

A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS

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Agency for International Development
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INTRODUCTORY NOTES

A.I.D. Research and Development Abstracts (ARDA) announces R&D titles produced under the sponsorship of the Agency for International Development. The goal of ARDA is to transfer development and technical information to LDC institutions, to USAID Missions, to A.I.D. staff, and to other interested parties. It guides its users to sources where copies may be obtained.

The following documents in this issue are of special interest:

(1) The supporting papers and reports of Study Teams appointed by the National Academy of Science to do the World Food and Nutrition Study—see items 514-518.

(2) Papers on the use of solar energy in LDCs—see items 588-589.

This issue also highlights the following subject areas:

(1) Appropriate Technology and Technology Transfer—see items nos. 458, 459, 543-546, 576-586, 600, and 601;

(2) Postharvest food loss—see items 510, 511, and 513.

ARDA is also continuing its coverage of documents on:

(1) Women in development—see items 462, 557, and 558;

(2) the SAHEL region—see items 461, 506, and 559;

(3) Sector papers on Latin America—460, 463, 552, 561, 562, and 575.

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April 1978

JUST PUBLISHED

CATALOGUE OF RESEARCH LITERATURE FOR DEVELOPMENT, Volume II:

- FOOD PRODUCTION AND NUTRITION
- DEVELOPMENT AND ECONOMICS
- EDUCATION AND HUMAN RESOURCES
- HEALTH
- SELECTED DEVELOPMENT AREAS

RESEARCH LITERATURE FOR DEVELOPMENT

**VOLUME II:
FOOD PRODUCTION AND NUTRITION
DEVELOPMENT AND ECONOMICS
EDUCATION AND HUMAN RESOURCES
HEALTH
SELECTED DEVELOPMENT AREAS**



**U.S. Agency for International
Development (A.I.D.)**

This work indexes a major portion of R&D materials produced since 1962 under programs supported by the former Bureau for Technical Assistance and other A.I.D. Bureaus. Approximately 3,600 titles, arranged by subject categories, are cited under appropriate descriptors. Author, contract, and issuing office indexes are provided. The CATALOGUE cumulates titles abstracted in past issues of A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS.

Volume II of the CATALOGUE cumulates titles in the following subject areas: food production and nutrition, development and economics, education and human resources, health, and selected development areas (science and technology, urban development and housing, social studies, population, communications, and library and information science).

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SAMPLE DOCUMENT CITATION AND ABSTRACT

Item Number & Title	[(171) WHEAT X RYE EQUALS TRITICALE Wolff, Tony]	Author(s)
Document Date & Number of Pages	[1976, 15p. CIMMYT (AID/ta-G-1083 GTS)]	Issuing Office & Contract/Grant Number or Symbol
Series Note	[(In CIMMYT today, no. 5)]	
Abstract	<div style="border: 1px solid black; padding: 5px;"> <p>Triticale, a new crop bred at CIMMYT, is a cross between wheat and rye. It is the first successful "man-made" cereal grain. It is more than a biological curiosity. For the tropics and subtropics, it offers promise of yields and other characteristics equal to those of wheat, combined with tolerance for drought and poor soil and the resistance to disease typical of rye. The success of triticales encourages the hope that other such intergeneric "wide crosses" will soon follow. Triticale has demonstrated an adaptation to acidic, low pH soils in several areas of the world. Such conditions exist in Colombia, Ethiopia, Northern India, and Brazil. In each of these countries triticales have shown yield performance superior to wheat. The resistance of triticales to bunts and loose smut at higher elevations is an advantage for the crop. Its greater resistance to <i>Septoria tritici</i> is an added advantage in areas where this disease is prevalent—Brazil, Argentina, Ethiopia, and the Mediterranean region. In Kenya and some other locations, triticales has outyielded wheat under drought conditions. Experts expect that in fifteen years triticales will be competing seriously with the bread wheats as one of the world's most important food crops.</p> </div>	
Publication Number	[PN-AAD-154	Paper copy \$2.00 Microfiche \$1.00] — Prices

(Related titles in a series are frequently listed below the citation.)

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AGRICULTURE AND NUTRITION

AGRICULTURAL RESEARCH

(451) CROP INDICATOR LINES FOR AGRICULTURAL RESEARCH AND PRODUCTION

Leininger, L.N.; Peterson, H.B.
1977, 16p.

Utah State (CSD-2459 211d)

The worldwide cultivar testing trials conducted each year generate large amounts of information which is not transferable because it is time- and site-specific. This paper suggests a means of solving this problem. It proposes that a systems analysis technique be used to develop mathematical relationships for describing significant interactions among the components of crop production. These relationships would be synthesized into computer simulation models of various crops. The test plants employed would have known genetic sources. Different genotypes would need to be used, but those could be held to a minimum if widely adapted genotypes in each crop are identified, catalogued, and made available. This paper discusses such selection by using two major world crops, corn and soybeans which illustrate two major genetic systems in use for crop production: hybrids and pure lines. Such a consolidation of research efforts would assist in making it more possible to meet world food needs. The paper defines indicator lines, discusses types of indicator lines needed, the types available, the number of indicator lines needed, the use of open-pedigree stock, and the benefits of using indicator lines. One benefit of the proposed research system is that plant breeders and geneticists could predict the value of new genetic combinations without having to grow them in all possible environments.

PN-AAE-487

Paper copy \$2.00
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(452) STATISTICAL PROCEDURES FOR AGRICULTURAL RESEARCH WITH EMPHASIS ON RICE

Gomez, K. A.; Gomez, A. A.
1976, 298p.

IRRI (AID/ta-G-1074 GTS)

Agricultural scientists need to apply correct statistical techniques in their experiments. However, many such scientists in developing countries have little training and experience with statistics. This book is for their use. It will help them to grasp statistical concepts and to apply them in practice. The chapters of the book discuss valid experimental designs, single-factor experiments, two-factor experiments, three-or-more-factor experiments, comparisons among treatment means, regression and correlation analyses, covariance analysis, the Chi-square test, problem data, soil heterogeneity, competition effects, sampling in experimental plots, and mechanical errors. The chapter on sampling in experimental plots discusses basic concepts in sampling, the sampling population, sampling unit, sample size, sampling design, simple random sampling, multistage sampling, stratified random sampling, methods of estimation, and development of a sampling plan. The chapter on mechanical errors discusses furrowing, selection of seedlings, thinning, transplanting, fertilizer application, seed mixture and off-types, plot layout, measurement errors, and transcription of data.

PN-AAE-505

Paper copy \$25.50
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(453) PROCEEDINGS; CONFERENCE ON THE U.S. UNIVERSITY AND TITLE XII, MINNEAPOLIS, MINN., 1977
Stavrakis, Olga; Nelson, Sally; Minn. Univ. Inst. of Agr., Forestry, and Home Economics
1977, 114p.

Minn. (AID/ta-G-1423 GTS)

This report includes the major addresses and summaries of the discussions at the Title XII Conference in Minneapolis in May 1977. The conference had three major purposes: to provide an opportunity for the Board for International Food and Agricultural Development to report on its deliberations, identify emerging issues, and to present programs, policies and procedures for implementation of Title XII legislation; to provide an opportunity for university administrators and faculty to raise questions and discuss issues with BIFAD and A.I.D.; and to provide an opportunity to identify and discuss various possibilities for effective university involvement in international food and agricultural development through Title XII. Some of the papers presented in the first section include: ways in which U.S. universities need to be strengthened to effectively respond to Title XII, a brief report on university linkages study, mobilizing resources of universities for agricultural development in developing countries, mobilizing resources to effectively contribute toward solving world hunger and malnutrition, and a progress report on the first six months for BIFAD. Section three contains several appendices which provide background, support or elaboration on various parts of sections one and two.

PN-RAB-767

Paper copy \$10.20
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(454) BOARD FOR INTERNATIONAL FOOD AND AGRICULTURAL DEVELOPMENT: THE FIRST YEAR; PROGRESS REPORT, 1977

AID/BIFAD
1977, 257p.

AID/BIFAD

A PROJECT: To provide an expanded role for U.S. agricultural colleges and universities in helping to solve the critical food problems of the developing world.

DURATION: October 1976-Ongoing

DEVELOPMENTS: This report is intended to inform the educational research and development communities, government and the public of the activities of the Board for International Food and Agricultural Development during its first year. It includes a section on each of the following: background, objectives, issues, progress, participation in policy, planning, budgeting and programming, baseline studies, participation in foreign assistance, communications, and the developments in farmer to farmer programs and the BIFAD budget. The principal activities of the first year were: the development and adoption of a charter, definition of the role of the board, establishment of criteria for the scope of Title XII activities, implementation of a process and establishment of a provisional roster of Title XII eligible universities, establishment and activation of subordinate units, review and recommendations on proposed revision of U.S. bilateral agricultural development assistance strategy, and participation in review of FY 79 program proposals and budget requests. Priority issues under active consideration are: means of rapidly expanding U.S. university participation in U.S. bilateral agricultural development assistance programs through Title XII, development of a roster of agriculturally developing countries which may benefit from participation in Title XII programs, means of improved communications with U.S. university communities, A.I.D. country missions and other interested entities, and evolving longer term issues such as A.I.D. reorganization for an effective Title XII program, and needed changes in de-

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AGRICULTURE AND NUTRITION

velopment assistance legislation for expanding U.S. bilateral agricultural developmental assistances.

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AGRICULTURAL EXTENSION

(455) MULTIPLE CROPPING PROJECT, USAID/EL SALVADOR; AND THE CENTRO NACIONAL DE TECNOLOGIA AGRICOLA—TRIP REPORT

McDermott, J. K.
1977, 14p.

AID/TA/AGR

This report evaluates the USAID multiple cropping project being implemented through a grant to the Centro Nacional de Tecnologia Agricola (CENTA) in the form of a contract with the University of Florida. A secondary purpose is an analysis of CENTA per se, since this has so many implications for the project. CENTA was established in 1942 and is a conventional research and extension organization. It emphasizes basic grains and genetics and relies heavily on modern inputs such as credit, fertilizer, herbicides, pesticides and certified hybrid seed. Operating style consists in the development of a commercial technology and in the persuading of farmers to adapt it with whatever material assistance the public sector can provide. The research division is divided into departments including agriculture, home economics and youth work. Multiple Cropping (MC) has an inter-disciplinary group attached to it, but places almost all its emphasis on crops and closely related disciplines. It appears that MC has not yet been made relevant to specific groups of small farmers. The major obstacle in making MC relevant is the style of operation that emphasizes commodities and modern biological and chemical technologies surrounding those commodities. Inadequate attention is given to the farmer and to economic technology and perhaps other social factors. Short-term alternatives recommended are: re-designing the project to better meet the needs, current technology and resource endowment of the farmer and forming a Center extension service within CENTA. It is also necessary to address the problem of material support to the field extension workers and to form linkages with those entities that grant authority and allocate resources. A long term expansion plan is recommended for CENTA, with special attention given to livestock and manpower development.

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AGRICULTURAL DEVELOPMENT

(456) CURRENT APPROACHES TO INTEGRATED RURAL DEVELOPMENT, NOTES

Zvinakis, Dennis
1974, 53p.

AID/TA/AGR/ESP

Examines integrated rural development (IRD) and recommends means by which donor agencies can successfully stimulate integrated rural development in the developing countries. Past attempts by donor agencies to stimulate IRD have often resulted in helping farmers who produce for market sales, rather than the poor farmers whose production is used for subsistence. Such programs have not achieved their major objective. This paper recommends that donors should select projects more carefully; they must study the political climate and find out which farmers the project will benefit. The donor agency must evolve and accept a new definition of economic progress—a definition that includes food production, the distribution of production, and the development of non-productive rural services. The donor

agency should shift from technical solutions and should concentrate on building local institutions and systems through which people can gain access to the economic and social system of the country. A donor agency must be willing to have the host country set the direction for the program; it should confine itself to evaluating and supporting locally initiated projects. Finally, existing information concerning IRD projects needs to be analyzed and codified. A donor agency should consider appointing a task force to evaluate available information on what has worked, what has not worked, and the reasons why.

PN-AAD-490

Paper copy \$5.15

Microfiche \$1.00

(457) FEASIBILITY ANALYSIS FOR AGRICULTURAL PROJECTS

Phillips, Richard
1970, 260p.

AID/ASIA/USAID/Korea

Korean agriculture is shifting from semi-traditional to more modernized techniques of production and commercial agriculture. This change will require a large private and governmental capital investment. Major investments are seen in all-weather farming, food processing, mechanization of agricultural production, livestock development, marketing and storage facilities, and rural roads. Since capital is scarce and costly, investment funds must be used wisely if the goals are to be achieved. A systematic approach is required to identify high priority projects. The highest priority projects are those that contribute most to national economic growth. A widely accepted indicator of a project's economic potential is the internal rate of return (IRR). The steps in economic feasibility analysis and procedures for determining the IRR are developed in detail in this Handbook. This document should assist local staffs in doing an economic feasibility analysis of agricultural projects. This handbook is organized around six specific case studies which illustrates the procedures and techniques involved. There are instructions for adopting these materials to other types of agricultural, forestry, and fisheries projects. There is also a system of worksheets covering all phases of feasibility analysis, from the projections of market demand for the products to the determination of the IRR and projected financial statements for the project.

PN-AAD-436

Paper copy \$22.35

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(458) APPROPRIATE TECHNOLOGY FOR AGRICULTURAL DEVELOPMENT

Balis, J. S.
1976, 53p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

An appropriate agricultural technology for LDCs should include three categories of hardware: hand tools, improved animal tools, and small tractors. For any particular country, the package should be designed to maximize both production and employment. The effects of introduction of such technological mixes need to be monitored to establish if they match expectations. The family farm enterprises of the LDCs are the most efficient users of available land. The small farmers are not well off economically; they are generally poorer than the urban labor

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class. Recent emphasis on assistance programs for the rural poor focused on the landless and thus neglected the family farm group. An increase in the food supply and in the income of a sizeable segment of the farm population will have broad social benefits. Appropriate technology will not produce maximum production per unit of input, but this is only one of the benefits sought by intervention. The industrial facilities for producing, distributing, and servicing this appropriate technology can be wholly indigenous, to broaden the economic benefits. The objective is to provide a modest positive economic/social benefit to a broad segment of the population. Strengthening the economic status of that segment will improve its political capability. The family farm group can exert a high multiplier effect in using resources to increase production and improve social well-being. An appropriate agricultural technology thus becomes an effective means of economic and social development.

PN-AAE-698

Paper copy \$5.15
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(459) APPROPRIATE AGRICULTURAL TECHNOLOGY; ASSESSMENT OF NONFARM IMPACTS

Edwards, Clark
1976, 29p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

LDCs need to increase their agricultural output, but they need to be concerned also with improving their means of distributing employment, income, and food. Intermediate technologies are better suited to this dual objective than are high technologies. However, even appropriate intermediate technology can have undesirable side effects. It can change opportunity costs for resources, particularly for unskilled labor. A successful program of introducing appropriate agricultural technology needs to be accompanied by strategies to maintain balanced growth. These strategies include increasing the availability of local resources, expanding markets for local products, ensuring equitable distribution of economic gains, and building appropriate institutions. Unskilled labor is the resource most likely to be underused. Education programs are the most promising solution to this problem. The technological advances made through application of intermediate farm technology must be matched by advances in nonfarm economic activity. This includes finding ways of processing and distributing farm products, manufacturing and marketing purchased farm inputs, and village developments for increasing the productivity of unskilled labor. Market expansion should occur first in village markets. The regional emphasis should be on development of a rural, nonfarm economy in the agricultural village and small town. To sustain regional growth, nonagricultural industries need to be developed. Institution building should include economic, social, religious, and political institutions.

PN-AAE-697

Paper copy \$2.40
Microfiche \$1.00

(460) PANAMA AGRICULTURAL SECTOR ASSESSMENT

Shearer, E. B.
1976, 88p.

AID/LA/USAID/Panama

To identify the types of assistance needed in LDCs, A.I.D. staff members in those countries periodically conduct studies of particular sectors. This report presents the results of an assessment of the agricultural sector of Panama. Sections of the report discuss the overall economy, the state of agriculture, land capability and climate, key characteristics of farming and land use, the agrarian structure and rural population, agricultural produc-

tion and trade for the period 1950-1975, programs for rural development since 1970, sectorial planning, rural development goals and strategy, constraints on development, and the role of A.I.D. The chief structural constraint is the land tenure structure. As long as some of the crop land is still in extensive pasture under the control of owners not motivated to use it for more productive purposes, subsistence campesinos will have to continue eking out a living on the hillsides. A.I.D. programs in rural development will continue to support rural-oriented education and health activities. A.I.D. will also continue joining other external donors in supporting area-specific agricultural development programs designed to create more productive use of the underutilized natural and human resources.

PN-AAE-495

Paper copy \$8.05
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(461) MALI AGRICULTURAL SECTOR ASSESSMENT; FINAL REPORT

Steedman, Charles; Daves, T. E.; Johnson, M. O.; Sutter, J. W.
1976, 263p.

Mich. (AID/afr-C-1143 GTS)

An A.I.D.-sponsored team visited the country of Mali in July 1976 to assess its agricultural sector and develop recommendations concerning ways of improving conditions in the agricultural sector. This report contains an extensive description of the agricultural sector as well as detailed recommendations for the government of Mali. These are: (1) The government should substantially increase resources allocated for technical, economic, and social research. (2) The effectiveness of agricultural personnel in government service should be increased by assessing agriculture-related documentation, creating a low-cost publications program, expanding Radio Mali rural programming, and improving training services within most operations. (3) The government should concentrate on low-cost methods of increasing the productivity of dryland farming, rather than undertaking high-cost irrigation projects. (4) The Office du Niger should consider expanding irrigation in areas close to Segou, rather than rehabilitating irrigation systems in questionable areas. (5) Crop conservation techniques at the farm level should be expanded so as to protect harvests against insect and rodent damage. (6) More attention should be given to development of attractive markets and facilities adequate for commodity movements of cereals and export crops. (7) Official producer prices should be increased for cash crops, notably cotton and peanuts. (8) Untapped local labor and materials should be employed in small-scale projects such as construction of irrigation canals, dikes, and buildings. Several other recommendations are given specifically for U.S. AID.

PN-AAE-453

Paper copy \$22.55
Microfiche \$ 3.00

(462) AFRICAN WOMEN IN RURAL DEVELOPMENT, RESEARCH TRENDS AND PRIORITIES

Pala, A. O.
1976, 44p.

OLC (AID/afr-635 GTS)

(In OLC paper no. 12)

Proposes that rural development theorists have not put forward explicit ideas on the role of women in agricultural production, and that extension services tend to exclude women or teach them things that do not enhance their agricultural skills. A rationale for the role of women in rural development is presented to highlight

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the serious loss of potential brought about by neglecting the role of women in agriculture and food production. An historical analysis of existing literature is made to point out the evolving role of women in rural economies of Africa and to indicate existing gaps in knowledge. Three levels of research concerning women's roles in rural Africa are described: the training of African women and men in techniques of data collection and analyses to reflect the differential roles of men and women in society; the assembly and synthesis of published and unpublished sources concerning African women in the rural economies; and the establishment of research priorities in accordance with each country's resource capabilities, focusing on key issues of primary significance for women and their nations. These research areas are proposed which have a general application to African rural development and which can be redefined on a comparative basis to suit individual countries: access to land, labor allocation, time budgeting, decision making in the household, male outmigration, agricultural training, participation of women in marketing and cooperative societies, women's self-help and work groups, women in pastoral societies and marginal areas, nutrition, family planning and community health.

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AGRICULTURAL ECONOMICS

(463) SMALL AGRICULTURAL PRODUCERS CREDIT PROGRAMS: EL SALVADOR, A CASE STUDY

Hatch, L. U.; Ames, G. C. W.; Davis, L. H.
1977, 105p.

AID/SER/PM/PS&CD

(In Case studies in development assistance, no. 3)

This report is a study of public credit programs to stimulate agricultural output from small scale farmers. Five conditions must be satisfied: (1) there must be a more productive agricultural technology to encourage farmers to invest; (2) farmers must know about the new capital intensive technology and its profitability; (3) profitability depends on the timely availability of inputs and access to commodity markets; (4) public institutions must lend the bulk of their funds to small farmers; (5) and the value of the additional agricultural output must exceed the costs of the program. The Administracion de Bienestar Campresino (ABC), a supervised credit program in El Salvador, generally meets these conditions. The loans must be highly secured, are usually for less than one year, and have interest rates of from eight to twelve percent per year. Production has increased substantially with the availability of improved varieties of corn, rice and sorghum, and fertilizer and pesticides. Marketing seems to be a major weakness of the small farmer credit program; small farmers in Central America and the Caribbean do not have marketing leverage at harvest time. There are more loans to small farmers than to large commercial operations, but the amount of loans is greater to the large farmers. The major topics in this report include: the need for small farmer credit, program design for small farmer credit, the situation in El Salvador, a case study of the ABC small farmer credit program in El Salvador, and the impact of the program. The program is working to achieve objectives of increasing food production, increasing small farmer net income, and increasing rural employment.

PN-AAE-588

Paper copy \$9.45
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(464) INCOME DISTRIBUTION, CONSUMPTION PATTERNS AND CONSUMPTION LINKAGES IN RURAL SIERRA LEONE

King, R. P.; Byerlee, Derek
1977, 107p.

Mich. State (CSD-3625 Res.)

(In African rural economy paper no. 16)

Researchers are beginning to consider consumption patterns as an important factor in the development process. This paper presents findings from a study of consumption patterns in rural Sierra Leone. The objectives of the study were: (1) to describe consumption patterns, (2) to estimate income elasticities for purposes of projecting consumer demands for specific income levels on labor, capital, and foreign exchange requirements; and (3) to determine the nature and strength of consumption-based locational linkages. This paper gives the demographic characteristics of the sample population, the data collection procedures, the income classes and commodity groups studied, and income distribution for the sample households. Budget shares for each commodity are presented, and seasonal patterns of consumer expenditures are analyzed. The sample population consisted of 203 households visited twice weekly for one year. Results of the study show that income averages \$128 per capita, with income distribution rather uniform. Almost half of all rural consumption expenditures in Sierra Leone are on subsistence consumption items. Estimated expenditure elasticities of demand at the mean income level were quite high (0.9) for food commodities, including rice, the staple food. The estimated elasticity for meat was high (1.8). A major proportion of increased rural incomes is spent on commodities produced in rural areas. The next most important source of goods for rural consumers is from imports of such commodities as cloth, shoes, and cooking ware.

PN-AAE-456

Paper copy \$9.65
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(465) ANATOMY OF PEASANT ECONOMY; THE ECONOMIC ACCOUNTS OF RURAL HOUSEHOLDS IN THE PHILIPPINES

Hayami, Yujiro; Moya, P. F.; Bambo, L. M.; Kikuchi, Masao
1977, 50p.

IRRI (AID/ta-G-1074 GTS)

(In IRRI paper no. 76-25 rev.)

This study documents the complex of economic activities in rural households in the Philippines in terms of a set of accounts in a double-entry system that summarizes the flows of goods and services. The data were generated from the integrated household record-keeping project conducted in a rice village. Supplementary data were collected from the assets surveys conducted both at the beginning and at the end of the record-keeping period. Tubuan is a relatively small barrio consisting of 95 houses in the Municipality of Pila, located about 25 kms east of Los Banos. Twelve cooperators were selected from this village for the record-keeping project. The accounting system consisted of six accounts: (1) current agricultural production; (2) current non-agricultural production; (3) income-expenditure; (4) fixed capital production; (5) saving-investment; and (6) outside-of-household. The agricultural production account was divided into rice production and non-rice agricultural production. The results of this effort were largely plausible, despite possible observational errors inherent in the process of highly complicated data collection for such an accounting system. The study clearly shows a possibility that data can be systematically collected and documented at a village household level to be consistent with the framework of macro national accounts. This approach applied to various locations over time will produce a solid data base for advancing the theory of peasant economy, as well as for formulating the rural development policy. Data tables are included.

PN-RAB-761

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AGRICULTURE AND NUTRITION

(466) SOCIAL ACCOUNTS OF A RICE VILLAGE IN SOUTHERN LUZON

Hayami, Yujiro; Moya, P.F.; Bambo, L. M.; Kikuchi, Masao
1977, 26p.

IRRI (AID/ta-G-1074 GTS)

(In IRRI paper no. 76-26 rev.)

(In Project: Anatomy of peasant economy. Rpt. no. 5)

This study constructs the social accounts of a typical rice village in the Philippines, based on the data generated from the integrated household record-keeping project conducted from June 1975 to May 1976. Barrio Tubuan, located in the Municipality of Pila, Laguna, consists of 95 households and a population of 549 persons. Daily records were kept by twelve sample cooperators who were selected for their ability and willingness to participate in the project. The system of documenting the flows of goods and services in the village consisted of six accounts: (1) current agricultural production; (2) current non-agricultural production; (3) income-expenditure; (4) fixed capital production; (5) capital finance; and (6) outside transaction. The current agricultural production account was divided into rice production and non-rice agricultural production. Private income accounts for individual households were prepared based on the one-year daily records of 11 cooperators. These accounts were averaged separately for large farmers, small farmers and landless workers. The transactions within village were deducted from the averaged private accounts, multiplied by the number of households in each category, and then aggregated into village totals. Government subsidies to the village in the form of public infrastructure, including irrigation systems, schools, agricultural extension and roads were estimated individually. Data analysis procedures and data tables are included.

PN-RAB-762

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(467) ACHIOTE, A PROMISING ALTERNATIVE FOR INCLUSION IN SMALL FARMING SYSTEMS

Johnston, T. D.
1976, 85p.

CATIE (AID-596-153-4 GTS)

(In English and Spanish; Spanish, 73p.: PN-AAE-639)

This report by the Department of Tropical Crops and Soils discusses the design of a methodology to analyze how a higher value, non-subsistence crop fits into a traditional basic grain cropping system. The methodology, which can be applied to any crop, was developed around achiote. Achiote grows wild between twenty-five degrees north latitude and twenty-five degrees south latitude in many parts of the Americas. The seeds are coated with a red-orange substance (Bixin) which may be extracted and used as a food colorant and flavor carrier. At the production level the methodology focuses on a comparison of resource competition, employment, and income generation aspects of the current and improved small farming systems. It then examines the transport, packing, pricing demand, potential competition, expansion of production and other items of importance in an achiote production-marketing system. The second objective of this study was to see if commercial achiote production is a realistic and profitable alternative for inclusion in small farming systems. Achiote is a promising alternative for a limited number of small farmers. While the production risk is low the marketing risk is high as the price fluctuates considerably. Achiote should only be considered for inclusion in small farming systems and not as a replacement for the entire basic grain system. A final objective was to train Central American technicians in a research methodology which would be useful in their analysis of agricultural projects. Among the major conclusions of this study are: achiote helps control erosion on steep slopes;

achiote spreads marketing risks by diversifying the farmer's set of products and reduces weather related risks because it is a hardy plant once established; and achiote prices and demand appear to be increasing on world markets. This paper deals specifically with achiote but also provides a methodology for analysing how other perennial crops could fit into a small farming system and how inclusion of a perennial crop reduces risks, increases income and increases labor utilization rates.

PN-AAE-638 (English, 85p.)

Paper copy \$7.80

Microfiche \$1.00

PN-AAE-639 (Spanish, 73p.)

Paper copy \$6.80

Microfiche \$1.00

(468) FROM AGRONOMIC DATA TO FARMER RECOMMENDATIONS, AN ECONOMICS TRAINING MANUAL

Perrin, R. K.; Winkelmann, D. L.; Moscardi, E. R.; Anderson, J. R.
1976, 52p.

CIMMYT (AID/ta-G-1083 GTS)

(In Information bulletin no. 27)

The quality of recommendations that agronomists make to farmers depends upon how carefully the agronomist has considered all of the factors relevant to the farmers' situation and goals. Some of those factors may not be evident to the agronomist. This manual shows agronomists how to develop recommendations suited to the farmer's desire to increase his average income, avoid risks, and, if possible, avoid investing in additional capital equipment. A good farm recommendation can be defined as a choice the farmer himself would make if he had all of the agronomic information available to the agronomist. Successful farm recommendations must be based on agronomic data that fit the farmer's agronomic conditions or the farmer will not obtain the predicted results. Because it is impossible to conduct experiments on each farm and then make recommendations tailored to each farm, the agronomist must define a target group of farmers, conduct experiments under conditions representative of their farms, and make recommendations applicable to the entire group. This manual assumes that farmers think in terms of net benefits as they make decisions. Illustrative examples of this decision process are discussed. The two main problems in evaluating agronomic alternatives in terms of their net benefits are (1) estimating the relative weights the farmers place on various kinds of goods, and (2) estimating the effect of uncertainty on farmers' decisions about net benefits. The process of deriving recommendations is discussed in detail.

PN-AAE-446

Paper copy \$5.05

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(469) THE CALIBRATION OF INSTRUMENTS FOR COLLECTING FARM LEVEL DATA

Roxas, Nicanor; Garrity, Dennis; Price, Edwin
1976, 26p.

IRRI (AID/ta-G-1074 GTS)

(In IRRI paper no. 76-32)

When agricultural economists are conducting field research, they have two basic options in collecting data on farm size, farm labor time, and crop yields. They can collect information supplied them by the farmer, or they can make direct measurements of those data. This paper describes a study designed to

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AGRICULTURE AND NUTRITION

establish whether consistent relationships exist between the data collected by those two means. The crops involved in the study were upland rice, field corn, glutinous corn, sorghum, mung, cowpea, peanut, soybean, and sweet potato. Thirty-nine farmers were studied in Batangas province, the Philippines, during the 1974-1975 crop season. The results of the study showed consistent relationships between measured and farmer-reported data. The farmers overestimated their parcel sizes by about 8% if they owned or leased their land, and by about 30% if they rented the land. They also consistently overestimated their labor time and underestimated their crop yields. The study results can be used to develop realistic labor requirements and labor costs for small-scale agronomic trials. They can also be used for transforming data obtained from farmers' reports into data more accurate for economic analyses.

PN-AAE-507

Paper copy \$2.15
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(470) AGACC: ACCOUNTING ROUTINE FOR THE AGRICULTURAL SECTOR

Pervis, D. W.; Wolf, Christopher
1976, 44p.

Mich. State (CSD-2975 Res.)

(In Computer Library for Agr. Systems Simulation. CLASS doc. no. 10)

In many models of socioeconomic systems, there are a number of repeated calculations which perform an accounting function. The use of AGACC (Accounting Routine for the Agricultural Sector) will ensure consistent accounting and aggregation of various parameters throughout a model. This allows comparison of the results of similar models used in different countries, or different models in the same country. AGACC calculates data on such items as the expenditures on production inputs, monetary profits, the value of production, and the consumption of products, at three aggregation levels—enterprise, regional and national. The data requirements are classified into four categories: model size parameters, policy-determined coefficients, technology determined coefficients, and model variables. The model size parameters include the number of regions of the country, the total number of enterprises, the number of single or multi-product enterprises, and the number of multi-product livestock enterprises. It also includes the number of products from multi-product crop and livestock enterprises, and the number of production inputs. Policy-determined coefficients require data on the tax rate on farm profits; technology determined coefficients refer to the proportions of total production lost on a farm, and the amount of nutrient in each product. The model variables are production of all products; consumption of each product; prices of production inputs and farm prices of each product; and the quantity of each production input and population sizes in each region. Mathematical calculations used in AGACC are simple arithmetic accounting calculations. The document gives indices used in these calculations, the input and output variable definitions, and mathematical calculations for each of the three aggregation levels. It also provides a sample run of the routine and a description of the programming, testing and implementations of AGACC.

PN-AAD-981

Paper copy \$3.65
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(471) COMPUTER LIBRARY FOR AGRICULTURAL SYSTEMS SIMULATION, A PROGRESS REPORT

Abkin, M. H.; Carroll, T. W.
1976, 53p.

Mich. State (CSD-2975 Res.)

(In Computer Library for Agr. Systems Simulation. CLASS doc. no. 1)

(Final rpt. of computer program: CSD-2975 Res.)

A PROJECT: To develop and operate a Computer Library for Agricultural Systems Simulation (CLASS) in one or more of the standard computer languages indexed and made available to borrowers on a national and international basis.

DURATION: October 1972-July 1976.

DEVELOPMENTS: Approaches are examined for institutionalizing an analytical capacity for planning, policy formulation, program development, and project implementation for agricultural sector development within the public decision making structure of developing countries. A major component of the analytical capacity is a series of system simulation models tailored to the needs of the individual country. The library acquires, catalogs, maintains and distributes computer programs and associated documentation. The library sets standards of admissibility for programs and documentation: catalogs and indexes programs and documentation to facilitate their retrieval by users seeking a set of programs to be used in a specific problem analysis. It distributes programs and documentation to users. Progress during the development and implementation stage discussed in this report includes: design of an idealized scope and structure for the library, specification of standards for library elements and their documentations and computer programs, acquisition of the components, routines and language, investigation of alternative institutional arrangements, and utilization of CLASS elements. The report concludes with a discussion of activities yet to be undertaken.

PN-AAD-980

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(472) POOR RURAL HOUSEHOLDS, TECHNICAL CHANGE AND INCOME DISTRIBUTION IN LDC's; ANNUAL REPORT, 1976/1977

Cornell Univ. Dept. of Agr. Economics
1977, 67p.

Cornell (AID/ta-C-1327 Res.)

A PROJECT: To examine how technical changes in agricultural production in Asia influence the distribution of income in rural households and how altered production techniques affect the demand and supply of farm labor.

DURATION: July 1, 1976-Ongoing

DEVELOPMENTS: The provinces of Laguna and Luzon in the Philippines, a coastal region of Java in Indonesia, and a sample of villages in Andhra Pradesh in India were chosen as typical of a broad spectrum of Asian production techniques. Most subsistence agriculture in the Asian lowlands centers around paddy rice, with other grains and tubers playing a less important role. Research was completed in the Philippines on the impact of improved rice production on income accruing to various factors of production, landlords, tenants and landless laborers. As land-holders' income increased because of the new technology, hired labor was substituted for family labor. The demand for hired labor and its share of output increased. Field work was completed on a study examining family decision-making, particularly as it related to the supply of male and female labor among families with varying resources. Cropping patterns and income distribution in Andhra Pradesh have been altered by tractor mechanization of land preparation, harvesting and transportation. Primary data was collected in six villages on the availability of tractors and how that has altered the supply and demand for labor on farms with a wide range of cropping combinations. Two related projects in Nepal are described. One deals with the role of highway transportation in the process of economic development and the other evaluates the technical transfers and income distribution aspects of multiple cropping. All research progress and results are discussed in detail. Six publication abstracts are included in the appendix.

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(473) POOR RURAL HOUSEHOLDS, TECHNICAL CHANGE AND INCOME DISTRIBUTION; ANNUAL REPORT, 1976/1977

Mich. State Univ. Dept. of Agr. Economics
1977, 46p.

Mich. State (AID/ta-C-1328 Res.)

A PROJECT: To provide empirical information on unemployment in rural Africa and to use this information to analyze the impact of alternative policies and development strategies on output and employment. Conducted by Michigan State University (MSU), Department of Economics.

DURATION: June 24, 1976-June 30, 1978

DEVELOPMENTS: During this report period activities were focused on the preparation of data files, descriptive analysis of data on income distribution, and specification of a conceptual framework and models to be employed in more detailed analysis. The countries chosen for study were Northern Nigeria and Sierra Leone. The institutional environments of both areas are essentially similar. Traditional village leadership is still dominant with the absence of a stable class structure defined on the basis of income or control of assets. The land tenure systems of both areas are relatively egalitarian with the communal assignment of usufructuary rights considerably more important than direct ownership of land. The farming technology of both areas is largely traditional with no substantially improved input packages currently available for widespread distribution. Natural conditions and population differ markedly, with Sierra Leone in a high rainfall forest zone and Nigeria in a zone of higher population density and savannah agriculture. Comparable analytical techniques and income measures are used whenever possible. Socioeconomic characteristics of the farming environment in Nigeria reduce the potential for a wide range of incomes. These characteristics include: (1) available surplus land; (2) a relatively egalitarian land tenure system; (3) absence of a class system based on ethnic criteria; (4) predominantly traditional agricultural production systems; and (5) an inheritance system effectively limiting permanent assets accumulation between generations. Much of the initial period of the Sierra Leone project was spent reorganizing data into a form suitable for the analysis of household incomes and technical change. Major projection systems were identified, and income and labor allocated in those systems.

PN-AAE-476

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AGRICULTURAL DISTRIBUTION AND MARKETING

(474) AN ANALYSIS OF RURAL FOOD DISTRIBUTION IN COSTA RICA

Weber, M. T.
1976, 306p.

Mich. State (CSD-2826 211d)

(Diss.—Mich. State)

A study of county-level developmental financing in Costa Rica showed that inadequate market research and cost/benefit analyses make the local officials susceptible to granting un-economic loans. A county government development unit—Instituto de Fomento y Asesoría Municipal (IFAM)—was established to provide long-term credit and technical assistance to local government units. Projects proposed for consideration by the IFAM included several for remodeling publicly owned food

markets in rural towns. Funds borrowed by IFAM at 8% interest would be supplied to the cities, which would remodel their public market buildings and repay IFAM with income generated from rental of market stalls to private merchants. To assess those proposed projects, the author conducted a study of the market structure and food distribution system in two of the counties. The findings showed that even remodeled public markets in the cities will not compete well in prices and services with retailer-wholesalers in cities and small-scale grocery outlets in rural areas in the future. Thus the remodeling projects would be un-economic, the renters of stalls would combine to maintain low rental fees, and the long-term return on the project loans would be less than half the cost of the loans. In effect, the IFAM would merely be subsidizing the merchants using stalls in the public markets of the cities.

PN-AAE-447

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(475) EVALUATION AND SUGGESTED INITIATIVES FOR THE DEVELOPMENT OF LOCAL MARKETING OF AGRICULTURAL COMMODITIES IN PARAGUAY

Hugo, Cornelius; Holmes, Elwyn
1977, 75p.

Kan. State (AID/ta-C-1162 GTS)

(In Grain storage, processing, and marketing rpt. no. 66)

In April of 1977 an A.I.D.-sponsored team of specialists from the Food and Feed Grain Institute of Kansas State University visited Paraguay to evaluate and recommend improvements in local marketing systems for agricultural commodities. The objectives of the study were to evaluate market system development within an area encompassed by the Community Based Area Development Project, evaluate three case study areas, and appraise the capability and needs of the government agency concerned with agricultural commerce and economics. The basic project region was evaluated with regard to market flows, intermediaries in the system, existing and needed physical facilities, training requirements, adaptive research needs, institutional capabilities, and market constraints. Recommendations discussed in this report include the following: (1) The proposed port facilities for Puerto Rosario should be constructed. (2) They would likely generate other commercial activities besides grain exports. (3) Members of the small farmer cooperatives should be offered a training program covering correct grain handling and storage procedures, equipment operation and maintenance, cooperative management, and extension marketing and credit practices. (4) A cotton gin should be constructed in the project area; it would be a very profitable enterprise. (5) The roads in the area need to be improved so that they are usable in wet seasons. (6) A pool of technically trained people in both the public and private sectors should be developed.

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PLANT PRODUCTION (GENERAL)

(476) FOOD LEGUMES, COMPOSITIONAL AND NUTRITIONAL CHANGES INDUCED BY BREEDING

Bliss, F. A.; Hall, T. C.
1977, 10p.

Wis. (AID/ta-C-1173 Res.)

(In Cereal foods world, v. 22, no. 3, p. 106-113)

Food legumes are a good source of protein when nitrogen fertilizer costs are high. The legumes fix nitrogen biologically and accumulate large amounts of seed protein. If food legumes are to maintain their roles in traditional diets, their yield and nutritional

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value must be genetically improved. Glycoproteins constitute a major portion of the storage protein of bean seeds. Since they are deficient in sulfur-containing amino acids, efforts to improve nutritional quality are likely to involve altering these proteins. Protease inhibitors and phytohemagglutinins, two major toxicants of legumes, often constitute a portion of the storage protein, and thus, attempts to alter protein quality must consider these constituents as well as total protein and amino acid composition. Seed protein percentage and sulfur amino acid content have generally low to medium heritability. Those traits can be improved through selection. However, selection for a particular trait should not be conducted without attention to the other affected traits. Possible approaches to improving methionine content include lowering the ratio of globulin to albumin and qualitatively altering the amino acid composition of specific protein fractions.

PN-AAE-417

Paper copy \$2.00

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(477) RURAL DEVELOPMENT SILIANA; REPORT ON TRIP TO TUNISIA

Rom, R. C.
1977, 49p.

Rom (AID/NE-C-1368 GTS)

This report is based on observations made and consultations with various personnel during a 12 day visit to the Tunisian countryside. It is supplemented with information from literature surveys, library research, and experience gained by the author as a professional pomologist and a fruit grower. The purpose of the trip was to: (1) Review information and data available in the National Agricultural Research Institute on fruit and nut varieties grown in Tunisia; (2) Visit existing nurseries experimental plantings and commercial orchards and review their results; (3) Evaluate the physical and climatic conditions of the project area (principally the Makthar delegation) and determine its suitability for fruit and nut production; (4) Evaluate a proposed site for adaptive testing at Ain Seddine and make specific recommendations for utilization. A list of 22 fruit and nut varieties were indicated as possible selections for cultivation at the test site in Tunisia. Of this list, almonds, apricots, dates, figs, grapes, and olives were eliminated in view of the fact that these fruits were already under production in the area. Other kinds of fruits on the list, such as blackberries, cashew nuts, strawberries, quince, were excluded due to production, shipping or marketing problems. The remaining kinds of fruit with promise were apples, peaches, nectarines, pears, cherries, plums and hazel nuts. Factors limiting success were considered to be: water for irrigation, understanding of fruit growing by the populace, financing, and patience on the part of the project leaders and populace. The area has no established tradition in the type of fruit culture anticipated and there will be some problems transferring and utilizing modern tree fruit production technology in an underdeveloped area. An approach to establishing tree fruit production is presented, to begin in 1978.

PN-RAB-605

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(478) PROCEEDINGS; SOUTHEAST ASIAN WORKSHOP ON PLANT GENETIC RESOURCES, LAGUNA, PHILIPPINES, 1976

Philippine Council for Agr. and Resources Research, Laguna, Philippines
1977, 96p.

IBPGR (AID/ta-G-1272 GTS)

The papers in this report were presented at an International Board for Plant Genetic Resources (IBPGR) working group on Southeast Asian genetic resources in December 1976. They

provide a current statement of the genetic resources work in the five countries of the region which participated (Indonesia, Malaysia, Papua New Guinea, Philippines and Thailand). There are also accounts of the work of regional and international organizations represented at the meeting. Some of the important points under consideration were: since southeast Asia is faced with a large number of species of crop plants, it is necessary to determine priorities for action as international funding may only be expected for major crop plants; there is a need to establish and increase existing living plant collections; what should be done with plants not native to southeast Asia; and organization of plant scientists. The IBPGR has tried to establish a pattern for a worldwide network of genetic resources centers based on regional and national centers in areas of genetic diversity and crop specific centers. During inter-country discussions, points of agreement were reached that laid the foundation for a regional cooperative program.

PN-AAE-521

Paper copy \$8.70

Microfiche \$1.00

(479) REPORT OF IBPGR WORKING GROUP ON ENGINEERING, DESIGN AND COST ASPECTS OF LONG-TERM SEED STORAGE FACILITIES

Int. Board for Plant Genetic Resources
1976, 23p.

IBPGR (AID/ta-G-1272 GTS)

The FAO made recommendations in 1975 on the standards and procedures to be used in storing seeds for long-term and medium-term conservation. To further this work, the International Board for Plant Genetic Resources (IBPGR) established a Working Group that met at FAO, Rome, in August, 1976, to define the engineering, design, and cost aspects of long-term seed storage facilities. This report presents the findings of that group. It includes discussion and recommendations concerning the following: types of seed to be stored; moisture content and storage temperature; seed drying and the control of moisture content; routine moisture determinations and germination tests; size of accessions and the volume of the cold room; selection of a site for a storage facility; seed bank construction; design of the cold storage room; insulation; refrigeration plant; air circulation; safety precautions; design standards; cost of prefabricated cold rooms; ancillary rooms and equipment required; and total cost of facilities for long-term seed storage. Appendices to the report identify the participants in the Working Group, present the IBPGR list of crop priorities and their seed storage characteristics, and discuss the use of deep-freeze chests for long-term storage of small seed collections.

PN-AAE-523

Paper copy \$2.00

Microfiche \$1.00

(480) ANNUAL REPORT, 1976

Int. Board for Plant Genetic Resources
1977, 34p.

IBPGR (AID/ta-G-1272 GTS)

A PROJECT: To promote an international network of genetic resources centers to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world.

DURATION: 1975-Ongoing

DEVELOPMENTS: In 1976, the second full year of opera-

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tion of the International Board for Plant Genetic Resources (IBPGR), numerous collection activities for priority crops were conducted, many with Board financing. Several regional programs in priority areas were initiated, and two new genetic resources centers became operational. Crop Germplasm Advisory Committees for five of the world's principal food crops met and submitted action recommendations for improvement of the conservation, evaluation, and use of genetic resources for those crops. Advances were made in the development and application of a computer-based data classification and retrieval system designed to make the world's principal germplasm collections more readily accessible to breeders everywhere. The principal aim of the Board is to promote a world-wide program in which collection, conservation, documentation, and evaluation are coordinated with regard to the requirements of geographic regions as well as particular crops. In 1976 the outlines of the prospective world network were more clearly defined, and lines of communication between workers and institutions essential to a coordinated program were established and are being used.

PN-AAE-522

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(481) ANNUAL REPORT, 1976

CIAT
1977, 343p.

CIAT (AID/ta-G-1090 GTS)

A PROJECT: To generate improved technology to increase production, productivity and quality of specific basic food commodities in Latin America and the Caribbean countries, and thereby enhance the purchasing power and improve the nutrition of the native populace. Conducted by the Centro Internacional de Agricultura Tropical (CIAT)

DEVELOPMENTS: CIAT carries on collaborative work with the Instituto Colombiano Agropecuario (ICA) at several of its experimental stations and similar work is done with national agricultural agencies in other Latin American countries. The seven study areas included in this report are: Bean Production Systems Program; Cassava Production Systems Program; Beef Production Program; Swine Nutrition Unit; Regional Andean Maize Unit; Rice Improvement Program; and Research Support Groups. The results achieved in 1976 are described in detail for each program and the highlights summarized at the beginning of each program section. Some of the key features common to all or several programs are: maximum use of natural resources, minimum input philosophy, outreach expansion, integration of training and research, and international cooperation. The CIAT bean program's chief product is germplasm. This may be supplied to national programs as a promising source of disease or insect resistance. The major emphasis of the cassava program is development and evaluation of hybrids for high yield, disease and pest resistance, ease of harvest, high starch content and long post-harvest shelf life. Minerals given consistently to the cattle in the Herd Systems Project improved the calf crop by increasing conception rates and reducing the number of abortions. In Bolivia, Colombia, Costa Rica and Peru, research and producer training programs in swine production were begun on a regional level. The evaluation of six promising rice lines was completed and the Training and Conference Program activities were decentralized to put them more into the realm of each one of the commodity programs.

PN-AAE-425

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PLANT PRODUCTION (SPECIFIC CROPS)

(482) THE IMPACT OF HIGH-YIELDING RICE VARIETIES IN LATIN AMERICA WITH SPECIAL EMPHASIS ON COLOMBIA

Scobie, G. M.; Posada T. Rafael
1977, 171p.

CIAT (AID/ta-G-1090 GTS)

(In ser. JE-01)

The purpose of this study by the Centro Internacional de Agricultura Tropical in Colombia was to measure the impact of high-yielding varieties of rice (HYV's) on Latin American rice production and to measure the size and distribution of the economic benefits resulting from the introduction of HYV's in Colombia. The report presents an overview of rice production and trade in Latin America with some observations on trade prospects. There are discussions of: measuring the additional output of rice in Latin America due to HYV's; the economic background to the Colombian rice industry with data which form the basis of subsequent analyses; a model to measure the economic benefits of the introduction of HYV's and the estimation of the parameters required by the model; the gross benefits, costs, net benefits and rates of return; the distribution of net benefits by income level; and an analysis of the farm-to retail marketing margin. The last chapter summarizes the principal findings which include: rice prices fell as a result of expanded output and became cheaper relative to other major foodstuffs; it is estimated that in 1970 almost 70% of the Colombian national output came from irrigated farms of over 50 hectares; in 1972 rice was the most important source of calories and the second most important source of protein in the Colombian diet; the gross value of additional rice production between 1964-1974 was about three hundred fifty million dollars; no evidence was found to indicate that the marketing sector captured abnormal profits from the introduction of HYV's; the net benefits were highly skewed toward the low income consumer and the domestic price has now fallen to the point that exporting appears profitable. The appendices include tables of rice area, production, yield and trade, and estimates of price and income elasticities in Latin America.

PN-RAB-603

**Paper copy \$14.95
Microfiche \$ 2.00**

(483) PROCEEDINGS; IRRI SYMPOSIUM ON CLIMATE AND RICE, IRRI, 1976

1976, 547p.

IRRI (AID/ta-G-1074 GTS)

In September, 1974, the International Rice Research Institute (IRRI) sponsored a four-day symposium on climate and rice. Biological and physical scientists concerned with the response of rice to climatic variables were invited. These included geographers, plant scientists, physicists, climatologists, soil scientists, and other specialists. Twenty-five papers on topics relating to rice and climate were presented and discussed during the symposium. The topics included the climatic environment of rice cultivation, adaptability of rice varieties to climate, the physical environment of the rice crop, environmental control of growth and yield, climatic stress on growth and yield, climatic effects on the incidence of diseases and insects, and climate and crop productivity. In his concluding remarks, N. C. Brady, Director-General of IRRI, commented on the contributions physical scientists made to the symposium. They called attention to improved methods of measuring microclimate, and challenged plant scientists to quantify the relationship between microclimate in the field and crop responses. The physical scientists warned against overdependence on controlled-environment ap-

AGRICULTURE AND NUTRITION

proaches. They urged a balanced program in which the measurement of field responses complements research with the phytotron—a bioclimatic laboratory donated to IRRI by the Australian government in 1974.

PN-AAE-506

Paper copy \$46.90
Microfiche \$ 6.00

(484) MULTI-SITE TESTS ENVIRONMENTS AND BREEDING STRATEGIES FOR NEW RICE TECHNOLOGY

Herdt, R. W.; Barker, Randolph
1977, 34p.

IRRI (AID/ta-G-1074 GTS)

(In IRRI research paper ser. no. 7)

This paper discusses rice environments and rice improvement efforts; it presents ideas that might assist efforts to produce improved rices for diverse lowland and upland conditions. Under a limited range of conditions, rice varieties of the IR8 plant type perform better than other varieties, but these first-generation modern varieties cannot withstand the environmental stresses in many rice-growing areas. The second-generation modern varieties are disease- and insect-resistant, but they still do not adapt to a wide range of environmental conditions. This suggests the need for different types of varieties and different approaches in producing them. Many scientists believe that environment-specific varieties should be produced. They are attempting to develop a more precise definition of rice environments in terms of water depth, soils, rainfall, and temperature. The paper focuses on gap I—the gap attributed to differences between farmer environments and environments at experiment stations. In many instances the gap is quite wide. To better understand why the gap exists, this paper examines the general strategy being followed by rice breeders, the environments in which rice is grown in Asia, and the use of multilocation testing programs for evaluating breeding materials. Some conclusions are presented concerning the interrelationships of networks, environments, and breeding strategies for new technology.

PN-AAE-498

Paper copy \$2.80
Microfiche \$1.00

(485) EXPANDING THE USE OF SOYBEANS, PROCEEDINGS OF A CONFERENCE FOR ASIA AND OCEANIA

Goodman, R. M.
1976, 272p.

III. (AID/cm/ta-C-73-19 Res.)

(In INTSOY ser. no. 10)

Reports on the proceedings of the third regional soybean conference to review all aspects of soybean production, protection, economics, and utilization. It was held in Chiang Mai, Thailand. The purpose was to call attention to the importance of soybeans in human nutrition, to bring together scientists from Asia and Oceania who are working with soybeans, and to encourage the exchange of information among scientists. This report includes all of the general session papers, symposium discussions, and country reports. The papers on soybean production include breeding varieties for the tropics, varieties for southeast Asia, soil fertility and moisture studies, control of seed-borne microorganisms, and concepts of improvement in lower latitudes. Papers on protection include weed control in tropical and Asian soybeans, foliar diseases, root and stem diseases, nematode diseases, virus diseases, and insect pests. Other papers are on fermented soybean foods, nutrition and processing, small scale equipment for oil extraction and the economic aspects of developing soybean markets in India. The symposia topics included soybean rust, biology and control of major insect pests of

Asian soybeans, breeding tropical soybeans, small scale soybean processing and extension of the research to the village farmer. Country reports are given from Australia, Bangladesh, India, Indonesia, Iran, Japan, Korea, Malaysia, the Philippines, Saudi Arabia, Sri Lanka, and Thailand.

PN-AAE-744

Paper copy \$23.30
Microfiche \$ 3.00

(486) EQUAL EXPRESSION OF THE MATERNAL AND PATERNAL ALLELES FOR THE POLYPEPTIDE SUBUNITS OF THE MAJOR STORAGE PROTEIN OF THE BEAN PHASEOLUS VULGARIS L.

Hall, T. C.; McLeester, R. C.; Bliss, F. A.
1977, 4p.

Wis. (AID/ta-C-1173 Res.)

(In Plant physiology, v. 59, p. 1122-1124)

Research designed to improve the protein content of the French bean (*Phaseolus vulgaris*) includes some complex analyses of its protein constituents. In this study, the G1 globulin from several strains of *P. vulgaris* seed were subjected to discontinuous sodium dodecyl sulfate slab gel electrophoresis. This permitted a clear resolution of the constituent polypeptides. Three strains (Tendergreen, Canadian Wonder, and BBL 240) had subunits of molecular weight 53,000, 47,000, and 43,000. Two strains (Seafarer and PI 229,815) had subunits of molecular weight 50,500, 47,000, and 43,000. F₁ seed from the cross BBL 240 with PI 229,815 showed four polypeptides on dissociation of the G1 protein. However, the amount of each of the 53,000 and 50,500 subunits was half that of the 47,000 subunit. This is interpreted as evidence that both the maternal and paternal loci for these polypeptides are transcribed and translated with similar efficiency. All of the polypeptides were found to have associated sugar residues. The nature of the molecular event resulting in the change in size of the large subunit has yet to be determined.

PN-AAE-420

Paper copy \$2.00
Microfiche \$1.00

(487) RESULTS OF THE SEVENTH INTERNATIONAL WINTER WHEAT PERFORMANCE NURSERY GROWN IN 1975

Wilhelm, K. D.; Kuhr, Steven; Johnson, V. A.; Mattern, P. J.; Schmidt, J. W.
1977, 208p.

Neb. (AID/ta-C-1093 Res.)

(In Research bul. no. 281)

This seventh report on results from the International Winter Wheat Performance Nursery gives data on grain yield, grain protein, test weight, one thousand kernel weight, plant height, lodging, winter survival, frost damage, maturity, shattering, plant diseases, and other traits. The entries included the most productive winter wheats in the world. Supplemental nursery management information is reported for each nursery site adjacent to the table of agronomic, grain quality and disease data for that site. Most of the report is the summary tables presented by trait over locations for each variety and across varieties for 1975. Means and other statistics based on regionalization of data into six broad geographic areas of the world with appropriate statistical analyses are reported. The Nursery was designed to: test the adaptation of winter wheat cultivars in a range of latitudes, daylengths, fertility conditions, water management regimes, and disease complexes; identify superior winter cultivars to serve as recipient genotypes for high protein and high lysine traits in an array of environments. Performance data were reported from forty-seven locations. Forty-two sites were in the Northern Hemisphere. Two Southern Hemisphere sites were in Argentina,

two in Chile, and one in the Republic of South Africa. Based on regional analyses for yield from six different geographic regions, none of the varieties was superior in more than one region. The highest yielding variety on a worldwide basis was Talent, which was not the highest yielding in any region. The lowest yielding winter cultivar over the two year period was Atlas 66.

PN-AAE-735

Paper copy \$18.00
Microfiche \$ 3.00

(488) ANNUAL REPORT, 1976

CIP
1977, 146p.

CIP (AID/ta-G-1181 GTS)

A PROJECT: By the International Potato Center, (Centro Internacional de la Papa (CIP) to develop and disseminate knowledge for greater use of the potato as a basic food.

DURATION: 1971-Ongoing

DEVELOPMENTS: Research continued to improve the yielding ability and adaptability of the potato for LDCs in the tropics. Primitive cultivars were collected and over 9,000 accessions were classified. In a Planning Conference on the "Exploration and Maintenance of Germ Plasm Resources," guidelines were developed for the systematic collection of wild *Solanum* species and for the computerized management of CIP's germ plasm bank. A population approach to breeding has demonstrated increases in the frequency of resistance to selected pathogens and nematodes in *Phureja-Stenotomum* diploid populations. Improved frost resistant and bacterial wilt resistant clones have continued to excel under severe field test conditions. The wilt resistant variety "Caxamarca" was released by the Peruvian National Potato Program. Progress was made in discriminating between "field" and "major gene" resistance to late blight. The survival of *Pseudo-monas solanacearum* has been correlated with the electric conductivity of soil. Breeding lines resistant to potato leaf roll virus were sent to nine developing countries for further evaluation, and efforts continued to further define the spectrum of viruses present in the center of potato evolution. Selected clones of *Solanum sparsipilum* are immune to root-knot nematodes and resistant to *P. solanacearum*. These clones are being used in breeding. Clones resistant to *Globodera (Heterodera) pallida* were identified in wide scale screening of germ plasm. In multiple cropping studies, potato-peanut systems more than doubled land equivalent usage over monocultural practices. An effective, well-integrated tissue culture, virus screening, and multiplication scheme for the production of pathogen-tested seed was firmly established in 1976. Other studies included routine nutrition assays, frost tolerance, and the selective role of potato lectins. Publications are listed.

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PN-AAC-328 (1975, 134p.)

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PN-RAB-382 (1974, 105p.)

Paper copy \$ 9.45
Microfiche \$ 2.00

LIVESTOCK

(489) IMPROVING RUMINANT LIVESTOCK PRODUCTION ON SMALL HOLDINGS

Scoville, O. J.
1976, 13p.

ADC (CSD-2813 GTS)

(In RTN sem. rpt. no. 11)

Reports on a workshop on small livestock production held in Morrilton, Arkansas, June 14-17, 1976. The purpose of the

workshop was to bring together an international group with experience in areas of smallholder and pastoral systems in which livestock keeping is important. Research and development work and projects on livestock for small holders have been neglected worldwide. The topics of discussion at this workshop included the role of livestock in the most important smallholder systems; the physical, biological, economic and other limitations on improvement of livestock enterprise for small holders; and methods, research and action programs to improve livestock enterprises and associated feed resources for the small farmers of the world. The following program guidelines are offered: people to be served by projects must be involved in planning and implementation; market development must be a part of project development; adequate feed supplies must be ensured; simple, easy to use packages of workable technologies must be devised; access to capital must be improved; programs should be location-specific; appropriate training at all levels must be devised and applied; more well planned pilot programs and more analyses of existing projects are needed; and programs must be supported for an adequate number of years. Assistance for small holders must emphasize labor use, self-help, stability, and land-saving technology. The programs must be economically viable and at a low cost per farmer, and the results must be extended to large numbers for meaningful results. While the workshop had no definition of "small holder," the concern was with those of small acreage, from the near landless man with one cow to those with above five hectares. Also included are those with small herds which range over large areas of public lands.

PN-AAE-754

Paper copy \$2.00
Microfiche \$1.00

(490) PROCEEDINGS; CIAT SEMINAR ON POTENTIAL TO INCREASE BEEF PRODUCTION, CIAT, 1974

CIAT
1975, 324p.

CIAT (AID/ta-G-1177 GTS)

The objectives of the 1974 Cali Colombia seminar were: (1) to explore the roles of beef cattle enterprises in the agricultural and economic development of the lowland tropics; (2) to evaluate factors influencing the development of the beef cattle industry in these areas; (3) to identify techniques for increasing the productivity of beef cattle enterprises; (4) to establish the bases for interchange of technology among institutions and individuals engaged in livestock and agricultural development programs; and (5) to assist C.I.A.T. and national agencies in establishing their own priorities for beef cattle research and training. In Latin America there is enough land for livestock production and for the lumber industry to supply the world and still leave enough farm land to feed Latin America's own growing population. There is also enough land to supplement pastures during dry periods or for intensive breeding and fattening systems. Seminar sections included: range management and the establishment of improved pastures; management, nutrition and animal breeding; animal health, intensive fattening systems, socioeconomic considerations; and development projects. This document includes the 17 seminar papers and the reports by the seminar work groups on pastures and forages, nutrition, intensive feeding systems, reproduction and animal breeding, animal health, applications of technology at the farm/ranch level, and socioeconomic and development projects.

PN-AAE-311

Paper copy \$27.65
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Index of Issuing Offices at the rear.

AGRICULTURE AND NUTRITION

(491) UTILIZATION OF AGRICULTURAL WASTE FOR ANIMAL FEED IN PANAMA

Cooney, C. L.; Dunlap, Charles
1975, 43p.

MIT (AID/ta-G-1113 211d)

(In INP discussion papers no. 1)

The objectives of this report are to introduce the climate, geography economy, and people of Panama and with this descriptive perspective to present the results of an A.I.D. survey of agricultural by-products and wastes. The survey is meant to be qualitative, descriptive, and quantitative so that each waste or by-product is placed in the proper perspective as to size, location, and problems. To examine the potential means for utilizing the most promising waste materials in the animal industry of Panama the report attempts to examine the current size of the industry and the current status of supply of other feeds. Production of cattle, swine, and poultry in Panama could be significantly increased if means could be found to use sugar cane, banana, and rice processing waste as animal feed. Almost 30% of the bananas harvested are rejected for poor quality. Although poultry manure is not available in as large an amount as banana waste, its high nitrogen content makes it a valuable material in a country where nitrogen is scarce. Molasses is a good carrier and trap for the ammonia nitrogen in poultry manure. A study should be done of the economic feasibility of using excess sugar cane bagasse as an absorbent or carrier for molasses and additional minerals and vitamins in a pelletized animal feed. The production of single-cell protein in Central America faces several important constraints. The agricultural industry in these countries cannot support the high technology processes for production of single-cell proteins. Relatively simple processes for extracting chemicals from agricultural wastes need to be developed. The recommendations are considered in terms of the resources and capabilities of Panama. This includes the establishment of a rationale and a set of criteria for the implementation of specific recommendations. The recommendations are summarized.

PN-AAE-434

Paper copy \$3.55
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(492) DIPHENADIONE RESIDUES IN MILK CATTLE

Bullard, R. W.; Thompson, R. D.; Kilburn, S. R.
1976, 3p.

Interior (PASA RA(ID) 1-67 Res.)

(In Agr. and food chemistry, v. 25, no. 1, p. 79-81)

Reports the results of an experiment to determine if mammillary transfer of diphenadione occurs in treated cows. Diphenadione is a systemic anticoagulant effective in killing vampire bats that consume blood from cattle treated intraruminally. The experiments indicate that mammillary transfer of diphenadione, like that of other anticoagulants, is dose dependent. This data indicates that it is safe to consume milk from cows dosed at the recommended rate of 1mg/kg.

PN-AAD-377

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SOIL RESOURCES

(493) THE EFFECT OF LIMING AN ULTISOL IN GHANA ON MAIZE (ZEA MAYS L.) YIELD AND SOME SOIL PROPERTIES

Mughogho, Spider Kajera
1977, 147p.

Cornell (AID/ta-C-1104 Res.)

(Thesis—Cornell)

Liming is usually aimed at eliminating such effects as low pH,

low base status, aluminum and/or manganese toxicity, and P fixation. Field and greenhouse experiments were conducted to study the effect of lime application on maize growth and some soil properties. The work was conducted on an Ultisol in the forest region of Ghana. Field results showed that liming did not have an effect on bicarbonate extractable P (Olsen), 0.1M HCl extractable Zn, and CEC an exchangeable Mg of the top soil. pH and exchangeable Ca increased with increased lime application. On the other hand, the subsoil was not affected by liming the top soil, which may indicate little or no leaching of the Ca. Lime application did not significantly increase maize grain yield in both the major and minor season. The first increment of lime (0.5 t/ha) increased grain yield economically and that subsequent levels did not, with a great yield depression at the highest lime rate (4 t/ha). Short time greenhouse experiments showed that increased lime application significantly increased the bicarbonate extractable P, 0.5M CaCl₂ pH 1.5 extractable SiO₂, pH, exchangeable Ca and also effective CEC in both the top and subsoil treatments. The results showed that the effect of excess lime application was to depress maize growth and that the effect was accentuated when the soil had a low buffering capacity, such as the subsoil in the present study. Response of maize growth to P application was significant, and the effect was greatest at the lowest P rate (45 kg P/ha), although P application did not alleviate the depressing effect of overliming the soils. In fact, highest P and lime rates caused Zn deficiency symptoms. Nutrient uptake was greatly increased with increased P rates, whereas lime depressed most of the nutrients except Ca uptake. Zn application increased maize growth significantly, more especially when lime was applied. One would be led to conclude that since there was a modest response to the first increment of lime in the field experiment, the lime requirement for Kumasi soil is low.

PN-AAC-948

Paper copy \$12.95
Microfiche \$ 2.00

(494) PLANT ADAPTATION TO MINERAL STRESS IN PROBLEM SOILS, PROCEEDINGS

Wright, M. J.; Ferrari, S. A.; Workshop on Plant Adaptation to Mineral Stress in Problem Soils, Beltsville, Md., 1976; USDA/ARS
1976, 415p.

Cornell (AID/ta-G-1308 GTS)

The 29 papers that constitute this volume include descriptions of how to screen breeding stocks for tolerance to soils that are grossly infertile, rich in toxic elements, or saline; delineations of soil mineral stress areas worldwide; synopses of screening trials and breeding programs with several major crops; and explanations of the chemical processes that determine the success or failure of crop production in hostile soils. Over 600 citations of papers are included. The Workshop that produced the volume was the first attempt to assemble the specialists in soil science, plant breeding and genetics, crop physiology and crop ecology who had undertaken research programs at scattered locations in order to solve a variety of problems traceable to what is called here "soil mineral stress." The reports indicated that genetic factors exercise some, in several cases substantial, control over the adaptability of crop plants to these adverse soil conditions. Instances where only a few cycles of selection were required to enhance tolerance or efficiency were described. As an alternative to the costly process of modifying the chemical environment in problem soils, the genetic approach appeared worthy of increased attention.

PN-AAE-310

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(495) MODELS OF SOIL LOSS, LAND AND WATER USE, SPATIAL AGRICULTURAL STRUCTURE, AND THE ENVIRONMENT

Nicol, K. J.; Heady, E. O.; Madsen, H. C.
1974, 253p.

Iowa State (CSD-2824 211d)

(In CARD rpt, 49T)

Presents an analysis of a regional model of soil-loss restraints and nitrogen balances for each of 223 agricultural producing regions, 51 water supply regions, and 30 market regions. Agriculture is complexly interrelated to problems of the environment, although legislation has been enacted at both the state and national levels to impose environmental controls on agriculture, it is not yet known how such controls might influence farm income, food costs, the interregional distribution of resource use and production, national requirements for water, rural community employment, and other complex aspects of the industry. These effects are analyzed through environmental controls emphasizing soil loss. The results indicate that agriculture can meet present and future levels of demand while maintaining a gross field loss of soil set at a level below 5 tons per acre. Total soil loss can be reduced by use of contouring, strip cropping, terracing, or reduced tillage methods. Commodity supplies can be increased with modest price increases, up to the export level where the available land base is fully used. Beyond this level, supply can increase only with substantial increases in prices unless more production is used.

PN-AAD-441

Paper copy \$21.75
Microfiche \$ 3.00

PLANT PROTECTION

(496) THE CURRENT STATUS OF RICE PEST MANAGEMENT IN THE PHILIPPINES

Sanchez, F. F.
1976, 11p.

Interior (PASA RA(ID) 1-67 Res.)

(Presented at annual meeting of the Entomological Soc. of Am., Honolulu, 1976)

Although the use of high-yielding varieties of rice in the Philippines has raised outputs significantly, ricefield pests (insects, weeds, pathogens, and rodents) destroy so much rice that the government has established a National Crop Protection Center and seven regional centers to conduct research and apply the findings in pest control programs. The most destructive insects are the brown planthoppers, the green leafhoppers, and the stemborers. The weed species causing the most problems are barnyard grass and pickerel weed. The most serious diseases of rice are the vector-borne tungro and grassy stunt viruses. Among vertebrate pests, four species of rodents (rats) are the most important. Current estimates of rice losses to pests average 35% of production, equivalent to 7.3 billion pesos or roughly one billion U.S. dollars. Current pest control methods used by farmers vary widely. Weeding by hand or by rotary weeder is labor-intensive. The use of herbicides, particularly 2, 4-D, is increasing. Chronic anticoagulant rodenticides in baits are used against rats, although many farmers still rely on acute toxicants and mechanical traps. The Masagana-99 rice production program launched in 1973 has been successful; it has raised production from 2.8 metric tons to 4.4 metric tons per hectare. The National Crop Protection Center, established in May, 1976, is undertaking problem analysis, manpower training, and dissemination of pest control information to farmers.

PN-AAE-421

Paper copy \$2.00
Microfiche \$1.00

(497) VOLATILE COMPONENTS OF UNPROCESSED RICE (ORYZA SATIVA L.)

Bullard, R. W.; Holguin, Gilbert
1976, 5p.

Interior (PASA RA(ID) 1-67 Res.)

(In Agr. and food chemistry, v. 25, no. 1, p. 99-103)

This report describes the attempt to understand the composition of rice volatiles in order to develop a synthetic additive for rodent baits. Wild ricefield rats cause severe damage to the rice crop in East and Southeast Asia. The rice is damaged in all growth stages from the germinating seeds to the hulled rice in retailer's bins. This man-rat conflict has led to research to develop effective means of curbing losses, focusing on the development of rat baits. A study of the flavor components of rice was undertaken with tests to determine rat preferences. The consistently high acceptance of aroma-intensified rice formulations encouraged the development of a bait additive from rice volatiles. Seventy-three compounds were identified, only nine of which have been previously reported in unprocessed rice.

PN-AAD-378

Paper copy \$2.00
Microfiche \$1.00

(498) METHODS OF WEED CONTROL IN CASSAVA

Doll, J. D.; Piedrahita, C. W.
1976, 12p.

CIAT (AID/ta-C-1090 GTS)

(In series EE-21)

Describes the results of three years' research at CIAT and highlights the importance of timely weed control and the adoption of an adequate control program. All crops are subject to weed competition for light, water and nutrients. The critical period of competition for cassava continues until the canopy has formed and can last up to 120 days. Weeding after 120 days did not increase production. Two well-spaced weedings produced 75% of the maximum yield. Crop density is also important. Under weed free conditions a crop maximizes its use of essential nutrients, water and light, and a low cassava population can yield as much as higher ones. Higher crop density will compensate for the effects of weed competition. Four trials were conducted to screen herbicides. Eighteen products were found to cause no injury to cassava even at three or four times the recommended rate. The report also discusses incorporated herbicides and the planting schemes, postemergence herbicides, and integrated control. There is a table showing the chemical weed control recommendations for cassava. To arrive at these recommendations, the effectiveness, selectivity, availability, and cost of each product was taken into account. Rarely will a single application of herbicide give sufficient weed control until the canopy closes so each field must be observed closely to determine when complementary hand or mechanical weedings should be performed.

PN-AAE-773

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(499) INHERITANCE OF RESISTANCE TO FUSARIUM SOLANI F. SP. PHASEOLI IN BEANS (PHASEOLUS VULGARIS L.) AND BREEDING STRATEGY TO TRANSFER RESISTANCE

Boomstra, A. G.; Bliss, F. A.
1977, 4p.

Wis. (AID/ta-C-1173 Res.)

For addresses of issuing offices see the Index of Issuing Offices at the rear.

AGRICULTURE AND NUTRITION

(In J. of Am. Soc. for Horticultural Science, v. 102, no. 2, p. 186-188)

Fusarium root rot of beans is a significant problem in bean-growing areas throughout the world. To gain additional information about the inheritance of resistance to root rot incited by *Fusarium solani*, crosses of resistant N203 with several susceptible cultivars were studied. The susceptibility to root rot was dominant in crosses between resistant PI 203958 and the susceptible cultivars Cascade, Falcon, State Half Runner, and California Small White. A quantitative inheritance pattern for disease reaction was observed. When F₂ plants showing slight disease symptoms were selected, this resulted in F₁ populations with a lower disease index than the unselected F₂ population, indicating substantial gain. The results suggested that breeding methods such as recurrent selection should be used to develop bean populations and cultivars resistant to *Fusarium* root rot. Those methods are more suitable for improving quantitative traits than are backcrossing or pedigree selection methods.

PN-AAE-418

Paper copy \$2.00
Microfiche \$1.00

(500) NEW SOURCES OF FUSARIUM ROOT ROT RESISTANCE IN PHASEOLUS VULGARIS L.

Boomstra, A. G.; Bliss, F. A.; Beebe, S. E.
1977, 5p.

Wis. (AID/ta-C-1173 Res.)

(In J. of Am. Soc. for Horticultural Science, v. 102, no. 2, p. 182-185)

Root rot of beans (*Phaseolus vulgaris*) occurs in all bean-growing areas of the world. No resistant snap bean cultivars have been developed, and only recently have tolerant dry bean cultivars been released in the U.S. Methods to assess the reactions of host plants to the disease have been used with varying degrees of success. In this study a new method was used to evaluate the resistance of bean seedlings to *F. solani*. The plants are inoculated, then grown in a nutrient culture solution to permit a test of the reaction of the seedlings to *F. solani*. Using that method in combination with other test methods, new sources of root rot resistance were identified. From more than 800 accessions, 18 plant introductions and several cultivars of *Phaseolus vulgaris* were found to be either resistant or tolerant. Susceptible plants grown with ammonium nitrate showed reduced symptoms, compared to plants grown on nitrate-N only. When ammonium was used as the sole nitrogen source, it was toxic to bean seedlings at identical nitrogen concentrations. Results based on the nutrient culture technique were generally consistent with field reactions.

PN-AAE-419

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(501) PROCEEDINGS; SEMINAR AND WORKSHOP IN PESTICIDE MANAGEMENT, ALEXANDRIA, EGYPT, 1977

Alexandria Univ. Plant Protection Dept.
1977, 186p.

Calif.—Berkeley (AID/ta-C-1195 GTS)

Presents the proceedings of the Pesticide Management Seminar/Workshop held in Alexandria, Egypt, March 5-10, 1977. This seminar/workshop provided an opportunity for leaders in government, industry, universities and private groups involved in pesticide management to focus on the complex issues and problems associated with the use of pesticides in agriculture and health programs in Egypt and to develop a knowledge and understanding of the interrelationship of health, agriculture and the environment to the economy and welfare of the country. Pesticide management is the technology concerned with safe, efficient and economical use and handling of pesticides from time

of manufacture to final utilization and disposal. Included in this process are formulation, packaging, transport, storage, official registration for use and sale, selection for use, application, and the disposal of containers and unwanted material. An additional concern is the problem of residues in food and the environment and their impact on man. The report includes papers on the subjects of the agromedical approach to pesticide management, principles of integrated pest control. Chemodynamics of pesticides, ecological aspects of pesticide use, and legislation on the regulation of pesticides. The report concludes with recommendations about the cooperation and coordination of UN agencies, the convening of an international conference to consider a global strategy for pesticide management, and the strengthening of the capabilities of institutions to assess the impact of pollutants and to develop methods and technologies for reducing them.

PN-AAE-751

Paper copy \$16.20
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(502) AN ENVIRONMENTAL AND ECONOMIC STUDY OF THE CONSEQUENCES OF PESTICIDE USE IN CENTRAL AMERICAN COTTON PRODUCTION, 1974-1976; FINAL REPORT

Central Am. Research Inst. for Industry, Guatemala City; National Research Council. Board on Science and Technology for Int. Development
1977, 313p.

NAS (CSD-2584 GTS)

(Staff summary rpt., 29p.: PN-AAE-304)

Based on two years of research on the effects of pesticides in Central American cotton production, this study identifies management measures which reduce environmental and economic problems associated with pesticide use while maintaining the benefits derived from cotton production. Most of the environmental components examined — food, forage, water, flora, and fauna — contained highly residual pesticides. Other findings point out that: aerial application of pesticides under unstable weather conditions is a key event in spreading pesticides through the environment; pesticide drift increases sub-clinical intoxication of humans and the possibilities of poisonings; it contributes to the development of resistance by the malaria vector; and it creates high economic losses because of meat contamination by DDT. Part One of the study presents a systems management program to reduce pesticide use and its environmental and economic consequences. The program, carried out in Guatemala, El Salvador, Honduras and Nicaragua, included integrated pest control. This meant reducing the number of pesticide applications by about 39% while increasing yields; improving soil conservation; using fertilizers more effectively; and discouraging the use of "hard" pesticides. The program also examined the use of a more refined pest economic threshold and the establishment of selected import duties. Part Two discusses the technical issues on which this study focuses, and it includes tables and appendices. The study makes these recommendations: (1) Adopt occupational safety procedures. (2) Improve and expand existing first-aid clinics to promptly treat human poisonings. (3) Implement integrated cotton pest control as an alternative to sole reliance on chemical pesticides. (4) Educate farmers regarding the economic and environmental significance of planting cotton in suitable land and of applying pesticides efficiently. (5) Establish an environmental monitoring program for pesticide use in Central America.

PN-AAE-305

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Example: PN-AAB-000

(503) VERTEBRATE DAMAGE CONTROL RESEARCH, ANNUAL PROGRESS REPORT, CALENDAR YEAR 1976

Denver Wildlife Research Ctr.
1977, 101p.

Interior (PASA RA(ID) 1-67 Res.)

A PROJECT: To develop safe, effective, and economical control methods suitable and practical for small farmers to reduce crop damage by rats and noxious birds.

DURATION: 1968-Ongoing

DEVELOPMENTS: Millions of dollars are lost annually in Africa, Asia, and Latin America by rat damage to rice, quelea and bird damage to small grains, and vampire bat transmitted rabies in livestock. During 1976 seven trips were made to these areas to assess the severity of vertebrate pest situations in agriculture, to arrange and conduct preliminary field trials, and to identify problems, plan programs, and provide current information. A summary of each trip is presented in this report. The most important areas of backup research in support of field programs are pharmacology, behavioral biology, sensory biochemistry, electronic development, and physiological biology. Abstracts are included of the backup research activities in these areas. Longer reports are included on the control of damage to small grains in Africa by quelea, the rodent research center in the Philippines, and vampire bat control in Latin America. Two vampire bat control methods are being evaluated in Southern Bolivia. In a study in northeastern Brazil the use of diphenadione reduced the vampire bat population by 99.4 percent. Campaigns for controlling bats are reviewed for ten Latin American countries. Two programs of the Rodent Research Center are aimed at reducing vertebrate damage to agricultural crops in the Philippines and other countries in southeast Asia. The program emphasized adaptive research and control methods evaluation and also the development of a technical backstop capability to advise regional plant protection agencies and a training capability to encourage rapid use findings. The main objective of the DWRC in Africa is to conduct research toward protection of small grain crops, such as wheat, sorghum, millet, and rice, from depredations by birds and rodents. Preliminary work suggests that use of chemical repellents and baits for direct crop production may help to reduce damage. This report is a general review of the quelea and its depredation in Africa along with the current status and future goals of research.

PN-RAB-687

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PN-RAA-707 (1973, 52p.)

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Microfiche \$1.00

(504) RODENT RESEARCH CENTER, LAGUNA, PHILIPPINES: 1976 ANNUAL PROGRESS REPORT

Denver Wildlife Research Ctr.
1977, 109p.

Interior (PASA RA(ID) 1-67 Res.)

A PROJECT: To develop safe, effective, and economical control methods suitable and practical for small farmers to reduce crop damage by rats and noxious birds.

DURATION: 1968-Ongoing

DEVELOPMENTS: This annual report of the Denver Wildlife Rodent Research Center discusses the program and

facilities, staff, research, training and international activities. Studies were conducted in the following areas: effectiveness of modified sustained baiting procedures in reducing rat damage to crops other than rice; a similar study for corn; continued studies on means of reducing rat damage to rice; and a study of bird damage in small ricefield plots at hard dough stage. A method has been adapted for coconuts in which bait is placed monthly in tree crowns. The damage in treated plots dropped to low levels. In a comparative study, both groundbaiting and crown baiting with anticoagulant rodenticides reduced rat activity and damage, but crownbaiting was more effective and cost less. In a trial for reducing rat damage to rice, conducted near the Chico River, the sustained baiting method protected a none hundred hectare baiting site from serious rat damage at low cost and with potentially high economic return. In an investigation on the operational characteristics of a non-lethal electric barrier to exclude rats from a ricefield, non-lethal barriers provided comparable or better protection to three, one-quarter hectare ricefield plots than lethal barriers, without the need for a night crew to remove electrocuted animals and without need for daily battery recharges. Two tests were conducted to determine the potential hazard of warfarin to domestic chickens. It was concluded that the use of warfarin represents a low hazard to domestic chickens by accidental poisoning if the recommended baiting program is followed.

PN-RAB-686

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PN-AAB-634 (1974, 110p.)

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FISHERIES

(505) IMPROVING FOOD AND NUTRITION THROUGH AQUACULTURE IN THE DEVELOPING COUNTRIES

Caton, Douglas; Moss, D. D.; Urano, J. A.
1974, 58p.

AID/TA/AGR

Aquaculture, the production of freshwater and marine organisms through husbandry, now contributes less than 10% of the water-derived proteins in the world. However, if the best existing methods were applied more widely, aquaculture could produce ten times as much protein annually by the year 2000. The total area presently used for fishculture is estimated to be four million hectares. This area could be expanded to about 30 million hectares. With improved methods, this would increase production from the present five million metric tons to 50 million tons by the end of the century. Ongoing research needs to be reinforced by coordinated planning and financial assistance. This paper describes selected aquacultures, including those of the Chinese carp, common carp, Indian carp, tilapia, trout and salmon, catfish, pangasius, walking catfish, milkfish, molluscs, shrimp, and eels, and discusses the most effective way to reinforce present

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research efforts. Research relating to LDC's should concentrate on important scientific problems concerning a small number of species: carps, catfish, tilapia, milkfish, mullets, and shrimps. The highest priority research is also needed on diseases and the broad spectrum of water quality problems related to the cultured animal and its aquatic environment. One or more regional research centers should be established to conduct the long-term research required, offer short-term training for scientific personnel of national institutions, and disseminate research findings. A network of national centers should also be established to investigate local problems and conduct pilot studies.

PN-AAE-442

Paper copy \$5.55
Microfiche \$1.00

(506) ANALYSIS OF FISHERIES DEVELOPMENT POTENTIAL IN CHAD

Hill, Barry Multinational Agribusiness Systems, Inc., Washington, D. C. 1976, 60p.

MASI (AID/afr-C-1149 GTS)

Analyses of the grain marketing system and the fisheries problems and future prospects in Chad. This study reviews the states of Chadian fishery production with reference to the effects of the 1971-73 drought on the abundance of fish. It describes and evaluates the marketing, conservation and preservation methods currently in use. It discusses the fishing methods used in Lake Chad and the Chari and Logone Rivers and assesses the fisheries potential. It evaluates the present structure of the Chadian National Fisheries Service, the major infrastructural problems hindering the development of the fishery. It recommends specific A.I.D. responses. It concludes that the major objective of any fisheries development plan should be increasing the geographical range and distribution of fish within Chad. It recommends that A.I.D. undertake a five part program which includes education and training, expatriate intervention, development of a National Fisheries Service, organization of fishermen through cooperatives, and development of a new fishing canoe construction method. Appendix D is a translation of a paper on the effects of the drought on the fish stock in Lake Chad and the Chari Delta. Appendix G is a translation of a paper on fishing techniques practiced in the Lake Chad Region and the Bas Chari.

PN-RAB-636

Paper copy \$5.75
Microfiche \$1.00

(507) THE ROLE OF FISHERIES; AQUACULTURE IN LATIN AMERICA

Bromley, D. W.; Lin, S. Y. 1975, 22p.

Auburn (CSD-2780 211d)

This trip report of a three-week visit to Brazil, Panama, El Salvador, and Guatemala describes the state-of-the-art of Latin American fisheries. Part I contains recommendations for A.I.D. Part II discusses the Brazilian situation, and Part III presents the situation in Central America. Recommendations for fishculture in Brazil include making a socioeconomic assessment of consumer acceptance of various fish species and of differing processing requirements, and assessing the need for more extension personnel to work with fish farmers on pond site selection, management, fish harvesting, and marketing. Also recommends continuity in funding to maintain the highly qualified personnel needed to allow the excellent research station at Pentecoste to reach its potential. The report recommends that in Central America, the consumer demand for fish be determined and the USAID-Auburn-Peace Corps-Government of El Salvador model for disseminating information on fishculture be expanded. Part II describes the station and focus of research at Pentecoste, Brazilian fish production and extension programs, and the need

to expand the extent of fishculture training programs for Brazilians and for other Latin American countries. Topics treated in the section on Central America include consumer acceptance of fish as a protein source, descriptions of research stations, and the possibility of developing fish cooperatives and/or extension programs. The Appendix contains lists of persons contacted and bibliographic references.

PN-AAE-306

Paper copy \$2.00
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(508) UTILIZATION OF RECOVERED SHRIMP PROTEIN AS A PIGMENT SOURCE FOR SALMONIDS

Kamata, Tadashi; Simpson, K. L.; Collins, J. G.; Collins, J. H. 1976, 17p.

R. I. (CSD-2455 211d)

A process was developed for the recovery of shrimp protein as a by-product of a chitin recovery operation. The protein was extracted and precipitated from the shrimp waste by acid and heat treatment. The coagulum was found to be 80.5% water and 7.6% ash, 10% calcium and 75% protein on a dry weight basis. It was low in bacteriological counts and odor and compared favorably to reported amino acid profiles for other shrimp meals. The meal and pigment extract of the meal was fed to rainbow trout. After two weeks, significant amounts of astaxanthin and its isomers were incorporated into the flesh and skin of the trout. The results show that the shrimp coagulum could be used as a pigment and protein source for salmonids raised in aquaculture.

PN-AAC-702

Paper copy \$2.00
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WATER RESOURCES

(509) WATER MANAGEMENT IN PHILIPPINE IRRIGATION SYSTEMS, RESEARCH AND OPERATIONS

Water Management Workshop, IRRI, 1972; IRRI 1973, 278p.

IRRI (AID/ta-G-1074 GTS)

Presents 18 papers read at the water management workshop held in December, 1972, by the University of the Philippines and the International Rice Research Institute. They deal with soil-plant-water relationships, system and pilot project operations, technical problems, economic problems, and the social aspects of water management. The most provocative issue addressed by many papers is the complexity of the administrative and social organization needed to make use of irrigation water. An essential requirement for management of an irrigation system is a set of procedures for keeping informed about the situation, needs, and intentions of the farmers who use it. The farmer must be able to depend on getting the water when he needs it. The administrative system must not only build and maintain the dams, canals, ditches, and pumping systems, but ensure fair allocation and efficient use of water among farmers. Maintenance and management of the system can be confused because one individual (the ditchtender) often performs both these tasks. What often goes unnoticed is the differences in these tasks and the different talents they require. The farmer's interests in water management decisions are not yet adequately served in many irrigation systems. Administrative policies and mechanisms need to be developed to solve this problem.

PN-AAE-429

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Example: PN-AAB-000

FOOD PROCESSING

(510) POSTHARVEST FOOD LOSSES IN DEVELOPING COUNTRIES; STAFF SUMMARY REPORT

Int. Working Group Meeting, Washington, D.C.; 1977; National Research Council. Board on Science and Technology for Int. Development
1978, 145p.

NAS (CSD-2584 GTS)

Describes the objectives, structure, and outcome of the working meeting on postharvest food losses held by the National Academy of Sciences in Washington, D.C., October 31 through November 3, 1977. Participants came from developing countries and from institutions with experience in food loss reduction. The workshop was designed (a) to examine loss problems for major food categories, (b) to discuss certain important aspects of food loss and loss reduction that are not commodity-specific, and (c) to synthesize both sets of issues into a meaningful perspective on food loss problems and the opportunities for intervention. This account gives the reports of working small-group discussions on cereal grains and grain legumes; roots, tubers, fruits and vegetables; fish; economics of postharvest food loss reduction; training and education for postharvest food loss reduction; and interventions. It gives the report of the final plenary session on food storage in the People's Republic of China and on allocation of resources to postharvest food conservation. It includes these contributed papers: "Postharvest Grain Loss Assessment Methodology" (by K. Harris); "Personnel Needs and Training for Postharvest Food Loss Reduction Activities" (by P. F. Prevet); "Economics of Postharvest Food Loss Reduction" (by M. Greeley); and "Towards a Social Theory of Postharvest Food Loss" (by H. Guggenheim).

PN-AAF-051

Paper copy \$12.80
Microfiche \$ 2.00

(511) POST HARVEST FOOD LOSSES: THE NEGLECTED DIMENSION IN INCREASING THE WORLD FOOD SUPPLY

Bourne, M. C.
1977, 52p.

AID/TA/AGR

(In Cornell int. agr. mimeograph, 53)

This paper outlines the nature of the problem of postharvest food losses, discusses the causes of loss, what is known of the extent of losses and where losses occur. The techniques for preserving food are briefly described and the techniques identified which offer the greatest promise for increasing the available food supply in developing countries. These techniques are discussed in terms of economic viability and the availability of pertinent resources in the LDC. There is no known method for stopping the deteriorative changes that foods undergo during storage. The two most important factors affecting the rate of deterioration are temperature and humidity. Cereals and dried foods maintain their resistance against microbial attack because of their low moisture content resulting in a water activity too low to support the growth of microbes, however, there are frequent problems with the growth of molds. Foods must have a water activity higher than 0.9 to permit the growth of bacteria, a water activity above 0.88 to permit the growth of yeast and a water activity above about .8 to permit the growth of common molds. The primary causes of postharvest food losses are: biological and microbiological, chemical and biochemical, mechanical, physical, physiological and psychological. Secondary causes which lead to conditions in which primary cause can occur are: inadequate drying, inadequate storage, inadequate transportation, inadequate refrigerated storage, inadequate marketing, and legislation. Losses may occur anywhere from point of harvest to point

of consumption. Appendix A lists specific examples showing how the definition of postharvest food loss works out in practical situations. Appendix B discusses crop production increases required to offset post harvest losses.

PN-AAE-321

Paper copy \$5.05
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For a bibliography on postharvest food loss, see ARDA 5:3, no. 448.

PN-AAC-835 (78p.)

Paper copy \$7.20
Microfiche \$1.00

(512) EQUILIBRIUM MOISTURE CONTENT OF BEANS

Guevara-Gulo, Melquiades; Pfof, H. B.
1973, 62p.

Kan. State (CSD-1588 GTS)

(In Grain Storage, Processing, and Marketing Research Report No. 5); (Thesis M.S. — Kansas State)

A proper understanding of adsorption and desorption characteristics of grains and legumes is important during their handling, storage, drying, and conditioning. These crops gain or lose moisture, depending on the vapor pressure of moisture in them and in air surrounding them. This study investigated isotherm data for beans—that is, curves describing the equilibrium relationship between the moisture content of beans and the relative humidity at a specified temperature. The results of the study are useful to storage engineers engaged in designing storage structures, and to managers of such facilities. The study results are summarized as follows: The equilibrium moisture content for beans investigated decreases with an increase in temperature. The Type-II isotherm or sigmoid isotherm for beans is consistent with those for other grains found by earlier investigators. Hysteresis, for beans, decreases with an increase in temperature. The rate of desorption for beans is a function of the relative humidity and temperature. The rates of desorption for beans were higher in the first two days of storage. The isotherm equation developed by Chung and Pfof will predict the equilibrium moisture of beans for a wide range of relative humidity at a given temperature. The heat of desorption for beans was found to be greater than that of the latent heat of vaporization of pure water. More technical findings concerning isosteric heats of desorption and adsorption for beans are also reported.

PN-AAC-651

Paper copy \$5.90
Microfiche \$1.00

(513) TECHNICAL ASSISTANCE IN GRAIN STORAGE, PROCESSING, AND MARKETING AND AGRI-BUSINESS DEVELOPMENT; ANNUAL REPORT, 1975/1976

Kan. State Univ. Food and Feed Grain Institute
1976, 67p.

Kan. State (AID/ta-C-1162 GTS)

(In Grain storage, processing, and marketing rpt. no. 60)

A PROJECT: To provide technical assistance to LDCs in post-harvest grain handling practices—including drying, storage, transportation and marketing. Conducted by the Food and Feed Grain Institute, Kansas State University.

DURATION: 1967—Ongoing

DEVELOPMENTS: Technical assistance was provided to Zaire, Senegal, Ecuador, Uruguay, Paraguay, Dominican Republic and Philippines. The objectives of each project and a summary of activities is reported on a country-by-country basis. Several potential areas for technical assistance are also dis-

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cussed. The fifth annual A.I.D. Grain Storage and Marketing Short Course was held. An attempt was made to provide greater depth of instruction in the economic and technical aspects for participants interested in these specific areas. A core of subject material for all participants included: structure of cereal grains; grain inspection; standards and grading; moisture and its measurement; causes of losses; micro-flora and chemical, physical, and nutritive changes; pest control; methods, equipment and structures for drying, aerating and handling of stored grains; principles of management and operation; storage costs and alternatives; bookkeeping and inventory control; and transportation and government in marketing. General assistance projects that may have application in many host countries included A Master Projection Model for Estimating Future Requirements for Grain Storage and Marketing Facilities and Functions, Rice Mill Feasibility Analysis, High Temperature-High Humidity Storage Conditions—Effect on Grain Quality, Development of a Grain Grading System for Developing Countries, Crop Losses, Modification of the "Brook" Grain Dryer for Farm Use, and Evaluation of Insect Damage and Losses to Stored Maize. Progress in each project is briefly discussed. A list of 55 reports is included in this document.

PN-AAE-458

Paper copy \$6.30

Microfiche \$1.00

HUMAN NUTRITION

(514) WORLD FOOD AND NUTRITION STUDY; VOL. I: SUPPORTING PAPERS

National Research Council. Commission on Int. Relations 1977, 324p.

AID/TA/AGR

(Main work, 217p.: PN-AAD-532. Incl. rpts. on crops, animals, and aquatic food sources)

Volume I of five volumes contains the reports of Study Teams appointed by the National Academy of Sciences. In 1974, the Academy was asked to make an assessment of the problem of world hunger and malnutrition and to "develop specific recommendations on how our research and development capabilities can best be applied to meeting this major challenge." The major areas considered in this volume include: Crop Productivity; Animal Productivity; and Aquatic Food Sources. Each Study Team reviewed research recommendations and possibilities for research from a variety of sources. Research priority was established on the basis of potential global effect on hunger and nutrition. The Crop Productivity report includes eight research profiles, a subgroup report on pest control, and a case study of pest control innovation and nutritional improvement in Columbia. The report on Animal Productivity includes sections on the role of livestock, four research profiles, a subgroup report on animal health and a current status report of animal disease control programs and major research needs. The report on Aquatic Food Sources contains six research profiles and a section on long-range program needs. Each report section outlines research needs, impact and implementation. References and bibliographies follow each major report.

PN-RAB-639

Paper copy \$27.65

Microfiche \$ 4.00

The main work is abstracted in ARDA 5:2, no. 193.

PN-AAD-532 (217p.)

Paper copy \$18.75

Microfiche \$ 3.00

(515) WORLD FOOD AND NUTRITION STUDY; VOL. II: SUPPORTING PAPERS

National Research Council. Commission on Int. Relations 1977, 305p.

AID/TA/AGR

(Main work, 217p.: PN-AAD-532. Incl. rpts. on general agr. and weather materials)

This is Volume II of five volumes containing the reports of the National Academy of Science Study Teams on the problems of world hunger and malnutrition. The major study areas considered in this volume are Resources for Agriculture and Weather and Climate. The report on Resources for Agriculture is divided into four sections: Farming Systems, Land and Water, Fertilizers and Energy and Equipment. Each sub group contains several research profiles outlining research needs, impact and implementation. References are included at the end of the report. The report on Weather and Climate contains six research profiles. Two appendices are (1) "Some characteristics of the Climatic System;" and (2) "Example of the Use of Weather Data in a Risk Management Model for the Construction Industry." The research areas discussed in the Weather and Climate report are based on the following considerations. In most regions of the world variability of climate is the rule rather than the exception. The world's food supply is precariously balanced considering the possible effects of a single year's poor harvest due to variations of weather and climate. A famine has occurred in some part of the world nearly every year since World War II, the most frequent causes being droughts and floods. In addition, a high probability exists that certain human activities may lead to climatic variations altering global patterns of food production. References and a bibliography are included.

PN-RAB-640

Paper copy \$26.05

Microfiche \$ 4.00

(516) WORLD FOOD AND NUTRITION STUDY; VOL. III: SUPPORTING PAPERS

National Research Council. Commission on Int. Relations 1977, 347p.

AID/TA/AGR

(Main work, 217p.: PN-AAD-532. Incl. rpts. on marketing, institutions, and information systems)

This is Volume III of five volumes containing the report of Study Teams appointed by the National Academy of Sciences. In 1974, the National Academy of Sciences was asked to make an assessment of the problem of world hunger and malnutrition and develop specific recommendations on research and development to meet the challenge. The major areas considered in this volume include: Food Availability to Consumers; Rural Institutions, Policies, and Social Science Research; Information Systems; and Interdependencies. Each Study Team Report contains several research profiles outlining research needs, impact and implementation in a specific area. Some subjects considered in the Food Availability report include the importance of research on food marketing and related technology, the U.S. and world food marketing systems, and special research problems of the developing countries. The report on Rural Institutions, Policies, and Social Science Research is divided into three sections: Policies, Programs and Projects; Research and Educational Institutions; and Intermediate Organizations. Information systems were analyzed from an historical perspective with specific recommendations and priorities. The Interdependencies Report includes sections on Population and Health; Energy, Resources, and Environment; International Trade Policy and Comit of Nations; and National Development Policies. Each Study Team Report is followed by a list of references and a bibliography.

PN-RAB-641

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(517) WORLD FOOD AND NUTRITION STUDY; VOL. IV: SUPPORTING PAPERS

National Research Council. Commission on Int. Relations
1977. 171p.

AID/TA/AGR

(Main work, 217p.: PN-AAD-532. Incl. rpts. on nutrition and hunger)

This is Volume IV of five volumes prepared by the National Academy of Sciences on issues of world hunger and malnutrition. Basic problem areas are assessed, research subjects and priorities recommended. The major study areas included in this volume are: Nutrition; and New Approaches to the Alleviation of Hunger. Research profiles in the report on Nutrition are entitled: (1) The Functional Significance of Nutritional Status; (2) Ensuring the Quality, Safety, and Adequacy of Diets; (3) Intervening to Improve the Nutritional Status of Selected Groups; (4) Nutritional Impact of Government Policies. Appendices include "Selection of Research Topics" and "The Malnutrition Problem." The report on New Approaches to the Alleviation of Hunger contains four research profiles: Quality of Life Index; Learning from the Successful Poor Countries; Nutritional Impact Statements; and Management Systems. There are ten sections on research direction: Coping with Weather Instability; Minimizing Food Waste and Disappearance; Should National Food Production Policy Stress Regional Specialization Based on Resource Advantage; Sociopolitical Obstacles to Program Implementation; How to Change Dietary Habits and Food Consumption Patterns; Infant Mortality and Fertility; Women and Nutrition; International Incentives to Encourage National Programs of Redistribution; The International Economic Environment; and U.S. Responsibilities and the World's Poor.

PN-RAB-642

Paper copy \$14.95
Microfiche \$ 2.00

(518) WORLD FOOD AND NUTRITION STUDY; VOL. V: SUPPORTING PAPERS

National Research Council. Commission on Int. Relations
1977, 210p.

AID/TA/AGR

(Main work, 217p.: PN-AAD-532. Incl. rpts. on agr. research inst.)

Volume V of five volumes prepared by the National Academy of Science on issues of world hunger and malnutrition. Basic problem areas are assessed and research subjects and priorities recommended. The major study area of this volume is Agricultural Research Organization. Today no country is insulated from changes in the global levels of food production, needs, trade and prices. Full U.S. participation in the larger world community of international food and nutrition science serves both self-interests and the larger goal of improving human welfare. Three subtopics are included in this report: Research Organization in the United States; Global Agricultural Research Organization; and Development of Research Personnel. The rate of increase in the productivity of U.S. agriculture appears to be tapering off and real U.S. resources going into agricultural research and development have been declining. More good scientists will be needed to solve food and nutrition problems. Private firms contribute to solving important agricultural and nutritional problems. They are major investors where they can retain proprietary interest in their investment. Steps are being taken to redirect the use of presently available funds to today's high priority needs. In providing for more flexible use of appropriated funds, there is an opportunity to improve the relevance, quality and performance of U.S. food and nutrition research. Better answers to world food problems will require a global effort with the U.S. working as a receiving and contributing partner in an international net-

work with research institutes in other high-income nations, international agricultural research centers and research and training institutions in LDC's.

PN-RAB-643

Paper copy \$18.20
Microfiche \$ 3.00

(519) NUTRITION AND NATIONAL DEVELOPMENT, ESTABLISHING THE CONNECTION

Hakim, Peter; Solimano, Giorgio
1975, 32p.

MIT (AID/ta-G-1113 211d)

(In INP discussion papers no. 5)

Only in the past five years have nutrition specialists begun to explore the social and economic dimensions of malnutrition in developing countries. The existing literature is limited both in its analysis of the problem and in its proposals for action. Various hypotheses advanced have not been seriously tested in national settings. Until such analyses are conducted, the only sound arguments for efforts to reduce malnutrition will continue to be ideological and ethical. The causes of malnutrition have been found primarily among the malnourished, and not in the social order in which they live. There has been no serious examination of the alternative hypothesis: that the persistence of widespread malnutrition is largely a reflection of the social and political organization and choices of development strategies. Child feeding programs have usually not been very effective because social, economic, and institutional barriers often prevent these programs from meeting their nutritional goals. In developing countries, groups having the greatest need are often legally or functionally excluded from the benefits of child feeding programs, as well as from other social welfare measures. What is needed is a change in the research priorities of the nutrition community. It should focus its attention on developing a better analysis of the problem in its social context. The basic assumption that nutritional standards can be improved without altering economic development strategies may well be wrong.

PN-AAE-437

Paper copy \$2.65
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(520) AN APPLICATION OF BENEFIT-COST ANALYSIS TO NUTRITION PROGRAM PLANNING

Popkin, B. M.
1974, 27p.

Cornell (AID/ta-C-1116 Res.)

Details the results of a benefit-cost analysis of three nutrition programs in the Philippines, each designed to eliminate and prevent xerophthalmia, a vitamin A deficiency. The report gives the conceptual framework of benefit-cost analysis which considers private benefits and social returns - monetary and nonmonetary. It describes the programs under consideration: (1) the provision of vitamin A capsules every six months to the sample of 1800 children, aged 1 to 16 years, about 40% of whom were affected by xerophthalmia; (2) a nutrition education and public health plus home gardening approach to provide nutrition and garden information, and public health intervention (PHI); (3) and the fortification with vitamin A of a major food in the diet of a target population. The report details the empirical analysis — of private benefits, of social benefits, of the effectiveness of eliminating xerophthalmia, and of program costs. It includes an in-depth program analysis. Tables illustrate earnings functions, economic benefits from the elimination of the affliction, benefit-

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cost ratios, and social benefit-cost ratios. The goal of the analysis was to select the program most meaningful to the Philippines. Application of the benefit-cost ratios showed that if the maximization of economic benefits were the sole goal of the endeavor, the mass capsule program should be selected. However, if other developmental goals are considered, such as the participation of the population in the program, changes in values and attitudes accompanying the mortality decline, or the health and nutrition benefits, the PHI appears to be the most appropriate program.

PN-AAE-296

Paper copy \$2.25
Microfiche \$1.00

(521) CASSAVA'S ROLE AS A FOOD STAPLE; A CROSS-DISCIPLINARY SYSTEM ANALYSIS OF NUTRITION PROBLEMS IN A CASSAVA DEPENDENT CULTURE

April, J. E.; Hersh, G. N.; Rogers, D. J.; Slater, C. C.
1974, 189p.

Colo. (AIM/CM/ta-C-73-44 GTS)

Presents the beginning phases of a systems approach to studying food and nutrition in Nigeria. The focus is on a single commodity, cassava, and it is used as a tracing mechanism for describing the structure of the food and nutrition system in southern Nigeria. Food production in southern Nigeria can barely keep pace with demand. Per capita income is not increasing fast enough to allow all segments of the population to get adequate nutrition. There is a need for intervention programs which yield high nutritional payoffs in relation to their costs. The report describes critical characteristics within the system that are important to understanding how the system operates. It develops recommendations concerning preliminary interventions which change or accelerate the ongoing processes within the system. It lays a foundation for drafting policy decisions which may assist a broader nutritional planning program. The diagnostic project is an effort to show specialists in many fields the value of examining nutrition problems from a systems perspective and to illustrate the value of looking at the impact of any intervention on the entire system.

PN-AAD-711

Paper copy \$16.45
Microfiche \$ 2.00

(522) SUPPLEMENTAL FEEDING AS A NUTRITIONAL INTERVENTION: THE CHILEAN EXPERIENCE IN THE DISTRIBUTION OF MILK

Hakim, Peter; Solimano, Giorgio
1975, 61p.

MIT (AID/ta-G-1113 211d)

(In INP discussion papers no. 2)

Whether supplementary feeding programs are an effective way of combatting malnutrition is controversial. Critics of such programs argue that the supplemental food commonly does not reach a high proportion of the target group, and that such programs effectively divert attention from basic problems of insufficient income and food. The usefulness of supplemental feeding as a nutritional intervention can only be decided within the context of a specific national setting. This study explores the Chilean experience of milk distribution over a 50-year period. It then examines the milk program in 1971 and 1972, during the first two years of the government of Salvador Allende. Finally, it discusses the consequences of the milk program in Chile and factors that have influenced its development. The milk program may have contributed to some improvement of nutrition standards in Chile. It certainly led to heightened attention to nutrition in the practice of health care. However, malnutrition is still a feature of Chile's social order. The eradication of malnutrition in Chile will require sharp changes in patterns of production, dis-

tribution, and consumption. Those changes are unlikely to be accomplished by autonomous measures grafted onto them.

PN-AAE-435

Paper copy \$5.80
Microfiche \$1.00

(523) NUTRITION, FOOD AND PRICES IN PAKISTAN

McCarthy, F. D.
1975, 82p.

MIT (AID/ta-G-1113 211d)

(In INP discussion papers no. 4)

In all countries, particularly developing countries, growth rates alone do not provide an adequate measure of economic development. It is necessary to look at other indices, including the nutritional status of the population. This paper analyzes aspects of this issue by considering the demand pattern for various key foods. Those preferences are then related to the "revealed demand" for nutrition. This study of West Pakistan is based largely on the household surveys conducted by the government of Pakistan. First, the "demand" for nutrition is established under the assumption that tastes are a given. Because income is a primary determinant of nutrient intake, malnutrition in low-income classes may be reduced by either direct or indirect income supplements. This would require some institutional changes. Secondly, the demand for various food groups is analyzed. Quality effects are introduced by developing a model for consumer demand. The results indicate that as income rises, most people spend a high portion of the increased income on higher priced foods. This suggests that even without any income increase, people above the lowest income level can improve their nutritional status by purchasing lower priced varieties of food. Thus, programs designed to adjust people's tastes toward more nutritionally efficient consumption patterns warrant careful consideration. Various policy options to achieve improvement in nutritional status are discussed.

PN-AAE-436

Paper copy \$7.55
Microfiche \$1.00

(524) AMINO ACID FORTIFICATION OF RICE STUDIES IN THAILAND, BACKGROUND AND BASELINE DATA

Gershoff, S. N.; McGandy, R. B.; Suttapreyasari, Dusanee; Nondasuta, Amorn; Pisolyaburta, Uthai; Tantiwongse, Puangton
1975, 13p.

Harvard (CSD-2170 Res.)

(In Am. J. of clinical nutrition, v. 28, p. 170-182)

A large-scale field study in villages in northern Thailand measured the health benefits derived from the fortification of rice with lysine, threonine, thiamin, riboflavin, vitamin A and iron. Twenty-nine villages with a total population of 13,500 were divided into five test groups: (1) raw control, no intervention; (2) placebo control, rice fortification plus day-care centers for preschool children; (3) rice, vitamin and iron fortification plus day-care centers; (4) rice, vitamin, iron, and amino acid fortification plus day-care centers; (5) rice fortification, no-day care centers. The means of rice fortification and dispensing and the day-care centers are described. The document also gives information on implementing the study, collecting data on population, mortality, morbidity and birth weight, and baseline data on both village preschool children and middle-class Bangkok preschool children. The study showed that the village children are retarded in growth and development when compared to the Bangkok children. Data obtained from an institutionalized population of preschool children in Bangkok support the hypothesis that marked catch-up growth may occur in undersized Thai preschool chil-

dren supplied with a comprehensive health program which includes good nutrition.

PN-AAE-309

Paper copy \$2.00
Microfiche \$1.00

(525) RESEARCH TO DETERMINE THE COST AND EFFECTIVENESS OF ALTERNATE MEANS OF CONTROLLING VITAMIN A DEFICIENCY; AND EVALUATION OF THREE ALTERNATE STRATEGIES IN THE PHILIPPINES

Solon, Florentino; Fernandez, Tomas; Popkin, B. M.; Latham, M. C.
1977, 138p.

Cornell (AID/ta-C-1319 Res.)

(Final rpt. of contracts: AID/ta-C-1319 and AID/ta-C-116)

Gives brief background on Vitamin A deficiency, details a three-year study of Vitamin A deficiency in the Philippines which included alternate means of control, and gives recommendations for a national policy to prevent xerophthalmia. The study, carried out by the Cebu Institute of Medicine in Cebu City and Cornell University, sought to determine the magnitude of the problem of Vitamin A deficiency in the Philippines. It examined the relative importance of the various factors associated with xerophthalmia and designed programs to eliminate and to prevent the affliction. Another goal was to determine the nutritional and economic effect of each program after the programs had operated for one year. Some 2715 sample children ages 1-16 were drawn randomly from 600 families in four Philippine ecologic zones. Clinical, biochemical, dietary, and socioeconomic information was obtained from the families. Among the study's findings: xerophthalmia was more prevalent in urban than rural areas, and it peaked in the 4 to 6 and 14 to 16 year age groups. The means of controlling Vitamin A deficiency in the project were a (1) public health disease elimination and horticulture program, (2) massive dosage capsule program, and (3) fortification of monosodium glutamate (MSG). Overall effects were a reduction of active clinical xerophthalmia by about 57%. Comparison of individual interventions showed that the MSG fortification program produced the best results in reducing active clinical xerophthalmia and improving serum A levels. The report points out that formulation of a national policy to deal with the problem of Vitamin A deficiency should consider whether there has been an examination of possible intervention strategies and their effectiveness, and the feasibility and cost-effectiveness of such intervention. Recommends that a national policy include a multiple-intervention approach in which programs are integrated into existing health services and in which other governmental agencies, such as those for agriculture and education, are involved.

PN-AAE-298

Paper copy \$12.20
Microfiche \$ 2.00

(526) NUTRITIONAL IMPROVEMENT OF RICE BY FORTIFICATION WITH SYNTHETIC AMINO ACIDS AND VITAMINS; FINAL RESEARCH REPORT, 1971 to 1975

Gershoff, S. N. Harvard Univ. Dept. of Nutrition
1975, 26p.

Harvard (CSD-2170 Res.)

Testing was carried out by the Harvard School of Public Health in 29 villages in Thailand to determine the health benefits of rice fortification with the nutrients most lacking in the diets of Asia. The study was based on the assumption that major health benefits might result if the rice were fortified with amino acids and other nutrients. The results of this study show that the desired health effects were not obtained. During the field study period, August 1971 to January 1975, grains fortified with lysine,

threonine, thiamin, riboflavin, vitamin A, and iron were provided to Thai villagers. The testing involved 2400 children from 6 months to 12 years old. Some adults were also part of the study. The fortified grains had no significant effect on the measurements of development and of health status. The study also concluded that poor growth among the villagers does not appear to be related to morbidity or to a lack of available food. It is more probably linked to inadequate caloric consumption or to the high prevalence of enteric parasite infections. As a result of this study, the Thai Ministry of Health is committed to further studies to evaluate health problems so that low-cost practical village nutrition and health programs can be started. Tables present the data collected on winter and summer physical examinations of the children each year from January 1971, detailed morbidity data on all children gathered every 15 days from July 1972 through June 1975, and data on the use of fortified rice. There is a section on nutrition intervention programs and their feasibility in Thai villages. The report observes that day care centers established for the study provide good delivery systems for nutrition and education programs.

PN-AAE-113

Paper copy \$2.15
Microfiche \$1.00

(527) NUTRITIONAL ASPECTS OF COMMON BEANS AND OTHER LEGUME SEEDS AS ANIMAL AND HUMAN FOODS

Jaffe, W. G.
1973, 325p.

Cornell (CSD-1815 Res.)

Reports on a symposium held at Ribeirao Preto, Brazil, in November 1973, on improving the production and nutritional quality of beans and other legumes, which are widely used as staple foods. The 22 participants were nutritional and food science specialists from Latin America, the U.S., Asia, and Africa. These proceedings of the symposium present the 25 papers delivered on the subjects of: (1) legumes as animal feed; (2) storage, processing, and nutritive value of legumes; and (3) the use of common beans and other legumes as human food. Also includes summaries of workshop sessions on these topics. Three of the major recommendations are that the Green Revolution in cereal crops be extended to legumes, that storage facilities for large and small producers be greatly increased, and that research on nutritional qualities of legumes be greatly expanded.

PN-AAD-487

Paper copy \$27.70
Microfiche \$ 4.00

(528) CONTROL OF NUTRITIONAL ANAEMIA, WITH SPECIAL REFERENCE TO IRON DEFICIENCY, REPORT OF A JOINT MEETING

World Health Organization; Int. Atomic Energy Agency;
1975, 71p.

AID/TA/N

(In WHO. Technical rpt. ser. no. 580)

This report presents a plan of action to combat nutritional anaemia. Since 1958, WHO investigations and other recent studies have disclosed a very high prevalence of nutritional anaemia in developing countries, especially among pregnant women and young children. Thus far, programs attempting to reduce this major health problem have had little impact. Thus a joint meeting was held in Geneva in 1974 to review recent advances in the field of iron and folate nutrition, and to focus on ways and means of combating nutritional anaemia through die-

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DEVELOPMENT ASSISTANCE

tary supplementation and fortification. The report of the meeting includes sections on definition of the problem, pilot and field therapeutic supplementation trials, and national programs of therapeutic supplementation. Recommends that: The WHO reference center in Seattle should continue to provide its valuable services. A simple screening method should be developed to permit public health workers to detect severely anaemic individuals. Further studies should be conducted on the detrimental effects of anaemia, iron deficiency, and folate deficiency. Further studies should be conducted to establish amounts of dietary iron available, as well as amounts absorbed by both normal and iron-deficient subjects. Surveys should be conducted to establish the prevalence of nutritional anaemia and deficiency of haematopoietic nutrients in countries where such data are not available. Pilot, field, and national supplementation programs should be initiated. Similar iron fortification programs should be begun. A suitable vehicle should be found for folate fortification, and trials initiated in populations with a high prevalence of folate deficiency. International assistance should be offered for training nutritional specialists, and close international cooperation promoted.

PN-AAD-533

Paper copy \$6.65
Microfiche \$1.00

(529) NUTRITIONAL IMPROVEMENT OF MAIZE, PROCEEDINGS

Bressani, Ricardo; Braham, J. E.; Behar, Moises; Int. Conf. on Nutritional Improvement of Maize, INCAP, Guatemala City, 1972
1972, 325p.

PAHO (CSD-3420 GTS)

Proceedings of an international conference. Maize is the basic staple food in large regions of Central America and the northern areas of South America and Africa. For the low socioeconomic sectors of the people in these regions, maize provides a high proportion of the protein in their diets. Because of the low concentration and poor nutritive value of maize proteins, its high intake is a contributing factor to the high prevalence of protein deficiency in these areas. This conference discussed various aspects of this problem and concluded that the low concentration and the low biological value of maize proteins must be considered simultaneously. Percentage of utilizable protein per unit of maize or NDP cal% best conveys the nutritional value of maize proteins and best evaluates its changes in different maize varieties or in the fortification—the two best ways of improving the nutritive value of maize protein. The papers included in these proceedings cover the progress of these developments as well as various problems of production, marketing, distribution, and technology.

PN-AAC-687

Paper copy \$27.70
Microfiche \$ 4.00

ANIMAL NUTRITION

(530) IMPROVED FEED NUTRITION INFORMATION; ANNUAL REPORT, 1975/1976

Utah State Univ. Int. Feedstuffs Inst.
1976, 85p.

Utah State (AID/ta-C-1159 GTS)

A PROJECT: To provide technical assistance and advice to LDCs in the development and use of information (nutritive value) about feeds available for livestock in formulating diets that

most economically satisfy the animals' requirements for regular reproduction, optimal growth, weight gains, and milk and/or other production. Conducted by Utah State University.

DURATION: November 15, 1974 to November 15, 1977

DEVELOPMENTS: A central data bank has been established at Utah State University so information about feeds can be funneled in from regional agricultural centers in LDCs, systematically processed, and sent back to each center. Regional centers are supported by countries and institutions within their region. These centers will pass the nutritional data on to the users—farmers, feed manufacturers, consultants, researchers, and extension personnel. An International Symposium was held in July, 1976, at the university. Scientists from 26 countries presented papers on feed composition, nutrient utilization by animals, effects of environmental stresses on animals, feeding regimes in temperate and tropical regions and formulating animal diets by hand and electronic means. Following the Symposium, the technical aspects of the international system were presented in a two week short course to representatives from Argentina, Australia, Brazil, France, Egypt, and Africa. Abstracts of papers published since 1975 included: (1) Are You Providing a Balanced Ration?; (2) Estimating DE from Chemical Analyses; (3) Latin American Forages; (4) Tablas de Composicion de Alimentos de America Latina; (5) Feed Grade Biuret as a Protein Replacement for Ruminants, A Review; (6) International Collection and Dissemination of Information on Animal Feeds; (7) Unique Problems in Formulating Diets; (8) Simple Diet Formulation; (9) Estimating Nutritive Value from Chemical Analyses; (10) International Network of Feed Information Centers; (11) Prediction Equations for Energy Values in Forages; (12) Formulating Diets to Correct for the Environment; and (13) Proceedings of the First International Symposium on Feed Composition, Nutrient Requirements and Computerization of Animal Diets.

PN-AAE-440

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Other titles in this series are:

PN-AAC-388 (1974/1975, 23p.)

Paper copy \$2.00
Microfiche \$1.00

DEVELOPMENT ASSISTANCE

(531) ELEMENTS OF PROJECT MANAGEMENT

Solomon, M. J.; Rizzo, E. E.
1976, 114p.

AID/TA/DA

This paper is for use in training project participants who need to share a common conceptual framework. Efforts to improve conditions or outputs in developing countries normally are organized as projects and programs that need to be planned, managed, and evaluated. The effort of separate contributors to a project can be best integrated if those persons understand the nature of a project and methods of project management. The first section of this paper defines a project, a program, the project cycle and its management, pre-authorization planning, post-authorization planning, and the differences between project management and ongoing management. Section two covers project planning—the iterative nature of planning, studying the environment, establishing planning premises, and setting objectives. Section three presents the cycle of planning-action-control, including targeting as a technique for planning and implementation. Section four discusses economic analysis, including decision-making, physical planning, cash flows, national concepts of return, non-market-oriented projects, and risk and uncertainty. A section on creativity discusses brainstorming and force field analysis. A section on design approaches treats of the diagnostic method and the crea-

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tive design or ideals concept. A final section on implementing the investment phases of the project includes discussions of the analysis of implementing capacity, social analysis, dealing with resistance, force field analysis, and involving the target population.

PN-AAE-449

Paper copy \$10.20
Microfiche \$2.00

(532) READINGS IN PROJECT DESIGN

Stout, Russell
1977, 78p.

MUCIA (AID/otr-C-1421 GTS)

This collection of papers constitutes a module for the study of project design, the study of methods and difficulties of program evaluation, and the application of a logical framework to program evaluation. "Foreign Aid: A Critique" provides an overview of the problems of aid administration and examines the link between project purpose and overall programmatic goals. The World Bank's programming process is examined in "The Project Cycle;" observations made in it are applicable to other institutions. The "Problems of Development Management" are assessed. It notes an increasing need for flexible, adaptive management, and points out that there is a tendency toward centralized decision making. The problem of the political contamination of project goals is also addressed. "Program Management and the Federal Evaluator" focuses on chronic difficulties in evaluating social programs and suggests that these programs often suffer from lack of definition, lack of clear logic, and lack of management. In fact some programs may not be evaluable and this must be communicated to policy makers and program managers. The same problems are addressed in "Formulating the Question and Measuring the Answer" where it is emphasized that lack of clear definition of program goals is a key problem in evaluating program success. "What Can We Actually Get From Program Evaluation" examines the potential value of evaluation of national programs and reviews the difficulty of meaningful evaluations of specific federal programs. "Principles and Methods of Program Evaluation" suggests a logical framework for program evaluation.

PN-AAE-988

Paper copy \$7.20
Microfiche \$1.00

(533) SOCIAL ANALYSIS OF DEVELOPMENT PROJECTS, A SUGGESTED APPROACH FOR SOCIAL SOUNDNESS ANALYSIS

Ingersoll, Jasper
1977, 55p.

AID/SER/PM/PS&CD

In 1975 A.I.D. issued guidelines for assessing proposed projects for their social implications: social-cultural compatibility, spread effects, and social impacts. The guidelines are not easy to apply to any particular project, since they were written to cover all types of projects. Moreover, they offer little guidance for identifying the pertinent features of the society in question. While the guidelines can be criticized, they formulated for the first time, a standard by which to define and judge the soundness of projects in terms of their impacts on the social organization of the communities they affect. What now must be done is to accumulate field experiences and codify them into approaches appropriate to various types of problems. This paper describes one such effort, begun in Thailand and used in two very diverse settings in Honduras and Senegal. This approach, though probably not applicable to all types of development projects, has the potential for clarifying dimensions of a people's social system in relation to the economic, ecological, technical, and managerial dimensions of their life. The only way in which social analysis can make its full contribution to improving development projects is through

an effort to relate the social aspects of a project with the institutional, ecological, technical, and economic aspects. This step has not yet been undertaken because it is unfamiliar, takes time, and cannot be intellectually coordinated by any one of the disciplines implied in the five aspects of social soundness.

PN-AAE-961

Paper copy \$5.30
Microfiche \$1.00

(534) SOCIO-ECONOMIC PERFORMANCE CRITERIA FOR DEVELOPMENT

AID/PPC/PDA
1977, 192p.

AID/PPC/PDA

Since both recipients and donors have many reasons for wanting to assess performance systematically, this report describes the steps A.I.D. has taken to improve and refine the criteria for assessing both commitment and progress. There is increased emphasis on distributive aspects of economic development by focusing socioeconomic analyses on target groups such as the small farmer and the rural poor in preparing development assistance programs, sector assessments and analyses, and project papers. Section 102(d) added to the Foreign Assistance Act in 1975 requires that "the President shall establish appropriate criteria to assess the commitment and progress of countries" towards the objectives for development assistance. These objectives emphasize participation by the poor and increased access for them to employment and income opportunities. These criteria are to be selected according to their value in assessing the efforts of countries to: increase agricultural productivity per unit of land; reduce infant mortality; control population growth; promote greater equality of income distribution; and reduce rates of unemployment and underemployment. The most important criteria now used for allocating development assistance is the overall poverty level. The host country's commitment and progress also play an important part. Commitment and progress are twin aspects of a country's performance; development progress provides a measure of the effectiveness of commitment. Commitment is reflected by the policy and program actions a country takes. Field missions will be asked to provide more information on host country commitment and progress as part of A.I.D.'s annual planning, programming and budgeting procedures. The last half of the report is devoted to the annexes including a list of bilateral projects with progress measurement aspects, a proposed program for developing criteria and statistics, issues in measuring development performance, and an inventory of selected centrally-managed activities contributing to development of progress criteria.

PN-AAE-764

Paper copy \$16.70
Microfiche \$ 2.00

(535) DECENTRALIZATION FOR DEVELOPMENT; THE CONCEPT AND ITS APPLICATION IN GHANA AND TANZANIA

Sherwin, W. J.
1977, 37p.

AID/SER/PM/PS&CD

(In Development studies program. Occasional paper no. 2)

Certain forms and degrees of government decentralization are an important means of furthering development in LDCs. This paper discusses the concept of decentralization and applies it to Tanzania and Ghana. Those two countries are undertaking major

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experiments in decentralization. Under one form of decentralization, deconcentration, a central ministry delegates authority to a regionally dispersed field staff. A second form of decentralization is devolution, in which powers of a central ministry are legally conferred on local authorities. In 1972 decentralization was begun in the planning and implementation of development programs. New collective villages have been established. However, there is considerable opposition to this program, and yields on collectivized fields have been consistently lower than on private plots. In Ghana the decentralization program has just begun. It calls for nine regional councils, 60 district councils, and local development committees. A.I.D. is providing extensive technical and capital assistance by means of three projects. The first, providing training and consulting services within each region, has just begun. A second project, concerned with district planning and rural development, will begin in 1978. The third, concerned with rural development resource support, is planned for FY 1979. The success of the decentralization and development efforts in Ghana will depend considerably on whether the existing ministries adapt their funding and operations to support links between the regional and district councils.

PN-AAE-543

Paper copy \$3.05
Microfiche \$1.00

ECONOMICS

GENERAL

(536) PROCEEDINGS; INTER-AM. SAVINGS AND LOAN CONF., 14th, CARACAS, 1976

Inter-Am. Savings and Loan Union
1976, 99p.

Inter-Am. Savings and Loan Union (AID/otr-C-1388 GTS)

(In Spanish and English; Spanish, 105p.: PN-AAE-486)

This publication presents a complete view of the meetings and other activities of the fourteenth Inter-American Savings and Loan Conference in Caracas, Venezuela, in March 1976. The proceedings have five fundamental parts: general information, speeches and papers of the general assembly and plenary sessions devoted to the examination of the basic agenda, papers of the complementary agenda, special sessions, and final recommendations and participations at the closing assembly. One of the objectives of this report is to aid in the implementation of bases for further analysis of the theme. This meeting demonstrates that the Interamerican Savings and Loan movement is a solid unity, an example of integration, solidarity and unity of thought in all America. There are two crucial economic and social problems which involve housing; the exodus to urban centers and the decay of some urban inner cities. The savings and loan business has a stake in preserving and upgrading these cities and will be called on to finance a large portion of the dwellings. The major themes of the conference included: equilibrium between housing supply and demand, savings and loan in relation to youth, forward planning, and projecting the image of a savings and loan system. Some of the supplementary papers were: how contractual savings and loan can better serve low income sectors, amortization of long term mortgage loans in a system of constant values, the savings and loan industry of the United States in transition, incentives for housing plan, recommendations for prompt and efficient collaboration of the Inter-American Savings and Loan Union to countries which suffer situations of great catastrophes, and building loans as a means of increasing housing supply within the savings and loans system. The recommendations include the need for promoting greater participation of young people in both the active and passive

operations of their respective institutions; the need for improved planning that will provide lower income families with greater access to use of credit for housing purposes; and the need to project the image of savings and loan systems as a mechanism different from any other financial or housing credit system.

PN-AAE-485 (English, 99p.)

Paper copy \$8.95

Microfiche \$2.00

PN-AAE-486 (Spanish, 105p.)

Paper copy \$9.45

Microfiche \$2.00

(537) COMMUNALISM, WEALTH, AND INCOME IN AFRO-ASIA

Von der Mehden, F. R.
1977, 259p.

Rice (AID/otr-C-1394 Res.)

(In Program of development studies. Publication)

Communal groups are elements of a population that can be identified by language, religion, race, ethnicity, or regional cultural patterns. This paper describes the role of communalism in the distribution of income within LDCs. It focuses on four interrelated areas of description and analysis: (1) the nature of the interaction of communalism and economic theory; (2) the types, availability, and reliability of literature and data on the distribution of wealth and income among communal entities; (3) types of government policies that may produce, maintain, or diminish economic inequality among communal groups; and (4) the influence of communal factors on the acceptance or rejection of state efforts. Chapters discuss the theoretical literature on education, communalism, and wealth; property confiscation, residence, quotas, and languages; taxation, pricing, subsidies, and licensing; and regional capital investments. Seven appendices present statistical data on communal factors in Malaysia, Ghana, Fiji, Cyprus, Uganda and India, Kenya, and Thailand.

PN-AAE-459

Paper copy \$22.25

Microfiche \$ 3.00

(538) LDC INCOME DISTRIBUTION AND PUBLIC POLICY; ANNUAL REPORT, 1976/1977

Princeton Univ. Woodrow Wilson School of Public and Int. Affairs
1977, 20p.

Princeton (AID/otr-C-1492 GTS)

A PROJECT: By Princeton University to study the effect of current government policies on income distribution in Turkey and Nigeria and to consider the most equitable alternatives.

DURATION: June 30, 1976-December 21, 1978

DEVELOPMENTS: During this report period, research plans were formulated and initiated. Areas to be studied include the effects of education, agricultural subsidies, migration, industrial factors, urbanization, taxation and religion. The problems of common definitions and data base inconsistencies were dealt with so that all papers will use standard definitions of common terms and standard regional groupings for data presentation. Final drafts of papers on Turkey are expected in January 1978. In the fall of 1978 a project-wide conference will draw on these materials for a meeting on cross-cutting issues in income distribution. Final drafts of reports from Nigeria are due by the summer of 1978. Approval is awaited on a further subcontract to extend the study of income distribution to Egypt. In 1978, Princeton participants, with the help of selected LDC colleagues from the country studies, will begin work on a volume or set of papers seeking to draw lessons and/or hypotheses from across the set of country studies that will then be emerging. Recruitment of participants for individual country studies was handled largely by the principal investigators in the host country. Almost all per-

sonnel on the Turkey project are Turkish nationals, and two are women. On the Nigerian project, almost all are Nigerians.

PN-AAE-474

Paper copy \$2.00

Microfiche \$1.00

(539) DECISIONMAKING AND HUMAN CAPITAL IN LESS DEVELOPED COUNTRIES; PROGRESS REPORT, JAN. 1976-May, 1977

Rand Corp., Santa Monica, Calif.
1977, 9p.

RAND (AID/otr-C-1432 GTS)

A PROJECT: To explore determinants of individual earnings and skill levels in developing countries using the human capital approach.

DURATION: January 1976 - December 1978

DEVELOPMENTS: If more understanding can be gained on how human capital factors contribute to skill levels and individual earnings, development efforts in LDCs can be made more efficient. This interim report summarizes progress during the first sixteen months of a two-year project. The factors being analyzed are schooling, family size, allocation of work hours, the life-cycle productivity of individuals, unemployment, human fertility, and nutrition and health. The project is expected to produce four or more background papers, nine or more empirical case studies, and four or more synthesis reports. Existing survey data have been prepared for analysis. Additional data collection efforts have been initiated. One important data set being analyzed is a survey of income, wealth, and agriculture in Guatemala. A contract has been signed with Survey Research Malaysia to develop and apply a survey instrument concerning networks of economic support. A contract is also being developed to collect detailed economic, demographic, and agricultural data on 2,700 households in Central Mindinao, Luzon, and Vasayas. The survey will include intelligence and knowledge tests. Other project activities underway include analyses of the interactions between demographic patterns, life cycles, and economic development; determinants of wages in rural India; determinants of market labor supply of landed and landless Indian farmers; determinants of rural-urban migration in Columbia; a description of aspects of full income distribution in Columbia; and the productivity of children in Guatemalan peasant agriculture.

PN-AAE-489

Paper copy \$2.00

Microfiche \$1.00

LABOR ECONOMICS

(540) EMPLOYMENT AND UNEMPLOYMENT PROBLEMS OF THE NEAR EAST AND SOUTH ASIA, VOLUME I

Ridker, R. G.; Lubell, Harold; Conf. on Employment Problems, Kathmandu, 1970, 1971, 482p.

AID/NESA

(v.2,404p.: PN-AAE-407)

This is Volume 1 of a two volume set of papers presented at a conference in July 1970 and sponsored by the A.I.D. Bureau of Near East and South Asia to discuss employment problems of countries in those areas. The purposes of this conference in Kathmandu were to: compare notes with officials, researchers and academicians about the nature of the employment problems within the region; to encourage some analytical work into these problems and subject it to the scrutiny of researchers from different backgrounds; and to raise the level of concern for the unemployment problem among persons who may otherwise not have the time and energy to dig deeply into this particular set of

problems. Thirty papers were presented; the fourteen in this volume discuss employment and manpower problems in Afghanistan, unemployment in Ceylon, the level and composition of labor force and unemployment in India, employment, underemployment and unemployment in Iran, labor force statistics in Turkey, projections of manpower requirements in Pakistan, prospective growth of non-agricultural employment in Turkey, and other similar economic problems. An essay is included which summarizes an integrated, comprehensive picture of the ideas and issues raised. The essay discusses five main points: (1) factor price distortions should be corrected, and if possible these corrections should be linked with measures to improve the operation of the relevant markets; (2) investments must be reallocated to favor sectors producing wage-goods and the necessary inputs into these sectors; (3) more emphasis must be placed on equity in the distribution of income, wealth, and economic opportunities; (4) the bias inherent in technical research and development must be reversed; and (5) a comprehensive planning package that includes the generation of better employment opportunities is required.

PN-AAE-406

Paper copy \$41.50

Microfiche \$ 5.00

(541) EMPLOYMENT AND UNEMPLOYMENT PROBLEMS OF THE NEAR EAST AND SOUTH ASIA, VOLUME II

Ridker, R. G.; Lubell, Harold; Conf. on Employment Problems, Kathmandu, 1970, 1971, 404p.

AID/NESA

(v.1,482p.: PN-AAE-406)

This is Volume 2 of a two volume set of papers presented at a conference in July 1970 and sponsored by the A.I.D. Bureau of Near East and South Asia to discuss employment problems of countries in those areas. The three fold purposes of the conference were: to compare notes with officials, researchers and academicians about the nature of the employment problems within the region; to encourage some analytical work into these problems and subject it to the scrutiny of researchers from different backgrounds; and to raise the level of concern for the unemployment problem among persons who might otherwise not be aware of the problem. Fifteen papers are presented in this volume on subjects including: the effects of tractors on farm output; the green revolution and agricultural development under conditions of rapid population growth in Pakistan; surplus labor in Turkish agriculture; prospects for increasing employment in Indian manufacturing, employment in Iranian industry; employment potential of roads; the effects on the labor force of Turkish workers going abroad; the problem of urban unemployment in Africa; employment and unemployment in Puerto Rico; and other similar employment and economic issues. An essay is included in Volume 1 which pulls together an integrated, comprehensive picture of the ideas and issues raised. The five main points discussed are: correcting price distortions; reallocating investments to favor sectors producing wage goods; emphasizing equity in the distribution of income, wealth, and economic opportunities; reversing the bias in technical research and development; and a comprehensive planning package including the generation of better employment opportunities.

PN-AAE-407

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(542) TRADE UNION FREEDOM AND HUMAN RIGHTS, AN INDEX APPROACH TO MEASUREMENT

Inst. for Conflict and Policy Studies, Washington, D.C.
1977, 29p.

AID/TA

(Rev. ed.)

This report focuses on an important issue in American foreign policy, the promotion of trade union freedom and rights around the world. It presents a practical approach for measuring and appraising the status of trade union rights in a country and provides a framework for undertaking more accurate and comprehensive country analysis and international comparisons. If the U.S. uses the reduction or expansion of foreign aid to encourage governments to respect trade union freedoms, it needs measures to show the trends in toleration of unions as the aid receiving nations react to these pressures. This paper presents a proposed index of comparative trade union freedom in an attempt to provide a scale on which to compare countries. The report includes precise interpretations of what the words "free and democratic trade unions" means. Use of the index involves subjective judgments, but it is sufficiently reliable that variations in the judgments of different users will not be extreme. The index measures how free trade unions are in relation to the state. It measures practice, not what laws promise on paper. It ranks countries in five categories with a numerical score and a percentile score. It is comparative rather than absolute; nations are ranked relative to each other from the freest to the least free. The five categories are the right to organize, the right to bargain collectively, the right to strike, the right to political action, and freedom from specific restrictions. These categories are described in detail. An example of the index is included at the end of the report.

PN-AAE-787

Paper copy \$2.40
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INDUSTRIALIZATION

(543) MULTINATIONAL CORPORATIONS IN LDCs: THE CHOICE OF TECHNOLOGY

Courtney, W. H.; Leipziger, D. M.
1974, 35p.

AID/PPC/PDA

(In AID discussion paper no. 29)

In many LDCs, foreign-owned firms are a large part of the modern manufacturing sector. These firms transfer technology to their LDC affiliates. Two factors govern the affiliates choice of technology: the firm's operations in the home country and elsewhere, and the underlying economic and political conditions of the host country. This study examines and compares the technologies of 1484 foreign affiliates in developed countries (DCs) and LDCs with more than 200 U.S. based multinational corporations in eleven manufacturing industries. The comparison seeks to determine whether LDC affiliates have more labor-using technologies than DC affiliates; to what extent the observed factor intensity of LDC technology is due to the foreign-owned firm's techniques of production, and to what extent it is due to host country conditions. It examines the implications for host governments wanting to increase the rate of labor absorption in the foreign-owned manufacturing sector. In order to make these determinations, the study compares factor intensities and employs production function hypotheses such as the

constant elasticity of substitution and other mathematical equations. The empirical results obtained from analyzing the data are discussed and presented in tables. Conclusions from the study are: (1) In six industries, technology differs between DC and LDC affiliates, but not in a more labor-using or a more capital using way. In the other five industries, technology does not differ significantly. (2) Returns to scale appear to be decreasing when total assets are used. (3) There is no evidence that the substitution of capital and labor is more limited in LDC affiliates than in DC affiliates. This paper recommends further research, especially in the area of joint ventures.

PN-AAE-098

Paper copy \$2.90
Microfiche \$1.00

(544) APPROPRIATE FACTOR PROPORTIONS FOR MANUFACTURING IN LESS DEVELOPED COUNTRIES; A SURVEY OF THE EVIDENCE

White, L. J.
1976, 39p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

A serious problem in LDCs is that unemployment is high and wages are low, yet most new manufacturing enterprises established are capital-intensive. They provide relatively few new jobs. This raises a set of critical questions: Are the high capital-labor ratios in LDC manufacturing necessary? Are there more efficient alternatives? If so, why have they not been used? If not, what are prospects for creating them? This paper presents a non-technical review of the evidence concerning the processes and institutions relating to creating new technology in LDCs. The evidence indicates substantial possibilities for labor-capital substitution, particularly when possibilities for international trade are acknowledged. One of the reasons capital-intensive enterprises are launched in LDCs is that factor prices favor them. Another is the absence of competitive markets; this allows the instincts of the engineer to prevail. The engineer designs a process that is optimal in terms of labor efficiency in a developed country. But such processes are not optimal in an LDC that lacks capital but has low wages and much unemployment. The evidence suggests that incentives are very important. Appropriate factor prices are an important incentive, as is effective competition in product markets. This would leave less scope for engineering instincts to dominate efficient factor use. The subsidies of capital use must be ended. An important part of this would be the replacement of exchange control and over-valued exchange rates with a realistic exchange rate. If wages in the modern urban sector cannot be decreased, at least their rates of increase must be moderated. They are too high in comparison with the incomes of the rest of the labor force in LDCs. Wage increases in the urban sector must necessarily reduce the potential for improving the incomes of the poorer majority.

PN-AAE-694

Paper copy \$3.25
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(545) THE INDUCEMENT OF U.S. FIRMS TO ADAPT PRODUCTS AND PROCESSES TO MEET CONDITIONS IN LESS-DEVELOPED COUNTRIES

Management Analysis Ctr., Inc., Boston
1976, 58p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

If U.S. business firms are to contribute to development of labor-intensive enterprises in LDCs, A.I.D. needs to devise incen-

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Example: PN-AAB-000

tives for them to do so. The same holds true for adaptation of U.S. products for low-income markets in LDCs. Host countries can influence multinational manufacturers by their import tax policies and by reducing factor price distortions in their labor and capital markets. An intermediate technology organization should be established. Its primary function should be to provide in-depth training in the choice and evaluation of appropriate technologies. This training would be provided for LDC government officials and entrepreneurs and for U.S. equipment suppliers, U.S. manufacturing companies, and U.S. consulting firms. The training organization would provide a permanent body of people interested in further dissemination of intermediate technologies to developing countries. It could organize conferences on particular topics, sponsor academic studies, act as an information clearinghouse, and provide experienced consultants to governments and industry. A.I.D., prior to creating such an organization, should visit technology-transfer organizations in other countries and organize an international conference on the subject. A.I.D. should also experiment with monetary incentives in the form of subsidies of plant designs, grants to equipment manufacturers and consulting firms, and export credits for U.S. firms that export used machinery for use in LDCs.

PN-AAE-701

Paper copy \$5.55

Microfiche \$1.00

(546) AN EXAMINATION OF MANUFACTURING FIRMS IN MONTERREY, MEXICO; PERFORMANCE AND SOURCES OF TECHNOLOGY

Fairchild, L. G.
1975, 28p.

Cornell (CSD-3158 211d)

This study sponsored by the Policies for Science and Technology in Developing Nations at Cornell University is one part of a multi-country project and was designed to provide a comparison of the behavior of joint ventures and Mexican firms with special reference to product and process innovation and sources of technology. The sample includes 25 firms with direct U.S. equity and matching firms with one hundred percent Mexican capital. Interviews were conducted with general managers and statistical data for individual firms were used to provide the basis for comparison of innovative activity and sources of technology used by the Mexican and joint venture firms. Their relative performance was measured in terms of profitability, growth and export-orientation. It was concluded that Mexican companies' performance was equal to joint ventures and their survival is not threatened by this competition. The managers of the Mexican firms believe they have competed so well because they know the Mexican market and have no time lags waiting for decisions from outside the country. There is no evidence to show that joint ventures are more innovative; the evidence shows slightly greater innovation by Mexican firms. More Mexican firms added products at increasing levels of sophistication, and Mexican firms initiated more changes in production processes. The evidence indicates that Mexican firms compete well by relying, not on foreign technology, but on local consultants who are often drawn from the universities, and on the firms' own internal technical capabilities. This conception of the Monterrey industrial community differs significantly from that in a large part of the "dependency" literature.

PN-AAE-733

Paper copy \$2.30

Microfiche \$1.00

EDUCATION

(547) KNOWLEDGE NETWORKS FOR EDUCATIONAL PLANNING ON BEHALF OF POOR COMMUNITIES, AN INTERIM REPORT

Hudson, B. M.; Mason, David, Siembab, Walter
1975, 113p.

Calif.—Los Angeles (AID/ta-C-1139 GTS)

Cost-effectiveness analysis is a feasible approach to educational planning, but it is practical only if "effectiveness" is carefully defined. This interim report describes the ongoing work of the Networks Project, which is concerned with identifying optimal strategies for educational planning. Work conducted to date includes a survey of theory relating to knowledge diffusion and its transfer to action; a review of case studies of various strategies of knowledge diffusion; a series of three conferences on knowledge networks; commissioning of several papers on selected problems of knowledge utilization; organization of a seminar on network strategies among graduate students at UCLA; and meetings with selected university and technical assistance groups in Europe to discuss research on cost-effectiveness of alternative strategies for university involvement. Some tentative conclusions from the work to date: In educational planning, standards of cost-effectiveness that are applied to middle-class communities should not be applied to poor communities. Strategies and criteria of networking effectiveness may have to seek out unorthodox measures of planning "output" if service to poor communities is to be an operational priority rather than just a pious wish. Problems of working with poor communities are so complex that solutions are not likely to come from general principles; the communities need to be studied, and specific success stories disseminated. It is difficult to make contacts with people close to the problems. Countries usually send VIPs to seminars and even training programs, rather than people immersed in the problems of poor communities. One must break through the filters built in at various levels of the system.

PN-AAE-669

Paper copy \$10.10

Microfiche \$ 2.00

(548) COST ANALYSIS FOR EDUCATIONAL PLANNING AND EVALUATION: METHODOLOGY AND APPLICATION TO INSTRUCTIONAL TECHNOLOGY

Jamison, D. T.; Klees, S. J.; Wells, Stuart
1976, 308p.

ETS (AID/ta-C-1347 GTS)

Presents methodology for the cost evaluation of ongoing educational projects—especially those in developing countries—and for the planning of future ones. The report is an attempt to improve cost-effectiveness and cost-benefit analyses in education. Part one of the report reviews the cost analysis process, discusses the collection and organization of cost data, and reviews special problems such as the difference in analysis for the project planner and for the project manager, and errors in cost estimation. A review of the literature on the effectiveness of instructional technology projects (radio and television) and a look at several projects in developing countries is the focus of the second section. It also includes examples of cost functions using such variables as project costs, utilization, and time. Detailed case studies in the final section of the document include two radio projects and five instructional television projects. The system and operation of each project is described, project costs are analyzed, and the effectiveness of each system is reviewed.

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EDUCATION

Where possible, the cost-effectiveness of the instructional project is compared with that of the traditional educational system.

PN-AAD-861

Paper copy \$26.30

Microfiche \$ 4.00

(549) STUDENTS AS TEACHING RESOURCES: A SURVEY OF TEACHING MODELS USING NON-PROFESSIONALS (PEER TUTORING)

Klaus, D. J.

1973, 230p.

AIR (AID/CM/otr-C-73-201 Res.)

To explore the possible use of students as teaching resources in developing countries, four general models of peer teaching were developed. These are: (1) in-class cooperation of student groups, (2) cross-grade tutoring, (3) monitorial instruction in which brighter children assist the teacher, and (4) ancillary teaching in which students teach children not in school. Survey results suggest that versions of any of these models could be used in almost any developing country. However, differences in requirements, traditions, and capabilities would influence the potential applicability and effectiveness of any approach. Findings indicate the limitations for each model. Cross-grade tutoring was regarded as appropriate for remedial assistance if conducted outside of normal school hours, and ancillary teaching was viewed as unnecessary in almost all countries. Innovative programs which use students as teaching resources can be a cost-effective solution to several significant problems. The author gives a research design for the systematic exploration of peer teaching in LDCs; it focuses on instruction in crowded classrooms and emphasizes an incremental implementation of the system. A proposed five-year schedule and suggested criteria for selection of researchers are included with the design.

PN-AAD-869

Paper copy \$19.85

Microfiche \$ 3.00

(550) THE GROWTH AND DEVELOPMENT OF NIGERIAN UNIVERSITIES

Fafunwa, A. B.

1974, 42p.

OLC (AID/afr-635 GTS)

(In OLC paper no. 4)

The growth of higher education and the development of the current universities in Nigeria are discussed, along with the topics of educational finance and administration. When Nigeria attained internal self-government in 1952, education was conceived as an indispensable tool for the development of human and natural resources. Top priority was given to the expansion of primary and secondary programs, and enthusiasm was generated for more higher education facilities. There are presently six universities in Nigeria: Ibadan, Nsukka, Ahmadu Bello, Lagos, Ife, and Benin. There are many problems and challenges in developing the future direction for higher education. Nigerian universities, like their counterparts in other developing countries, need to identify more closely with their environment. A greater awareness of the needs and aspirations of the people will effect a more flexible curriculum, relevant research, wider use of facilities, and a breaking down of the barriers between society and the universities.

PN-AAD-602

Paper copy \$3.50

Microfiche \$1.00

(551) REPORT ON THE SUPPLY OF SECONDARY LEVEL TEACHERS IN AFRICA; SHIFTING THE LOCUS AND FOCUS TO AFRICA

Hanson, J. W.; Crozier, D. J. S.; Hovey, Richard; Kotati, Besa; Peters, E. F.; Shields, John; Overseas Liason Committee; Mich. State Univ. African Studies Center
1974, 395p.

OLC (AID/afr-635 GTS)

This is the last of sixteen comprehensive and analytical reports on the supply of secondary level teachers in Africa. The reports focus on the problem of determining the demand for expatriate teachers for staffing secondary level schools. Expatriate teachers are more than twice as expensive as qualified local teachers and do not possess the commitment of those who have grown up in the indigenous culture. More long term benefit could be derived by providing teacher educators who can accelerate the production of local teachers. Basic solutions to teacher supply in Africa lie in the hands of African educators and governments. This volume is a summary, updating, and conclusion of an extensive study of this subject in the following countries: Botswana, Ethiopia, The Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Nigeria, Sierra Leone, Swaziland, Tanzania, Uganda, West Cameroon, and Zambia. This monograph is intended mainly for its recipients in Africa and secondarily for agencies providing teachers to that continent. The report includes discussions of the major social, political, and economic factors likely to affect educational development and teacher supply and demand. Also discussed are primary education, teachers' colleges, secondary schools, factors and issues related to attracting, retaining and preparing secondary level teachers and conclusions about secondary level supply and demand.

PN-AAD-587

Paper copy \$34.30

Microfiche \$ 5.00

(552) RURAL EDUCATION SUBSECTOR ASSESSMENT, REPUBLIC OF HONDURAS

Acad. for Educational Development, New York; AID/LA/USAID/Honduras
1976, 209p.

AED (AID/afr-C-1131 GTS)

Provides a basis for designing programs to enhance the development of human resources in rural Honduras. The major goals are to increase rural productivity and to improve income distribution. The study was limited to the effect of primary and non-formal education on the rural population of Honduras to determine the extent to which education is assisting, or can assist, this population to improve their economic and social status. The target group, the Honduran peasantry, comprises 70% of the national population. The contrast between highland subsistence peasantry and valley transitional peasantry is analyzed in detail. A general description of the educational system of Honduras is included with emphasis on the present status of rural primary education. The objectives of the Central-Satellite school program are described and the implementation of this concept in several schools is evaluated. Recommendations are made to improve the effectiveness of the Central-Satellite schools and increase their impact on rural development. Current activities in non-formal education in Honduras are examined. The policies of the government in the area of non-formal education are analyzed. Recommendations are made to improve the effectiveness of the Central-Satellite schools and to increase their impact on rural development. Some of the constraints to the achievement of national goals are identified and steps are recommended to remove or abate the effects of these constraints. Tables and charts are included in a statistical annex.

PN-AAA-822

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HEALTH AND POPULATION

HEALTH

(553) FUNCTIONAL ANALYSIS OF HEALTH NEEDS AND SERVICES

Johns Hopkins University
1970, 511p.

Johns Hopkins (CSD-832 Res.)

This study developed a methodology for identifying and measuring community health needs, demand on health resources and services, activities of health centers, the results of those activities, and practical alternatives for the reorganization of health centers. To ensure development of a methodology maximally useful under diverse circumstances, the methodology was developed and applied in field research conducted in Turkey and at two project headquarters sites in India. In each of those three sub-studies, data on community health needs were collected through household surveys, and data on activities of the local health centers were obtained through observations and interviews. Socio-anthropologic information was obtained concerning the local power structure, economic indicators, major health problems, attitudes toward the health center and various categories of its workers, and uses of other practitioners. The methods of assessment and evaluation produced by this study are intended for use by researchers concerned with improving the efficiency of health care delivery services in developing countries. The methods can be used to design the data collection, conduct household surveys, sample the health center work, sample the work of field workers, obtain the assistance of village leaders, analyze patient flows, assess health center records, and conduct a data analysis for a total evaluation of services. To illustrate what can be done with this functional analysis approach, the study report contains an example of the analysis of the estimated total annual demand and need for outpatient medical relief and family planning contacts for a population of 100,000 in the Punjab district of India.

PN-AAC-719

Paper copy \$43.90
Microfiche \$ 6.00

(554) TRADITION, BEHAVIOR, & HEALTH

Furst, B. G.; Mosher, Marcella; Conf. on Tradition, Behavior, & Health, Washington, D.C.; 1975, 106p.

AID/TA/H

In November 1975, the Office of Health, Technical Assistance Bureau, sponsored a conference to consider the health-related behaviors of traditional societies in order to plan projects more effectively. Specifically, it sought to help A.I.D. participants develop ways to analyze health care problems that would promote use of the local culture to support and improve health systems. It also sought to help them examine contributions of the behavioral and social sciences in understanding health care issues. Critical issues discussed included the most prevalent health problems as perceived by local inhabitants, other health problems which were not considered to be prevalent, traditional health institutions, and personnel and practices. Also discussed were the possibility of integrating indigenous health practitioners, institutions, and current public health efforts. The need to convert the demand for curative services to an appreciation and acceptance of preventive services was noted. The issue of

bureaucracy as a barrier to effective programs was also raised, and a discussion was held on how anthropologists could best be used in designing health programs. Five papers from the conference are included in the report.

PN-AAD-721

Paper copy \$9.55
Microfiche \$2.00

(555) IRAQ HEALTH SECTOR; BACKGROUND PAPER

Lucas, Steve; Weissman, Julie
1977, 97p.

HEW/OIH (RSSA HEW 1-74 GTS)

This paper, prepared as briefing material, contains detailed data on health status, resources and programs as well as information on related development sectors which interact with the health sectors. It discusses the sociocultural and physical environment of health, development sectors that impact on health, population, health status, infrastructure of health services, health resources, food supply and nutrition, environmental health, and national development planning and health policy. Schistosomiasis, malaria, ancylosomiasis and leishmaniasis have been endemic in Iraq for several thousand years. Trachoma and other eye infections have been common for centuries. Improvements in the quality of the water supply and waste disposal systems will contribute to the control of these diseases. Isolation of rural communities makes it difficult to deal with health problems. Industrialization has been accompanied by the usual health related problems. Information concerning nutritional status is limited, but the macro-indicators of food production and available supply of nutrients suggest serious deficits. The supply of facilities and manpower is inadequate for the provision of minimal health care for the majority of the population. There are few physicians, and there is a shortage of auxiliary medical manpower. The new Iraqi development plan should indicate the direction of the health system for the next five years. This plan is the first written one since the oil price increase, and it should reflect the growth in financial resources. The government hopes to improve preventive care through the construction of preventive care health posts and through the continuation of the malaria eradication program and of the project fighting against tuberculosis. Fifty-five water systems will be expanded and eighty-six new projects will be started to provide more potable water.

PN-AAE-789

Paper copy \$8.80
Microfiche \$1.00

(556) HEALTH IN AFRICA

AID/AFR/DS
1975, 95p.

AID/AFR/DS

Presents an overview of the existing health problems in Africa and of the factors which relate to solutions to these problems. This study discusses possible alternative actions which might have an impact on the problems, and it also evaluated the possible effects of this intervention. Three aspects of health problems encountered in Africa are: (1) the problem from the quality of life, equity, and economic development perspective; (2) health status, resources and programs in Africa; and (3) socioeconomic development and income distribution. Because an increased income level, shared in an equitable way, is one of the major objectives of economic development, improved health should receive substantial emphasis. Due to poor nutrition the people of Africa are afflicted with a wide range of diseases. This report discusses health status and nutrition and presents tables with data on major disease problems and caloric intake. Chapters assess the extent of the activities of multilateral and bilateral agencies in the health programs of Africa by examining health intervention, the rationale for it, and areas in which this action can have a health impact. Such areas are the health services

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sector, nutrition, family planning and demographic change, education, and agriculture. Alternative intervention approaches are also presented. Conclusions from the study concerning recent A.I.D. policy toward health in Africa are: (1) More should be done to help people attain health and education levels that will allow them to develop their own institutions. (2) In order to gain acceptance, a population control program must be part of a broader based preventive health service program. (3) Economic development programs need to place more emphasis on contributing to the improvement of the quality of life of people in developing countries.

PN-AAE-198

Paper copy \$8.65

Microfiche \$1.00

(557) MATERNAL AND CHILD HEALTH/CHILD SPACING EXTENSION PROJECT (NIGER), FINAL REPORT

Organization for Rehabilitation through Training, Geneva, Switzerland
1975, 90p.

ORT (AID/afr-839 GTS)

In June 1972, the Organization for Rehabilitation through Training (ORT) signed a contract with USAID to carry out a Maternal and Child Health (MCH) Extension Project in Niamey, Republic of Niger. Field operations began in December 1972 and terminated in January 1975. This report reviews the MCH Project in Niger, summarizes the project activities, and indicates project achievements. Difficulties and constraints are noted as well as the measures taken during the course of the project which modified the work plan but were essential to achieve its objectives. The arrondissement of Say, with a population of 50,000, was selected as the pilot zone. In this area, the project attempted to: (1) Improve the health infrastructure by providing essential equipment and supplies; (2) Provide refresher training to MCH personnel; (3) Integrate MCH activities in all the existent health facilities; (4) Emphasize health education; (5) Train village health workers; (6) Evaluate the health needs of the population through surveys and special studies; and (7) Introduce child spacing activities. Prevalent attitudes in Niger, a pronatalist country, were negative to Family Planning. There was general political suspicion of the motivation for assistance in Family Planning, lack of knowledge of what it meant and confusion between such measures as sterilization and contraception. Major education activities and special studies were undertaken to demonstrate leadership that the health of mothers and children would benefit from the timing, spacing and limitation of pregnancies. Studies included: (1) Survey of Women to Determine Risk Factors; (2) Health Demographic Survey; (3) Survey of Physicians—Prescription of Contraceptives—Definition of "Medical-Social" Indications; (4) Malnutrition Survey. These studies are discussed in detail.

PN-RAB-632

Paper copy \$8.20

Microfiche \$1.00

(558) REPORT OF AN EVALUATION OF THE MATERNAL AND CHILD HEALTH EXTENSION PROJECT IN THE GAMBIA AND DAHOMEY

Hilbron, Elizabeth; Williams, Walker
1975, 42p.

APHA (CAS-2604 GTS)

The Maternal and Child Health (MCH) Extension Project was designed as a regional project to assist small "non-emphasis" African countries to improve and expand basic health services for mothers and children and to introduce child spacing as an essential part of these services. At the request of the A.I.D./Africa Bureau and the A.I.D./Office of Population, a two member team has evaluated the MCH Extension Project ac-

tivities in The Gambia and Dahomey. The on-site review was conducted from May 18-31, 1975. This report is divided into the following sections: Summary Conclusions and Recommendations; Historical Background of the Project; Project Goal and Purposes; Findings in the Gambia; Findings in Dahomey, and Contractor Performance. The project goal and purposes were found to be appropriate in the light of the Gambia's and Dahomey's stated national health objectives and priorities and of A.I.D.'s health strategy for Africa. Health education, nutrition and child spacing have been recognized as essential MCH services. Simple low cost methods of adding these functions and improving services have been demonstrated in the pilot areas. In-service training has been provided for health workers in and outside the pilot areas. The potential exists in both countries for the extension of demonstrated improvements in MCH services. It was recommended that A.I.D. continue to support MCH activities in both Gambia and Dahomey and that a way be found to give more autonomy to continued project development so that project activities can proceed at their own pace in each country.

PN-RAB-635

Paper copy \$3.50

Microfiche \$1.00

(559) HEALTH AND NUTRITION SERVICES OF THE SAHEL R AND R PROGRAM IN MALI

Imperato, P. J.
1974, 66p.

APHA (CSD-2604 GTS)

The specific purposes of this report are: (1) the assessment of the current status of health planning for the Recovery and Rehabilitation (R and R) Program in Mali; (2) the recommendation of specific health and nutrition activities and levels of USAID support of elements listed within the Rural Health Sectors of the Sahel R and R Program Assistance Approval Document (PAAD); and (3) the examination of assistance in the areas by other non-USAID donors and the recommendation of in-country coordination and a plan of action for health and medical activities. The general background of the Sahel region is discussed in terms of its ecology, economy, and population densities. The nomads of the Sahel comprise two large groups, the Bedouin Arabs (Maures) and the Tuaregs. The former are found in those portions of the Sahel which lie in Mali, Mauritania, and Senegal and the latter in the Sahelian zones of Mali, Niger and Upper Volta. The social organization, economic activities and nomadic movements of these groups are discussed in detail. With inadequate rains in 1972, pastureland became scarce and many nomads were stranded around wells. Donkeys, camels, and cattle died in large numbers in early 1973. The Government of Mali organized a program to bring the stranded nomads into what are now called *Camps des Sinistres*. Four such camps were visited by the author. They were located in Gao, Goundam, Dire and Timbuctoo. Each camp is evaluated under the following categories: general description; population composition; administrative organization; food storage and distribution; nutritional status; health status; health services; environmental hygiene; and general impression. Most nomads have expressed the desire to resume their nomadic pastoral existence after the drought ends.

PN-RAB-634

Paper copy \$6.20

Microfiche \$1.00

(560) THE TSETSE RESEARCH PROJECT; AN ENVIRONMENTAL ASSESSMENT

U.S. Agr. Research Service
1977, 155p.

AID/TA/AGR

This report assesses a project jointly sponsored by A.I.D. and the United Republic of Tanzania to determine the effect of the Sterile

Insect Release Method on the tsetse fly population in Tanga, Tanzania. This project tests the SIRM under controlled circumstances. Advances in tsetse fly biology and fly sterilization techniques indicate that the tsetse fly may be susceptible to control by the SIRM in combination with other methods. The SIRM may also become an important maintenance control method. This experiment will provide the necessary guidelines for future large scale operational programs. The information collated in this report is derived from the team's assessment of: the existing ecosystem, the activities that might have beneficial or deleterious effects on the environment, the types and levels of pesticide and herbicide application, the effect of the treatment on the ecosystem, the direct social and economic implication of the SIRM on animal and human populations and how an understanding of the basic science of tsetse fly eradication can contribute to ecosystem management. The team concludes that the tsetse research project will have negligible detrimental impact on the environment. The bulk of the report is the appendices which include information on precipitation, geology, the mammals, birds and reptiles of the area, a literature review, plant communities and cover types, a plant list, a review of insecticides and application equipment, and a bibliography. Given the successful conclusion of the SIRM, future tsetse fly eradication projects may be undertaken with a 40-50% less dependence upon insecticide applications.

PN-AAE-794

Paper copy \$13.60
Microfiche \$ 2.00

(561) COMMONWEALTH CARIBBEAN HEALTH SECTOR STUDY; PART I: THE HEALTH SECTOR IN PERSPECTIVE

Laskin, M. J.
1977, 493p.

HEW/OIH (RSSA HEW 1-74 GTS)

This report is organized into three major sections: National Regional Health Policy and Infrastructure; Resource Availability; and Donor Assistance in the Health Sector. The thirteen English-speaking territories which are the primary focus of this study include Jamaica, Guyana, Barbados, Grenada, Trinidad, Tobago, St. Vincent, St. Lucia, Dominica, St. Kitts-Nevis-Anguilla, the British Virgin Islands, Belize and Montserrat. The report is prefaced by a brief overview of factors influencing health, such as geography and climate, economy, education, language, socio-cultural attitudes, transportation and communications. In spite of wide divergencies in size, population density and political organization, a common culture is shared by all the countries of the Caribbean. Family patterns include serial monogamy, early sexual activity, and frequent illegitimate births. Legal or church marriage is rare. In 1960 Census data, 55% of private households contained 1-2 rooms, with 1.5-1.9 persons per room. The role of superstition is pervasive in Caribbean society and affects the nature of mental health problems, treatment of children, and the origin of diseases. The Commonwealth Caribbean Conference of Ministers Responsible for Health has attempted to place some priority on the identification of goals and objectives in the formulation of national and regional health policy. These priorities are based on the number of people affected, the susceptibility of the problem to remedial and preventive measures, and its social and economic importance. Numerous tables and annexes contain data specific to various aspects of the health sector. Appendices are: "Magnitude of Health Problems," "Multilateral Assistance Projects in the

Health Sector PAHO/WHO/UNDP," and "Country Health Summaries."

PN-RAB-760

Paper copy \$42.40
Microfiche \$ 6.00

(562) COMPARATIVE ANALYSIS OF HEALTH MANPOWER ISSUES IN LATIN AMERICA

Loomis, S. A.; Cox, Karen
1977, 539p.

HEW/OIH (RSSA HEW 1-74 GTS)

As part of A.I.D.'s continual evaluation of policy-related strategies, the Office of Development Resources, Latin America Bureau (LA/DR) and the Office of Health, Technical Assistance Bureau (TAB/H) began a review of developmental issues of programmatic significance. This review was to critically examine the underlying assumptions basic to the design and implementation of A.I.D.'s programs. It was also to identify unanswered questions which would benefit from further research, in-depth field studies, or sector analyses. Fifteen A.I.D. Project Papers and Capital Assistance Papers concerned with health manpower were analyzed. Issues were examined in eight functional categories: (1) Task Analysis and Definition; (2) Staffing Patterns; (3) Recruitment Mechanisms and Selection Requirements; (4) Training and Continuing Education; (5) Acceptability of Staff Types by Other Professionals; (6) Support Systems; (7) Markets for Manpower; and (8) Efficiency of Manpower. The study concluded that the manpower components of A.I.D.-supported health programs apparently operate under a number of unproven assumptions, though it is not clear whether the Project Papers reflect actual field conditions, A.I.D. health programs, especially those involving community-level auxiliary workers, continue to be funded and implemented with a great deal of uncertainty concerning manpower costs, productivity, and effectiveness. A good deal of this uncertainty could be eliminated by three complimentary approaches: research, more thoughtful and detailed program planning, and project review. The conceptual framework and identified issues developed in this report could serve both as general guidelines for health manpower project development and project review.

PN-RAB-759

Paper copy \$46.25
Microfiche \$ 6.00

(563) TEACHING COMMUNITY MEDICINE, PHASE III; ANNUAL REPORT, 1976/1977

Boston Univ. Ctr. for Educational Development in Health
1977, 205p.

Boston (AID/ta-C-1355 GTS)

A PROJECT: To train health professionals to serve as field directors to train health teachers in their own countries in systematic instructional design methods and to provide technical assistance and consultation to LDCs on country specific health manpower development problems.

DURATION: 1977-Ongoing

DEVELOPMENTS: This first year summary of the progress of Boston University Center for Educational Development in Health discusses the field director training, teacher training, instructional materials development, and country requests for technical assistance. The bulk of the report is devoted to the appendices which include the timetable for technical assistance, instruments to evaluate leader's guide, and leader's guide for a workshop in systematic course design. The center is to annually train four to six LDC health professionals in systematic instructional design methods for the health fields. Field directors are to annually train 50 to 100 health teachers in their own countries. Technical assistance and consultation to three to five LDCs on country specific health manpower development problems is to be

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provided annually. In the second year, a field tested Instructor's Manual for use with the text, *Systematic Course Design for the Health Fields* is to be published, followed in the third year by an adapted and simplified version of the text.

PN-AAE-793

Paper copy \$17.75

Microfiche \$ 3.00

(564) MALARIA CONTROL PROJECT, EVALUATION AND REDESIGN OF THE PROJECT; FINAL REPORT

Shurkin, W. S.

1977, 16p.

Shurkin (AID/Asia-C-1237 GTS)

A PROJECT: To assist with the evaluation and redesign of the malaria control program in Pakistan.

DURATION: 1961-1977

DEVELOPMENTS: This report describes the background of the program, the monies used, problems encountered, short term measures, long term measures, staffing, technical assistance, integration, and recommendations and conclusions. The Malaria Control Program began in 1961 and originally aimed at total eradication of malaria in Pakistan by 1975. There was outstanding success from 1961-1967 but a resurgence became evident in 1969. The resurgence was due to increasing resistance by the vectors to DDT, unchecked urban malaria infiltrating back into malaria free areas, lack of organization in the permanent health services, and reduction in the malaria eradication program budget and manpower. By 1973, ten million people were infected with malaria, a condition worse than 1961 when the program began. The 1973 epidemic caused the Government of Pakistan to revise the original 1961 plan. A.I.D. assistance was requested in financing the substantial foreign exchange and local support costs of the program. The short term measures for malaria control include larviciding, adulticiding, minor engineering works for source reduction, case detection and treatment, and biological control of the vectors. The ultimate solution of the malaria problem is the elimination of the conditions which are conducive to the generation of vector breeding areas. Since 1976 the Pakistan Malaria Control Program has sprayed over eight million houses annually and protected an estimated forty-seven million people from malaria.

PN-AAE-788

Paper copy \$2.00

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POPULATION AND FAMILY PLANNING

(565) WORLD POPULATION GROWTH AND RESPONSE, 1965-1975: A DECADE OF GLOBAL ACTION

Population Reference Bureau, Inc., Washington, D.C.

1976, 279p.

Pop. Ref. (AID/pha-C-1096 GTS)

This publication is the work of the Population Reference Bureau and illustrates the services of the Bureau to other population agencies and institutions. The report is a benchmark document covering population changes, policy actions, and program developments up to mid-1975. It gives an overview of major population developments worldwide, regional, and in individual countries, from 1965-1975. The report will be of interest to legislators, administrators, journalists, teachers, population workers and anyone else concerned with population dynamics. The focus of the report is on family planning programs and their services. Family planning, while including fertility control, also involves family welfare as a whole. Sixty-five of the developing countries

now have population and family planning programs. In the industrialized countries there were further reductions in fertility in the last decade. Fertility control is receiving special emphasis in the developing countries. The People's Republic of China has a comprehensive birth control program. Other countries carrying on vigorous programs are Colombia, Costa Rica, Egypt, El Salvador, Hong Kong, Indonesia, Pakistan, Panama, the Philippines, Singapore, South Korea, Thailand, and Tunisia. In most of these countries birth rates have dropped significantly. Family planning has generally not yet been implemented in central Africa. The majority of the report is devoted to detailed discussion of the status of family planning in the countries of Africa, Asia, Europe, Latin America, the Caribbean Islands, the Near East, North America, and Oceania.

PN-AAB-996

Paper copy \$23.90

Microfiche \$ 3.00

(566) WORKSHOP FOR POPULATION AND ENVIRONMENTAL EDUCATION IN EGYPT, ALEXANDRIA, 1977

Smallegan, M. J.; Wileman, R. E.; Am. Public Health Assn., Washington, D.C.

1977, 37p.

APHA (AID/pha-C-1100 GTS)

Reports on a workshop for population and environmental education held in Alexandria in July 1977, and sponsored by the American Public Health Association and A.I.D. An outline of the two week workshop appears as Appendix A. Appendix B shows the worksheets developed to outline each day's activities. Appendix C is the questionnaire used by the participants to evaluate the workshop. Appendix D is a list of suggested resource materials for the planning and conducting of workshops dealing with population and environmental education. Recommendations for future workshops include: a need for fewer and more tightly defined objectives with a considerably lower participant to consultant ratio; a need for training teacher/trainers in areas such as teaching methodologies and environmental and population concepts for the public schools; workshops on integrating concepts into the elementary school curriculum; and a series of workshops for teachers on problem-solving teaching methodologies in the areas of inquiry, value clarification, stimulation, role-playing, and field study.

PN-AAB-994

Paper copy \$3.05

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(567) DEVELOPMENT OF A PLAN FOR FAMILY PLANNING TRAINING AND EDUCATIONAL ACTIVITIES IN SENEGAL

Chaudry, S. L.

1976, 17p.

APHA (AID/pha-C-1100 GTS)

The present aim of the Government of Senegal Ministry of Health in this project is to initiate a government-sponsored program that would make family planning information and services available to all Senegalese people regardless of income level. The activities of the project team included: the assessment of the present status of family planning training and services within various government health facilities and academic institutions; a review of the curriculae contents of these schools; and on-site visits to various government health facilities to be used as service and training centers. To date, there is no legal basis for the government's provision of family planning services in Senegal. Courses relating to family planning do not exist in any of the present health training programs and none of the government facilities participate in the direct delivery of family planning services. Although the officials in the Ministry of Health are

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generally in favor of the project. they urged that it proceed cautiously because of the political and religious sensitivity of the issue of family planning. It was recommended that: (1) Family planning be introduced and integrated into a context providing a full range of services, and not include such services as abortion, sterilization or injectables in the elementary stages of the project; (2) Services be delivered within the existing health care delivery system by trained health personnel; (3) All family planning activities be channeled through government sources and not through isolated private sectors.

PN-RAB-633

Paper copy \$2.00
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SOCIAL SCIENCE

(568) PLANNING FOR INTERNAL MIGRATION: A REVIEW OF ISSUES AND POLICIES IN DEVELOPING COUNTRIES

Findley, Sally
1977, 172p.

Census/ISPC (Com/Cen 4-75 GTS)

(In ISP-RD-4)

This paper by the International Statistics Programs Center summarizes the results of research on internal migration and related factors as a basis for investigating the policy tools with which LDC policymakers can influence migration, particularly rural-urban migration. The report addresses the following: issues and factors involved in planning for internal migration and related factors as a basis for investigating the policy tools with which LDC policymakers can influence migration, particularly rural-urban migration. The report addresses the following: issues and factors involved in planning for internal migration; informational requirements, determinants and contexts and impacts of rural-urban migration; relationships between population growth and rural-urban migration; the options available to LDC policymakers who want to increase the consistency between migration patterns, population distribution, and regional and national development goals; and the problems and constraints to implementing an internal migration and population distribution strategy. Evidence indicates that the main factor motivating migrants is economic, yet migration continues to the cities in spite of high urban unemployment. This problem is examined in a discussion of theories bearing on migration. A review of the economic, social, demographic, and physical impacts experienced in many countries provides a basis for estimating the likely consequences of continuing present rural-urban migration trends and gives a structure that can be used to evaluate potential impacts of changes in migration patterns. This study attempts to provide a broad perspective and includes analyses from throughout the developing world. It is multidisciplinary, covering research in anthropology, demography, economics, geography, public administration, regional planning, sociology and related disciplines. This paper makes a systematic effort to document the range of policies affecting migration flows and does it in a way that shows why policies have migration consequences and how policymakers may reinforce or alter migration patterns and consequences.

PN-RAB-503

Paper copy \$15.00
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(569) THE MIGRATION AND RETURN OF PROFESSIONALS

Glaser, W. A.; Habers, G. C.; Columbia Univ. Bureau of Applied Social Research; United Nations Inst. for Training and Research, N. Y.
1973, 475p.

Columbia (CSD-2524 GTS)

This overview presents the findings from a survey of the migration and return of people from developing countries who study in developed countries. The survey was made in 1972 by the United Nations Institute for Training and Research (UNITAR). Analysis of the data collected from questionnaires was done at three different places using three computer systems: at the Columbia University Computer Center in New York, at the Rio Datacentro of the Pontificia Universidade Catolica, and at the Instituto Brasileiro De Informatica, both in Rio De Janeiro. The design of the study focused on explaining why persons from developing countries study in developed countries, why some stay on to work, and why others return home. The report presents the overall patterns of migration derived from the survey. Tables list long-run migration plans of principal groups of foreign students and stay-ons, grouped by country and career specialty. Many attitudes and influences induce the student to study abroad. This paper presents information on the long-term career decisions while working abroad, migration decisions after return, and the prediction of migration and return. It also discusses the losses and gains derived from each decision. Conclusions from the survey indicate that whether professionals emigrate or return depends on many conditions; variations which can effect this decision are the length of stay, conditions in the home country and the host country, and personal motives.

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(570) THE PLACE OF THE BEHAVIORAL SCIENCES IN DEVELOPMENT AGENCIES: THREE PROPOSITIONS BASED ON PERSONAL EXPERIENCES WITH MULTILATERAL ORGANIZATIONS

Scudder, Thayer
1977, 22p.

AID/PPC/PDA

(Presented at Workshop on the Role of Anthropology in AID, Washington, D.C., 1977)

The behavioral sciences (anthropology, cultural geography, sociology, and social psychology) need to be used at all stages in the development process. This is essential for meeting the concern of involving rural and urban low-income populations in the benefits of development. Behavioral scientists must also be actively involved in designing the whole development approach of agencies like A.I.D. Behavioral science must also be institutionalized within the development agency. Too few behavioral scientists have been employed by the FAO, World Bank, and UNDP. As a result, for example, the Department of Fisheries at FAO has put too much emphasis on fish as opposed to fishermen, and on biology and limnology as opposed to extension and development. The only solution to such problems is to institutionalize behavioral science within development organizations by building up the necessary critical mass of personnel at junior, intermediate, and senior levels, and complementing this through use of carefully selected consultants. Finally, behavioral science must have friends in high places within a development organization. This is because behavioral scientists, by the very nature of their work, must deal with politically sensitive activities far more often than do other categories of personnel. The fear is that behavioral science inputs may alienate host country officials. It is safer to emphasize agricultural production rather

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URBAN DEVELOPMENT AND HOUSING

than farmers and income distribution; easier to stress fish than fishermen; easier to discuss specific health hazards than government policies and local medical systems. In spite of the Congressional mandate, behavioral scientists have not been recruited for high-level posts in A.I.D. or any of the other multilateral agencies.

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URBAN DEVELOPMENT AND HOUSING

URBAN DEVELOPMENT

(571) LAND-USE PROGRAMMING AND CONTROL FOR INTERMEDIATE-SIZE CITIES IN THE DEVELOPING AREAS; AN EXPERIMENTAL PROJECT IN LEON, NICARAGUA; RECONNAISSANCE REPORT, WORK PLAN, SCHEDULE

PADCO, Inc., Washington, D.C.
1976, 53p.

PADCO (AID/ta-C-1276 GTS)

Under an agreement between the government of Nicaragua and A.I.D., the city of Leon, Nicaragua, was selected for an experimental program of U.S. assistance with urban planning and development. This report from the contractor to A.I.D. describes the planned program as of January, 1976. It presents the basic approach to integrated development programming which includes project preparation and support for implementation of projects, institutional development and staff training, evaluation of development programming activities, and the work schedule. It gives the logistic arrangements, staffing requirements, staff training, the proposed schedule for evaluation of the project, and the phasing out of the contractor's support. It includes the proposed project budget revisions, resumes of candidates for professional staff positions, and contacts made in Nicaragua by the reconnaissance team. The four objectives of the project are (1) to identify types of urban planning and development activities that can function effectively within and near the City of Leon; (2) to assist the City of Leon in dealing with day-to-day development issues that will affect the long-term character of urban growth and change; (3) to establish a system of development institutions within Leon that are linked effectively with existing institutions at the regional and national levels; and (4) to establish a mechanism for a continuing evaluation of the Land Use Programming approach and the methods adopted in the project.

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(572) LAND-USE PROGRAMMING AND CONTROL FOR INTERMEDIATE-SIZE CITIES IN THE DEVELOPING AREAS: AN INTERMEDIATE PROJECT IN LEON, NICARAGUA; PROGRESS REPORT, FEB.-MAY, 1977

PADCO, Inc., Washington, D.C.
1977, 58p.

PADCO (AID/ta-C-1276 GTS)

A PROJECT: To develop effective institutionalization of the land use programming process in Leon, Nicaragua. Conducted by A.I.D.

DURATION: 1976-Ongoing.

DEVELOPMENTS: The focus of this quarterly report is to identify the final "product" which might be expected at the end of the 18-month contract period and to determine the mechanism by which the initial success of the project would be built upon and extended beyond the original contract period. As a part of the final product four to five projects will be identified and de-

veloped. Among them are: General program and specific project for Leon's repartos ilegales; Calle real - urban restoration and street closing projects; CEPAD-Alcaldia de Leon—low-income housing project; and historic restoration and preservation program - restoration of the cathedral and the Sutiaba Church, identification and programming of the colonial zone. These are not necessarily the most critical projects for Leon's future development, but they are good examples of the types of project-related activity which should be carried out on a continuing basis within the planning and programming process. They also are projects which have a potential basis of interest and support in Leon today. A one-hour presentation radio interview was carried out in mid-March concerning the nature and purposes of the pilot project and its future utility to the Leon community. Specific work accomplishments were reviewed. Another formal session is projected for the beginning of June. This session will also be broadcast by radio to the general public and will include discussion of the Marco para el Desarrollo de Leon.

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Other titles in this series:

PN-AAE-415 (Nov. 1976-Feb. 1977, 68p.)

Paper copy \$6.40
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HOUSING

(573) PROCEEDINGS; CONFERENCE ON HOUSING IN AFRICA, NAIROBI, 1976

Kenya National Housing Corp., Nairobi
1977, 147p.

AID/SER/H

This is a summary of the proceedings on Housing in Africa, held in Nairobi, Kenya, in April 1976. The theme of the conference was providing housing for lower-income groups. Papers are presented on low cost housing, design of housing including site-and-service and squatter upgrading schemes, land availability and cost, technical innovations, and sources of funding. It was concluded that the enormous urban growth has raised many difficult problems and a logical approach to these problems would have to include: the creation of an organization or unit to develop a strategy, the development of the strategy for financing and building the housing and related facilities, training programs to develop capable people, and the development of demonstration projects. The Kenya Government feels that the concept of site and service schemes is the only pragmatic approach to providing shelter for the poor. This concept should allow for the standards of service and structures to be raised in line with improving incomes and standard of living. A corporate approach to housing must be considered including a fully comprehensive approach by governmental, local authority and non-governmental agencies. Earnest thought must be given to the need to encourage a community spirit among the plot holders. The consensus of the papers presented was that officially planned solutions which seek to meet low cost housing needs by orthodox conventional ideas are not likely to be successful.

PN-RAB-689

Paper copy \$12.95
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(574) AFRICAN DEVELOPMENT BANK: SHELTER SECTOR POLICY CONSIDERATIONS

Van Huyck, A. P.
1977, 110p.

PADCO (AID/otr-C-1395 GTS)

This report considers whether or not the African Development Bank (ADB) should undertake activities in support of the housing sector in Africa. The various chapters of this report describe

SCIENCE AND TECHNOLOGY

APPROPRIATE TECHNOLOGY AND TECHNOLOGY TRANSFER

(576) THE APPLICATION OF TECHNOLOGY IN DEVELOPING COUNTRIES

Bulfin, R. L.; Greenwell, J. R.; Ariz. Univ. Office of Arid Land Studies
1977, 184p.

Ariz. (AID/ta-G-1111 211d)

(Papers presented at Interdisciplinary Programs Sem. Ser., Univ. of Ariz., 1976)

One of the most difficult questions facing donor countries is to determine the types and levels of technology that are best suited to the overall development needs of a particular LDC. The answer must be derived from a careful analysis of the LDC's economic, political, social, cultural, and populational situation. This volume presents twelve papers delivered in a seminar series conducted at the University of Arizona between September and December, 1976. The papers present views of specialists in industrial, civil, nuclear, agricultural, and systems engineering, physical geography, and cultural anthropology. The papers are: The Role of Technology in Developing Countries—An Overview, by Robert L. Bulfin; Appropriate Technology in Food Production, by Kenneth K. Barnes; Dual Technological Systems in Water and Grain Storage, by Hans Guggenheim; Appropriate Technology in the Industrial Sector, by Ross W. Hammond; The Appropriateness of Appropriate Technology, or, Can the Carabao Happily Co-exist with the Gasoline Engine?, by Simon Ince; Some Criteria for Choices of Technology for Developing Countries, by Hugh H. Miller; Remote Sensing and Developing Countries: Potential and Problems in the Transfer of a Technology, by Leonard Berry; Controlled-Environment Agriculture and the Developing Countries, by Wayne L. Collins and Carl N. Hodges; An Argonne National Laboratory Venture in High Technology Transfer, by Norman Hilberry; On the Introduction of Modern Agricultural Technology in a Developing Country, by A. Wayne Wymore; Some Emerging Modes of Technology Exchange in the U.S. Foreign Assistance Program, by Henry Arnold; Some Retrospective Thoughts on Technology in Developing Countries, by Robert L. Bulfin.

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(577) PROPOSAL FOR A PROGRAM IN APPROPRIATE TECHNOLOGY, TRANSMITTED PURSUANT TO SECTION 107 OF THE FOREIGN ASSISTANCE ACT (REV. ED)

AID/TA
1977, 386p.

AID/TA

(In U.S. Congress. House. 95th Congress, 1st Ses. Committee print)

In 1975 the House Committee on International Relations proposed a new section 107 of the Foreign Assistance Act. The section is intended to authorize A.I.D. to support an expanded private effort to promote development of intermediate technologies in developing countries. A.I.D. undertook a study of what could usefully be done to implement section 107. On June 30, 1976, A.I.D. transmitted to Congress the proposal that resulted. This document contains the proposal, and papers on appropriate technology. The goal of the section 107 program is to assist developing countries strengthen their own capacities to develop, adapt, and utilize appropriate technology. As proposed

some of the options to be considered in selecting appropriate housing activities for support, as well as the forms of delivering that support by ADB. Since a very wide range of possible housing activities must be considered, the question of resource mobilization is central to the eventual strategy selected. This report concludes that it is desirable for ADB to initiate a further, more detailed inquiry into the feasibility of supporting housing activities on a relatively modest basis. Appendices to this report are entitled: "An Overview of African Housing;" "Overall ADB and ADF Current Commitments and Pipeline of Future Projects and Studies; and "Field Memorandum." In assessing housing problems in Africa, it becomes apparent that differences in the region's climate, resources, cultural heritage, political institutions make easy solutions impossible. However, some general guidelines and priorities are identified: (1) Urban and rural areas must be developed in harmony; (2) Housing standards and designs must be very modest and adaptable to self-help schemes; (3) Systems of land tenure should be further developed to curtail land speculation and ensure adequate land for the needs of all income groups; (4) Each country must develop a coordinated delivery system for housing and technical, social, and economic institutions; (5) Construction industries should be further developed within the context of existing African conditions; (6) Most Africans will have to build their own homes or plan an active part in their construction.

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(575) SHELTER SECTOR ANALYSIS: JAMAICA

AID/SER/H
1977, 160p.

The government of Jamaica is attempting to improve housing of the urban and rural poor, but it faces difficult problems. Those are discussed in this report, which describes an A.I.D.-sponsored study of shelter problems in Jamaica. About 70% of the population lacks an income necessary for minimal standards of living. More than 40% of the population—500,000 people—live in the Kingston metropolitan area. The sewer system serves less than half of the residents. Most of the poor live in squatters' shacks that lack sanitary and kitchen facilities. The Jamaican economy is poor. The island imports a large proportion of its consumer goods at inflated prices, and Jamaica's chief exports have not kept pace. In 1976 real growth declined, the deficit in foreign reserves increased, and unemployment increased. In rural areas, much of the fertile land is owned by large estates. Government housing projects are constructing housing for low-income people, but not on a large enough scale. The government is also attempting to develop the production of locally produced building materials because imported materials are very costly. The recommendations based on the study include the following: (1) The government should provide squatters with land-lease tenure and a source of credit for home improvements. (2) In rural areas, the poor who own their own land should be provided a source of credit for home improvements. (3) Cooperatives and credit unions should be given responsibility for the management of individual housing projects, including the collection of loan repayments. (4) The government should continue to explore the use of indigenous construction materials as alternatives to imported materials. (5) Existing training programs for construction workers should be expanded. (6) An effort should be made to improve the coordination among various government agencies concerned with housing.

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SCIENCE AND TECHNOLOGY

by A.I.D., the program will focus on the small-scale sector in LDCs—small farms and small and medium-scale enterprises. Special attention will be given to the role of women. The program is expected to be oriented largely toward rural areas. High-priority activities will include agricultural machinery and rural-based food processing industries; technical, management, credit, and marketing assistance; energy for rural areas; cooking fuels; health and sanitation improvements; low-cost housing technology; and projects to strengthen capabilities of LDC institutions for identifying local problems. The goal is to involve U.S. businesses in development and dissemination of appropriate technology in developing countries. A.I.D. proposed that an independent, private, non-profit organization carry out section 107 activities. It will have a board consisting of representatives of business, private and voluntary agencies, universities, and others.

PN-AAE-693

Paper copy \$33.55
Microfiche \$ 4.00

(578) APPROPRIATE TECHNOLOGIES FOR DEVELOPING COUNTRIES

Eckaus, R. S. National Research Council. Board on Science and Technology for Int. Development
1977, 158p.

NAS (CAS-2584 GTS)

Along with new technologies from industrial countries, the developing nations—since the 1960's—have been importing economic and social problems as well. A close interrelationship exists between the technological choices available to a country and the economic, social and political aspects of that country's developmental process. This report makes decision makers aware of the complexities and restraints of those choices. It includes alternative criteria for the appropriateness of a technological decision, such as the reduction of unemployment or improvement in the quality of life. A description of the factors that determine the effectiveness of a country's technological choice includes who the decision makers are and their appropriateness. Also pointed out are special features of these technical decisions as they affect agriculture, small-scale businesses, and areas of the service sector such as health care and education. Technical, economic, and institutional policies should all be examined carefully to help improve the match between development goals and performance.

PN-AAD-298

Paper copy \$13.85
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(579) POLICIES TO ENCOURAGE THE USE OF INTERMEDIATE TECHNOLOGY

Pack, Howard
1976, 57p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

LDC governments need to be convinced of the benefits of using a labor-intensive approach to their future economic development. They need to alter the prices that businesses pay for their factors of production, so that private decisions related to profit-making can be aligned with the national interest. This would help the small-business sector in many LDCs. The small businesses are labor-intensive and highly profitable, but they have been severely discriminated against by government policies that control credit and the availability of imported raw materials. If governments increase the price that larger companies pay for capital goods, this would also tend to make the companies change their mix of capital and labor and make their processes more labor-intensive. Both the large-business and small-business sectors

would benefit from technical advice that would help them maintain profits while making their processes more labor-intensive. These advisors could be organized by A.I.D. or international organizations. They might be resident in a country for a year, or visit for shorter periods. They would be experts in well-specified production processes such as meat packing, rather than being "food processing" specialists. They would be older businessmen rather than academics and would be production managers or supervisors rather than staff engineers. But, without a change in the set of economic incentives faced by business, there is little reason to believe that technical advice by itself will lead to substantial changes in the labor intensity of production. The potential for labor-intensive development in other sectors also exists. Studies show that labor can be effectively substituted for capital in constructing roads and housing.

PN-AAE-695

Paper copy \$5.50
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(580) APPROPRIATE INSTITUTIONS FOR APPROPRIATE TECHNOLOGY: A FRAMEWORK FOR ANALYSIS AND GUIDELINES FOR AID ROLES

Loppel, Bruce; Hansen, Gary
1976, 70p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

Questions of appropriate technology are usually discussed in terms of economic and engineering decision-making. Questions of the social effects of technology are always present but are rarely given the sustained attention which they should be. Technology is insinuated into social and cultural situations. The local social and cultural organization affects the roles technologies have and how they are used. The decision-problem in appropriate technology is not how to satisfy lists of criteria of what appropriate technologies are or ought to be. It is a tradeoff problem in which judgments need to be made about costs and benefits, impacts and opportunities. In making those decisions, it is necessary to anticipate what the terms of the tradeoffs will be and to continue assessing the terms of the tradeoffs. One way to do this without sacrificing change is to compare intervention and explication strategies. The former seeks to minimize social effects, the latter tries to use them. External assistance can make a short-range contribution by providing the materials to enter a diffusion stream. In this kind of contribution, the assistance role is defined in relation to alternative forms of initiating and maintaining a diffusion stream. External assistance can make a long-range contribution by seeking to create an integrated professional community that can develop and maintain perspectives, standards and experience. In this kind of contribution, the role of assistance is then defined in relation to the joining together of alternative substantive (disciplinary) strands of the professional community.

PN-AAE-696

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(581) APPROPRIATE TECHNOLOGY STUDY: SOME BACKGROUND CONCEPTS, ISSUES, EXAMPLES, AND RECOMMENDATIONS; A WORKING PAPER

Goodman, L. J.
1976, 146p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

A large number of research and development activities on appropriate technologies is being conducted in many countries in

Asia. The governments of the LDCs are providing some support for most of those R&D activities. However, no coordinated effort is being made to maximize the use of available resources. Another bottleneck is the lack of viable information systems, both inter-country and intra-country. In some instances this results in duplication of R&D efforts. A coordinated global network of Appropriate Technology Centers (ATCs) should be established. This should be accomplished by strengthening national or private organizations that have demonstrated capabilities for this type of R&D. In-country linkages should be encouraged with regional institutions to maximize the multiplier effects within a given country. Information exchange systems should be established to link local ATCs in a network, so that each can be an information source. These local information resources should be aggregated in national data banks that are coordinated on a regional (multinational) level to ensure uniform exchange policies and practices.

PN-AAE-702

Paper copy \$12.85
Microfiche \$ 2.00

(582) INTERMEDIATE TECHNOLOGY, AN INFORMAL SURVEY

Askin, P. W.
1976, 64p.

AID/AG/OAS

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

Intermediate technology has several distinctive characteristics: low-cost inputs, intensive use of abundant factors of production, simplicity of inputs and outputs, low-cost outputs, smallness of scale, commercially viable, compatible with local environment, geographically dispersed, and adaptive to changing conditions. This paper defines and discusses intermediate technology; describes some applications of it in the Philippines, Indonesia, and Sri Lanka; and discusses the role of international assistance in supporting the adoption of intermediate technology. Philippine applications discussed include the "Jeepney" industry, the IIRI machinery development program, the Kaunlaran industrial shop, zero tillage concept, the Institute of Small Scale Industries, and the Regional Adaptive Technology Centers, Mindanao State University. Indonesian applications include the work at the Institute of Technology at Bandung, the Farm Machinery Testing Program of the Department of Agriculture, the Institute of Agriculture at Bogor, the bio-gas conversion project at the Gajah Mada Institute, and the "Butsi" or domestic peace corps program of the government. In Sri Lanka, projects include industrial cooperatives organized by the Ministry of Planning and Employment, involving blacksmithing, metalworking, pottery, pharmaceuticals, the Farm Mechanization Training Center, and the Somisiri Rice Huller Manufactory. As for international assistance, A.I.D. should probably take the lead in establishing a clearinghouse for dissemination of information on appropriate technology. It should also consider a review of its current activities to determine the "appropriateness" of the technologies called for by those activities.

PN-AAE-700

Paper copy \$6.05
Microfiche \$1.00

(583) INTERMEDIATE TECHNOLOGY (IT) ORGANIZATIONS IN AFRICA AND THE INDIAN SUB-CONTINENT

AID/TA
1976, 97p.

AID/TA

(Issued as Appen. to Proposal for a program in appropriate technology: PN-AAE-693)

One function of the Intermediate Technology Development Group in the United Kingdom (ITDG) is to assist in building up such organizations in the developing countries. It has been closely associated with the formation of ITDGs in Botswana, Ghana, India, Pakistan, and Sri Lanka. This paper by the ITDG in the UK describes African and Assian IT organizations and some of their activities. All fourteen of the organizations discussed were originated in the 1970s. In Botswana, the Technology Center proposed by the government is planning to investigate low-cost housing designs and materials, low-cost water and power supplies, and post-harvest processing facilities. In Ethiopia, the Appropriate Technology Unit of the Christian Relief and Development Association is engaged in information dissemination and technical assistance consulting. The Engineering Department of the National University at Addis Ababa is conducting experiments in small-scale technologies. In Ghana, the University of Science and Technology, Kumasi, is providing consulting services. In Tanzania, the Small Industries Development Organization is conducting work in food processing, building materials, and textiles. In Zambia, the Family Farms Ltd. is providing assistance with agricultural technology, as is the University of Zambia. In Bangladesh, the Appropriate Agricultural Technology Cell in Dacca is active on several fronts. In India, four organizations are active: the Appropriate Technology Cell, sponsored by the government; the Appropriate Technology Unit, sponsored by Christian Aid, the Gandhian Institute, and others; the Indian Research Institute sponsored by the AT Unit of India; and the Application of Science and Technology to Rural Areas, sponsored by the I.I.S., Tata Institute, and others. In Pakistan, the AT Development Unit is sponsored by the government. In Sri Lanka, the AT Group is sponsored by the government and industry.

PN-AAE-699

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(584) TECHNOLOGY ASSESSMENT AND THE DEVELOPMENT PROCESS, REPORT OF A TECHNOLOGY ASSESSMENT WORKSHOP

Christakis, A. N.; Malone, D. W.
1976, 138p.

AID/TA/OST

An A.I.D. technology assessment workshop was conducted in January, 1976, to identify a methodology of assessing policies. The participants also expressed their views regarding: (a) a set of LDC objectives for the 1980s; (b) a set of technological innovations that could affect those objectives; and (c) a set of U.S. policies in support of those objectives. The participants were divided into two groups. On the first day, one group set objectives, the other set policies. On the second day the objectives and policies were separately structured on graphic charts that showed their interactions. Those charts or maps were developed by employing a computer-assisted technique called Interpretive Structural Modeling (ISM). They provided the groups insights on barriers that need to be overcome by A.I.D. to support development in LDCs. As perceived by the first group, the basic LDC objectives for the 1980s are (1) reforming and reorganizing the structure of their society; (2) designing their institutions for cost-effective delivery of services; and (3) increasing the use of mass media and other non-formal methods of education. The second group perceived these policies for the U.S.: allocating U.S. aid according to multiple criteria; continuing emphasis on LDC food production and employment; differentiating among LDCs for program purposes; concentrating U.S. bilateral assis-

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tance; promoting a multilateral population control program; developing hard technology specifically for LDC productive processes; requiring adequate attention to human resource development; facilitating comprehensive and assured access to technology; and providing comprehensive, assured access to donor country markets for LDCs. The authors concluded that it appears desirable to adopt a conceptual and methodological framework within A.I.D. for Technology Assessment studies. This could help produce region-specific appropriate technologies for LDCs, and help identify the role of the private and public sectors.

PN-AAE-668

Paper copy \$12.20
Microfiche \$ 2.00

(585) INSTITUTIONAL RESPONSE TO THE CAMPAIGN OF LDC'S ON TRANSFERS OF TECHNOLOGY

Mintzes, Joseph
1975, 32p.

AID/TA/OST

As a result of cumulative LDC pressures since the early 1960's, a number of resolutions were adopted in the 1974 and 1975 Special Sessions of the UN General Assembly. These resolutions were intended to help foster better terms in agreements on technology imports into developing countries and to improve the nature of the technology transferred. They also call for national and international measures to strengthen the scientific and technological capabilities of LDCs and to encourage R&D efforts oriented to the special requirements of these countries. A code of conduct on technology transfers oriented to the needs of the LDCs is underway in UNCTAD. A completion date was set for the end of 1977. The World Intellectual Property Organization is the specialized UN agency concerned with patents and related types of property rights. It has undertaken an examination of LDC-proposed changes in the Paris Convention, the basic patent treaty. These initial responses will have an important impact on international institutions in this sphere. They will also be influenced by the responses to LDC proposals for changes in the international economic system with respect to trade, aid and foreign direct investment. All of these involve technology transfers. LDCs object to the costly terms of technology transfers and the lack of suitability of much of the technology imported. Their proposals for action are intended to strengthen the relatively weak bargaining position of LDC firms compared to foreign suppliers. Reforms on rules and practices of existing institutions are more probable than sweeping changes. Progress will depend largely on the allocation of adequate funds and qualified personnel as well as the better use of available resources.

PN-RAB-690

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(586) FACILITATING TRANSFERS OF TECHNOLOGY TO DEVELOPING COUNTRIES

Mintzes, Joseph
1975, 36p.

AID/TA/OST

Technology transfers have been both a boon and a concern to the LDCs. Industrialization of the developing countries has been accelerated by these critical imports, but the cost in scarce foreign exchange has been rising at a rapid rate. Some LDC spokesmen are also troubled by the cost in politico-economic terms of an increasing national dependency on foreign technology. Capital-intensive technology, developed primarily to meet

the needs of industrially advanced countries, is often not appropriate for most LDCs with surplus labor problems. However, in the absence of an indigenous scientific and technological capability, foreign technology is actively sought by LDCs, particularly those which are the most industrially advanced. This study finds that foreign financial aid could facilitate priority technology transfers to the LDCs through a number of practical program approaches. It would stimulate the development of institutional arrangements in LDCs that could accelerate technological development by encouraging innovative elements in the business community and by supporting selective imports of technology most appropriate to the special needs of a country. Preferential licensing terms and tax policies on technology exports are not considered feasible. As the predominant supplier of technology to LDCs, the initiative is up to the U.S. Other donor countries and international organizations would probably be responsive to such an initiative. Possible approaches and their implications are discussed in detail.

PN-RAB-691

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APPLICATIONS

(587) STAFF SUMMARY REPORT OF WORKSHOP; WORKSHOP ON SYSTEMS DEVELOPMENT, SEOUL, KOREA, 1977

National Research Council. Board on Science and Technology for Int. Development
1977, 104p.

NAS (CSD-2584 GTS)

A workshop was held in Seoul in July 1977 to assist A.I.D. in its program to foster systems analysis in Korea and to focus on the systems aspects of energy, environment, and transportation planning. This report includes the agenda, a list of participants, and comments. The main part of the report is the following appendices: biographical data on National Academy of Sciences panelists, presentation paper for the workshop on systems development, participant list, and the reports of the workshop in the Korean Herald and Korea Times. The presentation paper discusses the methodological problems of urban transport systems, energy supply and demand modeling, power system planning analysis, and environmental problems in Korea. Existing environmental legislation is insufficiently detailed and comprehensive as a basis for the management of current problems. It is recommended that: responsibility for all aspects of environmental management should be coordinated under a single ministry of central government responsible to the prime minister; management of water resources should be the responsibility of central government through management boards set up on single river basin area bases; a national environmental research center accompanied with a national environmental information system should be established; and more emphasis should be placed on applied research rather than fundamental research. Solar energy has potential in Korea for water and space heating but is too expensive to use for electricity. Korea must try to develop local, conventional resources such as coal and wind power to supply the energy needed for industrialization.

PN-AAE-791

Paper copy \$9.40
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(588) STAFF SUMMARY REPORT OF WORKSHOP; WORKSHOP ON SOLAR ENERGY FOR THE VILLAGES OF TANZANIA, DAR ES SALAAM, 1977

National Research Council. Board on Science and Technology for Int. Development
1977, 53p.

NAS (CSD-2584 GTS)

This staff report of the workshop on solar energy for the villages

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of Tanzania discusses the possibility of using solar energy as an alternative to fossil fuel. The potential value of solar energy was considered for Tanzanian villages as well as the significance of solar energy for an environmentally sound design for Dodoma, the proposed capital of Tanzania. The report describes the workshop's background, organization, conclusions and recommendations, concluding resolution, highlights, working sessions, and follow-up activities. The appendices include the workshop program, a list of participants, conclusions and recommendations, opening address, and several commentaries. Participants at the workshop recommended that attention be focused on technologies having the greatest potential in terms of cost-effectiveness, availability of resources, and long-range power requirements as follows: photovoltaic electricity generation, solar drying and cooling for food and crop preservation, and solar stills for water purification. It is also recommended that solar energy projects be initiated in three villages in each agro-economic zone of Tanzania. Criteria for the selection of the villages would include the village's energy/power needs, availability of renewable energy resources, human skills, the economic viability of the project, village enthusiasm and interest in participation, and social utility of the project. The provision of an adequate supply of clean water should receive top priority in Tanzania. Other suggestions were that reforestation programs should be implemented at the village level and that a limited program for training village technicians should be created. The solar energy forms discussed were direct sunlight, wind, falling water, and photosynthesis.

PN-AAE-792

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(589) SOLAR KILNS: FEASIBILITY OF UTILIZING SOLAR ENERGY FOR DRYING LUMBER IN DEVELOPING COUNTRIES

Tschernitz, J. L.; Simpson, W. T.
1977, 70p.

USDA/FS (PASA TA(AG) 03-75 Res.)

This detailed study, by the U.S. Forest Products Laboratory at Madison, Wisconsin, tested the feasibility of using solar energy to improve lumber drying by small-to medium-scale operators in LDCs. The literature review of solar lumber drying throughout the world confirms the potential of solar drying and points out the success or failure of some design features, construction details, and applications of solar dryers. Feasibility estimates show that solar drying is practical if a dryer meets production and cost requirements. Two solar dryer designs, a greenhouse type and an external collector type, have good potential to provide low cost kiln capacity. Production capacity is estimated by a material and energy balance analysis, and construction costs are estimated. Some alternatives for solar kilns are discussed—the conventional steam heated or direct fired dry kilns and the low cost, concrete block furnace kiln. The limitations to these types are the poor air circulation, lack of humidification, and the sensitivity of the availability of wood waste. Another alternative is a solar kiln with a back-up heating system for night or cloudy day operation. A large section of this report is devoted to solar dry kiln design optimization by computer modeling. The initial engineering study resulted in a computer program capable of exploring the merits of supplemental solar drying, which is a combination of solar and conventional fuels as an energy source. This computer model estimated the feasibility of sup-

plemental solar energy as a possible way to reduce drying fuel costs.

PN-AAE-799

Paper copy \$6.55
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(590) PYROLYTIC CONVERSION OF AGRICULTURAL AND FORESTRY WASTES IN GHANA, A FEASIBILITY STUDY

Chiang, T. I.; Graft-Johnson, J. W.; Tatom, J. W.; Powell, J. W.
1976, 46p.

Ga. IT (AID/ta-C-1290 Res.)

Waste materials from agricultural and forestry production can be converted into valuable fuels. This study in Ghana demonstrated that wood, sawdust, ground nut shells, or rice straw can be converted to charcoal, oil, and gas by pyrolytic conversion. A simple, self-sustaining, continuous-batch process is specially applicable in Ghana. A system based on this process could be constructed with many "off-the-shelf" items, along with components readily fabricated in Ghana. Ghana is generating 2.7 million tons of waste materials each year that are suitable for pyrolytic conversion. Those could produce 342,000 tons of charcoal and about 275,000 tons of oil. The amount of energy generated by the conversion would exceed the total energy produced in Ghana in 1973. The demand for domestic charcoal in Ghana was estimated at 250,000 tons in 1975, with an annual growth rate of 2.7%. More than 99% of this demand was met by locally produced charcoal, using earth mounds that are primitive and wasteful. The char yield of modern pyrolytic converters is more than double that of the earth mound method. In addition, they produce both oil and gas fuel. The oil may be used as fuel for boilers, furnaces, and other industrial uses. Any surplus oil can be exported. The char and oil mixed together can also be used in place of coal in running trains and ferries. Gas generated by pyrolytic converters is most practically used on site in drying feed materials or in utility boilers. This report includes a description of a pyrolytic conversion system that would use an input of six dry-tons of sawdust per day with a crew of 11 workers per shift. It would run three shifts per day, 300 days per year, and produce 450 tons of charcoal and 350 tons of oil a year. Capital requirements, gross returns, net profit, and payout times are discussed.

PN-AAE-557

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(591) LOWER COST METHODS OF WATER AND WASTE TREATMENT IN LESS DEVELOPED COUNTRIES; FINAL REPORT

Okla. Univ. Bureau of Water and Environmental Resources
Research
1977, 82p.

Okla. (AID/CM/ta-7313 Res.)

Past efforts at assisting LDCs to develop low-cost water and sewage treatment methods have not been too successful. The technology transfers have usually been incompatible with in-country resources of manpower and materials. In 1973, A.I.D. sponsored a three-year project at the University of Oklahoma to develop a predictive model for use in selecting water treatment sites and methods compatible with the needs and resources of developing countries. The project produced a predictive model that uses cost and demand analysis. It also produced a data collection system, computer and manual user guides, and an analytic kit that can be used in LDCs. Selected studies were made of the "high make" technologies at several LDC sites in assessments of their economic performance and consumer acceptance. The analytic field kit was also tested for its capacity to monitor water and wastewater treatment processes. The project

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produced some 32 publications which are being disseminated by A.I.D. and other national and international agencies. However, the analytic tools which were developed have yet to be widely disseminated. A need exists for a prioritizing model to assist in-country programs in establishing orderly construction of facilities. The use of the predictive model is expected to be expanded as information concerning its capacities is disseminated in international conferences.

PN-AAE-468

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(592) COST EFFECTIVENESS OF THE SOCIO-CULTURAL AND HEALTH BENEFITS OF SEWERLESS ALTERNATIVES FOR DOMESTIC WASTE DISPOSAL IN DEVELOPING COUNTRIES; FINAL REPORT

Townley, Gayle
1977, 185p.

AID/TA/H

This study gives a cost-effectiveness analysis of the health and sociocultural benefits of sewerless alternatives for domestic waste disposal in developing countries. This involves a comparison of the conventional methods of treating sewage with newer higher-level technological methods which eliminate the need for sewers. "Sewerless" refers to waterless or water restricted systems, while "conventional" means waterborne. There are five basic categories of advanced methods of sewerless treatment: incinerating toilets, biological toilets, composting toilets, vacuum systems, and aerobic tanks. Oil flush toilets may also be applicable. The major advantage to these methods is the low water consumption. Two alternate disposal techniques are aquaculture (the use of sewage as a fish food) and land applications. Since piped water is not available in many areas of LDCs, the necessity for consideration of alternatives to centralized sewage treatment practices is evident. Transfer of technology from developed countries is fiscally prohibitive. In this report, cost effectiveness techniques are applied to identify the most cost-effective, commercially available systems. Unit costs are developed using a decision weighting model which seeks a measure of objectivity by delineation of the physical performance characteristics of the available alternatives. A comprehensive literature and market survey on conventional and individual household treatment systems was conducted to obtain data on costs, technology requirements, and other pertinent factors. The report includes an historic development of wastewater systems and treatment, a discussion of conventional treatment systems, the state of the art of sewerless treatment systems and water reduction, and many tables and illustrations supporting the text. This study is useful to engineers, planners, and administrators when making decisions on selecting disposal for new or expanding areas.

PN-AAE-786

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BIBLIOGRAPHIES

AGRICULTURE

(593) AGRICULTURAL MARKETING, A PRELIMINARY BIBLIOGRAPHY

ICRISAT
1975, 33p.

ICRISAT (AID/ta-G-1073 GTS)

Gives 189 references to journal articles, books, and reports dealing with agricultural marketing. The dates of publication of

the literature cited range from 1959 to 1975. The bibliography is organized into twelve sections: Marketing, General; Demand; Supply; Prices; Efficiency—Market Margins and Costs; Marketing Policies; Processing; Marketing Research; Storage; Systems and Structure; Transportation, and Regional Development. One of the most frequently cited periodicals is the *American Journal of Agricultural Economics*.

PN-AAE-499

Paper copy \$2.75
Microfiche \$1.00

(594) A BIBLIOGRAPHY OF YAMS AND THE GENUS DIOSCOREA

Lawani, S. M.; Odubanjo, M. O.
1976, 199p.

IITA (AID/ta-G-1251 GTS)

This bibliography on yams brings together the scattered literature on the genus *Dioscorea* from the early nineteenth century through 1975. The 1,562 entries in this bibliography are grouped into 36 subject categories, and arranged within each category alphabetically by author. Some entries, particularly those whose titles are not sufficiently informative, are annotated. The major section titles in the book are as follows: general and reference works; history and geography; social and cultural importance; production and economics; botany (including taxonomy, genetics, and breeding); yam growing (including fertilizers and plant nutrition); pests and diseases; storage; processing; chemical composition, nutritive value, and utilization; toxic and pharmacologically active constituents; author index; and subject index. Most entries are in English, with a few in French, Spanish, or German.

PN-AAC-745

Paper copy \$17.25
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(595) A BIBLIOGRAPHY OF PLANT GENETIC RESOURCES

Hawkes, J. G.; Williams, J. T.; Hanson, Jean
1976, 189p.

IBPGR (AID/ta-G-1272 GTS)

(Suppl. 42p.: PN-AAE-484)

This bibliography includes over three thousand references in both English and Spanish in such areas as documentation, evaluation, forest resources, forage grasses, and plant breeding. It contains more voluminous references on crop origins and their variation and evolution. Also included are relevant aspects of exploration, sampling theory, variation, adaptation, genecology, genetics, cytogenetics, ecophysiology, seed and tissue conservation, biochemistry, taxonomy, biosystematics, and archaeology, where these have a bearing on genetic resources. The literature on major staple food crops and important industrial crops is included. The literature on crops is focused on primitive forms and related wild species, as well as the taxonomy, origin, and evolutionary advances within the crops. The purpose of this emphasis was to help clarify the use which may be made of them by plant breeders now and in the future. Citations relating to cereals include literature on wheat, oats, rye, maize, barley, sorghum, and rice; for roots and tubers, potato, sweet potato, cassava, South American minor tubers, and aroids; for fibers, cotton; for sugar and starch plant, sugar cane, beets, and yams; for stimulants, tobacco, tea, coffee, and cocoa; for oil plants, sesame, sunflower, safflower, oil palm, peanut, coconut; for dates and other palms; *Phoenix*, etc.; for minor crop plants, chili peppers and rubber; for temperate fruits, vine; for tropical fruits, pineapple, citrus, durian, mango, banana, breadfruit; for vegetables, onion and garlic, brassicas, cucurbits, carrot, let-

tuce, tomato, phaseolus, broad bean, vigna, pea, soy, chickpea, lentil, and other tropical legumes. This bibliography is not intended to cover the entire field but to provide a basic survey of the relevant literature.

PN-AAE-483

Paper copy \$16.45
Microfiche \$ 2.00

(596) A BIBLIOGRAPHY OF PLANT GENETIC RESOURCES, SUPPLEMENT

Williams, J. T.
1976, 45p.

IBPGR (AID/ta-G-1272 GTS)

(Main work, 189p.: PN-AAE-483)

This supplement to the Bibliography of Plant Genetic Resources (PN-AAE-483) was published for several reasons. First, it contains additional citations suggested by genetic resources workers. It also contains a few key references inadvertently omitted from the first volume. Lastly, it includes coverage of some crops omitted from the original volume—for example, millets. This supplement is organized in the same way as the original Bibliography. It contains about 450 additional citations.

PN-AAE-484

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(597) SOCIO-ECONOMIC ASPECTS OF THE PRODUCTION AND UTILIZATION OF POTATOES IN PERU; A BIBLIOGRAPHY

Werge, R. W.; Centro Internacional de la Papa, Lima, Peru
1976, 75p.

CIP (AID/ta-G-1811 GTS)

(In English and Spanish)

The purpose of this bibliography is to facilitate socioeconomic investigations on potato production and use in Peru. The 359 works cited are grouped under six headings: journal articles, articles in documents and books, bulletins and technical reports, documents, books, and theses. Within these categories, citations are arranged alphabetically by author. Most of the works cited are in Spanish and were written between 1902 and 1975. The contents of the bibliography reflect the strengths and weaknesses of existing sources on socioeconomic aspects of potato production and use in Peru. The areas most documented are production systems and consumption patterns. In contrast, post-harvest technology has received little attention. The weakest aspect of the existing literature is the general lack of quantitative information at the micro-level, especially for subsistence production and use.

PN-AAE-058

Paper copy \$6.95
Microfiche \$1.00

(598) MEALYBUGS, ABSTRACTS OF SELECTED LITERATURE

Ibekwe, G. O.; Lawani, S. M.
1977, 154p.

IITA (AID/ta-G-1185 GTS)

This collection of 504 abstracts by the International Institute of Tropical Agriculture covers the literature on mealybugs published throughout the world during the last fifteen years. Earlier publications reporting work done in Africa and other tropical areas are included. All recorded species of mealybugs are covered. In addition to control of the pest, other aspects included are taxonomy and morphology, physiology and histology, genetics and evolution, reproduction and development, and ecology.

Chemical, biological, integrated and cultural control are covered. The entries are divided into sections and subsections and are arranged alphabetically by author. Mealybug research has previously been the concern mainly of scientists working on horticultural crops, but they are pests of some major tropical and subtropical crops and therefore economically important. Their host plants include citrus, cocoa, coffee, pears, apples, rice, sorghum, cassava, potatoes, and yams. They are widely distributed throughout the world and are pests of citrus plants wherever they are grown. In 1970 mealybugs were found in considerable numbers on cassava in Zaire. Cassava is a staple food in Zaire and in many African countries so it is necessary to bring this pest under control. IITA has a large research program on cassava and therefore became involved in mealybug research.

PN-AAE-616

Paper copy \$13.55
Microfiche \$ 2.00

(599) NUTRITION EDUCATION RESEARCH

Whitehead, F. E.
1973, 59p.

Iowa (CSD-258G GTS)

(In World rev. of nutrition and dietetics, v. 17, p. 91-149)

Research in nutrition education is continually needed, for each new generation must be taught to use existing food supplies intelligently and the science of nutrition is evolving. This project paper reviews and critically analyzes reports concerned with nutrition education research which may or may not have resulted in improved dietary habits. Studies from 1900-1970 are included. A summary of findings resulting from the literature review is presented along with the investigator's conclusions and recommendations related to problems of effective nutrition education.

PN-AAD-426

Paper copy \$5.65
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APPROPRIATE TECHNOLOGY

(600) APPROPRIATE TECHNOLOGY FOR NATURAL RESOURCES DEVELOPMENT; AN OVERVIEW, ANNOTATED BIBLIOGRAPHY, AND GUIDE TO SOURCES OF INFORMATION

Bulfin, R. L.; Weaver, H. L.
1977, 169p.

Ariz. (AID/ta-G-1111 211d)

This volume presents an overview of the topic of appropriate technology (AT), and it also contains a directory of institutional sources of information and an annotated bibliography. The overview gives a brief history of the development of AT, followed by its thematic framework. Examples of AT in LDCs are given, and the question "Is Intermediate Appropriate?" is also discussed. Appendix A contains the directory, and it gives the survey results from 74 worldwide institutions concerned with AT which answered a questionnaire. It also lists 70 institutions which did not respond. Appendix B, annotated bibliography, has 315 citations, most of which are journal articles and are annotated. All citations are in English, and most fall within the dates 1970-1976.

PN-AAF-052

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(601) APPROPRIATE TECHNOLOGY IN SOCIAL CONTEXT, AN ANNOTATED BIBLIOGRAPHY

French, David
1977, 39p.

AID/PPC/PDA

Appropriate technologies for people in developing countries should be inexpensive, simple, sparing in the use of imported resources, and well adapted to local social contexts. The subject of this bibliography is the last of those criteria—the consistency of a technology with its social environment. The “social” impact of a project usually refers only to changes in employment and income distribution. But to understand the concept of appropriate technology, a broader conception of the “social context” is needed. It means the whole set of shared values, beliefs, and institutions that join people in common endeavor. Evidence shows that implanting a socially “inappropriate” technology in a village can have two results: either the technology is rejected or the village may “die” as a social organism. The material included in this bibliography gives a unified impression of how to approach the problem of matching technology and society. It is drawn from four sources: development agencies, the applied social sciences, village-based programs, and sources of technical information. The 180 references include abstracts.

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