-project cost estimate \$675,000. Purpose: To utilize and enhance the A.I.D. response capability created under project 934 and to provide support to the USAIDs and LDCs in non-formal education. Outputs: U.S. quality response capabilities, non-formal education centers in at least two LDCs, and functioning international network. Project Manager: M. H. Vent, TA/EHR.

CENTRAL RESEARCH

Quality of Life: Family Life Patterns, 931-690-564. Worldwide. Obligation span: FY 1973. Life-of-project cost estimate: \$25,000. Purpose: Explore the feasibility of developing nonformal education programs to improve the quality of life in rural and urban families. This study is a forerunner of a possible \$300,000 implementation project in FY 1973. Output: Feasibility report. Contractor: Howard University. Contract: AID/CM/TA-C-73-29. Project Manager: J. D. Singletary, TA/EHR.

Completed Projects

Impact of Literacy on a Guatemalan Peasant Community. Ref.: RR p. 77.  
Diffusion of Information Through Radio and Supporting Media (Pilot Project in Ecuador). Ref.: RR p. 85.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

Multidisciplinary Applications to Traditional Education Systems in Latin America, 931-11-690-121. Major countries: Latin America. Obligation: FY 1970 (work span FY 1971-75). Life-of-project cost estimate: \$600,000. Purpose: To build a capability for evaluating the relevance, efficiency, methodologies, and costs of non-formal education as well as for formal educational alternatives to traditional education. Outputs: U.S. and LDC nationals trained to work with problems of non-formal education. A network of linkages among LDC, U.S., and third-country institutions working on problems of educational finance. Grantee: Latin American Center, University of California, Los Angeles. Grant: AID/csd-2825. Project Manager: Willis C. Schaefer, TA/RIG (in collaboration with Thomas W. Hazard, Jr., LA/DR). Ref.: IR p. 111. ES p. 33.

Innovation in Non-Formal Education. Proposed project. Worldwide. Obligation span: FY 1974 (work span FY 1974-78). Life-of-project cost estimate: \$1,000,000. Purpose: Develop an institutional resource in the U.S. for studying, developing, implementing, and evaluating innovative approaches to non-formal education. Outputs: Institutional and staff capability, a research network, and new techniques and materials for non-formal education. Project Manager: M. H. Vent, TA/EHR.

g) Other A.I.D. Projects (partly non-formal education)

Haiti: Rural Comm. Dev., CP-LA p. 179.  
 Thailand: Rural Education, EC p. 8. CP-ASIA p. E-15.  
 Vietnam: Support of Rural Development, CP-IC p. 46.  
 Ethiopia: Rural Agric. Development, CP-AFR p. 24.  
 Kenya: Rural Development — (Vihiga), CP-AFR p. 49.

(h) Policies and Priorities

See "Program Strategy in Education and Human Resources" (Ref. ES)

## (i) No entry.

(j) Selected References

Bibliography: Non-Formal Education (Preliminary Edition), SER/DM/ARC Education and Human Resources Bibliography No. 2, 1970.  
 Breubeck, Cole S., and Thompson, Timothy J., New Strategies for Educational Development, D.C. Heath & Co., Boston, 1973.  
 McCall, W. Steen, Non-Formal Education, A Definition, TA/EHR, 1970, 8 p.  
 Paulston, Rolland G. (ed.), Non-Formal Education — An Annotated International Bibliography, Praeger Publishers, 1972, 356 p.  
Development Digest (ref. DD):  
 "Non-Formal Education", Jan 1973, p. 51-72.  
 "Rural Mimeo Newspapers", Oct. 1970, p. 27-32.

4. EDUCATION FINANCE AND MEASUREMENT(a) Significance of Key Problem Area/Subsector

The financing of education in developing countries is in a bind resulting from three trends — the increasing demand for education, the rising unit cost of education (especially for teachers), and the threatened leveling off of resources available for education as a result of competition for budget funds. Remedy lies in finding sources of funds supplementing national government appropriations and in improving educational efficiency, i.e., increasing the quantity and quality of learning per unit cost. Supplementary funds can come from local self-help, local taxes, student payments, and military funds applied to "civic action" training in auto mechanics, paramedicine, etc. Improved efficiency may result partly from wider application of educational technology (key problem area E-2 in this directory) and from non-formal education (key problem area E-3). In addition, the key problem area discussed here — education finance and measurement — is concerned with identifying and making available measurement methodologies and analytical tools useful in education management, planning, decision-making and implementation.

(b) A.I.D. Specialists

Robert Schmeding, Deputy Director, TA/EHR

(c) Consultants to A.I.D.

None

(d) Institutional Resources

School of Education, University of California, Berkeley, ES p. 40, 47.  
Public Services Laboratory, Georgetown University, Washington, D. C.

e) Conferences and Committees

Task Force in Educational Finance and Measurement (AID/W in-house). Conferences at Cartagena, Colombia, in February 1973 and in Malta in March 1973 to review draft manual on education funding, costs, and efficiency. Manual developed under project No. 935, described below.

Conference in Washington, D. C., in July 1973 of A.I.D.-funded contractors and representatives of grantee institutions involved in this key problem area.

f) TAB ProjectsGENERAL TECHNICAL SERVICES

Inventory-Classification of Activities in Educational Finance, 931-11-690-935. Worldwide. Obligation span: FY 1971-72. Life-of-project cost estimate: \$231,000. Purpose: To survey and evaluate LDC educational cost and expenditure patterns, funding schemes, analytical tools for measuring educational efficiency, and ways of adjusting financial capabilities to pressures for more education. Outputs: A manual systematically describing LDC activities and problem-solving in educational finance. Contractor: Harvard University. Contract: AID/csd-3322. Project manager: R. W. Schmeding, TA/EHR. Ref.: ES p. 42.

Educational Outputs Measurement, 931-11-690-994. Worldwide. Obligation span: FY 1973-74. Life-of-project cost estimate: \$260,000. Purpose: To improve methodologies used by LDC planners to evaluate the efficiency of their educational systems in achieving desired results. Outputs: Collaborative relationship established between a U.S. institution and an LDC institution. Handbook describing various evaluation methods. Field research designs. Contractor: Georgetown University. Contract: AID/cm/ta-C-73-8. Project Manager: R. W. Schmeding, TA/EHR. Ref.: ES p. 43.

Methods for Reducing Unit Costs of Education, a subproject of Evaluation and Utilization Activities, sponsored by TA/RIG. Worldwide. Obligation: FY 1973. Life-of-project cost estimate \$25,000. Purpose: To develop from knowledge produced from AID Research and General Technical Services projects an information resource for educational planners and managers to guide them in selecting alternative methods for effecting reductions in unit costs of education. Outputs: A handbook, in English and Spanish, describing methods for reducing unit costs of education. Contractor: Multi-National Educational Research Center (CEMIE), San Jose, Costa Rica. Contract: AID/cm/ta-C-73-37. Project Manager: R. W. Schmeding, TA/EHR.

Research and Development Grants. Proposed project. Worldwide. Obligation span: FY 1974-75. Life-of-project cost estimate: \$400,000. Purpose: Develop, through grants for field trials, analytical tools improving such things as calculation of resource needs, allocation of funds, cost/benefit analyses, output measurement, problem diagnosis, and project design. Outputs: Study and field trial results from actual tests of analytical tools and methodologies in LDCs. Guidance documents on how to use methodologies. Project Manager: R. W. Schmeding, TA/EHR.

### CENTRAL RESEARCH

#### Completed Project

Research on Practical Uses of Cost Analysis to Improve Education Planning and Efficiency. Ref.: RR p. 79.

### U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211d)

Program in Education Finance, Costs, and Efficiency. Worldwide. Obligation: FY 1973 (work span FY 1973-78). Life-of-project cost estimate: \$998,354. Purpose: To strengthen the capacity of the institution to carry out research, training, and service activities related to the key problem area. Outputs: U.S. and LDC nationals trained to work with problems of educational finance, including use of analytical tools. Consultant service for work in LDCs. Specialized research, data bank, and library. A network of linkages among LDC, U.S., and third-country institutions working on problems of educational finance. Grantee: Division of Policy Planning and Administration, School of Education, University of California, Berkeley. Grant: CM/TA/G-73-17. Ref.: ES p. 47. IG p. 13.

#### (g) Other A.I.D. Projects

Brazil: Education Admin. and Planning, CP-LA p. 102  
 Dominican Rep.: Foundation for Educational Credit, CP-LA p. 169.  
 El Salvador: Educational Reform, EC p. 76.  
 Guatemala: Educational Credit, CP-LA p. 46.  
 Nicaragua: Educational Credit, CP-LA p. 69.  
 LA Reg.: Experimentation to Lower Education Unit Cost, CP-LA p. 212.  
 Afghanistan: Kabul Univ. Adm. Improvement, EC p. 22. CP-ASIA p. 51.  
 Turkey: Natl. Education Research and Planning, EC p. 27. CP-ASIA p. 17.  
 Nigeria: Education Plng. & Advisory Services, EC p. 39. CP-AFR p. 79.  
 Uganda: Educational Development, EC p. 43.  
 E. Afr. Reg.: Educational Research and Dev., EC p. 46.

#### (h) Policies and Priorities

See "Program Strategy in Education and Human Resources" (ref ES), p. 35-48.

(i) No entry.

(j) Selected References

Development Digest (ref. DD):

"Education as Investment", Jan. 1968, p. 53-90.

"Educational Planning", Oct. 1963, p. 89-118.

"Planning: The Education Sector", Jan. 1966, p. 41-62.

Dougherty, C.R.S., Optimal Allocation of Investment in Education: Center for International Affairs, Harvard University (contract AID/csd-1543), 1969, 41 p.

Gould, Elaine; Neuringer, Adele; and Zymelman, Manuel, Selected and Annotated Bibliography on Financing Education, Nimrod Press, Boston, 1973, 48 p.

Rogers, Daniel C., Summary of studies of Cost Analysis in Educational Planning and Management by the International Institute for Educational Planning, A.I.D., 1971, 7 p.

Zymelman, Manuel, Financing and Efficiency in Education — Reference for Administration and Policymaking, Nimrod Press, Boston, 1973, 314 p.

5. OTHER EDUCATION SUBSECTORS

(a) Content of Other Education Subsectors

The education subsectors, not readily classified under the three preceding key problem areas, are higher education, secondary education, technical/vocational education, teacher training, primary education, curricula, participant training and libraries.

(b,c,d,e) No entries.

(f) TAB Projects

CENTRAL RESEARCH

Completed Projects

Mathematics Curriculum Development in Africa. Ref: RR p. 74.

Evaluation of A.I.D. Participant Training Facilities in the U.S. Ref.: RR p. 75.

Overseas Evaluation of Participant Training Program. Ref.: RR p. 76.  
Universities and Political Change in Latin America. Ref.: RR p. 89.

Research on New Techniques for Training Teachers of English. Ref.:  
RR p. 74.

Research and Development in Beginning Science Curricula for English-Speaking Tropical Africa (Africa Primary Science Program). Ref.:  
RR p. 73.

(g) Other A.I.D. Projects

Higher Education

Brazil: Higher Education, CP-LA p. 101.

Caribbean Reg.: Univ. of the West Indies, CP-LA p. 166.

Central Am. Reg.: Dev. of Institutions of Higher Learning, CP-LA p. 18.

- LA Reg: Latin American Scholarship Program of American Universities (LASPAU), CP-LA p. 223.  
Latin American Teaching Fellowships (LATF), CP-LA p.224.
- Afghanistan: Kabul Univ. Admin. Improvement, CP-ASIA p. 51.
- Turkey: Higher Education, CP-ASIA p. 17.  
Bosphorus University, CP-ASIA p. 17.
- Vietnam: Higher Education, CP-IC p. 18  
Scholarship Program, CP-IC p.19.
- Asia Reg.: American Univ. of Beirut, CP-ASIA p. 43.
- Ethiopia: University General Support, CP-AFR p. 20,26.
- Nigeria: Ahmadu Bello Univ., CP-AFR p. 78.  
Advance Professional Studies, Univ. of Lagos, CP-AFR p. 79.
- Tunisia: Univ. of Tunis, CP-AFR p. 114.
- E. Afr. Reg.: Makerere Univ. College, CP-AFR p. 163.
- S. Afr. Reg.: Univ. of Botswana, Lesotho and Swaziland, CP-AFR p. 176.
- Afr. Reg.: African Graduate Fellowship Program, CP-AFR p. 196.  
African Higher Education Program - Scholarships (INTERAF), CP-AFR p. 197.  
African Scholarship Program of American Universities (ASPAU), CP-AFR p. 186.

#### Secondary Education

- Honduras: Secondary Education, CP-LA p. 53.
- Afghanistan: Elementary and Secondary Education, CP-ASIA p.57.
- Vietnam: Secondary Education, CP-IC p. 51.
- Nigeria: Port Harcourt School, CP-AFR p. 78.
- Uganda: Comprehensive Sec. Girls School, CP-AFR p. 127.

#### Technical and Vocational Training

- Nepal: Teacher and Technical Education, CP-ASIA p. 91.
- Turkey: Middle East Technical Univ., CP-ASIA p. 16.
- Vietnam: Vocational Education, CP-IC p. 51.  
Nguyen Truong To School, CP-IC p. 51.
- Asia Reg.: Asian Institute of Technology, CP-ASIA p.39.
- Tanzania: Technical Education, CP-AGR p. 99.

#### Teacher Training

- Nepal: Teacher and Technical Education, CP-ASIA p. 91.  
Teacher and Materials Utilization and Dev., CP-ASIA p. 96.
- Nigeria: Teacher Training Schools, CP-AFR p. 78.  
Northern Teacher Training Schools, CP-AFR p. 78.  
Institute of Education, Ahmadu Bello Univ., CP-AFR p. 79.

Uganda: Teacher Training Colleges, CP-AFR p. 126.  
C&W Afr. Reg.: Teacher Training College (Mali), CP-AFR p. 143.  
E. Afr. Reg.: Teacher Education East Africa, CP-AFR p. 164.

Primary Education

Ecuador: Primary Education Improvement, CP-LA p. 125.  
Guatemala: Primary Education, CP-LA p. 46.  
Afghanistan: Elementary and Secondary Education, CP-ASIA p. 57.  
Vietnam: Hamlet and Elementary Education, CP-IC p. 51.

(h,i) No entries

(j) Selected References

Development Digest (ref DD): "A Program for Vocational Training in Peasant Areas", July 1962, p. 81-89.  
Barnett, Stanley A., and Piggford, Roland R., "Manual on Book and Library Activities in Developing Countries", School of Library Science, State University of New York (A.I.D. contract csd-2156), 1969, 235 p.  
"Book, Textbook and Library Development", SER/DM/ARC Education and Human Resources Bibliography No. 1, 1970, 36 p.

HEALTH SERVICES

1. HEALTH IN GENERAL

(a) The Health Sector

Health, as applied to human life, is the state of equilibrium or level of physical, psychological, and social adaptation achieved between man and his environment. Traditionally, the health sectoral product has been interpreted to be improved quality of physical well-being as measured by reduced sickness and delayed mortality. The outputs have been reductions of abnormal biological factors (e.g., disease, malnutrition, high birth rates) as well as establishment of means to maintain physical health (e.g., programs for disease control, human nutrition, and fertility reduction). From a development point of view, physical and psychological health is an intersectoral product. It reflects the impact of the whole social and biological environment on life. Human health, then, is conditioned by many factors such as food quality, agricultural yields, employment, educational levels, per-capita income, social values, and levels of internal security.

The rationale for the Technical Assistance Bureau approach to the health sector is contained in "Key Problems Impeding Modernization of Developing Countries--The Health Issues." (HI). It emphasizes three key problem areas: Health planning, health delivery services, and environmental health. They are the subjects of the three following sections of this directory.

(b) A.I.D. Specialists

Lee M. Howard, M.D., Director, TA/H  
 James E. Banta, M.D., Deputy Director, TA/H  
 Lloyd A. Florio, M.D., Senior Health Advisor, TA/H (Health Delivery Systems)  
 James Lynch, M.D., Health Advisor, TA/H (Health Delivery Systems and Medical Education)  
 Amos D. Worthington, Public Health Advisor (Administration and Management), TA/H  
 William Worcester, Health Planning Officer, TA/H  
 Don Newman, Public Health Advisor (Health Delivery Systems), TA/H  
 A. Dale Swisher, P.E., Sanitary Engineer  
 Joe L. Stockard, M.D., (Tropical Diseases)  
 Jean Rogier, M.D., (Health Services and Cholera Task Force)  
 Richard C. Parsons, Cholera Task Force Coordinator, TA/H  
 Julius S. Prince, M.D., PHA/POP (tuberculosis)

(c) Consultants to A.I.D. (speciality in parentheses)

Alfred J. Davidson (health administration and management)  
 Joe Davis, M.D., (health planning)  
 Robert W. Babione, M. D., (tropical diseases, malaria, health manpower)  
 Edward B. Cross, M.D. (medical and health services)  
 Robert S. Jason (health manpower), M.D. (medical education)  
 Jacques M. May, M.D. (nutrition and health services)  
 Willard Wright, D.V.M. (tropical diseases)  
 Paul Zukin, M.D., (health planning)  
 Elizabeth Hillborn, R.N. (nursing, auxiliary manpower development)

(d) Institutional Resources

American Association of Medical Colleges  
 American Hospital Association  
 American Public Health Association  
 Harvard University  
 Johns Hopkins University - IR p. 70  
 Tulane University  
 University of California, Los Angeles  
 University of North Carolina - IR p. 77  
 University of Texas  
 Department of Health, Education and Welfare

(e) Conferences and Committees

Task Force on Health Delivery Systems  
 Task Force on Health Planning  
 Task Force on Environmental Health  
 Task Force on Cholera

(f) TAB ProjectsCENTRAL RESEARCHCompleted Projects

- Study of Methods for Improving the Training and Use of Middle-Level Health Manpower - RR p. 38.  
 Research in Health Manpower Planning for Selected LDCs - RR p. 39.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Institutional Development of International Health and Population Dynamics, 931-11-570-101. Five-year grant of \$1,800,000 authorized 5-31-68. Institution: School of Hygiene and Public Health, Johns Hopkins University. Project manager: Erven J. Long, TA/RUR. Ref.: IR p. 70.

(g) Other A.I.D. Projects

- Bolivia: Health Services, CP-IA p. 91.  
 Brazil: Health Sector Loan, CP-IA p. 97.  
 Colombia: Health Sector, CP-IA p. 118.  
 Laos: Public Health Development, CP-IC p. 69.  
 Vietnam: Public Health Services, CP-IC p. 32.  
           Medical and Dental Education, CP-IC p. 33.  
           Health Logistics Support, CP-IC p. 34.  
           National Rehabilitation Institute, CP-IC p. 35.  
 Liberia: National Medical Center, CP-AFR p. 60.  
           Maternal-Child Health Training  
 C&W Afr. Reg.: Regional Public Health Training, CP-AFR p. 144.  
                   Measles Control-Smallpox Eradication, HN p. 42.  
                   CP-AFR p. 144  
                   Evaluation of Measles/Smallpox Eradication Program,  
                   HN p. 44.

(h) No entry.

(i) No entry.

(j) Selected References

- Howard, Lee M., "Key Problems Impeding Modernization of Developing Countries--The Health Issues", TA/H, 1970, 55 p. (HI)  
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 Baker, Timothy D., and Perlman, Mark, Health Manpower in a Developing Economy: Taiwan, A Case Study in Planning, Johns Hopkins Press, Baltimore, 1967, 203 p.  
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 Bryant, John, Health and the Developing World, Cornell University Press, Ithaca, 1969, 345 p.

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- King, Maurice (ed.), Medical Care in Developing Countries - A Primer on the Medicine of Poverty and a Symposium from Makerere, Oxford University Press, Nairobi, 1966, 1 vol. (various pagings).
- Long, Ernest Croft (ed.), Health Objectives for the Developing Society; Responsibility of Individual Physician, and Community, Duke University Press, Durham, N.C., 1965, 163 p.
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- Wilcocks, Charles, Health and Disease in the Tropics, Oxford University Press, London, 1950, 200 p.
- Development Digest (ref.DD):  
"Doctors and Development", Oct. 1966 p. 1-17.  
"Health", July 1971, p. 67-100.

2. HEALTH DELIVERY SERVICES(a) Significance of Key Problem Area/Subsector

Less than 10 percent of the population of low-income countries has access to services of basic health, nutrition, and family planning. The major constraints are shortages of funds and of managerial and technical manpower. Thus the need is to develop services which are lower cost than conventional systems and which utilize a higher proportion of subprofessional (paramedical) personnel and, where feasible, the self-supporting health practitioners. To the degree this results in wider distribution of health services, it will reflect the high-priority development objective of translating national growth into activities benefiting the majority of the people.

(b) A.I.D. Specialists

Lee Howard, M.D., Director, TA/H  
 James E. Banta, M.D., Deputy Director, TA/H  
 Lloyd A. Florio, M.D., Senior Health Advisor, TA/H  
 James Lynch, M.D., Health Advisor, TA/H  
 Don Newman, Public Health Advisor, TA/H  
 Willard H. Boynton, M.D., PHA/POP  
 Julius S. Prince, M.D., PHA/POP  
 Edward Rizzo, PHA/POP

(c) Consultants to A.I.D.

Edward B. Cross, general health  
 David French, Boston University (health delivery services)  
 Richard A. Smith, MEDEX, University of Hawaii (health delivery services)  
 Paul Zukin, public health

(d) Institutional Resources

Public health and population:  
 American Association of Medical Colleges  
 American Hospital Association  
 American Public Health Association  
 Harvard University  
 Johns Hopkins University - IR p. 70  
 Meharry Medical College

Tulane University  
 University of California, Los Angeles  
 Mainly population:  
 University of Michigan - IR p. 74.  
 University of North Carolina - IR p. 77.

(e) Conferences and Committees

Task Force for Health Delivery Systems  
 DEIDS Task Force. Pertains to Development and Evaluation  
 of Integrated Delivery Systems, project 928 below.

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Development and Evaluation of Integrated Health Delivery Systems, 931-11-530-928. Countries to be selected. Obligation span: FY 1972-80. Life-of-project cost estimate: \$15,000,000, all from Title X population funds. Purpose: To develop and evaluate low-cost integrated systems for better and more receptive delivery of family planning, nutrition, and health services to population majorities. The target populations include especially women of reproductive age and children under five years of age. Outputs: At least four project sites made available by LDCs. Alternative designs for delivery systems. Trained leaders. Meetings and reports disseminating findings, linking worldwide experience, and evaluating results. Contractor: American Public Health Association. Contract: AID/csd-3423. Project manager, Lloyd J. Florio, M.D., TA/H.

Health Facilities for Hospital Administration, 931-11-540-211. Worldwide. Obligation span: FY 1970-74. Worldwide. Obligation span: FY 1970-74. Life-of-the-project cost estimate \$232,000. Purpose: To provide a resource to plan and design health facilities systems as a basis for maximum health coverage of the population. Outputs: Plans and designs for hospitals, clinics, dispensaries, etc. Advisory services and evaluations of facilities component of health delivery systems. Training for operation of health facilities networks. Contractor: American Hospital Association. Contract: AID/csd 2598. Project manager, Lloyd J. Floria, M.D., TA/H.

Health Manpower Development, 931-11-540-212. Major countries: Guatemala, India, Indonesia, Lebanon, Cameroon, Uganda. Obligation span: FY 1966-74. Life-of-project cost estimate: \$704,000, including \$87,000 from Title X population funds. Purpose: To establish channels between the LDC professional health community and U.S. medical schools, particularly in family planning, nutrition, and preventive medicine. Outputs: Identification of U.S. and LDC universities and other resources most suitable for linkages strengthening training in priority health areas, e.g., family planning and MCH. Technical assistance, seminars, and information services helpful to LDC institutions teaching medicine and health. Contractor: Association of American Medical Colleges. Contract: AID/csd-2587. Project manager, Lloyd J. Florio, M.D., TA/H.

Teaching Community Medicine and Family Planning in Public Health, 931-11-540-975. Worldwide. Obligation span: FY 1972-73. Life-of-project cost estimate: \$100,000 including \$52,000 from Title X population funds. Purpose: To improve the competence of teachers of community medicine and family planning in LDCs. Outputs: Trained health teachers, capable in curriculum evaluation and audio-visual media. Case studies, manuals, and other teaching materials. Contractor: Harvard University. Contract: AID/csd-3613. Project manager, Lloyd J. Florio, M.D., TA/H.

Institutional Development in Family Planning, 931-11-580-957 Major countries: Brazil, Colombia, Mexico. Obligation span: FY 1971-74. Life-of-project cost estimate: \$1,588,000, all from Title X population funds. Purpose: Utilize grantee institution (Tulane University) capacity to assist five or more LDC institutions conduct large-scale family planning delivery system prototypes. Outputs: Feasibility studies. Institutional capacity to provide technical assistance to five collaborating institutions. Establishment of a network for problem-solving among them. Contractor: Family Health, Inc. Contract: AID/csd-3311. Project manager, Lloyd J. Florio, M.D., TA/H.

Role of Voluntary Health Organizations, 931-11-590-890. Major countries: Colombia, Costa Rica, Venezuela, India, Indonesia, Iran, Philippines, Thailand, Ethiopia, Kenya. Obligation span: FY 1970-73. Life-of-project cost estimate: \$290,000, including \$211,000 from Title X population funds. Purpose: To demonstrate utilization of national voluntary health organizations and professional associations in support of national health goals in nutrition, family planning, maternal and child health, etc. and to develop methods for strengthening voluntary health organizations. Outputs: Country studies of role of voluntary health organizations in LDCs. Assessments of voluntary health agencies, and pilot demonstrations how to initiate and stimulate them. Contractor: American Public Health Association. Contract: AID/csd-2801. Project manager, Lloyd J. Florio, M.D., TA/H.

#### CENTRAL RESEARCH

##### Completed Project

Functional Analysis of Health Center Activities in Developing Countries, 931-17-530-429. Ref.: RR p. 36.

(g) Other A.I.D. Projects

- Brazil: Integrated Health Delivery Systems, CP-LA p. 98.  
 Dominican Rep.: Maternal and Infant Care, CP-LA p. 169.  
 Guatemala: Rural Health Service, CP-LA p. 41.  
 Nicaragua: Health Centers and Rural Mobile Health, CP-LA p. 36.  
 Panama: Rural Health Centers and Clinics, CP-LA p. 79.  
 Mobile Rural Health Program (PUMAR), CP-LA p. 76.  
 Uruguay: Maternal/Child Care, CP-LA p. 156.  
 Laos: Maternal and Child Health, CP-IC p. 68.  
 Nepal: Integration of Health Services, CP-ASIA p. 93.  
 Thailand: Comprehensive Rural Health, CP-SA p. 13.  
 Vietnam: Provincial Health Assistance, CP-IC p-31.  
 Ethiopia: Training in Maternal/Child Health Care, CP-AFR p. 21.  
 Ghana: Rural Health Delivery Systems, CP-AFR p. 39.  
 C&W Afr. Reg.: Strengthening of Health Delivery Systems in Central/West Africa, CP-AFR p. 153.

(h) Policies and Priorities

Instead of developing formal hospital-based systems, reaching only a limited part of the population, A.I.D. seeks to help develop new low-cost delivery patterns. They will be multi-purpose-integrating services in disease prevention, nutrition, family planning, and other public health — and make maximum use of voluntary and non-formal workers. There will be close cooperation with international organizations and private voluntary agencies, and efforts to link the formal with the non-formal traditional health systems. Reaching the preschool-child deserves special attention.

(i) Technological Developments

Advances in family planning techniques are expected to require major use of health and medical facilities.

(j) Selected References

- Ref. HI, p. 40, 46.  
 Deuschle, Kurt W., "The Training and Use of Medical Auxiliaries in a Primitive Rural Community", U.N. Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, 1963, vol. 6, Health and Nutrition, p. 182-189.

Takulia, Harbans S., et al., The Health Center Doctor in India, John Hopkins Press, Baltimore, 1967, 76 p.

3. HEALTH PLANNING

(a) Significance of Key Problem Area/Sector

The some forty A.I.D.-assisted countries spend an estimated \$10 billion of their own public and private funds on health annually. Yet the results in terms of health maintenance and improvement are not so great as expected from that expenditure. This is partly because an unduly small proportion of health resources is allocated to preventive programs. Another reason is insufficient health analysis and planning. More thorough and sophisticated efficiency analyses of the health sector should be made available. They are needed by budgetmakers so that health matters are accorded their proper role in national development, and by health planners for optimum allocation of resources within the sector.

(b) A.I.D. Specialists

Lee Howard, M.D., Director, TA/H  
James E. Banta, M.D., Deputy Director, TA/H  
Robert Muscat, PPC  
Norman Holly, PPC  
Carl Hemmer, PHA/POP  
Edward Rizzo, TA/DA  
Joe H. Davis, M.D., Health Economist, TA/H  
William Worcester, TA/H

(c) Consultants to A.I.D.

John A. Daly, Dept. of Health, Education & Welfare (health planning)  
Robert Grosse (health economist)  
Jean Newman, Johns Hopkins University (health planning)  
Melvyn E. Thorne, Johns Hopkins University (health planning)  
Miklos Wass de Czege  
Burton Weisbrod (health economics)  
Paul Zukin (health planning)

(d) Institutional Resources

Johns Hopkins University - IR p. 70.

(e) Conferences and Committees

TA/H has established an external advisory committee on health planning consisting of Henrik Blum, University of California at Berkeley; Robert Grosse, University of Michigan; Wilfred Malenbaum, University of Pennsylvania; Vicente Navarro, Johns Hopkins University; and Burton Weisbrod.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Cataloging of Health Sector Analysis Methods and Techniques. Proposed project. Will describe alternative types of health sector analysis in terms of their final products, data requirements, cost and personnel requirements.

Training of National Health Planners. Proposed project. Countries to be selected. Obligation span: FY 74-75. Life-of-project cost estimate: \$250,000. Purpose: To develop a curriculum and to train personnel of national economic planning organizations in health planning in a 9 month curriculum. Output: A curriculum capable of training 20 economists, operations researchers, and general planners in national health planning. Project manager: Joe H. Davis, M.D., TA/H.

CENTRAL RESEARCH

Analytic Investigation of Relationships of Health and Socio-economic Development. Proposed project. Countries to be selected. Obligation span: FY 74-75. Life-of-project cost estimate: \$500,000. Purpose: To provide analytical tools assisting health and development planners to integrate health improvement programs into national development plans. To determine the socio-economic impact of health programs upon human populations. To provide a basis for allocating disease-control funds among various diseases. Outputs: Construction of health planning statistical models and relating health to other socio-economic development. Applications of models to selected LDC's and to specific diseases including schistosomiasis. Project managers: Joe H. Davis, M.D., and Joseph L. Stockard, M.D., TA/H.

Completed Projects

Feasibility Study of the Relationship of Health Investment and Social and Economic Development. Ref.: RR p. 35.  
Inter-American Investigation of Mortality in Infancy and Childhood. Ref.: RR p. 35.

Efficiency of Alternative Health Sector Technologies. Proposed project. Countries to be selected. Obligation span: FY 74-78. Life-of-project cost estimate: \$500,000. Purpose: To provide vital information elements to national health planning entities. Outputs: Information concerning alternative intervention effectiveness and costs. Project manager: Joe H. Davis, M.D., TA/H.

U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Institutional Support for International Health. Proposed project. Country or countries to be selected. Obligation: FY 1974 (work span FY 74-78). Life-of-project cost estimate: \$950,000. Purpose: To strengthen an American institution's capability for assisting LDC's in health planning. Output: Improvement in health planning units in one or more LDC's. Training of LDC health planners in U.S. Grantee: Johns Hopkins University under consideration (as expansion of existing grant). Project manager: Joe H. Davis, M.D. TA/H.

g) Other A.I.D. Projects

Bolivia: Health Sector Analysis (proposed).  
Brazil: National Public Health Planning and Coordination, HN p. 141.  
Colombia: Health Sector Analysis, CP-LA p. 114.  
Guatemala: Evaluation Rural Health Loan (proposed).  
Honduras: Health Sector Analysis (proposed).  
Nicaragua: Health Sector Analysis, CP-LA p. 67.  
Pakistan: Public Health and Nutrition Technical Support, HN p. 235.  
Turkey: Hacettepe University, HN p. 241.  
Attaturk University Medical School, HN p. 242.

NESA Reg.: Health Planning Research (proposed CENTO project), HN p. 216.  
Ghana: Health Sector Analysis (proposed).  
C&W Afr Reg.: Regional Public Health Training, HN p. 43.  
Worldwide: Implementation Studies of National Health and Health Manpower Plans (proposed)  
Health Planning Conference Series (proposed).

(h) Policies and Priorities

High priority is given to training LDC health planners and collaborating with WHO, PAHO, UNDP, and other donors in introducing innovative techniques in analysis and planning of health programs to optimize investments. This includes health sector analysis, both simplified and sophisticated models.

(i) Technological Developments

The technology used in health planning normally is transferred from methods or techniques developed in other sectors.

(j) Selected References

Ref. HI p. 39, 46.

Hanlon, John J., Principles of Public Health Administration,

C. V. Mosby Co., St. Louis, 1969 (5th ed.), 656 p.

Dubos, Rene; Langmuir, Alexander D.; Baumgartner, Leona,  
et al., "Planning for Health Services", UN Conference  
on the Application of Science and Technology for the  
Benefit of the Less Developed Areas, 1963, vol. 6,  
Health and Nutrition, p. 1-53.

4. Environmental Healtha) Significance of Key Problem Area/Subsector

Many characteristics of the environment have direct and substantial effects on health. The heat and humidity of tropical climates reduce the productivity of physical labor. Illness is more prevalent because such climates permit perennial rather than seasonal breeding of insect, snail, and other animal sources of disease. Community practice on waste disposal seriously affects the quality of water used for drinking, bathing, and washing. Polluted water inhibits intestinal food absorption and causes malnutrition. Fevers also cause malnutrition by accelerating metabolism. Malnutrition causes individuals, especially children, to be vulnerable to diseases a healthy body can usually overcome. A variety of actions can be taken to counteract unfavorable climates. However, the highest priority measures to protect and improve the environment are disease control, water supply improvement, and waste disposal.

(b) A.I.D. Specialists

Richard C. Parsons, TA/H (cholera)  
Jean Rogier, M.D., MPH., TA/H (tropical diseases)  
Joseph L. Stockard, M.D., M.P.H., TA/H (tropical diseases)  
Edgar A. Smith, TA/H (malaria eradication)  
A. Dale Swisher, P.E., Sanitary Engineer, TA/H  
Theodore Thompson, Water Resources Branch Chief, SER/ENG  
Thomas Leahy, Sanitary Engineering Branch Chief, SER/ENG  
Miloslav Rechcigl, Jr., Assistant Director for Operations, TA/RIG  
Bill Long, TA/OST

(c) Consultants to A.I.D.

Tropical Medicine:

Carl Anderson, University of North Carolina  
Abram S. Benenson, University of Kentucky  
Frank Consolazio, Fitzsimmons General Hospital, Denver  
Franz von Lichtenberg, Harvard Medical School  
Gerald Spurr, Marquette School of Medicine  
Willard Wright, Washington, D. C.

Cholera:

Oscar Felsenfeld, Tulane University

Malaria:

L. J. Bruce-Chwatt, London School of Hygiene and  
Tropical Medicine  
Kenneth Courtney (research), San Diego, California  
M. A. Farid, World Health Organization  
Melvin Griffith (research), formerly TA/H  
Alexander Langmuir, Harvard Medical School  
Andre J. Lebrun (education), Wisconsin Medical College  
Max Miller, Tulane University  
Donald Pletsch (research), Mexico City, Mexico  
Elvis H. Sadun, Walter Reed Hospital, Washington, D.C.  
John Scanlon, University of Texas

Sanitary Engineering:

Leonard L. Board, Front Royal, Va.  
James D. Caldwell, Beaufort, S.C.  
Edward J. Cleary, University of Cincinnati  
George P. Hanna, Dean of Engineering, University of  
Nebraska  
John A. Logan, Rose Polytechnic Institute, Terra Haute, Ind.  
Daniel A. Okun, University of London  
Charles S. Pineo, Bethesda, Md.  
Gilbert White, University of Colorado

(d) Institutional Resources

U. S. Public Health Service, Center for Disease Control,  
Atlanta, Ga.  
Johns Hopkins University - IR p. 70.

(e) Conferences and Committees

- Cholera: Cholera Task Force established by TA/H. Seminar planned by TA/H on relation of environmental hygiene to cholera incidence.
- Schistosomiasis: Meeting planned by TA/H for specialists to recommend A.I.D. research.
- Malaria: TA/H will organize an expert panel to review the status of the worldwide malaria programs in relation to U.S. participation. TA/H, with WHO, will sponsor international conferences on alternative methods of malaria eradication and on needed research.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Food Waste and Sanitation Cost-Benefit Methodology, 931-11-510-867. Worldwide, including Guatemala in particular. Obligation span: FY 1971-77. Life-of-project cost estimate: \$1,153,000. Purpose: Develop cost-benefit methodology for determining the effects of sanitation on food malabsorption and health. Outputs: Manual describing methodology. Epidemiological data on health and environmental condition of field test communities. Contractor: University of North Carolina. Contract: AID/csd-2959. Project manager: Joseph L. Stockard, M.D., TA/H.

International Program in Sanitary Engineering Design, 931-11-521-204. Worldwide. Obligation span: 1963-75. Life-of-project cost estimate: \$608,000. Purpose: To train LDC technicians in more effective design, operation, and maintenance of water supply systems. Outputs: Train 10 or more technicians in water supply per year. Contractor: University of North Carolina. Contract: AID/csd-1888. Project manager, A. Dale Swisher, P.E., TA/H.

CENTRAL RESEARCH

Laboratory Improvement for Development of Malaria Vaccine from Irradiated Sporozoites, 931-17-511-549. Worldwide. U.S. Obligation span: FY 1972-75. Part of small research projects program. Purpose: To improve laboratory facilities to supply irradiated malaria sporozoites. Outputs: Improved capability to deliver sporozoites to U.S. institutions using their own funds to do research toward a human malaria vaccine. Contractor: New York University. Project manager, Edgar A. Smith, TA/H. Ref.: RS p. 25.

Preliminary Field Evaluation of Biodegradable Analogues of DDT, 931-17-511-551. Worldwide. Obligation span: FY 1972-73. Part of small research projects program. Purpose: Large-scale production and field testing of biodegradable DDT analogues. Outputs: Same as purpose. Contractor: University of Illinois. Project manager, Edgar A. Smith, TA/H. Ref.: RS p. 26.

Malaria Immunity and Vaccination, 931-17-511-552. Major countries: All countries with malaria. Obligation span: FY 1972-75. Life-of-project cost estimate: \$1,371,000. Purpose: Development of a vaccine for use against human malaria. Outputs: Development of (a) standard parasite-mosquito-mouse and parasite-mosquito-monkey models, (b) practical method for preparation of antigens, and (c) practical method of laboratory growth of parasites. Contractor: University of New Mexico. Contract: AID/csd-3689. Project manager, Edgar A. Smith, TA/H. Ref.: RR p. 31 (predecessor contract with University of Illinois). CR p. 5.

Field Testing of Hand Water Pump, 931-17-521-454. Major countries: Brazil, Thailand, Nigeria. Obligation span: FY 1971-73. Life-of-project cost estimate: \$50,000. Purpose: Field tests to determine durability, dependability, and operating cost of a simple hand pump, designed under a predecessor project. Outputs: Drawings and specifications, at least three completed pumps, and two-year field tests. Contractor: Battelle Memorial Institute. Contract: AID/csd-3305 (predecessor contracts 1434 and 2174). Project manager, A. Dale Swisher, professional engineer, TA/H. Ref.: RR p. 36. RS p. 7. CR p. 5.

Measurement of Nutrient Loss Due to Malabsorption, 931-17-560-508. Major countries: Puerto Rico, India, Iran. Obligation span: 1969-73. Life-of-project cost estimate: \$252,000. Purpose: To determine whether intestinal malabsorption is a significant obstacle to development. Outputs: Measurements of nutrient waste in about 100 adults in each of three communities, and interpretation of results. Contractor: Department of Health, Education and Welfare, PASA RA(HA)9-69. Project manager: Joe L. Stockard, M.D., TA/H. Ref.: RR p. 38.

Lower Cost Methods of Water and Waste Treatment in LDCs. Proposed project. Major countries: Peru, Thailand. Obligation span: FY 1973-75. Life-of-project cost estimate: \$188,000. Purpose: To devise and test simplified, lower cost water treatment plants and sewage disposal systems in less developed countries. Outputs: Evaluation of newer techniques by research, pilot operation, and plant testing. Preparation of reports on results and manuals of procedure. Contractor not yet selected. Project manager, A. Dale Swisher, professional engineer, TA/H.

Economic Feasibility of Genetic Control of Aedes Aegypti Mosquitoes -  
See Section G-2-e.

### Completed Projects

Investigation of Engineering Aspects of Schistosomiasis Control - RR p. 33.

Worldwide Malaria Eradication Research - RR p. 31.

Central America Malaria Research Station - RR p. 33.

Serologic Diagnosis of Malaria - RR p. 32.

Thailand Malaria Operational Research Unit - RR p. 34.

Development of Methodology for the Determination of Design Capacities of Small Water Supplies - RR p. 37.

Malaria Insecticide Research - RR p. 34.

### (g) Other A.I.D. Projects

#### Malaria Control

Brazil: Malaria Eradication, HN p. 140. CP-LA p. 97.

Costa Rica: Malaria Eradication, CP-LA p. 26.

Ecuador: Malaria Eradication, HN p. 164. CP-LA p. 125.

El Salvador: Malaria Eradication, HN p. 168.

Haiti: Malaria Eradication, HN p. 176. CP-LA p. 182.

Honduras: Malaria Eradication, HN p. 178.

Nicaragua: Malaria Eradication, HN p. 185.

Panama: Malaria Eradication, HN p. 190.

Paraguay: Malaria Eradication, HN p. 196. CP-LA p. 135.

Jordan: Malaria Eradication, CP-SA p. G-12.

Philippines: Malaria Eradication, HN - p. 110. CP-ASIA p. 135.

Nepal: Malaria Eradication, HN p. 231. CP-ASIA p. 91.

Pakistan: Malaria Eradication, HN p. 238. CP-ASIA p. 83.

Vietnam: Malaria Control, HN p. 251. CP-IC p. 51.

Ethiopia: Malaria Control, HN p. 51. CP-AFR p. 20.

Water and Sewerage

- Brazil: National Water and Sewerage, HN p. 142  
Sewerage Maintenance Equipment for Guanabara, HN p. 143.  
Water System Maintenance Equipt., HN p. 144. CP-LA p. 97.  
Municipal Water and Sewerage Loan Fund, HN p. 145.  
Urban Sanitation, HN p. 146. CP-LA p. 97.
- Colombia: Cali Sewerage, HN p. 157.
- Guyana: Water Supply Improvement, HN p. 174. CP-LA p. 189, 192.
- Jamaica: Community Water Supplies, HN p. 181.
- Panama: Colon Sewerage, HN p. 191.  
Panama City Sanitary Sewerage, HN p. 192. CP-LA p. 76.  
Panama City Water, HN p. 193. CP-LA p. 76.
- Peru: Lima Water and Sewerage System, HN p. 199.
- Indonesia: Surakarta Emergency Water Supply, CP-ASIA p. 117.
- Korea: Seoul City Bokwang Dong Waterworks, HN p. 102. CP-ASIA p. 124.  
Seoul City Sewage Treatment Plant, HN p. 103.  
Chong Gye Chun Sewage Treatment, CP-ASIA p. 124.  
Inchon City Waterworks, HN p. 104. CP-ASIA p. 124.
- Pakistan: General Advisory Services to Public Health Engineering, HN p. 237.
- Vietnam: Provincial City Water Supply, HN p. 257. CP-IC p. 52.  
Saigon Water and Sewerage, HN p. 258. CP-IC p. 51.  
National Water Loan Fund, CP-IC p. 52.
- Yemen: Rural Water Supply, CP-ASIA p. 30.  
Sanaa Emergency Water Supply, CP-ASIA p. 31.  
Taiz Water Systems Rehabilitation, CP-ASIA p. 32.  
Taiz Water and Sewerage Systems, CP-ASIA p. 35.
- Spain: Underwater Aqueduct Studies, CP-SA p. 49.  
Studies on Hydraulic Structures, CP-SA p. 49.
- Dahomey: Rural Water Supply, HN p. 49. CP-AFR p. 143.
- Liberia: Monrovia Sewerage, HN p. 68.
- Morocco: Water Supply Kenitra/Rabat/Casablanca, HN p. 73.
- Nigeria: Ibadan Water Supply, HN p. 76. CP-AFR p. 78.
- Somalia: Mogadiscio Water Supply, HN p. 79. CP-AFR p. 185.

Other Environmental Health

- Ecuador: Polio Eradication (proposed project)
- Haiti: Communicable Disease Control, CP-LA p. 183.
- Central Am. Reg.: Immunization Requirements (proposed project)
- Asia Regional: Public Health Services, HN p. 253. CP-ASIA p-42
- C&W Afr Regional: Onchocerciasis Control, CP-AFR p. 158.  
Measles Control-Smallpox Eradication, HN p. 42.  
CP-AFR p. 144.  
Evaluation of Measles/Smallpox Eradication Program,  
HN p. 44.

(h) Policies and Priorities

Pharmaceuticals: M.O. 1455.3.2, MC of 11/24/69  
Xerophthalmia: M.O. 1612.56.3, Aug. 23, 1966, 1 p.  
AID Policy for Malaria Eradication: Multilateralization of  
Technical Services, AIDTO CIRC A-1727, Aug. 3, 1970.

(i) Technological Development

Larvicidal techniques for mosquito control: National Academy  
of Sciences Advisory Committee on Technological Innovation  
and Monitoring formed an expert panel in early 1972 to  
recommend steps for further research.

(j) Selected References

- Ref. HI p. 25-26, 28-29, 38, 47.  
Parsons, Richard C., et al., "Interim Report of the Task Force  
on Cholera", TA/H, 1971, 149 p.  
Gibson, Ulric P. and Singer, Rexford D., Small Wells Manual,  
University of Minnesota, School of Public Health, 1969, 156 p.  
(under A.I.D. contract)  
McJunkin, Frederick E., Community Water Supply in Developing  
Countries: Quarter Century of United States Assistance, Office  
of International Health, U.S. Department of Health, Education  
and Welfare, 1969, 85 p.  
McJunkin, Frederick E., "Engineering Measures for Control of  
Schistosomiasis", prepared for A.I.D., 1970, 69 p.  
McJunkin, Frederick E., and Pineo, Charles S., "Role of Plastic  
Pipe in Community Water Supplies in Developing Countries", TA/H,  
1969, 100 p.  
Miller, Arthur R., Water and Man's Health, A.I.D. Technical Series  
No. 5, TA/H.  
U.S. Public Health Service, "Guidelines and Criteria for Community  
Water Supplies in the Developing Countries" prepared for A.I.D.,  
1969, 101 p.  
World Bank, Water Supply and Sewerage -- Sector Working Paper, 1971,  
15 p.

NUTRITION SERVICES1. NUTRITION IN GENERAL(a) Significance of Sector

Shortages of food quantity (calories) and quality (especially proteins) cause widespread poor health and early deaths in less developed countries. At least half of the deaths of young children in the lowest-income countries are related to malnutrition. Nutrient shortages arrest the physical and often the mental development of many of the children who survive. Yet few countries have instituted national nutrition programs and policies. A.I.D. policy recognizes the importance of nutrition for both wellbeing and nutrition (see circular airgram on "A.I.D. Nutrition Strategy" approved by the Administrator's Advisory Committee and expected to be circulated in late Sept. 1973.)

(b) A.I.D. Specialists

Martin J. Forman, Director, TA/N  
 I. Hornstein, Deputy Director, TA/N  
 Harold Rice, Research Officer, TA/N  
 Robert J. Muscat, PPC/PDA  
 Miloslav Rechcigl Jr., Assistant Director for Operations, TA/RIG  
 Samuel G. Kahn, Nutrition Advisor, TA/RIG  
 David G. Mathiasen, Associate Assistant Administrator, TA/PM

(c) Consultants to A.I.D.

Aaron Altschul, physical chemistry  
 Bernard R. Schweigert, nutrition, biochemistry, physiology

(d) Institutional Resources

Cornell University, Department of Agricultural Economics and Graduate School of Nutrition - IR p.2.  
 Massachusetts Institute of Technology, International Development Center and Department of Food Sciences and Nutrition  
 Stanford University, Food Research Institute  
 TransCentury Corp., Washington, D. C.

(e) Conferences and Committees

Agency-wide In-Service Workshops on Nutrition at Coolfont, W. Va., June 1971 (second), and at Harper's Ferry, W. Va., Oct. 1973 (third).

Committee on International Nutrition Programs, Food and Nutrition Board, National Academy of Sciences.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Nutrition Scientific and Technical Support, 931-11-560-799. Includes former project 931-11-560-804. Worldwide. Obligation span: FY 1968-75. Life-of-project cost estimate: \$865,000. Purpose: To provide central resource facilities for developing country governments, USAIDs, et al. to use in solving problems related to nutrition and food technology. Outputs: To provide expertise in response to inquiries on malnutrition.

Contractors: League for International Food Education (L.I.F.E., a consortium of eight professional societies) and National Academy of Sciences. Contracts: AID/csd-1915 and -2570, respectively. Project manager, A. Pound, TA/N. Ref: HN p. 379, 381.

Completed Projects

Regional Malnutrition Conference, 931-11-560-798, CM-TO p. 160.  
Professional Exchange - Travel Grants, 931-11-560-834, HN p. 383.

CENTRAL RESEARCH

Completed Project

Study of Liver Disease and Nutrition in Uganda, 931-17-560-457.  
Ref.: RR p. 47

(g) Other A.I.D. Projects

Afr. Reg.: Workshop on Nutrition. CN-TO p. 34.  
Colombia: Family Food and Nutrition, CP-LA p. 126.  
Tunisia: Food Fortification and Nutrition, CP-AFR p. 115.  
Afr. Reg.: Workshop on Nutrition, CN-TO p. 34.

(h) Policies and Priorities

"The A.I.D. Nutrition Program Strategy", AID/W, June 1973, 65 p.  
"A.I.D. Nutrition Strategy", AIDTO CIRC A - 996, Sep. 29, 1973

(i) Technological Developments

The incorporation of economic considerations into nutrition analysis and planning is described in "The Nutrition Factor; Its Role in National Development" by Alan Berg (cited in part j below).

A comprehensive methodology for consideration of nutrition factors in analysis and planning at national and sector levels has been developed and tested in an A.I.D. project in Ecuador. See "Planning National Nutrition Programs" (cited in part j below).

(j) Selected References

- A.I.D. Office of Nutrition, Bureau for Technical Assistance,  
 "The A.I.D. Nutrition Program Strategy", June 1973, 65 p.
- "Protein Gap, AID's role in Reducing Malnutrition in Developing Countries",  
 AID, 1970, 24 pages.
- "An A.I.D. Nutrition Research Rationale and Program for the 70's," TAB,  
 AID, 1970, 19 pages.
- "The Nutrition Factor; Its Role in National Development", Alan Berg with  
 portions by Robert Muscat, Brookings Institution 1973, 290 p.
- "Planning National Nutrition Programs - A Suggested Approach": Vol. I,  
 "A Summary of the Methodology", Jan. 1973, 39 p., Vol. II, "Case Study  
 (Ecuador)", March 1973, 153 p., TA/N.
- Berg, Alan; Scrimshaw, Nevin S.; and Call, David L. (ed.), Nutrition,  
 National Development, and Planning, MIT Press, Cambridge, Mass., 1973,  
 416 p.
- Rechcigl, Miloslav, Jr. (ed.); Food, Nutrition and Health, A Multidisciplinary  
 Treatise Addressed to the Major Nutrition Problems from a World  
 Wide Perspective, S. Karger, Basel, 1973, 511 pages.
- Development Digest (ref. DD), Jan. 1969, p. 3-40.
- "Famine, a Symposium dealing with Nutrition and Relief Operations in  
 Times of Disaster, Symposium of the Swedish Nutrition Foundation IX,  
 Almqvist and Wiksell, Stockholm, Sweden, 1971, 200 pages.
- CENTO: Conference on Combating Malnutrition in Preschool Children,  
 Pakistan, March 1968, 165 pages.
- "Malabsorption and Nutrition" Workshop, Reprint from American Journal  
 of Clinical Nutrition, April 1971.
- West African Conference on Nutrition and Child Feeding, Senegal 1968,  
 287 pages.
- Third African Conference on Nutrition and Child Feeding, Tunisia,  
 May 1970, 400 pages.
- East African Conference on "Nutrition and Child Feeding", Kenya, 1969,  
 311 pages.
- Interdepartmental Committee on Nutrition for National Defense (ICNND),  
Nutrition Surveys and Reports, 1956-1971, 34 vols. The countries  
 covered were--
- Latin America: Brazil (northeast), Bolivia, Chile, Colombia  
 Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua,  
 Panama, Paraguay, Peru, Uruguay, Venezuela, West Indies, and a  
 summary of Central America and Panama.
- Asia: Bangladesh (East Pakistan), Burma, Iran, Jordan, Korea,  
 Lebanon, Malaysia, Pakistan, Philippines, Taiwan, Thailand, Turkey,  
 Vietnam.
- Europe and Africa: Spain, Ethiopia, Libya, and Nigeria.
- (NOTE: In latter years, ICNND became the Nutrition Program, National  
 Center for Chronic Disease Control, Bureau of Disease Pre-  
 vention and Environmental Control, U.S. Public Health Service,  
 Bethesda, Md.)

## 2. AVAILABILITY OF NUTRITIOUS LOW-COST FOOD

### (a) Significance of Key Problem Area/Subsector

Traditional sources of nutrients, particularly proteins, are often too expensive for many people requiring them. A major need is to develop palatable new protein foods which can be produced feasibly at prices low-income consumers can afford. An alternative is to increase the nutrient content of foods traditionally being consumed by the majority, e.g. fortification of the basic staple (generally a grain or tuber) with proteins, vitamins, and minerals. Fortification can be applied not only to cereals but also to bread, milk, cassava, tea, salt, etc. The fortificants may include amino acids, soy protein, fish protein concentrate, other protein concentrates derived from legumes, oilseeds etc. and minerals.

Another approach is to promote increasing the proportion of more nutritive foods (existing or new) in diets.

### (b) A.I.D. Specialists

Martin J. Forman, Director, TA/N  
I. Hornstein, Deputy Director, TA/N  
Harold Rice, Research Officer, TA/N

### (c) Consultants to A.I.D.

Arron Altschul, Chemistry and Food Science  
James Carter, pediatrics and parasitology and nutrition

Max Milner, nutrition and food chemistry  
Bernard Schweigert, nutrition, biochemistry, and physiology  
Harold L. Wilcke, breeding and food fortification

### (d) Institutional Resources

U.S. Department of Agriculture, Economic Research Service and Agricultural Research Service  
University of California at Davis, Departments of Food and Science and of Nutrition.  
Cornell University, Graduate School of Nutrition - IR p-2.

Kansas State University, Food and Feed Grain Institute, Manhattan, Kansas.  
League for International Food Education, H55 16th St., N.W., Washington,  
D. C., 20036.

Massachusetts Institute of Technology, Department of Food Science and  
Nutrition.

Rutgers University, Food Science Department.

Texas A&M University, Food Protein Research and Development Center.

(e) Conferences and Committees

Third Brazilian Workshop on Cassava Fortification, Rio de Janeiro,  
March, 1972.

Workshop on Food Fortification, Vail, Colo., May 1972.

Wheat Improvement Tunisia Workshop, Tunis, Sept. 1973.

(f) TAB Projects

GENERAL TECHNICAL SERVICES

Food and Nutrition: Technical Services, 931-17-560-831. Major coun-  
tries: Brazil, Ecuador, Philippines, Thailand. Obligation span:  
FY 1969-75. Life-of-project cost estimate: \$1,904,000. Purpose: To  
identify means and promote use of low-cost nutritious foods among  
deprived persons in developing countries. Outputs: Conceptualization  
of nutrition systems, feasibility studies of production and consumption,  
and pilot manufacturing and distribution projects. Contractor: U.S.  
Department of Agriculture. PASA TA (AJ) 1-69. Project manager,  
A. Pound, TA/N. Ref.: HN p. 382.

LDC Nutritious Foods Feasibility Grants, 931-17-560-963. Major countries:  
Brazil, Philippines. Obligation span: FY 1972-73. Life-of-project cost  
estimate: \$120,000. Purpose: To interest LDC commercial organizations  
in processing and marketing low-cost nutritious foods. Outputs:  
Feasibility studies. New or adapted product development. Contract:  
Pre-investment market feasibility grants or contracts of up to \$30,000  
each to LDC food organizations directly or through local intermediary  
organizations. Project manager, I. Hornstein, TA/N.

Completed Projects

Acceptability of FPC, 931-11-560-907. Ref.: HN p. 399.

Evaluation of High-Protein Foods, 931-11-560-911. Ref.: HN p. 400.

Mini-Conference of U.S. and LDC Food Firms, 931-11-560-921. Ref.:  
HN p. 401.

Evaluation of CSM, 931-11-560-926. Ref.: HN p. 402.

Nutritional Improvement of Cassava, 931-11-560-927. Ref.: HN p. 403.

CENTRAL RESEARCH

Clinical Evaluation of New Protein Sources, 931-17-560-459. Worldwide. Obligation span: FY 1972-75. Life-of-project cost estimate: \$716,000. Purpose: To establish whether new protein sources and high-protein foods are safe and nutritious for children. Outputs: New methods for evaluating nutritive value of proteins. Training of researchers and dissemination of results. Contractor: Institute of Nutrition Research, Lima, Peru. Contract: AID/csd-2946, csd-1433. Project manager: Harold Rice, TA/N. Ref. HN p. 385, RR p. 43.

Improving Nutritious Value of Cereal Foods, 931-17-560-481. Major countries: Pakistan and Morocco. Obligation span: FY 1967-74. Life-of-project cost estimate: \$1,164,000. Purpose: To improve the nutritive quality of breads by incorporating high-protein flours derived from indigenous oilseeds, legumes, etc. Outputs: Methods for preparing "flours" from oilseeds and pulses and incorporating them into bread. Evaluation of cost and acceptability. Utilization manuals. Contractor: Kansas State University. Contract: AID/csd-1586. Project manager: Harold Rice, TA/N. Ref: HN p. 386. RR p. 49.

Development of Infant and Pre-School Food, 931-17-560-482. Major countries: Chile and worldwide. Obligation span: FY 1972-74. Life-of-project cost estimate: \$353,000. Purpose: To promote consumption, especially among pre-school children, of foods containing proteins from indigenous legumes. Outputs: Improved methods for processing legumes. Methods for incorporating proteins from legumes into locally used foods. Availability of consultants to food processors interested in applying new methodology. Contractors: University of Rhode Island and University of California. Contracts: AID/csd-3646 and -1587, respectively. Project manager: Harold Rice, TA/N. Ref.: HN p. 387.

Nutritional Improvement of Rice Fortification with Synthetic Amino Acids, Vitamins, and Iron, 931-17-560-492. Major countries: Thailand and worldwide. Obligation span: FY 1968-75. Life-of-project cost estimate: \$575,000. Purpose: To determine the feasibility of fortifying rice at the village level. Outputs: Tests at village mills of the mechanics and cost of rice fortification. Determination of acceptability of fortified rice, especially by pre-school children. Project manager: Harold Rice, TA/N. Contractor: Harvard School of Public Health. Contract: AID/csd-3291, csd-2170. Ref.: HN p. 390. RR p. 50.

Relation of Caloric Intake and Protein Utilization, 931-17-560-519. World-wide. Obligation span: FY 1970-73. Life-of-project cost estimate: \$335,000. Purpose: To determine the efficiency of protein utilization in human beings when caloric requirements are not met or when protein and major calorie sources are eaten at different times. Outputs: Biochemical studies (including nitrogen balance) on test individuals with varying calorie and protein intakes. Contractor: Massachusetts Institute of Technology. Contract: AID/csd-2808. Project manager, Harold Rice, TA/N. Ref.: HN p. 392. RR p. 45.

Coconut Protein Products for Use in Foods, 931-17-560-522. Worldwide. Obligation span: FY 1970-74. Life-of-project cost estimate: \$601,000. Purpose: To develop coconut protein suitable for incorporation in foods. Outputs: Coconut protein concentrates produced by several different processes, nutritional and cost data on each concentrate, and training personnel to transfer technology to less developed countries. Contractor: Texas A&M University. Contract: AID/csd-2804. Project manager: Harold Rice, TA/N. Ref.: HN p. 393. RR p. 52.

Evaluation of Corn Fortification, 931-17-560-544. Major countries: Guatemala and worldwide. Obligation span: FY 1972-75. Life-of-project cost estimate: \$465,000. Purpose: To determine by field study whether fortification of corn at the village level is feasible for improving nutrition. Outputs: Production of fortificants, viz., lysine, soy flour, vitamins, and minerals. Comparisons of effects of conventional corn and fortified corn on height, weight, and shigella infection of children and pregnant women. Acceptability of fortified corn. Contractor: Institute of Nutrition for Central America and Panama (INCAP). Contract: AID/csd-3357. Project manager, Harold Rice, TA/N. Ref.: CR p. 10. RS p. 11.

Acceptability of Opaque-2 Corn. Proposed project. Major countries: Brazil and worldwide. Obligation span: FY 1973. Life-of-project cost estimate: \$30,000. Purpose: To determine from field studies whether subsistence farmers can be induced to shift from the production and consumption of local varieties of corn to the more nutritious Opaque-2 corn. Outputs: Production of Opaque-2 corn on farms and utilization in foods. Dissemination of farmers' experience in growing and utilization Opaque-2 corn. Project manager, I. Hornstein, TA/N.

Economics of Food Fortification. Proposed project. Worldwide. Obligation span: FY 1974. Life-of-project cost estimate: \$200,000. Purpose: To provide a basis for LDC decision makers to allocate resources for implementation of fortification programs designed to alleviate malnutrition. Outputs: Methodology for determining the economics of food fortification. Dissemination of results. Project manager, Harold Rice, TA/N.

Food Legume Improvement. Proposed project. Worldwide. Obligation span: FY 1975-76. Life-of-project cost estimate: \$21,000. Purpose: To improve food legume utilization characteristics. Outputs: Selected varieties of legumes with improved utilization and better nutritional characteristics. Procedures for drying, storing, and cooking to enhance eating qualities and nutrient availability. Project manager, I. Hornstein, TA/N.

#### Completed Projects

- Evaluation of High-Protein Supplements in Child-Feeding Programs in the Philippines. Ref.: RR p. 46.
- Effects of Extrusion Processing Variables on the Nutritional Quality of Inexpensive High-Protein Food Mixtures. Ref.: RR p. 48.
- Development of Soy-Based Foods of High Nutritive Value for Use in the Philippines. Ref.: RR p. 49.

- A Practical Approach to the Lysine and Tryptophan Supplementation of Lime Treated Corn. Ref.: RR p. 51.  
 Research on New Processing Technology for Oilseed Proteins, Ref.: RR p. 52.  
 Adaption of an Integrated Rice Milling Process and Development of Resultant Food Products for Use in South East Asia. Ref.: RR p. 53.  
 Lysine Enrichment of Wheat Flour, Ref.: HN p. 389 RR p. 44.  
 Extending Protein concentrates for Child Feeding by addition of Inexpensive simple nitrogen sources, 931-17-560-458. Ref. RR p. 44.

(g) Other A.I.D. Projects

- India: Nutritional Foods Development, HN p. 228, CP-ASIA p. 75.  
 Tunisia: Food and Nutrition - Lysine Fortification Study. CN-TO p. 81.  
 HN p. 83.  
 P.L. 480 Program: Distribution of non-fat dry milk (NFDM), CSM (corn-soya-milk), and WSB (wheat-soy-blend).

(h) Policies and Priorities

- "An A.I.D. Nutrition Research Rationale and Program for the 70s", TA/N, Feb. 1970, 19 p.

(i) Technological Developments

- aerospace preserved foods MT July 1972, p. 90.  
 fish protein concentrate, economics of MT July 1972 p. 91.  
 fish protein concentrate, feasibility of MT July 1972, p. 91.  
 food bar manufacture MT Oct. 1972 p. 104.

(j) Selected References

- Association of Food Technologists, Eastern Regional Branch, "Protein Fortification of Foods", 1969, 125 p.  
 UN Joint FAO/WHO Expert Group on Protein Requirements, FAO Nutrition Meetings Report No. 37, Rome, 1965, 71 p.  
 U.S. Department of Agriculture, "Fortified Foods: The Next Revolution", 1970, 5 p.  
 "Reaching the Preschool Child", Workshop Report, August 1970, 25 pages. (English, French and Spanish)  
 "Maternal Nutrition and the Course of Pregnancy", Summary Report, 1970, (English) and 1972 (Spanish-RTAC/Mexico) 23 pages.  
 Tannenbaum, Steven; Stillings, Bruce; and Scrimshaw, Nevin S. (ed), Economics, Marketing and Technology of Fish Protein Concentrate, MIT Press, Cambridge, Mass., 1973 (expected publication in Sept.), 270 p.

3. REACHING PRE-SCHOOL CHILDREN

(a) Significance of Key Problem Area/Subsector

The pre-school child is nutritionally the most vulnerable of any age group. They are among the most inaccessible to public services. Malnutrition in this age group can result in physical and mental retardation. It is not known how much of such retardation can be overcome by adequate nourishment in later years. A.I.D.'s assistance in improving nutrition of pre-school children will be directed particularly into integrated programs concerned with maternal and child health and with family planning.

(b) A.I.D. Specialists

Martin J. Forman, Director, TA/N  
I. Hornstein, Deputy Director, TA/N  
Andromache Sismanidis, Nutritionist, TA/N (HEW)

(c) Consultant to A.I.D.

George Graham, pediatrics and nutrition

(d) Institutional Resources

University of California, Los Angeles, School of Public Health  
Johns Hopkins University, School of Public Health - IR p. 70.

(e) Conferences and Committees

In-service A.I.D. workshop on nutrition and child feeding:  
May 26-29, 1969 at Easton, Md. 28 p. report.  
June 14-17, 1971 at Berkeley Springs, W. Va. Report.

Conference on the Use of Growth Charts for Assessing the Progress of  
Children and Teaching of Parents, Columbia, Md., May 1971.

Reaching the Pre-School Child, American School Food Service Association,  
August, 1971.

(f) TAE Projects

GENERAL TECHNICAL SERVICES

Evaluation of Supplementary Child Feeding Programs, 931-11-560-879.  
Includes former project 931-11-560-883. Major countries: Brazil, Colombia,

Philippines, Kenya. Obligation span: FY 1971-75. Life-of-project cost estimate: \$363,000. Purpose: To evaluate the effectiveness of supplementary feeding programs in improving the mental and physical condition of young children in the LDCs. To assist in developing criteria for more effective delivery systems in reaching these children. Outputs: Methodology for supplemental feeding, evaluation procedures, and application in four developing countries. Contractors: Checchi and Co., Synetics, Inc., American School Food Service Association. Contracts: CM/otr-c-73-199, AID/csd-2776 and 2613. Project manager, A. Pound. Ref.: HN p. 394, 395.

Nutrition Programming Capability for Voluntary Agencies. Proposed project. Worldwide. Obligation span: FY 1974-76. Life-of-project cost estimate: \$300,000. Purpose: Assist U.S. registered voluntary agencies to develop their nutrition programming capabilities. Outputs: Training programs for volag headquarters and field personnel and their local counterparts to upgrade their nutrition programming and implementation. Personnel trained. Project manager: A. Sismanidis, TA/N (HEW).

Changing Maternal and Weaning Dietary Behavior. Proposed project. Worldwide. Obligation span: FY 1975-77. Life-of-project cost estimate: \$210,000. Purpose: Determine intervention measures effective in LDCs in promoting good weaning and dietary practices for children 6 months to 3 years of age. Outputs: Literature review of weaning and dietary practices, study of trends and relative importance of pertinent factors, projections of nutritional status of young children, conferences, field testing, incorporation into A.I.D. programming, and follow-up action. Project manager: A. Sismanidis, TA/N (HEW).

Development of Vitamin A Delivery Systems. Proposed project. Worldwide. Obligation span: FY 1974-76. Life-of-project cost estimate: \$200,000. Purpose: Assist LDC planners to adapt existing vitamin A delivery systems to incorporate innovative methods. Outputs: Innovative methodologies developed that are applicable to mass treatment and prevention of vitamin A deficiency. Project manager, I. Hornstein, TA/N.

#### CENTRAL RESEARCH

Maternal Nutrition and Progeny, 931-17-560-530. Taiwan and worldwide. Obligation span: FY 1971-75. Life-of-project cost estimate: \$371,000. Purpose: To determine effect of improving protein intake of pregnant women during gestation and lactation on physical and mental development, morbidity, and efficiency of food utilization of offspring. Outputs: Measurements of child development correlated with protein supplements fed to their mothers during pregnancy. Contractor: Johns Hopkins University. Contract: AID/csd-2944. Project manager: H. Rice, TA/N. Ref.: HN p. 391.

Completed Project

Effects of Environmental Enrichment on Subsequent Development of Malnourished Children, 931-17-560-550. Ref.: RS p. 24.

(g) Other A.I.D. Projects

No entry.

(h) Policies and Priorities

Combatting Malnutrition in the Pre-school Child, M.O. 1612.56.2, Aug. 19, 1966.

Policy emphasis on pre-school children and lactating women is established in "The A.I.D. Nutrition Program Strategy", AID/W, June 1973, 65 p.

(i) No entry.

(j) Selected References

Jelliffe, Derrick B., Child Nutrition in Developing Countries - A Handbook for Field Workers, Office of War on Hunger, AID, 1969 (revised ed.), 200 p. In English, French and Spanish.

Development Digest (ref. DD), Child Nutrition, Oct. 1966, p. 19-42.

Weight charts and reprint nutrition reviews, vol. 26, No. 9, Sept. 1968 - English and French.

Food for Peace, "An Evaluation of PL 480 Title II"

Summary Evaluation of Eight Countries. Checchi and Co., July 1972.

4. NUTRITION PLANNING AND MOTIVATION(a) Significance of Key Problem Area/Subsector

Malnutrition affects development and individual wellbeing to a greater degree than usually recognized in government policies and family food choices. The initial need is to devise methodologies for demonstrating to budget planners and decision-makers the benefits versus the costs of nutrition programs. The benefits being measured are mental and physical growth, work capacity, and health in general. There is also a need to inform and persuade families to have as high a proportion of nutritious food in meals as their circumstances permit.

(b) A.I.D. Specialists

Martin Forman, Director, TA/N  
 I. Hornstein, Deputy Director, TA/N  
 Harold L. Rice, research officer, TA/N  
 Andromache Sismanidis, Nutritionist, TA/N (HEW)

(c) Consultants to A.I.D.

Timothy D. Baker, health planning and analysis  
 A. Peter Ruderman, health economics

(d) Institutional Resources

American Technical Assistance Corp., McLean, Va.  
 Cornell University, Department of Agricultural Economics and  
 Graduate School of Nutrition - IR p. 2.  
 Richard K. Manoff Associates  
 Massachusetts Institute of Technology, International Development  
 Center and Department of Food Sciences and Nutrition  
 Trans Century Corp., Washington, D. C.

(e) Conferences and Committees

Economics of Malnutrition Conference, AID/W, Sept. 1972  
 Nutrition and National Planning Workshop, AID/W, Oct. 1973

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Evaluation of Nutrition Education, 931-11-560-872. Worldwide. Obligation span: FY 1970-76. Life-of-project cost estimate: \$220,000. Purpose: To

determine effective educational methods for improving the food habits of developing country families. Outputs: Literature review to evaluate effectiveness of nutrition in overseas programs. Contractors: Synetics Corp. and formerly University of Iowa. Contracts: AID/csd-3358 and 2586, respectively. Project manager: A. Sismanidis, TA/N. Ref.: HN p. 398.

Analysis of National Planning, 931-11-560-885. Major countries: Ecuador, Indonesia, Pakistan, Philippines, Thailand, Nigeria. Obligation span: FY 1968-76. Life-of-project cost estimate: \$2,149,000. Purpose: Develop methods and planning tools for analyzing nutrition problems and planning nutrition programs to assist LDC planners and decision-makers allocate scarce resources. Contractor: American Technical Assistance Corporation. Contract: AID/cm/otr-73-1198. Project manager: H. L. Rice, TA/N. Ref.: HN p. 396.

New Mass Media Approaches to Nutrition Education, 931-11-560-993. Major countries: Brazil, Colombia, Ecuador, El Salvador. Obligation span: FY 1973-76. Life-of-project cost estimate: \$363,000. Purpose: To determine the feasibility of new methods of motivating large numbers of individuals, particularly mothers of pre-school children, to improve their nutrition. Outputs: Programs for promoting consumption of specific nutritious foods. Evaluations of mass media programs promoting nutrition. Contractor: Manoff Assoc. Contract: AID 518-345-T. Project manager: A. Sismanidis, TA/N.

Guidelines for Pre-School Interventions. Proposed project. Worldwide. Obligation span: FY 1974-75. Life-of-project cost estimate: \$245,000. Purpose: Improve the information basis of LDC programming the betterment of pre-school child nutrition. Outputs: Manual of techniques of improving nutrition of pre-school child; includes case histories and cost-benefit analyses. Project manager: A. Sismanidis, TA/N.

#### Completed Projects

Nutrition Education Material, 931-11-560-801. Ref.: HN p. 380.  
Voluntary Agencies Incentive Grants, 931-11-560-846. Ref.: HN p. 384.

#### CENTRAL RESEARCH

Malnutrition: Effect on Work Capacity, 931-17-560-529. Major Countries: Colombia and worldwide. Obligation span: FY 1971-74. Life-of-project cost estimate: \$190,000. Purpose: To determine the effect of mild and severe malnutrition on the work capacity of individuals. Outputs: Correlation of malnutrition with work capacity in individuals classified according to age, climate, and altitude. Determination of work capacity norms in Colombia and U.S. Contractor: Medical College of Wisconsin. Contract: AID/csd-2943. Project manager: H. L. Rice, TA/N. Ref.: HN p. 404. RS p. 9.

Effect of Nutrition Services on Family Planning Programs. Proposed project. Worldwide. Obligation span: FY 1975. Life-of-project cost estimate: \$280,000. Purpose: Provide planners with nutrition programs effective in increasing family planning acceptance and encouraging contraceptive usage. Outputs: Data relating nutrition and health to fertility and child spacing. Project manager: I. Hornstein, TA/N.

Planners and Decision Makers Methodology. Proposed project. Worldwide. Obligation span: FY 1975-76. Life-of-project cost estimate: \$200,000. Purpose: Provide planners and policy makers with evaluated methodology for nutrition policy formulation. Outputs: Economic models of nutrition sector evaluated for intervention impact and adaptability to LDC data. Project manager: H. L. Rice, TA/N.

Effectiveness of Interventions at Community Level. Proposed project. Major country: Colombia. Obligation span: FY 1974-77. Life-of-project cost estimate: \$500,000. Purpose: Assess alternative approaches to changing nutrition of communities. Outputs: Tests in five villages of alternative interventions suitable for closing the nutritional gap in a community. Cost/effectiveness data. Limitations to acceptability of opaque-2 corn as a nutrition intervention. Project manager: H.L. Rice, TA/N.

#### Completed Project

Study of the Influences of Early Nutrition on Cognitive Development in the Young Child in Peru, 931-17-560-460. Ref.: RR p. 46.

#### U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Nutrition and National Planning. Major countries to be selected. Obligation span: FY 1974 (work span FY 1974-79). Life-of-project cost estimate: \$1,000,000. Purpose: To meet a developing country need for a U.S. university to train, conduct research, and offer technical assistance in national planning of nutrition. Outputs: Trained faculty, both in U.S. and developing countries, in nutrition planning. Courses and research on the subject. Grantee universities expected to be MIT, Stanford, and Cornell. Project manager: H.L. Rice, TA/N.

#### (g) Other A.I.D. Projects

India: Nutritional Foods Development HN p. 228.  
(especially State of Tamil Nadu survey)

Philippines: Nutrition Support, HN p. 111.

Pakistan: Public Health and Nutrition Technical Support,  
HN p. 235.

Africa Regional: Workshop on Nutrition and Child Feeding,  
HN p. 34.

(h) Policies and Priorities

"The A.I.D. Nutrition Program Strategy", AID/W, June 1973,

65 p.

"A.I.D. Nutrition Strategy", AIDTO CIRC. A-996, Sept. 29, 1973.

(i) Technological Developments

The incorporation of economic considerations into nutrition analysis and planning is described in "The Nutrition Factor; Its Role in National Development" by Alan Berg (cited in part j below).

A comprehensive methodology for consideration of nutrition factors in analysis and planning at national and sector levels has been developed and tested in an A.I.D. project in Ecuador. See "Planning National Nutrition Programs" (cited in part j below).

(j) Selected References

"The Nutrition Factor; Its Role in National Development", Alan Berg with portions by Robert Muscat, Brookings Institution, 1973, 290 p.

Final Report "The Sixth Conference of the Americas on Malnutrition as a Factor in Socio-Economic Development," May 1969, 36 pages.

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SCIENCE AND TECHNOLOGY SERVICES

Science and technology services by the Technical Assistance Bureau are designed to assist developing countries with selected aspects of the problem of technological transfer and adaptation. They focus on: (a) helping LDCs develop national policies and institutions which permit them to make better technological choices, particularly in industry; (b) natural resources assessment and management; and (c) reducing public investment costs. The program is designed as a supplement to AID's priority programs in agriculture, population and health, education, etc.

Experience has demonstrated that comparatively little U.S. technology can be transferred to LDCs without significant adaptation. The LDCs are aware of the need for technologies which fit their factor endowments and absorptive capacities. Stress is being placed on innovation to develop more appropriate technologies and on devising policies and institutions which permit developing countries to make better technological choices. The problem of technological choice is growing in significance as unemployment and urbanization increase in the developing countries. The need for policies and technologies which increase productive employment in the urban industrial and service sectors as well as in the rural sector will grow.

AID's use of U.S. science and technology has generally followed the main lines of its program. Extensive use has been made of American science and technology in agriculture, health, and family planning. Substantial programs of research and development in these areas have been launched by the Agency. Similarly, AID has drawn on U.S. talent in the social sciences and on engineering firms concerned with construction of economic infrastructure. However, relatively limited use has been made of U.S. capabilities in other biological and engineering sciences and in the physical sciences.

It is also important for AID to have the capability to provide services on the general problem of technological choice -- how LDCs can best adapt and utilize foreign technologies and encourage indigenous technological development. AID can also take advantage of selected opportunities for application of U.S. scientific and technological strengths outside its main areas of concentration.

The first emphasis of the science and technology program is on policy and institutional development -- helping LDCs build their capabilities for using science and technology more effectively in support of development. There are also smaller programs in natural resource assessment and management, and reducing public investment costs. AID will support LDC initiatives where they are strongly supported locally.

#### 1. SCIENCE AND TECHNOLOGY INSTITUTIONAL DEVELOPMENT

##### (a) Significance of Subsector

AID focuses on helping developing countries in three areas:

- Developing institutions for formulating national science and technology policies, priorities, and organizational responsibilities and for implementing decisions in this field.
- Encouraging more effective orientation of LDC university science and engineering programs to development needs.
- Strengthening the capabilities of LDC industrial service institutions to assist local industries in selecting, adapting, and using technologies suited to their circumstances, with special attention to support of small-scale industry.

This program reflects a need for national institutions that are effective in pursuing two related purposes: One purpose is to stimulate the efficient development of scientific and technological capabilities which meet national development requirements. The other purpose is to stimulate more effective use of existing scientific and technological capabilities in support of economic and social development.

While selection of technologies is largely a matter for private entrepreneurs, LDC technological institutions can play an important role through their influence on macro-economic policies of the Government, advice to entrepreneurs on availability of alternative technologies and supporting services to industry. Included in these services is the network of industrial research, extension, and standards institutes throughout the LDCs. Generally, AID will sponsor collaboration between U.S. and LDC technological institutes that work with private industry. Particular attention will be paid to stimulating commercially viable small-scale industry, which tends to use more labor and less capital per unit of output.

(b) A.I.D. Specialists

Henry A. Arnold, Director, TA/OST  
John C. Fry, Deputy Director, TA/OST  
William H. Littlewood, Associate Director, TA/OST  
Bill L. Long, Environmental Affairs, TA/OST  
Robert H. Goeckermann, Latin America, TA/OST

(c) Consultants to A.I.D.

Daniel Margolies, science policy  
Dr. David A. Adams, science and environmental technology  
David Beckler, science and technology policy  
Dr. Franklin A. Long, physical sciences and science policy  
Dr. Perry W. Pratt, science and innovative technology

(d) Institutional Resources

National Academy of Sciences  
National Academy of Engineering  
Cornell University - IR p. 117.  
National Science Foundation  
Denver Research Institute  
National Bureau of Standards  
National Technical Information Service  
Illinois Institute of Technology Research Institute  
Georgia Institute of Technology  
Fund for Overseas Research Grants and Education, Inc.

(e) Conferences and Committees

<u>Year</u>	<u>Convenor</u>	<u>Topic</u>
<u>Policy Seminars</u>		
1969	President's Science Advisory Committee	Science and Technology Priorities
1970	National Academy of Sciences	Environmental Policies
1971	A.I.D.	Science and Technology Priorities
	National Academy of Sciences	Science and Technology Priorities
	A.I.D.	Science and Technology Priorities
1972	A.I.D.	Natural Resources
1973	Cornell University	Science and Technology Priorities
<u>Technical Seminars</u>		
1971	National Bureau of Standards	Industrial Standards and Technology
	American University	Computers
	National Academy of Sciences	International Development Institute
	A.I.D.	Role of Individual U.S. Scientists
	National Academy of Sciences	Technical Information
	National Academy of Engineering	Role of U.S. Engineering Schools
	National Academy of Engineering	Role of Multinational Corporations
	National Academy of Sciences	Training of Research Managers
1972	National Bureau of Standards	Industrial Standards and Technology
	National Academy of Engineering	International Industrialization Institute
	A.I.D.	Economics and Technology
1973	National Bureau of Standards	Industrial Standards and Technology
	A.I.D.	Science, Technology, and Development Planning

(f) TAB ProjectsGENERAL TECHNICAL SERVICESScience PolicyStrengthening Scientific and Technological Capabilities of Less Developed Countries, 931-11-995-029. Worldwide.

Obligation span: FY 1970-75. Life-of-project cost estimate: \$3,685,000. Purpose: Stimulate more effective ordering of research priorities in developing countries and greater use of science and technology in development. Prepare framework for more effective mobilization of U.S. scientific and engineering talent in foreign assistance. Identify opportunities for technical innovation in developing countries. Outputs: Better use of science and technology in LDC economic and social development planning. More effective use of limited LDC technical resources and infrastructure. Identification of opportunities for technological innovation. Contractor: National Academy of Sciences. Contract: AID/csd-2584. Project manager: R. H. Goeckermann, TA/OST.

Role of Sister Laboratories in Economic Development, 931-11-995-914.

Major country: Pakistan. Obligation span: 1971-73. Life-of-project cost estimate: \$50,000 to \$100,000. Purpose: Demonstrate how advanced technologies, such as nuclear technology, can be linked through U.S. sister laboratories to meet needs in national development. Outputs: Cost/effectiveness studies of nuclear techniques in industry, medicine, and government. Greater attention of nuclear scientists to user organizations. Greater use of nucleonics in development. Contractor: U.S. Atomic Energy Commission. PASA TA(AE) 8-71. Project manager: R. H. Goeckermann, TA/OST.

Science Policy in a Small Developing Country, 931-11-995-969.

Major country: Costa Rica. Obligation span: FY 1972-73. Life-of-project cost estimate: \$64,000. Purpose: Develop and demonstrate approaches to application of science and technology in selected areas in a small developing country. Analyze the demonstration for its relevance to application in other small developing countries. Outputs: Studies on university science and technology education planning and provincial natural resource planning. Analysis of approaches and studies for general conclusions on methodology. Contractor: Cornell University. Contract: AID/csd-3391. Project Manager: R. H. Goeckermann, TA/OST.

University Orientation

Scientists and Engineers in Economic Development, 931-11-995-962. Worldwide. Obligation span: FY 1972-74. Life-of-project cost estimate: \$600,000. Purpose: Test the effectiveness of heavier reliance on existing linkages between U.S. and developing country scientists and engineers in strengthening developing-country research. Outputs: Strengthened ties between U.S. and developing-country scientists and engineers. Contractor: National Science Foundation. PASA (TA(NA)6-72. Project manager: R. H. Goeckermann, TA/OST.

Mini-Grants for University Research, 931-11-995-992. Worldwide. Obligation span: FY 1973-77. Life-of-project cost estimate: \$500,000 to \$700,000. Purpose: Stimulate closer relationships between university research and national development in less developed countries. Assist developing-country universities obtain research equipment and services needed from abroad. Outputs: Greater contributions of developing-country university research to national development. Contractor: Fund for Overseas Research Grants and Education (FORGE), Stamford, Conn. Project manager: R. H. Goeckermann, TA/OST.

System for Promoting Engineering Education Development (SPEED). Proposed project. Worldwide. Obligation span: FY 1974-78. Life-of-project cost estimate: \$1,000,000. Purpose: Demonstrate transfer of objectives and methods of a U.S. mission-oriented engineering school to selected developing country universities. Encourage more effective orientation of their programs to development needs. Outputs: University staffs better linked to action organizations of their country. International Institute program of seminars and studies on appropriate engineering education. Contractor to be selected. Project manager: R. H. Goeckermann, TA/OST.

Industrial Institutions

Application of Industrial Technology Developed Under NASA Auspices to the Needs of a Developing Country, 931-11-995-876. Major country: Korea. Obligation span: FY 1970-74. Life-of-project cost estimate: \$198,800. Purpose: Test the feasibility of transferring selected types of technology, developed as part of the U.S. space program, to the mainstream of industrial activities of a developing country. Outputs: Identification of certain problems in Korean industry; organized search for potentially relevant aerospace technology; and application to industry where feasible. Contractor: National Aeronautics and Space Administration, subcontracting with Illinois Institution of Technology Research Institute. PASA TA(ZA) 7-70. Project manager: H. A. Arnold, TA/OST.

Utilization of Industrial Technical Capabilities of National Bureau of Standards, 931-11-995-910. Worldwide. Obligation span: FY 1971-76. Life-of-project cost estimate: \$765,000. Purpose: Develop approaches for enhancing developing country competence in industrial standards, metrology, and quality control to advance domestic and international commerce. Outputs: Improved capability in standards and quality control and heightened awareness of their commercial payoff. Contractor: National Bureau of Standards, U.S. Department of Commerce. PASA TA(CE) 5-71. Project manager: J. C. Fry, TA/OST.

Technological Information Network, 931-11-995-961. Worldwide. Obligation span: 1972-75. Life-of-project cost estimate: \$420,000. Purpose: Facilitate transfer of most relevant U.S. scientific and technical information to LDC's for development purposes. Establish linkages between U.S. and LDC information services. Outputs: Broadened LDC awareness and utilization of U.S. scientific and technical information and strengthening of related LDC institutions. Contractor: National Technical Information Service (NTIS), U.S. Department of Commerce. PASA TA(CG) 7-72. Project manager: J. C. Fry, TA/OST.

More Effective Use of Computer Technology in Developing Countries, 931-11-995-970. Major countries: Brazil, Colombia, Korea, Thailand, Turkey, Ethiopia, Nigeria, Uganda. Obligation span: FY 1972-73. Life-of-project cost estimate: \$60,000. Purpose: To determine the value of an extended AID capability to assess problems related to computer implementation in developing countries and to respond to requests by developing countries regarding computer investment and applications. Outputs: Identification of criteria for LDC investment in computer technologies. Training, facility, and manpower requirements for computer investment. Contractor: Bureau of the Census, U.S. Department of Commerce. PASA TA(CG) 9-72. Project manager: J. C. Fry, TA/OST.

Training Industry Research Managers, 931-11-995-988. Major countries: Brazil, Mexico (tentative), Korea, Thailand. Obligation span: FY 1973-74. Life-of-project cost estimate: \$120,000. Purpose: Design short-term training programs for senior personnel in developing country industrial research institutes, with special emphasis on relating institute work to national priorities and industry needs. Outputs: Tested training programs, including reference materials and case histories, in three regions. Appropriate training for 50-100 applied research managers. Contractor: World Association of Industrial and Technological Research Organizations (WAITRO)/Denver Research Institute. Contract: Project manager: H. Arnold, TA/OST.

Small Industry Grants, 931-11-995-990. Worldwide. Obligation span: FY 1973-77. Life-of-project cost estimate: \$800,000. Purpose: Strengthen capabilities of four developing-country institutions to provide technical assistance to small industry and generate new opportunities for employment. Outputs: Increased job opportunities and viability of indigenously owned enterprises. Contractor: Georgia Institute of Technology. Project manager: W. H. Littlewood, TA/OST.

Coupling with Industry, 931-11-995-991. Worldwide. Obligation span: FY 1973-77. Life-of-project cost estimate: \$1,800,000. Purpose: Strengthen the capabilities of the existing international network of industrial research institutes to serve the interests of developing-country local industry. Outputs: Developing-country research programs more responsive to industrial needs. Successful commercialization of products of research, emphasizing local factor endowments. Linkages among research institutes strengthened. Contractor: Denver Research Institute. Contract: Project manager: H. Arnold, TA/OST.

#### CENTRAL RESEARCH

Mechanical Engineering Innovations. Proposed project. Major countries: Colombia, Nigeria (tentative). Obligation span: FY 1974-76. Life-of-project cost estimate: \$530,000. Purpose: Provide basis for reducing developing-country foreign exchange expenditures for engineering materials such as iron, steel, aluminum, and polymers through use of indigenous or other more appropriate substitute materials. Outputs: Improved knowledge of appropriate engineering materials, techniques, and processes usable in developing countries. Strengthened capability of developing-country institutions to perform laboratory research. Proposed contractor: Massachusetts Institute of Technology. Project manager: W. H. Littlewood, TA/OST.

Technology Transfer Analysis. Proposed project. Major countries to be selected from four regions. Obligation span: FY 1974-75. Life-of-project cost estimate: \$570,000. Purpose: Investigate factors affecting utilization of innovative technology in developing countries to improve effectiveness of technology transfer. Outputs: Compilation of incentives and barriers to technology transfer in ten countries and comparative analysis. Case histories of specific transfers in four countries. Project Manager: H. A. Arnold, TA/OST.

Labor-Intensive Technology. Proposed project. Major countries: Colombia and Philippines. Obligation span: FY 1975-76. Life-of-project cost estimate: \$500,000. Purpose: Clarify advantages and disadvantages of labor-intensive technology for representative types of public construction in selected countries under specific known conditions. Outputs: Identification of important economic, technical, and social criteria for LDC investment decisions. Analytical report of benefits, costs, and trade-offs among technological alternatives. Project manager: H. A. Arnold, TA/OST.

Mini-Research. Small research projects costing about \$25,000 each which are underway or planned include the following:

- Utilization of Research Reactors, 931-11-995-545. funded FY 1972.
- Survey of Agricultural Machinery, proposed FY 1974
- Survey of Productivity Centers, proposed FY 1974
- Survey of Mainland China Labor-Intensive Industry, proposed FY 1975.

#### U.S. INSTITUTIONAL DEVELOPMENT (Sec. 211d)

Policies for Science and Technology in Developing Countries, 931-11-995-137. Worldwide. Obligation span: FY 1972 (work span FY 1972-76). Life-of-project cost estimate: \$580,000. Purpose: To strengthen the capabilities of a U.S. institution in technical assistance, research, and education related to science and technology policy in developing countries. Outputs: Techniques for improved coupling of scientific and technological interests of developing-country governments, industries, and universities. Fuller utilization of science and improved technology in development planning and implementation. Grantee : Cornell University. Grant: AID/csd-3158. Project manager: R. H. Goeckermann, TA/OST. Ref.: IR p. 117.

Worldwide.

Technology Adaptation, 931-11-995-138. Obligation span: FY 1972/(work span FY 1972-76). Life-of-project cost estimate: \$900,000. Purpose: To develop a U.S. university's capability in technical assistance, research, and education in the field of developing-country industrial and public works technology. Outputs: Improved understanding of the nature of technology appropriate to developing-country needs and of the processes by which technological knowledge and skills can be introduced. Grantee: Massachusetts Institute of Technology. Grant: AID/csd-3360. Project manager: W. H. Littlewood, TA/OST. Ref.: IR p. 119.

Employment Through Small Industry, 931-11-995-149, Worldwide.  
 Obligation span FY 1973 (work span FY 1973-76). Life-of project  
 cost estimate: \$800,000. Purpose: To develop a U.S. university  
 capability in technical assistance, research, and education in the  
 field of intermediate technologies to increase employment and national  
 productivity in developing countries. Outputs: Improve understanding  
 of employment effects of various technologies, of technological  
 innovations which can stimulate employment pockets in rural areas,  
 and of technologies for increasing value added locally to natural  
 products. Grantee: Georgia Institute of Technology. Grant: AID/CM/ta/g/73/18.  
 Project manager: W. H. Littlewood, TA/OST.

(g) Other A.I.D. Projects

Brazil: Science and Technology for Development, CP-LA p. 98.  
 LA Regional: Special Multilateral Fund for Education, Science and  
 Technology, CP-LA p. 236.  
 India: Teaching of Science and Mathematics, CP-ASIA p. 75.  
 Korea: Standards System Development, CP-ASIA p. 128.  
 Korea Adv. Inst. of Science, CP-ASIA p. 124.  
 Science and Technology, CP-ASIA p. 125.  
 Turkey: Hacettepe Science Center, CP-ASIA p. 16.  
 Asia Reg.: Grants to CENTO Multilateral Cooperation, Science  
 and Industrial Funds, CP-ASIA p. 39.  
 Southeast Asia Development Advisory Group (SEADAG),  
 CP-ASIA p. 46.  
 Spain: Institute of Automatics, CP-SA p. 49.  
 Institute of Molecular Biology, CP-SA p. 49.  
 Scientific and Technical Info. Service, CP-SA p. 49.  
 Institute of Oceanography, CP-SA p. 49.  
 Primate Neurophysiology Study, CP-SA p. 49.  
 Studies on Frontiers of Science, CP-SA p. 49.  
 Afr. Reg.: African Mathematics Program, CP-AFR p. 186.  
 African Primary Science Program, CP-AFR p. 186.

(h) Policies and Priorities

The policy and priorities for science and technology institutional development are derived from Policy Determination 51 dated January 12, 1973, "Guidance Statement on Selected Aspects of Science and Technology" (M.O. 1018.11).

(i) Technological Development (Ref. MT)

diffusion of innovation research - Apr. 1972 p. 103.  
 industrial innovations, successful - Jan. 1973 p. 103.  
 industrial standards and quality control in Korea, MT July 1972 p. 105.  
 laboratories, need for - Apr. 1972 p. 104.  
 research priorities in Ghana - Jan. 1972 p. 63-64.  
 research related to development - Oct. 1972 p. 110.  
 science and technology in development:  
   general - July 1972 p. 95  
   Brazil - Jan. 1972 p. 65, 66-68; Oct. 1972 p. 105.  
   Colombia - Jan. 1972 p. 66.  
   Nigeria - Jan. 1972 p. 67  
   Peru - Jan. 1972, p. 64-65  
   Philippines - Jan. 1972 p. 68; July 1972 p. 95.  
 scientific and technical information for developing countries  
   Oct. 1972 p. 110.  
 space technology transfer - July 1972 p. 118.  
 technological forecasting - Apr. 1972 p. 104; Oct. 1972 p. 107.  
 technology assessment - Apr. 1972 p. 105-108; Oct. 1972 p. 108;  
   Jan. 1973 p. 103.  
 technology transfer - Jan. 1972 p. 60; Apr. 1972 p. 104; Oct. 1972  
   p. 108; Jan. 1973 p. 103 (bibliography).

(j) Selected References

1. Policies and Programs in Selected Areas of Science and Technology, TA/OST 73-18, 1973, 29 p.
2. Appropriate Technologies for International Development - Preliminary Survey of Research Activities, TA/OST 72-11, 1972, 59 p.
3. Science and Technology for International Development: A Selected List of Information Sources in the United States, TA/OST 72-7, 1972, 50 p.
4. Contract Program in Centrally Funded Research, Office of A.I.D. Research and University Relations, AID/TA, 1972, 21 p.
5. RANN Program: Potential Benefits to Developing Countries, TA/OST 73-16, 1973 43 p.
6. Workshop on Science and Technology Priorities for International Development, TA/OST 72-6, 1972.
7. Technology and Economics in International Development, TA/OST 72-9, 1972, 84 p.
8. Impact on the United States of Transfers of Technology, TA/OST, 73-14, 1973, 28 p.

9. Computer Technology in Developing Countries, TA/OST/AU-71-1, 1971, 194 p.
10. Contract Program in Centrally Funded Research, Office of A.I.D. Research and University Relations, AID/TA, 1972, 21 p.
11. Papers prepared for the UN Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, AID/W, 12 vol., 1963. Vol. IX covers scientific and technological policy planning, and organization. Vol.X covers international cooperation and problems of transfer and adaptation. Vol XI includes training of scientific and technical personnel.
12. Mason, H. L., and Peiser, H. S. (ed.), Metrology and Standardization in the Less-Developed Countries: The Role of a National Capability for Industrializing Economies, Proceedings of a Seminar at Warrenton, Va., organized by AID and NBS, National Bureau of Standards Special Publication 359, 1971, 383 p.

Note: Additional material is cited in reference 3.

2. NATURAL RESOURCES ASSESSMENT AND MANAGEMENT(a) Significance of Subsector

Improved LDC capabilities for assessing the location and nature of their natural resources and for determining how these resources can best be produced and utilized is of great importance. This includes extractive resources such as minerals and clays and the renewable resources of water, soil, and forests. Attention is being given to faster, cheaper, and more effective techniques for identifying and appraising natural resources, as well as to improved techniques for managing natural resource development such as integrated land-use planning, conservation of renewable resources, and pollution abatement and control. Particular attention is being paid to opportunities to advance knowledge of means for environmental protection.

The Technical Assistance Bureau's role in this field is one of an agent or broker between the developing countries and U.S. experts, such as the organizations involved in the Earth Resources Technology Satellite (ERTS) program. It avoids the politically sensitive areas of commercial contracting to develop these resources.

(b) A.I.D. Specialists

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 John C. Fry, Deputy Director, TA/OST  
 William H. Littlewood, Associate Director, TA/OST  
 Bill L. Long, Environmental Affairs, TA/OST  
 Robert H. Goeckermann, TA/OST

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Daniel Margolies, Science Policy  
 Edward Cliff, Forestry  
 Kurt Stehling, Aerospace Technology  
 Dr. David A. Adams, Science and Environmental Technology  
 Dr. Dean Peterson, Water Resources Management

(d) Institutional Resources

National Academy of Sciences  
 Universities: Arizona, California, Colorado State,  
 North Carolina, Notre Dame, and Utah State  
 National Aeronautics and Space Administration  
 National Oceanic and Atmospheric Administration,  
 Department of Commerce  
 U.S. Bureau of Land Management, Department of the Interior  
 U.S. Forest Service, Department of Agriculture  
 U.S. Geological Survey, Department of the Interior

(e) Conferences and Committees

<u>Year</u>	<u>Convenor</u>	<u>Topic</u>
<u>Policy Seminars</u>		
1970	National Academy of Sciences	A.I.D.'s Role in the Environmental Field
1972	A.I.D.	A.I.D.'s Role in the Field of Natural Resources Management
<u>Technical Seminars</u>		
1970	Smithsonian Institution	Remote Sensing
1971	A.I.D.	Geothermal Exploration Techniques
	National Academy of Sciences	Solar Energy
1972	Colorado State University	Hydrology Research Priorities
	National Academy of Sciences	Low Power Energy Sources
1973	A.I.D.	Marine Sciences

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Strengthening Capability of Developing Countries to Acquire Information about Ocean Resources, 931-11-995-897. Worldwide. Obligation span: FY 1971-73. Life-of-project cost estimate: \$244,000. Purpose: Provide impetus for developing countries to obtain and use information about ocean resources. Strengthen embryonic national oceanographic data centers. Outputs: Curriculum on ocean resources. Train 23 developing-country specialists in ocean resources. Contractor: UN Education, Scientific, and Cultural Organization (UNESCO). Contract: AID/csd-2877. PASA TA(CG)4-71. Project manager: W. H. Littlewood, TA/OST.

Application of Remote Sensing Technologies, 931-11-995-902. Worldwide. Obligation span: FY 1971-76. Life-of-project cost estimate: \$902,000. Purpose: Demonstrate the value of airborne and satellite remote sensing to agriculture, hydrology, and mineral exploration in selected developing countries. Outputs: Strengthened institutional capabilities in developing countries for planning and implementing natural resource surveys, using appropriate mix of ground-based, aerial, and space methods. Contractor: Geological Survey, U.S. Department of the Interior. PASA TA(IC)2-72. Project manager: J. C. Fry, TA/OST.

Environmental Training 931-11-995-983. Worldwide. Obligation span: FY 1972-75. Life-of-project cost estimate: \$370,000. Purpose: Demonstrate how U.S. knowledge and experience can be focused to train less developed country policymakers, planners, managers, and educators in techniques of predicting, evaluating, and controlling environmental problems associated with development activities. Outputs: Training methodologies, curriculum, and resources developed, tested, and evaluated. Less developed country industrial planners, managers, and educators trained in environmental aspects of industrial development. U.S. personnel experienced in presenting course to, and working with, less developed country participants in this field. Project is a follow-on to the course conducted at the University of North Carolina January 20-April 10, 1973. Contractor to be selected. Project manager: B. L. Long, TA/OST.

Remote Sensing Census Project, 931-11-995-997. Major countries: Afghanistan and two other countries to be selected. Obligation span: FY 1973-77. Life-of-project cost estimate: \$1,190,000. Purpose: Test the usefulness of satellite remote sensing imagery (ERTS) in planning and implementing census and related statistical programs in selected less developed countries. Outputs: Maps for census operations. Baseline statistical data on rural agriculture and urban development. Evaluation of new technological capabilities for detecting significant changes in rural and urban population. PASA TA(CA)07-73. Project manager: J.C. Fry, TA/OST.

Environmental Economics. Proposed project. Obligation span: FY 1974. Life-of-project cost estimate: \$200,000. Purpose: Provide, through case studies, reliable and relevant data and an analytical methodology for evaluating the short- and long-term benefits and financial costs of building different levels of environmental safeguards into selected types of less developed country operations. Outputs: Availability of data and methodologies on which to base analyses of costs of environmental protection. Expanded U.S. and less developed country capability and interest in considering economic factors associated with environmental protection. Handbook of technologies and costs necessary to achieve different levels of environmental protection. Project manager: B. L. Long, TA/OST.

Energy for Less Developed Countries. Proposed project. Worldwide, with major countries to be selected (probably including Niger). Obligation span: FY 1974-78. Life-of-project cost estimate: \$750,000. Purpose: Assist less developed countries design and implement sound energy policies based on an improved understanding and availability of alternative strategies, optional mixes of energy types, and technological approaches to the development of new sources. Outputs: New principles and strategies for developing country energy policies. Development and testing of new techniques for energy assessment and utilization by developing countries. Linkage between U.S. and developing country institutions. Project manager: B. L. Long, TA/OST.

#### CENTRAL RESEARCH

Mosquito Genetic Control, 931-11-995-535. Major country: Kenya. Obligation span: FY 1970-77. Life-of-project cost estimate: 758,000. Purpose: Determine feasibility of eradicating mosquitoes by introducing strains with artificially induced genetic deformations as a basis for non-chemical control of insects. Outputs: Data on mosquito ecology and breeding habits. Technical and economic feasibility study of large-scale control programs. Methodology for large-scale demonstration program. Contractor: University of Notre Dame. Contract: AID/csd-3159. Project manager: B. L. Long, TA/OST. Ref.: RS p. 22.

Survey of Knowledge Regarding Properties and Uses of Secondary Tropical Woods, 931-17-995-556. Major countries: Colombia, Philippines, Ghana, Niger. Obligation span: FY 1973. Life-of-project cost estimate: \$25,000. Purpose: Survey and evaluate status of knowledge of properties and potential uses of secondary (underutilized) tropical woods and compare with other constraints on utilization. Outputs: Analytical report of properties and uses of tropical woods. Recommendations for actions to increase utilization of secondary woods. Contractor: Forest Service, U.S. Department of Agriculture. PASA TA(AJ)2-73. Project manager: W. H. Littlewood, TA/OST.

Geobotanical Remote Sensing for Minerals, 931-11-995-559. Major countries: Colombia, Guyana, Panama, Philippines. Obligation span: FY 1973-76. Life-of-project cost estimate: \$779,000. Purpose: Determine the technical and economic feasibility of using vegetative and other surface indicators detectable by remote sensors to explore for ore deposits in vegetated tropical areas. Outputs: Costs and effectiveness of aerial reconnaissance techniques. Correlations of vegetative metal uptake, reflectance properties of vegetation, and mineral occurrence potential. Contractor: Geological Survey, U.S. Department of the Interior. PASA TA(IC)05-73. Project manager: B. L. Long, TA/OST.

Hydrologic Data Network. Proposed project. Worldwide, with major countries: Chad, Mali, Mauritania, Niger, Senegal, Upper Volta. Obligation span: FY 1975-78. Life-of-project cost estimate: \$500,000. Purpose: Increase developing country capabilities to manage their water resources on a regional basis in a manner designed to minimize costs of equipment and data collection, and to maximize the analytical and predictive capacity of the system. Outputs: Data collection network for West Africa Sahel region designed and agreed to by developing country and donor institutions. West African governments and institutions have sharper focus on specific data and institutional needs, and mix of systems and stations which should be utilized. Generalized methodology for regional hydrologic data networks designed and evaluated. Project manager: B. L. Long, TA/OST.

Promoting Use of Underutilized ("Secondary") Tropical Woods. Proposed project. Worldwide. Obligation span: FY 1974-76. Life-of-project cost estimate: \$200,000. Purpose: Stimulate utilization and export of unutilized or underutilized ("secondary") tropical woods by increasing awareness of their industrial potential. Research aimed at breaking technological bottlenecks identified by mini-research survey project number 556 above. Outputs: Research stimulating industrial use of secondary tropical woods. Proposed contractor: Forest Service, U. S. Department of Agriculture. Project manager: W. H. Littlewood, TA/OST.

Laterite Investigations. Proposed project. Major countries: Guyana and other countries to be selected. Obligation span: FY 1974-78. Life-of-project cost estimate: \$440,000. Purpose: Improved developing-country capability for mineral exploration in laterite areas, using methods reducing time and costs. Outputs: Demonstration of effectiveness of geochemical sampling and new exploration techniques. Developing country geologists better trained in laterite geochemistry and mineral exploration. Proposed contractor: Geological Survey, U.S. Department of the Interior. Project manager: B. L. Long, TA/OST.

#### Completed Project

Research in the Utilization of Latin American Woods (Exploratory Study). Ref: RR p. 95.

#### U. S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Natural Resources Planning. Proposed project. Major countries to be selected. Obligation span: FY 1974 (work span FY 1974-78). Life-of-project cost estimate: \$750,000. Purpose: Develop multidisciplinary capability in technical assistance, research, and education at a U.S. university in the field of regional resource and environmental planning, with particular emphasis on the economic and conservation aspects of reconciling conflicting demands on limited land, water, forest, minerals, energy, and other natural resources. Outputs: Application in and by less developed countries of improved techniques and methodologies for planning and managing use of the land and associated natural resources. Cooperative linkages between the grantee and developing country institutions. Proposed Grantee: University of Arizona. Project manager: B. L. Long, TA/OST.

(g) Other A.I.D. Projects

- Brazil: Mineral and Water Resources, CP-LA p. 97.  
Colombia: Mineral Resources Survey, CP-LA p. 114.  
Indonesia: Geological Survey Assistance, CP-ASIA p. 106.  
Nepal: Groundwater Investigation, CP-ASIA p. 92.  
Pakistan: Groundwater Survey, CP-ASIA p. 82.  
Philippines: TIWI Geothermal Power, CP-ASIA p. 146.  
Water Resources Development, CP-ASIA p. 136.  
Liberia: Geological Survey and Appraisal, CP-AFR p. 58.  
C&W Af. Reg.: Water Resources, CP-AFR p. 144.

(h) Policies and Priorities

"Guidance Statement on Selected Aspects of Science and Technology",  
PD 51, M.O. 1018.11, TL 9:184, p. 3-4.

(i) Technological Developments

forestry development policy - MT Oct. 1972 p. 106.  
U.S. Geological Survey participation in AID projects — MT July  
1972, p. 117.

(j) Selected References

1. Science and Technology for International Development: A Selected List of Information Sources in the United States, TA/OST 72-7, 1972, 50 p.
2. Environmental Considerations for Construction Projects, TA/OST 71-1, 1971, 31 p.
3. Environmental Problems in Selected Developing Countries (Preliminary Survey), TA/OST 71-2, 1971, 12 p.
4. Role of Remote Sensing in Developing Countries, TA/OST 71-3, 1971, 95 p.
5. Water Quality Standards and International Development, TA/OST 71-4, 1971, 26 p.
6. Economic Damage Caused by Aquatic Weeds (Preliminary Survey), TA/OST 71-5, 1971, 13 p.
7. The Role of AID in the Field of Natural Resources Planning and Management, TA/OST 72-8, 1972, 155 p.
8. Desert Encroachment on Arable Lands Significance, Causes, and Control, TA/OST 72-10, 1972, 55 p.
9. Forestry in Developing Countries, TA/OST, 72-12, 1972, 73 p.
10. The Application of Geochemical, Botanical, Geophysical, and Remote Sensing Mineral Prospecting Techniques to Tropical Areas, TA/OST 72-13, 1972, 74 p.
11. Remote Sensing: A Developmental Framework and Case Studies, TA/OST 73-15, 1973, 51 p.
12. Techniques for Assessing Hydrological Potentials in Developing Countries, TA/OST, 1973, 66 p.

13. Proceedings of the Symposium on Potential Application of Remote Sensing to Economic Development in Developing Countries, TA/OST/SM-70-1, 1970, 117 p.
14. Papers prepared for the UN Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, AID/W, 1963, 12 vol. The first two volumes are titled Natural Resources, Vol. I covers Energy, Water, and River Basin Development. Vol. II covers Minerals, Mining, Mapping, and Geodetic Control.

Note: Additional material is cited in reference 1.

3. REDUCING PUBLIC INVESTMENT COSTS

(a) Significance of Subsector

The Bureau for Technical Assistance explores, on a selective basis, technological innovations that can greatly reduce the costs of economic infrastructure activities that are heavy users of public funds, such as public works, housing, transportation, communications, and energy development. Success here releases public revenues that could be applied to other development needs. Priority is given to those activities which relate directly to the quality of life for the mass of the population such as water and sewage for low-income areas, low-income housing, and rural development.

(b) A.I.D. Specialists

Henry A. Arnold, Director, TA/OST  
 John C. Fry, Deputy Director, TA/OST  
 William H. Littlewood, Associate  
 Director, TA/OST  
 Bill L. Long, Environmental Affairs,  
 TA/OST  
 Robert H. Goeckermann, TA/OST

(c) Consultants to A.I.D.

Daniel Margolies, Science Policy  
 Dr. David Adams, Science and Environmental  
 Technology  
 Kurt Stehling, Aerospace Engineering

(d) Institutional Resources

National Academies of Sciences and Engineering  
 National Bureau of Standards  
 Massachusetts Institute of Technology - IR p. 119.  
 Arthur D. Little, Inc.  
 Monsanto Research Corporation  
 Southwest Research Institute  
 University of Oklahoma

(e) Conferences and Committees (All Technical Seminars)

most suited to overall needs. Outputs: Improved basis for regional and national transportation planning, technological choice, and investment decisions. Contractor: Massachusetts Institute of Technology. Contract: Extension of Institutional Research (Sec. 211(d)) project number 138. Project manager: J. C. Fry, TA/OST.

Completed Projects

Research on Problems of Shortage of Power at the Local Level. Ref.: RR p. 95.

Development and Performance Test of a Solar-Powered Battery Recharging Center. Ref.: RR p. 96.

Research on Foam Plastics for Housing. Ref.: RR p. 97.

Transport Research Program. Ref.: RR p. 112.

International Air Transport Study. Ref.: RR p. 113.

g) Other A.I.D. Projects

Brazil: Power Training and Technical Assistance, CP-LA p. 97.

Nicaragua: Earthquake - Public Infrastructure, CP-LA p. 71.

Peru: Housing and Urban Development (including earthquake resistant adobe houses), CP-LA p. 149.

h) Policies and Priorities

Guidance Statement on Selected Aspects of Science and Technology, PD 51, M.O. 1018.11, TL 9:184, Jan. 12, 1973, p. 4.

i) Technological Developments

See following reference.

j) Selected References

1. Science and Technology for International Development: A Selected List of Information Sources in the United States. TA/OST 72-7, 50 p., 1972.
2. Papers prepared for the UN Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, AID/W, 1963, 12 vol. Vols. V and XII cover Transportation and Communications, respectively.

URBAN DEVELOPMENT SERVICES(a) Significance of Sector

The urban population of the less developed countries has increased six-fold in the past fifty years, nearly three times as fast as in developed countries. Half of the increase is attributable to rural-to urban migration and half to more births. As a result, by 1970 the portion of the population that was urban in Latin America was 54 percent, East Asia 38 percent, Africa 22 percent, and South Asia 14 percent. Large parts of the less developed cities are characterized by the well-known problems associated with poverty and crowding -- unemployment, unsanitary conditions, malnutrition, poor housing, and discontent. On the other hand, people moving to the city have demonstrated a greater than average willingness to change, and their concentration enhances their accessibility to development activities. Urban people, as much as rural people, can benefit from such A.I.D. priorities as reducing poverty and unemployment, improving income distribution, and spacing family additions. Urban development can be viewed as a process encompassing physical growth of the city, concentration and stimulation of economic activity, attitudes and adaptations of individuals and institutions, and relationship of the urban center to the region and the nation.

(b) A.I.D. Specialists

William R. Miner, Director, TA/UD

Eric Chetwynd, Jr., urban development advisor, TA/UD

Peter M. Kimm, Director, SER/H

William Mann, Jr., Chief, Urban Industrial Development Division, LA/DR

Alan B. Jacobs, urban development, environment, aviation officer, SA/TCD

Juan C. Cabrero, Chief, urban/environment branch, SER/ENGR

(c) Consultants to A.I.D.

None

(d) Institutional Resources

Foundation for Cooperative Housing (LA/DR contract)  
 National League of Insured Savings Associations (contract  
 AID/csd-1493; services performed under task orders).  
 Urban development is an element of section 211(d) contracts  
 with Cornell University (IR p. 117) and Massachusetts  
 Institute of Technology (IR p. 119).  
 Department of Housing and Urban Development (various resources  
 including documentation service)

(e) Conferences and Committees

Urban development workshop on Aug. 28-30, 1972, at Urban Life  
 Center, Columbia, Md.  
 International Information Exchange Group on Housing and Urban  
 Development

(f) TAB ProjectsGENERAL TECHNICAL SERVICES

Selective Analytical Compendium of U.S. Experience in Urban Development, 931-11-995-993. Worldwide. Obligation span: FY 1973. Life-of-project cost estimate: \$60,000. Purpose: Analyze U.S. urban experience, describe the lessons learned which appear to be useful to developing countries, and share the results with them. Outputs: Compendium of selected aspects of U.S. domestic urban experience shared in an international urban information network. Contractor to be selected. Project manager, E. Chetwynd, Jr., TA/UD.

Capital Development: Assessing the Urban Impact of the Agency Capital Investments. Proposed project. Worldwide. Obligation span: FY 1974-76. Life-of-project cost estimate: \$115,000. Purpose: Determine impact on urban development of certain A.I.D. investments, promote better understanding of relationships between sectoral activities and urban development, and discover more effective means of allocating developmental resources. Outputs: Techniques adapted and field-tested to improve programming for specific categories of capital assistance and sectors. Contractor to be selected. Project manager, E. Chetwynd, Jr., TA/UD.

Pilot Networking in Urban Development: Fostering LDC and U.S. Institutional Resources and Linkages. Proposed project. Worldwide. Obligation span: 1974-76. \$325,000 plus institutional grants. Purpose: Help A.I.D. and LDCs improve their capacity to deal with opportunities and problems in urban development, strengthen multidisciplinary expertise, and build

information and experience into international urban development programming and research. Outputs: Selected U.S. and LDC institutions fostered as nodes of an international urban development network and an expanded reservoir of manpower and other resources in research, training, analysis, and problem solving. Contractor to be selected. Project manager, W. R. Miner, TA/UD.

#### CENTRAL RESEARCH

Land Use Programming: Discovering Practical and Adaptable Approaches for Developing Countries. Proposed project. Worldwide. Obligation span: FY 1974-77. Life-of-project cost estimate: \$375,000. Purpose: To help meet the LDC need for techniques usable in solving urban land use problems. Outputs: Practical approaches to land use developed for use in urban development programming and for incorporation in international urban development network. Project manager, E. Chetwynd, Jr., TA/UD.

#### Project cross-references (See Science and Technology section 3)

- Structures for earthquakes
- Low-cost housing for typhoons
- Low-cost roofing
- Sulfur bonding

#### U.S. INSTITUTIONAL DEVELOPMENT (SEC. 211(d))

Networking in Urban Development. U.S. institutional grants of \$1.5 million are proposed in connection with the General Technical Services network project described above.

(g) Other A.I.D. Projects

- Bolivia: Sites and Services (Housing), CP-LA p. 92.  
 Colombia: Urban/Regional Sector, CP-LA p. 119.  
           Savings and Loan Seed Capital, CP-LA p. 114.  
           Urban Development, CP-LA p. 115.  
 Costa Rica: Savings and Loan System, CP-LA p. 26.  
           Municipal Development, CP-LA p. 28.  
 Ecuador: Social and Civic Development, CP-LA p. 130.  
 Guatemala: Municipal Development, CP-LA p. 46.  
 Honduras: Savings and Loan System, CP-LA p. 58.  
 Jamaica: Jamaica Mortgage Bank, CP-LA p. 197.  
 Nicaragua: Municipal Planning, CP-LA p. 68.  
           Secondary Cities Development, CP-LA p. 70.  
 Panama: Cooperative Housing System, CP-LA, p. 76.  
           Low-Income Housing, CP-LA p. 76.  
 Paraguay: Municipal Development, CP-LA p. 135.  
           Savings and Loan, CP-LA p. 135.  
 Peru: Housing and Urban Dev., CP-LA p. 149.  
 Caribbean Reg.: Caribbean Dev. Loan - Housing, CP-LA p. 163.  
 LA Regional: Cooperative Approaches to Low-Income Housing, CP-LA  
           p. 213.  
 Spain: Environmental and Urban Affairs, CP-SA p. 49.

(h) Policies and Priorities

"Guidance Statement on Urban Development", approved by the Administrator, June 15, 1973, 4 p. Its program conclusions, in summarized form, are:

- (1) AID needs to keep abreast of the urban dimensions of the development process in the LDCs and to look ahead to the implications of their growing urbanization for LDC development programs and policies.
- (2) Country programs should continue to provide capital and technical assistance and investment guarantees for urban development, selectively, where host country interest and support is strong and where the activities are comparatively potent means of improving the quality of life.
- (3) As Agency resources permit, a modest set of research and development and interregional services activities should be supported to increase understanding of urban problems, improve information on urban development, and train LDC manpower in urban development.
- (4) We should encourage other assistance organizations, including private voluntary organizations, to become more active in urban development. We should foster building collaborative networks of research and development and experience sharing in this field.

(i) No entry.

(j) Selected References

- Urban Growth and Development As a Component of Agency Policy and Programs, TA/UD, Feb. 12, 1973, 39 p. plus annexes.
- Urban Development Including Housing - A Selected List of References for A.I.D. Technicians, A.I.D. Bibliography Series, Development Administration No. 7, 1970, 16 p.
- Focus on Urban Development: Perceptions, Problems, Approaches, and Needs - A Potential Role for U.S. Foreign Assistance, TA/UD, 1972, 252 p.
- Cooley, Stephen W., A.I.D. Technical Assistance for Urban Development: A Study of Agency Experience, 1949-1970, TA/UD, 1971, 33 p.
- Fukuda, Mariko, A.I.D. Technical Assistance for Urban Development: Experience and Trends During Fiscal Year 1971, TA/UD, 1972, 16 p.
- Report on A.I.D. Urban Development Workshop, TA/UD, 1972, 135 p.
- Urbanization - Sector Working Paper, World Bank, 1972, 111 p.

Development Digest (ref. DD):

- "Guidelines for Housing and Slum Clearance in African Cities", Oct. 1962, p. 81-91.
- "Housing", July 1963, p. 51-76.
- "Housing and Development", April 1966, p. 47-72.
- "Housing in Latin America", Oct. 1962, p. 44-48.
- "Urban Dispersion", July 1972, p. 93-124.
- "Urban Problems", Jan. 1967, p. 1-38.
- "Urbanization", July 1969, p. 45-84.

Note: TA/UD has a brief annotated bibliography in process. The office maintains an urban information resource file of over 500 entries cross-referenced by author, subject, and country.

MULTI-SECTOR SERVICES

The Bureau for Technical Assistance has separate offices providing services in the previously described seven sectors-- agriculture, development administration, education, health, nutrition, science/technology, and urban development. In addition, the Bureau has three offices conducting technical assistance projects encompassing all or many sectors. They are, as described in M.O. 204.8, the Office of Program and Methodology (TA/PM), Office of Research and Institutional Grants (TA/RIG, formerly TA/RUR), and Office of Special Technical Services (TA/STS). Descriptions of functions and projects of these three offices follow.

Office of Program and Methodology

TA/PM is the Bureau for Technical Assistance's program office and also has a Methodology Division concerned with analytical techniques for applying behavioral science to the design and management of technical assistance activities. Senior staff: David G. Mathiasen, Associate Assistant Administrator. James W. Green, Chief, Technical Assistance Methodology Division. Carl R. Fritz, Chief, Program Division.

Technical Assistance Methodology Development, 931-11-995-960.  
Worldwide. Obligation span: FY 1970 and continuing as long as needed. Cost estimated to vary up to \$373,000 annually. Purpose: Improve efficiency of the processes and relationships of technical assistance by identifying and further developing more effective generic methodologies, and having them adapted and utilized by technical assistance personnel. Outputs: Reports on identification of high-potential technical assistance personnel and on effective training and support of them. Sector analysis methodology. Measurements of social development. Dissemination of technical assistance methodological research findings and validated experience. Expand competence of U.S. and developing-country institutions in technical assistance methodology and in operations research. New section ("Focus: Technical Cooperation") in International Development Review. Completed publications include "Selecting Effective Leaders of Technical Assistance Teams", Technical Assistance Guidance Series, TAGS-2, 1973; "Guide for Team Leaders in Technical Assistance Projects", 1973; bibliographies on social Technical Assistance Projects, 1973; bibliographies on social indicators and on advisor/counterpart relations; "Institution Building: A Source Book" by Melvin G. Blase, A.I.D., 1973; and "Institution Building-A Model for Applied Social Changes" edited by D. Woods Thomas, et al. Also were reports of institution-building conferences at Purdue University in 1969 and in Kathmandu, Nepal and San Salvador, El Salvador, in 1971. Project manager: J. W. Green, TA/PM.

Host-Country Colleagues/Technical Assistance Advisor Relationships.  
Proposed project. Worldwide. Obligation span: FY 1975. (work span FY 1975-77). Life-of-project cost estimate: \$500,000. Purpose: Obtain improved insights into relationships between host-country expert colleagues and technical advisors so as to improve selection, training, assignment, and support. Outputs: Empirical research analyzing the interrelationships between host-country and donor-country personnel during technical assistance. Reports of such results written and distributed in a way as to be receptive and to contribute to improvement of projects. Project manager: J. W. Green, TA/PM.

Office of Research and Institutional Grants

TA/RIG is A.I.D.'s central staff office responsible for centrally-funded research and for grants to institutions (under Foreign Assistance Act section 211d) to strengthen specified aspects of their technical assistance, research, and training capabilities. Its mission includes fostering effective utilization of research findings and providing a central point of contact with university communities. Senior staff: James K. McDermott, Director. Miloslav Rechcigl, Jr., Assistant Director for Operations, Delbert T. Myren, Assistant Director for Planning Analysis and Utilization. Of the following three projects, the first two are General Technical Services and the third is Central Research.

University Data Bank, 931-11-995-884. Worldwide. Obligation span: FY 1970-74. Life-of-project cost estimate: \$150,000. Purpose: Provide up-to-date information on resources of universities from the standpoint of possible A.I.D. contracts or grants. Outputs: Periodic printouts of university activities, by institution, program, subject matter, and country or region. Annual analysis of findings and trends. Ad hoc printouts, on request, of university activities having prescribed characteristics. Contractor, through U.S. Department of State (Bureau of Educational and Cultural Affairs): Academy of Educational Development, Washington, D. C. Project manager: C. H. Barker, TA/RIG. Ref.: M.O. 1621.3, Nov. 17, 1971.

Evaluation and Utilization Activities, 931-11-999-987. Worldwide. Obligation span: FY 1973 and continuing as long as needed. Cost estimated at \$1,316,000 in FY 1973-75. Purpose: Improve utility of TAB-funded research and 211(d) grants through evaluation and dissemination of results. Outputs: Evaluation reports. Improved publications dissemination system. Project manager: D. T. Myren, TA/RIG.

Small Research Project Program, a general term for small research projects reported elsewhere in this directory. Worldwide. Obligation span: FY 1972 and continuing as long as needed. Cost estimated to increase from \$89,000 in FY 1972 to \$300,000 annually by FY 1974, each component funded elsewhere as a separate project. Purpose: (1) Provide "pre-research" either to improve project design of major research projects before they are accepted or to analyze problem situations before firm decisions on research approaches are reached. (2) Arrange specific

analyses of data in hand for immediate agency needs or for high returns from small, one-shot research investments. Outputs: Quick analytical reports on research project feasibility, state-of-the-art of specific subjects, potential contractors, project design, etc. Project manager: M. Rechcigl, TA/RIG.

Office of Special Technical Services

TA/STS develops cooperation with non-AID-related developing countries by programs of technical exchange and reimbursable technical services, encourages increased use in AID-related countries of reimbursable technical services where suitable, and undertakes special projects not readily performed by technical offices or which cross organizational boundaries. In conducting these activities, TA/STS arranges with the U.S. private sector and government agencies for reimbursed technical advisory services, arranges reimbursed training of LDC technicians in the U.S., and sends individuals or teams of experts on short assignments to LDCs (at no cost to the LDC) to discuss requirements for purchase of U.S. services or commodities. As an example of the latter, a survey mission went to Iran in 1972; a report is available from TA/STS. (One outgrowth of the survey was a government of Iran agreement with the U.S. Department of Agriculture for the services of a seven-member, reimbursed livestock development team for two years.) TA/STS also participates in transition planning to assure institutional continuity and viability as concessional assistance is reduced. Senior staff: John H. Tobler, Director; Alex Dickie, Jr., David K. Harbinson, William W. Rhodes, Ogden Williams.

Project Review Committees

Central Research projects and U.S. Institutional Development (section 211d) are reviewed by the inter-bureau Research and Institutional Grants Committee (RIGC). Membership in July 1973 was as follows.

<u>Bureau</u>	<u>Member</u>	<u>Alternate</u>
Asia	William R. Thomas, 3rd	James J. Dalton Rodger Sedjo
Latin America	Carl F. Van Haeften	Glenn O. Patterson
Africa	Princeton Lyman	John Blumgart John L. Cooper
Supporting Assistance	Robert R. Johnson	James Cudney
Program and Policy Coordination	Robert J. Muscat	Frank J. Moore
Population and Humanitarian Assistance	Stephen Bergen	
Program and Management Services:		
Contract Mgt.	Robert J. O'Brien	
Int. Training	Philip Sperling	William J. Elsen
Engineering	John H. Rixse	
General Counsel	A. R. Richstein	Anne Vignovic
Labor Affairs	Burnie Merson	

Central research projects are also reviewed by A.I.D.'s external Research Advisory Committee (RAC). Members, as of July 1973, were as follows:

- David A. Adams, President, Coastal Zone Research Center, Wilmington, N.C.
- C. Arnold Anderson, Director, Comparative Education Center, University of Chicago.
- James P. Carter, Director, Maternal and Child Health/Family Planning Training and Research Center, Meharry Medical College.
- Charles R. Frank, Jr., Brookings Institution
- Everett E. Hagen, East-West Technology and Development Institute, East-West Center, Honolulu.
- Earl O. Heady, Executive Director, Center for Agricultural and Economic Development, Iowa State University.
- Herbert H. Kramer, Director, Agricultural Experiment Station, Purdue University.
- Forrest E. Linder, Director, International Program of Laboratories for Population Statistics, School of Public Health, University of North Carolina.
- Varnum D. Ludington, Cary, N.C.
- Malcolm H. Merrill, Director, Division of International Health Programs, American Public Health Association.
- Max Milner, Director of Secretariat, Protein Advisory Group of the United Nations System.
- John D. Montgomery, Professor of Public Administration, Harvard University.
- D. F. Peterson, Dean, College of Engineering, Utah State University.
- Maurice L. Peterson, Professor, Department of Agronomy, University of California, Davis.
- Vernon W. Ruttan, Chairman, Department of Agricultural Economics, Institute of Agriculture, University of Minnesota.
- B. S. Schweigert, Chairman, Department of Food Sciences and Technology, University of California, Davis.
- Ralph H. Smuckler, Dean of International Studies and Programs, Center for International Programs, Michigan State University.
- Raymond Tanter, Associate Professor, Department of Political Science, University of Michigan.
- Robert S. Whitney, Head, Department of Agronomy, Colorado State University.
- Samuel M. Wishik, Director, International Institute for the Study of Human Reproduction, Columbia University.

DOCUMENTS

References in the main body of this directory are of two types: (1) Those indicated by a two-letter symbol, such as CP; they are basic A.I.D. publications which cover across-the-board several or all sectors and subsectors. (2) Other documents, usually specialized as to subsector, whose author, title, publisher, date, and number of pages are spelled out in subdivision "j" of each subsector section of the directory.

1. Cited A.I.D. Publications

A two-letter symbol identifying each A.I.D. publication frequently cited in this directory is given in the accompanying list together with title, office of issuance, and nature of contents. The list includes a few publications by A.I.D.-funded contractors. Every USAID and AID/W Bureau should have received these twenty-four basic A.I.D. references (some are sets of references). It may be useful to have them located where all staff members have ready access to them. Copies may be obtained as indicated in the following pages. Problems in obtaining documents or general questions should be addressed to Allan Matthews, TA/PM, AID/Washington.

List of Cited A.I.D. Publications

<u>Symbol</u>	<u>Title, Originating Office, and Contents</u>
AG	Research and Technical Assistance Programs in Agriculture and Fisheries, Fiscal Year 1970-1971 ("Gray Book"), TA/AGR 1971, 56 p. Describes projects begun in 1960-70 as to problems, objectives, plan of work, and results. Lists starting date, projected termination date, and contractor.
AY	Summary of Ongoing Centrally-Funded Research and Technical Assistance Projects in Agriculture, Fiscal Year 1971-72 ("Yellow book"), TA/AGR, 1972, 36 p.
CH	TAICH News, issued periodically by Technical Assistance Information Clearing House, New York, N.Y., an AID-funded contractor. Contains news, project highlights, and notices of new publications pertaining to U.S. voluntary agencies, foundations, church missions, and other non-profit organizations. To get on mailing list, write to TAICH, 200 Park Ave. South, New York, N.Y. 10003.
CN	Office of Controller, W-253 project reports, as of June 30, 1972:  CN-TC Technical Assistance Completed Projects CN-TO Technical Assistance Projects (Ongoing) CN-CC Capital Assistance Completed Projects CN-CO Capital Assistance Projects (Ongoing)  Contains project number, month started and expected completion, obligations and expenditures in FY 1972 and cumulative through 6/30/72, unliquidated obligations 6/30/72. Available from Financial Analysis Section, Central Accounts Branch, SER/C/ACC.
CP	AID FY 1974 Presentation to Congress, 1973, 6 vol.:  CP-DA Development Assistance (General) CP-LA Latin America CP-ASIA Asia CP-IC Indochina Postwar Reconstruction Assistance CP-AFR Africa CP-SA Security Supporting Assistance  Available from L/LPCS.
CR	AID Central Research Program (TA Bureau), Projects Data from January 1962 through March 31, 1973. Contains project title, contractor name, contract number, duration dates, funding data. Available from TA/RUR.

- DD Development Digest. (Titled Development Research Digest in 1962-64). Published quarterly by the National Planning Association for A.I.D. since July 1962. Each issue contains a dozen or more professional articles (some of which are condensed from other sources). Like articles are grouped in categories changing from issue to issue. PPC/MGT handles A.I.D. distribution.
- EC A Survey of A.I.D. Educational Cooperation with Developing Countries, U.S. Office of Education, 1972, 91 p. Prepared at request of TA/EHR. Describes A.I.D. education projects, including objective, expenditures, and progress to date. The projects are grouped by country and region.
- ES Program Strategy in Education and Human Resources, FY 1973-1974, TA/EHR, 1972, 59 p. Describes key problem areas in education in terms of problems, potentials for development, strategy, strengthening U.S. and LDC capabilities, prospects, and A.I.D. resource allocations. There is also a section on externally determined education program activities.
- HI Key Problems Impeding Modernization of Developing Countries — The Health Issues, by Lee M. Howard, M.D., TA/H, 1970, 55p.
- HN Report on the Health, Population and Nutrition Activities of the Agency for International Development, Department of State, for Fiscal Year 1971, prepared by Office of International Health, Department of Health, Education, and Welfare, 1972, 425 p.
- IG Institutional (Development) Grants, 211(d) Program, May 31, 1972, 10 p. Contains name of institution, document numbers, amount and date of grant, AID and institutional project manager, purpose. Available from TA/RUR.
- IR A Directory of Institutional Resources Supported by Section 211(d) Grants--U.S. Centers of Competence for International Development, TA/RUR, 1972, 124 p. Under subject groupings such as subsectors, the directory describes each U.S. institution in terms of its Section 211(d) projects, instructional resources, research resources, information resources, and consulting services.

- IT Instructional Technology Report, published periodically by the Information Center on Instructional Technology, Academy for Educational Development, Washington, D. C. Describes current and planned projects, conferences, etc.
- MD AID Memory Documents, A.I.D. Reference Center, SER/DM
- MD - 1/1 Vol. 1, No. 1, March 1972  
 MD - 1/2 Vol. 1, No. 2, June 1972  
 MD - 1/3 Vol. 1, No. 3, September 1972
- These are catalogs of A.I.D.-generated documents, maintained in the A.I.D. Reference Center. The documents include feasibility studies, issues papers, sector analyses, progress reports, evaluation studies, program plans, and project reports. They are indexed in four ways: subject and geographic, personal author, corporate author, and contract and project numbers.
- MT Application of Modern Technologies to International Development, a periodical sponsored jointly by TA/OST and the National Technical Information Service (NTIS), U.S. Department of Commerce. First four issues designated 72-1, 72-2, 72-3, and 72-4, published in Jan., Apr., July, and Oct. 1972, respectively. Issues 73-1 and 73-2 published in Jan. and April 1973, respectively. Contains annotated references of research sponsored by the U.S. Government in the fields of chemistry, materials, and engineering. Each reference is available from NTIS at a nominal stated price.
- NP U.S. Non-Profit Organizations in Development Assistance abroad, edited by Barbara Crosby and Stuart J. Smyth, Technical Assistance Information Clearing House, New York, 1971, 1038 p. Under contract to A.I.D. Part I lists alphabetically voluntary agencies, foundations, and religious missions and describes personnel, objectives, programs, resources, and publications. Part II is classified by continent and country and presents organizations, local address and personnel, and projects.
- PR Contract Program in Centrally Funded Research, TA/RUR, 1972, 21 p. Describes types of research projects funded by AID/TA, project proposal submission, and project review procedures.

- RA Roster of Scientists, Technicians and Experts  
Available through the Office of Agriculture, TA/AGR, 1973, 76 p. Includes for each specialist: field of competence, education, positions held, summary of foreign language proficiency, and other skills and specializations. With regard to institutional resources, describes regions and subjects of special concern and lists some of staff.
- RR The AID Research Program 1962-1971 - Project Objectives and Results, TA/RUR, 1971, 115 p. Under subject groupings such as subsectors, describes purpose and results of each research project. Lists name of contractor, principal investigator, and A.I.D. monitor, and gives dates of project duration and contract number.
- RS Supplement to the AID Research Program 1962-1971 (RR) above, TA/RUR, 1972, 29 p. Excludes results (as these are new projects).
- TG Technical Assistance Guidance Series. Presents generic methods and techniques which have been found to make technical assistance processes and relationships more effective. Issued periodically by Technical Assistance Methodology Division, TA/PM.
- VF Voluntary Foreign Aid Programs, PHA/PVC, 1972, 25 p.  
Gives address of voluntary agencies, principal activities, dollar amounts of income, A.I.D. assistance, U.S. government grants and contracts, donations of supplies and equipment, and expenditures.
- VT Village Technology Handbook, prepared by VITA (Volunteers for International Assistance), Schenectady, N.Y., and published by AID/TA/AGR, 1970, 387 p. Describes techniques and devices which can be made and used in villages.

## 2. Other Documents

How to obtain documents, other than the cited A.I.D. publications listed above, is described in the following paragraphs.

**BEST AVAILABLE DOCUMENT**

A.I.D. Bibliographies. -- Twenty-two annotated bibliographies on key problem areas and other subsectors of agriculture, development administration, and civic participation have been issued in the AID Bibliography Series and are listed in this directory under appropriate categories. These bibliographies (in contrast to A.I.D. Memory Documents) cover mainly publications from sources other than AID. AID personnel may obtain the bibliographies from the Information Systems Division of SER/DM. The bibliographies are prepared under the auspices of the Division's A.I.D. Reference Center (ARC) and are open for inspection at the Center, room 1656 New State Building. Additional bibliographies in this series are expected to be published.

A.I.D.-Funded Research Documents. -- A.I.D. will initiate in mid-1973 a new periodical, A.I.D. Research Abstract Quarterly, issued by the National Technical Information Service (NTIS), U.S. Department of Commerce. Each issue will contain about 100 abstracts of reports prepared by A.I.D.-funded contractors. Most of the reports will emanate from A.I.D.'s Centrally Funded Research program, but some will be from the General Technical Services and U.S. Institutional Development (Section 211(d)) programs. The periodical will indicate how the original document, microfiche, or xerox copy can be obtained and at what price.

Books. -- Books may be ordered through a central source on the basis of a SER/PROC/RSS contract in accordance with M.O. 1425.3, Procedures for A.I.D. Procurement: Books, Aug. 23, 1972. The present contractor is BFL Communications Inc., 50 Liberty Ave., Freeport, N.Y., 11520. Books may also be procured from their publisher or from an alternative dealer provided the dealer prices are not higher than those of the A.I.D. contractor.

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Pamphlets and Reports. -- Generally, A.I.D. personnel

desiring retention copies of pamphlets and reports should submit their requests to the office of issuance. Alternatively, requests may be directed to the technical or subsector backstop office.

References containing an NTIS PB number can be ordered from:

National Technical Information Service  
U. S. Department of Commerce  
Springfield, Virginia 22151

The NTIS copies (up to 300 pages in length) cost \$3.00 in paper and \$.95 in microfiche. References containing an ARC number may be used in or borrowed by AID/W personnel from the AID Reference Center, SFR/DM, Room 1656, NS. AID overseas staff interested in references with ARC numbers should ask their technical backstop office to consult with ARC as to the best means of making the materials available.

Periodicals. - Periodicals may be ordered through a central source on the basis of a SER/PROC contract in accordance with M.O. 1425.3.1, Procedures for AID Procurement: Magazines and Periodicals, Aug. 22, 1972. The present contractor is EBSCO Subscription Services, 545 Cedar Lane, Teaneck, New Jersey, 07666. Periodicals may also be procured from their publisher or from an alternative dealer provided the dealer prices are not higher than those of the A.I.D. contractor.

Project Documents. -- If a person is interested in details about particular AID projects such as those listed in this directory, he should ask for the PROP, PAR, loan paper, or other project documents from his technical backstop office. The A.I.D. Reference Center and occasionally the geographic desks and USAID Mission also have loan or retention copies.



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Motion Picture Films. -- Motion picture films, 16 mm. in size, may be borrowed from the A.I.D. Film Loan Library in SER/MO/PAV. Requests from USAID Missions should be in two-way memoranda (DF 27) via unclassified air pouch. Films will be forwarded by air pouch and should be returned in the same manner. "Motion Pictures Catalogue -- Loan Films on Agriculture, Education, Industry, and Health", published by AID/W in 1966, describes available films and indicates sound and color characteristics, viewing time, and institutional source. An updated edition of the catalogue is expected to be issued in fall 1973. PHA/PVC distributes a descriptive list of films which may be borrowed from voluntary agencies.

Foreign Language Publications and Films. - Translation, production, and distribution of U.S. technical publications and films in the Spanish language are provided by the A.I.D.-supported Regional Technical Aids Center (RTAC), Mexico City, with a branch office in Buenos Aires. (The similar center in Paris for services in the French and Arabic languages has been discontinued.) A.I.D. assists a Regional Textbook Production Center, Yaounde, Cameroon, to publish textbooks in French and English.

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