

A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS

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Volume 4
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Technical Assistance Bureau
Agency for International Development
Washington, D.C. 20523

**MAJOR RESEARCH IN
U P L A N D
R I C E**

Major Research in Upland Rice is a 255-page report which summarizes the results of research conducted by the International Rice Research Institute on selected aspects of upland rice between 1962 and 1973. It includes topics such as: upland rice around the world; climates of upland rice regions; characteristics of upland rice; varietal improvement of upland rice; cultural practices of upland rice; studies on insect pests of upland rice; mineral microbial transformations in upland rice soil; and future emphasis on upland rice.

The report can be purchased from the Office of Information Services at U.S. \$2.00 per copy via surface mail and \$5.00 per copy via airmail, and ₱10.00 per copy in the Philippines.

Write to: The Office of Information Services, The International Rice Research Institute, P.O. Box 933, Manila, Philippines.

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INTRODUCTION

PURPOSE

The Agency for International Development sponsors a large amount of research in problems related to national development. Studies ranging from agriculture to economics are pursued in many universities and international research centers.

Realizing that research findings have no great value until they are in the hands of people who can make good use of them, the A.I.D. Research and Development Abstracts (ARDA) announces research and development studies as they are completed, and describes how copies of the studies can be obtained. Copies are available in paper or microfiche form, and limited numbers are available at no cost to developing countries.

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The original mailing list was assembled by listing addresses of institutions and organizations known to have a professional interest in development. Titles and positions within institutions are used rather than names of individuals because positions tend to remain in place while incumbents move from one organization to another. If we used individual names the mailings would soon become undeliverable because such mail is usually not forwarded.

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AGRICULTURE

GENERAL AGRICULTURE

ROSTER OF SCIENTISTS FOR THE MAJOR FOOD CROPS OF THE DEVELOPING WORLD

Hutchinson, M.T.; Nelson, E.G.
1975, 207p.

Office of Agriculture, Technical Assistance Bureau, Agency for International Development, Washington, D.C. 20523

This directory begins with biographic citations of the roster of scientists. These are professionals who have been identified as being chiefly concerned with food crops research and production and whose fields of specialization have a direct concern with increased productivity or improvement of the nutrient content of edible parts of plants in the less developed countries. The food crops concerned are those of major importance worldwide, namely wheat, rice, maize, barley, sorghum, millet, and oats; potatoes, yams, cassava, and sweet potatoes; beans, cowpeas, soybeans, pigeon peas, mungbeans, chickpeas, peanuts or groundnuts, and other lesser known grain legumes. The citation for each scientist includes name, year of birth, languages fluency, academic degrees, specialties, experience, title, and address. The Country-Crop section groups specialists according to country where employed and shows the discipline and crops (or subject) with which each is concerned. The Institutions section lists international and regional research institutions concerned with food crops in developing countries. The Directories of Agricultural Scientists section lists other compilations of specialists who are concerned with agricultural development. The Nonprofit Organizations section lists religious and charitable groups concerned with food crops in the developing countries. The National Associations in the United States section gives rosters that list professional and scientific societies. Some of these societies make available membership lists compiled according to specialty.

PN-AAB-617 \$16.60

UNDEREXPLOITED TROPICAL PLANTS WITH PROMISING ECONOMIC VALUE

National Research Council
Board on Science and Technology for
International Development
1975, 200 p.

National Academy of Sciences
Washington, D.C.

Avec resume en francais. Con resumen en espanol.

A report on tropical plants with a potential of improving the quality of life in their indigenous areas. Its objectives were to: 1) identify neglected but seemingly useful tropical plants, both wild and domesticated, with economic potential; 2) select those plants with the greatest promise for further exploitation throughout the tropics; 3) indicate the requirements and avenues for research to ensure that these plants reach their fullest potential. The 36 plants described here were selected from among 400 nominated by plant scientists around the world. Only a brief introduction to these plants is intended in this study. Each plant is presented in a separate chapter which is divided into the following subheadings: 1) description of the plant and its advantages; 2) limitations and special requirements; 3) research needs; 4) selected readings (significant reviews, general articles); 5) research contacts and germ plasm sources (individuals or organizations known by the panelists to be involved in relevant research or to have appropriate seeds, cuttings, or rootstock).

PN-AAB-651 \$16.00

MINNESOTA AGRICULTURAL GROWTH, 1880-1970

Fitzharris, J.C.
1976, 54p.

Department of Agricultural and Applied Economics
University of Minnesota
St. Paul, Minnesota 55108

(In Staff paper P76-4)

More than a history, this provides the necessary background for examining in detail Minnesota's agricultural research system. It shows output and production, production factors, relative output and input price changes, and structural changes in the agricultural sector. Growth and productivity changes in the state's agriculture are not covered. Numerous tables, graphs, and charts are included.

PN-AAB-704 \$4.35

CEREAL CROPS

REEVALUATION OF COMMON WHEATS FROM THE USDA WORLD WHEAT COLLECTION FOR PROTEIN AND LYSINE CONTENT

Vogel, K. P.; Johnson, V. A.; Mattern, P. J.
1975, 36 p.

The Agricultural Experiment Station, Institute of Agriculture and Natural Resources, University of Nebraska, Lincoln, Nebraska 68508

(In Research bulletin #278)

Analysis of the 12,000 common wheats of the USDA World Wheat Collection indicated significant differences among wheats for grain protein and lysine content. Much of the variation for protein and lysine was non-genetic in origin, since the wheats analyzed were not all grown during the same year. To test the validity of those analyses, 600 wheats which represented the range of protein and lysine among the common wheats were grown at Yuma, Arizona, in 1972 and 1973. Most of the variation in percent protein was found to be due to genetic differences among the wheats tested. Wheats with the highest mean protein percentages were five percentage points higher than the lowest-protein wheats. Wheats that should be useful to wheat breeders as genetic sources for high protein are identified. Lysine expressed as a percent of sample was positively correlated with percent protein, but lysine expressed as a percent of protein was negatively correlated with percent protein. Selection for lysine using both criteria would produce conflicting results. Results of other researchers indicate that the complex relationship between lysine and protein is due to high-protein wheats having more gluten proteins which are low in lysine than low-protein wheats.

PN-AAB-598 \$2.90

MULTILINES: SAFETY IN NUMBERS

Breth, S.A.
1976, 11 p.

(CIMMYT) Centro Internacalnde Mejoramiento de Maiz y Trigo, Apartado Postal 6-641, Mexico 6, D.F., Mexico

(In CIMMYT Today, no. 4)

Multiline varieties—mixtures of genetically related lines that have different genes for disease resistance—offer farmers a way to tame outbreaks of rust, thus stabilizing annual wheat yields. CIMMYT is producing large numbers of component lines that national wheat programs can use in compositing their own multiline varieties. A multiline variety is created by mechanically mixing seed of several lines that are similar in appearance and genetic make-up, but that have different genes for resistance to

AGRICULTURE

rust. The lines are bred and selected to be nearly identical in height, maturity, plant type, grain quality, and other characteristics, except for rust resistance. Since 1970 CIMMYT has been working towards a dwarf multiline variety based on the 8156 cross. This cross, grown under variety names like Siete Cerros, Mexipak, Kalyansona, and P.V. 18, has doubled and tripled yields of wheat farmers from Casablanca to Katmandu. The 8156 cross has proved its capacity for stable high yields in many environments. But no pure-line variety can be expected to be safe from devastating attacks of rust forever. By creating an 8156 multiline, CIMMYT hopes to retain the best characteristics of the 8156 cross while building in insurance against rust attack. Yield trials of six experimental multilines harvested in Sonora, Mexico, in 1975 averaged 8.4 t/ha. M. V. Rao, in India, also has a crossing program under-way leading to an 8156 multiline. CIMMYT and the Indian program are cooperating by exchanging the lines they develop.

PN-AAB-612

\$2.00

HORIZONTAL RESISTANCE TO THE BLAST DISEASE OF RICE (PROCEEDINGS)

Seminar on Horizontal Resistance to the Blast Disease of Rice, CIAT 1971
1975, 251 p.

(CIAT) Centro Internacional de Agricultura Tropical, Apartado Aerer 67-13, Cali, Colombia, S.A.

(In Series - CE-No. 9)

Proceedings presented at a seminar held at CIAT headquarters, near Palmira, Colombia, October 8, 1971. The papers deal with the main topic of the meeting as well as with related topics important to explain the high variability of the causative pathogen, *Pyricularia oryzae*. The topics included phenotypic variability, pathogenic variability, production of the perfect stage, and the geographic situation of the disease in Latin America, Africa, and Asia. The titles of the papers:

Horizontal resistance in plants: concepts, controversies, and applications, by R. R. Nelson.

Horizontal resistance: six suggested projects in relation to blast disease of rice, by J. E. van der Plank.

Technical and philosophies on the development and use of perfect stages to understand pathogen variation and host resistance to plant disease, by R. R. Nelson.

Variability of *Pyricularia oryzae* Cav. and its relation to varietal resistance, by S. H. Ou.

Recent progress of studies on horizontal resistance to blast disease of rice in Japan, by Takuji Kozaka.

Factors which may express general resistance in rice to *P. oryzae* Cav., by Jose Tadashi Yorinori and H. David Thurston.

Indications of partial resistance of rice to the fungus *P. oryzae* Cav., by Marat Rodriguez and Guillermo E. Galvez.

Pathogenic variability and cytology of monoconidial subcultures of *P. oryzae* Cav., by Richard A. Frederickson.

Production of the perfect stage of *Pyricularia* from rice and other hosts, by T. T. Herbert.

Rice blast disease in Peru, by Hernando R. Huerta P.

Rice blast disease in Brazil, by Regina E. de Mello Amaral.

Rice blast disease in Africa, by R. J. Williams

Phenotype stability of pathogenic races of *P. oryzae* and its implications for breeding of blast resistant rice varieties, by Frances M. Latterell.

Geographical distribution and predominant races of *P. oryzae* Cav., by Shohei Matsumoto.

PN-AAB-623

\$20.10

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Example: PN-AAB-000

PROCEEDINGS, 2ND INTERNATIONAL WINTER WHEAT CONFERENCE, ZAGREB, YUGOSLAVIA, 1975

International Winter Wheat Conference, Zagreb, 1975
1975, 561 p.

Institute of Agriculture and Natural Resources
The Agricultural Experiment Station
University of Nebraska, Lincoln, Nebraska 68508

The conference, attended by 177 participants from 35 countries, addressed winter wheat production problems, international research in wheat, and opportunities for more effective cooperation in improvement of winter wheat throughout the world. These proceedings contain 64 scientific papers classified under the headings of Genetics and Breeding, Wheat Physiology and Agronomy, Quality, Diseases and Insects, and International Nurseries and Cooperation.

PN-AAB-631

\$44.90

FEASIBILITY OF BREEDING OAT CULTIVARS SUITABLE FOR PRODUCTION IN DEVELOPING COUNTRIES; ANNUAL REPORT, 1975

University of Wisconsin - Madison
1976, 42 p.

College of Agricultural and Life Sciences
Agronomy Department, University of Wisconsin
Madison, Wisconsin 53706

(Research summary)

A world collection of 7960 oat varieties was partitioned and grown in four locations in South America. Emphasis was placed on finding lines with crown rust resistance, preferably with satisfactory agronomic adaptation. This was found in the Texas variety Coronado, which is being grown commercially in southern Brazil and which also has demonstrated its usefulness for forage, grazing, and grain. However, stem rust can attack Coronado, and only limited sources of oats with this resistance are available and these have only mediocre grain quality. Red leaf, too, is widespread and difficult to combat. Breeding lines assembled at Wisconsin exhibit individual characteristics of earliness, resistance to crown rust and to stem rust, but only moderate tolerance to red leaf. With characteristics available in various sources of germ plasm, it appears quite possible to improve oats by breeding methods to become more competitive with other crops and therefore be used more frequently. The amount of use, or area (acreage) increase of new and improved varieties cannot be predicted, but improvement certainly enhances this long-useful crop.

PN-AAB-654

\$3.35

CONSULTATION VISIT ON THAILAND SEED PROJECT, A REPORT

Dougherty, G. M.
1975, 58 p.

Seed Technology Laboratory
Mississippi State University
Mississippi State, Mississippi 39762

(In TA 75-20)

A report on the preparation of designs and equipment specifications for Thai seed facilities previously recommended by a project analysis team. Objectives of this assignment were to prepare: 1) facility layout plans and equipment specifications for corn shelling, seed drying, and seed storage facilities needed at Phitsanulok; 2) facility layout plans and equipment specifications for a seed facility to be established in Khon Kaen; and 3) information needed to design and to provide equipment speci-

cations for seed facilities to be constructed in Chieng Mai and in Chai Nat.
 PN-AAB-656 \$4.65

CIMMYT ANNUAL REPORT ON MAIZE IMPROVEMENT, 1974

Centro Internacional de Mejoramiento de Maiz y Trigo
 1974, 68 p.

Centro Internacional de Mejoramiento de Maiz y Trigo, Apdo Postal 6-641, Mexico 6, D. F., Mexico

(Research summary)

A detailed and technical progress report of CIMMYT's maize improvement program in 1974. The program is aimed at developing appropriate technology as a joint venture with various public and private groups so that new varieties or practices are tested as part of the development and delivery process. Training stresses on-the-farm experience, with instruction and use of improved practices under conditions found in the trainee's home countries. Operations of the maize program have been divided into several stages, with two major divisions, the Back-up Unit and the Advanced Unit. The Back-up Unit covers introductions, testing of combinations, and building population complexes. The Advanced Unit is primarily the delivery vehicle into national programs; the materials here are much more homogeneous and thus nearer commercial use. Simultaneous progeny evaluation at several sites provides abundant information in the gradual improvement of populations, and materials can be multiplied immediately at any stage of development with knowledge of the performance accumulated during the selection of the progenies over previous cycles.

PN-AAB-667 \$5.45

RICE AS AN ALTERNATIVE CROP IN THE SANTA LUCIA REGION OF THE ATLANTICO, NO. 3 IRRIGATION DISTRICT

Fullerton, T. M.; Garcia S., Hugo; Molina M., Luis; James, D. W.
 1975, 22 p.

Department of Agricultural and Irrigation Engineering
 Utah State University
 Logan, Utah 84322

(Available in English and Spanish; Spanish, 26 p.: PN-AAB-689)

Corn, cotton, sesame, sorghum, and soya crops in the Santa Lucia region of the Atlantico #3 irrigation district of Atlantico, Colombia, frequently are characterized by erratic growth and low yields. A field study of the heavy soils of the Malambito Experiment Station of the Colombian Agrarian Reform Institute was made to evaluate irrigated rice as an alternative crop for this zone. Uniform, vigorous strands of rice were produced in two preliminary tests, and rice appeared much better adapted to Malambito soil conditions than corn, cotton, sesame, or sorghum when tested simultaneously with them. Yields of rice produced under upland and inundation water management systems were measured at 3951 and 7302 kg/ha, respectively. More grain was obtained from control plots (no nitrogen) or plots to which 75 kg/ha had been applied than from plots which had received 225 kg/ha of nitrogen, regardless of irrigation management. Small areas containing stunted plants were observed in some of the upland plots but not in the inundation plots. Root depths were considered shallow for all treatments although slightly increased where flood irrigation was utilized. Data from this study indicate that CICA 4 rice could be a profitable alternative to those crops currently grown in the Santa Lucia region. Further research on rice adaptability to the soils, irrigation efficiency, and drainage control should be conducted.

PN-AAB-688 - English edition \$2.00
 PN-AAB-689 - Spanish edition \$2.00

CROP STORAGE

CONSULTATION VISIT WITH USAID/EL SALVADOR AND CENTA, A REPORT

Delouche, J. C. ; Welch, G. B.
 1975, 43 p.

Seed Technology Laboratory
 Mississippi State University
 Mississippi State, Mississippi 39762

(In TA 75-09)

The report of two Mississippi State University seed specialists required by the GOES (CENTA) for advice on seed processing and storage facilities under development. These plans had been based on earlier consultations made in 1968-70, and because of an expanded seed program and more favorable funding, they were able to be implemented, enlarged, and revised. The recommended revisions, presented here in drawings and specifications, are: 1) modification of approximately one-third of one conditioned store room into a bag-dryer; 2) rearrangement of an on-site drying system; 3) provision of a receiving area for all-weather operation; 4) provision of a small, quality control laboratory in the storage unit connected to the processing room; 5) procurement of equipment specified in Appendix 1; and 6) a return by Dr. G. Burns Welch of the consulting team to El Salvador to explain changes to CENTA engineers (already arranged).

PN-AAB-655 \$3.45

REVIEW OF ON-FARM GRAIN STORAGE IN TANZANIA

Chung, Do-sup
 1975, 70p.

Food and Feed Grain Institute
 Kansas State University
 Manhattan, Kansas 66506

(In Grain Storage, Processing, and Marketing Report, No. 49)

Cereal grains produced in Tanzania include maize, rice, wheat, grain sorghum, and millet, with maize the most important. A large percentage of the grain is stored and consumed on the farm, though all wheat is marketed through the National Milling Corporation. Nearly all farm storage containers involve indigenous materials and can be classified into six categories: 1) in homes above cooking areas, in baskets or in bark containers; 2) ear maize storage on poles; 3) "baskets" woven from reeds, bamboo, or grass (may be covered with other substance); 4) dried gourds for small quantities; 5) mud pots with sealed lids; and 6) metal drums. The main causes of loss and damage are improper and inadequate post-harvest grain handling, drying, and storage methods, but the actual losses in Tanzania have not been determined. Recommendations to improve farm level grain storage in Tanzania include: 1) establishment of a "farm storage section" within the Crop Development Division, Ministry of Agriculture; 2) extension of "Kilimo" technical services to on-farm storage problems; 3) initiation of research on aspects of farm storage at the Faculty of Agriculture, University of Dar-es-Salaam, Morogoro; 4) appointment of a qualified storage person to the National Crop Research Coordinating Committee; 5) provision of a qualified grain storage specialist to "Kilimo" for two years; and 6) short-course training for four Kilimo personnel and long-term training in grain storage for six other carefully selected Tanzanians.

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AGRICULTURE

MEASUREMENT OF MAIZE WEEVIL AND FUNGI DAMAGE TO STORED CORN

Mora, M. A.; Pedersen, J. R.
1975, 56p.

Food and Feed Grain Institute
Kansas State University
Manhattan, Kansas 66506

(In Grain Storage, Processing, and Marketing Report No. 8)

An evaluation of the effectiveness of various methods and tests to measure quantitative and qualitative losses in maize due to insect infestation. Changes occurring in maize infested with the maize weevil under constant conditions of 80°F and 65% relative humidity were observed over 36 weeks of storage. Dry matter weight loss in infested maize was 3.6% at the end of 9 months of storage and 0.7% in non-infested maize. Numbers of insects from probe samples of 200-pound lots of maize were not a reliable indication of damage when compared to X-ray examination of samples. Non-infested lots of maize did not pick up moisture from the atmosphere under the constant environmental conditions. Large numbers of insects in infested lots of maize resulted in moisture increases; however, considerable damage occurred before moisture changes were detected. No temperature changes due to insects in the infested maize were detected. Seed germination in infested samples decreased, but whether the decrease was caused by insects or by molds was not determined. Chemical tests of maize quality did not show maize damage. Fat acidity values remained below the maximum for sound maize and glutamic acid decarboxylase activity decreased (a sign of deterioration) in sound maize. Proximate analyses (percent fiber, ash, protein, and fat) remained unchanged despite observed damage and measured loss in quality. Research in this area is continuing.

PN-AAB-646

\$4.50

FARM MECHANIZATION

AGRICULTURAL MACHINERY DEVELOPMENT PROGRAM; TERMINAL REPORT FOR USAID/IRRI PROJECTS NO. CSD-834 AND CSD-2541, MAY, 1975

IRRI - The International Rice Research Institute - Philippines
1975, 97 p.

Agricultural Engineering Department
The International Rice Research Institute (IRRI)
P.O. Box 933, Manila, Philippines

(Research summary; final semi-annual progress report, January to May, 1975)

From 1965 to 1969 the International Rice Research Institute conducted a study designed to determine the amount, adequacy, and cost of power used on rice production in the Philippines and other Far East and South Asia countries. Research was conducted on the economics of mechanization in three major rice-growing areas of the Philippines, including studies of hand tractors and extra-wide rotary tillers for wetland cultivation. In 1969 USAID initiated a new research contract with IRRI to develop new agricultural equipment for tropical rice cultivation. From 1969 to 1974, a wide range of agricultural machines was developed, some of which were successfully commercialized in the Philippines. These machines are now produced regularly and have received widespread acceptance in Southeast Asia. The IRRI-developed machines have spurred development of an organized small farm equipment industry in the Philippines, where 18 companies are producing the IRRI machines. Production of IRRI machines has also started in 11 other countries in Asia and Africa. Industrial extension of the machines is being emphasized in most of the developing countries where rice is an important crop.

PN-AAB-597

\$7.85

THE IMPACT OF AGRICULTURAL MECHANIZATION ON EMPLOYMENT AND FOOD PRODUCTION

Merrill, W. C.
1975, 45 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Occasional paper no. 1)

The major conclusions of this study are as follows: 1) The horsepower per hectare available to the agricultural sector is extremely low in most less developed 2) Mechanization, over the run, is the only viable means of increasing agricultural horsepower per hectare. 3) Fossil fuels are likely to be the main energy source for mobile agricultural equipment for at least the next twenty to thirty years. 4) In its early stages, mechanization usually has very little, if any, effect on crop yields. 5) In its early stages, mechanization may be associated with a slight increase in multiple cropping and some minor adjustments in the types of crops grown. 6) Mechanization which replaces animal power usually results in a reduction in labor inputs. 7) Non-agricultural employment engaged in the manufacture, distribution, repair, and maintenance of farm equipment replaces only a small part of the displacement in on-farm employment resulting from mechanization. 8) Tractorization programs may result in a gradual increase in the size of land holdings and the displacement of tenants or farm workers, unless there are institutional factors or government policies to prevent or discourage such trends. 9) Government policies and programs to promote mechanization through subsidized interest rates, favorable import arrangements, or increased credit availability can cause a significant increase in the rate of mechanization and are likely to benefit large landholders more than others. 10) Finally, the mechanization of agriculture is a continuous and inevitable process in economic development but one whose speed and direction can be altered by public policies and programs.

PN-AAB-722

\$3.60

FISHERIES

AN EVALUATION OF PROPOSED USAID PROJECT FOR IMPROVEMENT OF LAKE TANGANYIKA'S FISHERY RESOURCES IN ZAIRE

Hall, G. E.; Seay, Edmond; Kowalski, Tadeus; Madimba, Luyeye; Labanzadio Sokolua
1975, 74 p.

Department of Fisheries and
International Center for Aquaculture
Auburn University
Auburn, Alabama 36830

This report presents the results of a survey to assess the feasibility of assistance to a fishing cooperative (COOPELAZ) to increase its fish production from Lake Tanganyika, in Zaire. The survey was conducted from March 10 to April 10, 1973. Its objectives were (1) to report on the harvest, distribution, and consumption of fish in the Uvira-Fizi Zona of Zaire; (2) to analyze proposed actions for and impacts from doubling the present fish harvest; and (3) to assess the capabilities of COOPELAZ to attain and handle expanded capacities from a technical, managerial, financial, and institutional standpoint. The report presents detailed information on the lake, fish, fish production and technology, consumption and demand, the marketing system, and capabilities of COOPELAZ and local agencies. It then presents a revised project proposal and additional recommendations. The proposed project involves modernizing the present COOPELAZ fishing fleet, using reconditioned industrial vessels, assuring that 40 percent of the catch is distributed to outlying regions where fish protein is needed most, providing techni-

cal assistance to develop the marketing system, and exploiting additional means of fish processing and preservation. The \$702,000 proposed for the three-year project could double fish production. A loan of this amount is recommended.
PN-AAB-592 \$5.90

PROGRESS REPORT ON FISHERIES DEVELOPMENT IN NORTHEAST BRAZIL

Jensen, J. W.
1976, 7 p.

International Center for Aquaculture
Agricultural Experiment Station
Auburn University
Auburn, Alabama 36830

The most significant activities and advances outlined in this progress report include: 1) The intensive culture of the male Tilapia hybrid (*T. hornorum* x *T. nilotica*) was proved to be technically and economically feasible. 2) A simple but comprehensive fish culture manual was published to promote fish culture and teach methods. 3) Twenty-five ponds of the Waldemar de Franca fish hatchery were placed in Tilapia hybrid fingerling production. 4) During 1974-1975, farms involved in intensive culture of Tilapia hybrids increased from 1 to 13. Although reservoir fish production still is not meeting consumer demand, knowledge from the new fish culture research program may help to alleviate such food shortages in the future. A fish culture system has been adapted to conditions of Northeast Brazil, and numbers of fish farmers have increased as word of success has spread.
PN-AAB-687 \$2.00

FORESTRY

THE ECONOMICS OF FORESTRY INFORMATION: CASE STUDIES IN CENTRAL AMERICA

Latham, R. P.
1975, 147 p.

Economic Development Center, Department of Economics and Department of Agricultural and Applied Economics
St. Paul, Minnesota 55108

(Doctoral dissertation - Minnesota)

A series of theoretical models of how decision makers design and administer natural resource information projects were established. The author then conducted field work in Guatemala, Costa Rica, and Colombia, during which he attempted to relate the theoretical models to the actual decision making performed by real-world administrators (25 decision makers in six case studies). The field work demonstrated that the theoretical models were of no practical use whatsoever. Then, in a move that transcended the frequent dissertation exercised in unrealities, the author rather carefully analyzed why the theoretical models, and the literature upon which they were based, had very little to do with the real-world behavior of the administrators whose decisions the models were supposed to simulate and explain. A first obstacle to use of the models was that they were based on the assumption that administrators make rational choices concerning what information to gather, and then base resource allocations upon decisions reached after evaluation of the information obtained. In reality, says the author, the reverse is true; the decisions are not made solely on the basis of achieving the ostensible goals of the organization. Maintenance and growth of the organization are evidently organizational goals in and of themselves. These may or may not have much to do with the stated goals of the organization (and the information needs related to those stated goals). A third obstacle relates to a lack of

tradeoffs between multiple goals. The theoretical models assumed that organizational goals had been well defined, and that tradeoffs between multiple goals were well understood. A fourth obstacle concerns the fact that often information activities are carried out habitually, as a matter of course, with no conscious consideration of why they are conducted by the organization. A fifth obstacle is the requirement for a consistent and explicit expression of risk aversion. Several other rather technical obstacles are discussed. The author concludes that no quantitative model can optimize the design of information projects in real-world situations, but this does not mean that one should dismiss the theoretical base upon which such a model would rest. Understanding of that theory will focus attention on designing information projects well.
PN-AAB-622 \$11.75

INSECTS AND PESTS

PEST MANAGEMENT AND PESTICIDE MANAGEMENT IN THE ARAB REPUBLIC OF EGYPT, A SPECIAL REPORT

Adkisson, P. L.; Gutierrez, A. P.; Harris, F. A.; Reynolds, H. T.; Smith, R. F.; Watson, T. F.
1975, 24 p.

UC/AID Pest Management and Related Environmental Protection Project
University of California
Berkeley, California 94720

This report presents observations on pest management and pesticide management in Egypt, made by six United States participants in the Pest Management Colloquium during a seven-day visit in October, 1975. The team made several recommendations. Among them: A radically modified approach to pest control problems of cotton must be developed in Egypt if its cotton production is to be maintained. The model for this approach, called integrated pest control, is set forth in the FAO Guidelines for Integrated Pest Control on Cotton. Economic injury levels need to be scientifically established in Egypt for the bollworm, pink bollworm, and cotton thrips. Economic thresholds need to be developed for the cotton leafworm, and more effective insecticide programs developed. Studies should be initiated on the *G. barbadense* cottons of Egypt to determine the effects of thrips populations on yield. Importation of exotic beneficial parasites and predators should also be considered, as well as eventually mass release of beneficial species. The value of United States/Egypt exchanges of scientists was discussed. Also discussed were plans for the February, 1977, Pesticide Management Seminar/Workshop, and the possibility of establishing outside Cairo an Institute of Integrated Pest Control for Cotton.
PN-AAB-630 \$2.00

RODENT RESEARCH CENTER, LAGUNA, PHILIPPINES: 1974 ANNUAL PROGRESS REPORT

Denver Wildlife Research Center
1975, 110 p.

Denver Wildlife Research Center
Fish and Wildlife Service
U.S. Department of Interior
Denver, Colorado 80225

(Research Summary)

Results of the Rodent Research Center's 1974 rat damage surveys, control method evaluations, and preliminary bird damage studies. The surveys of Philippine ricelands showed twenty-four provinces as having over 5000 hectares of severely affected ricelands, and twenty-five had less than 1000 hectares severely affected. These data and those of previous surveys were used to estimate minimum losses of rice due to rats. Evaluations of two

AGRICULTURE

field trials revealed that the sustained baiting procedure using anticoagulants can provide very good protection in riceland areas in which *Rattus rattus mindanensis* and *R. argentiventer* previously have been responsible for lower production. Studies of three species of Philippine weavers, *Lonchura malacca*, *L. punctulata*, and *L. leucogaster*, suggest that these birds can consume 7-10 grams of rice grain per bird-day. Acute toxicity and cage studies indicate that the birds are more sensitive to fenthion than to methyl carbamate, and that *L. leucogaster* is the least sensitive to either compound.

PN-AAB-634 \$8.80

STORAGE AND SEXUAL SEPARATION OF GLOSSINA MORSITANS MORSITANS WESTWOOD PUPARIA

Birkenmeyer, D. R.; Dame, D. A.
1974, 6 p.

Agricultural Research Service
United States Department of Agriculture
Tsetse Research Unit, University College of Rhodesia
Salisbury, Rhodesia

(In *Annals of tropical medicine and parasitology*, v. 69, no. 3, p. 399-405)

An investigation of techniques by which puparial sexual separation can be achieved and of the feasibility of stockpiling *Glossina morsitans morsitans* Westwood by storing puparia for extended periods at temperatures near the threshold of metabolic activity. Maintenance of unknown-age tsetse puparia at 4°C for six days substantially reduced emergence; normal emergence occurred when puparia were held at temperatures of 12°, 14°, or 16°C for two, three, or four weeks, respectively. In-storage eclosion of adults either was suppressed completely at the temperatures used or was slight. Weight, puparial duration, and density of puparia were examined in an attempt to detect sexual differences in puparia. There appeared to be no usable correlation between pupal weight and sex, but the difference between the puparial duration of each sex offers a mechanism for retaining 81% of the females produced and releasing 84% of the males. The flotation of unknown or known-age puparia in methanol-water solutions of varying specific gravities demonstrated some differences in the density of male and female puparia. However, these differences were not great or consistent enough to provide an efficient system of separating puparia by age or sex.

PN-AAB-635 \$2.00

REPORT ON TSETSE RESEARCH PROJECT, TANGA, TANZANIA: JANUARY-JUNE 1975

Williamson, D. L.
1975, 19 p.

Tsetse Research Project
Agricultural Research Service
U.S. Department of Agriculture
Tanga, Tanzania

The first of the project's three goals was the establishment of a thriving colony of Tanga strain *Glossina morsitans morsitans* in Tanzania. This virtually assures completion of the second goal, expansion of the colony to produce excess pupae for sterilization, release, and ecological studies; and to supply field test operations. These will lead to the third goal of conducting a large-scale field trial to evaluate the sterile-male-release-method against tsetse flies. Two fully operational laboratories were staffed with trained personnel, and construction of the third and final insectary unit was begun. The first irradiation tests on Tanga strain *G. m. morsitans* using the Cesium unit were performed on April 24, 1975. A useful technique for irradiating flies in a nitrogen atmosphere was developed. Efforts were continued in improving goat-host animal herds to overcome the shortage of hosts

while simultaneously striving for maximum efficiency in the fly feeding process and use of animal housing facilities. Finally, preparation of a test site for sterile male releases was continued at Mzeri Hill Ranch.

PN-AAB-643 \$2.00

RODENTS AFFECTING FOOD SUPPLIES IN DEVELOPING COUNTRIES: PROBLEMS AND NEEDS

Sanchez, F. F.
1975, 7 p.

Fish and Wildlife Service
Department of the Interior
Denver, Colorado 80225

(In *FAO plant protection bulletin*, v. 23, p. 96-102)

A brief discussion of rodent damage to food crops in Southeast Asia, the Pacific Islands, South Asia, Latin America, Africa, and the Near East. To boost the production of needed food, the world now is looking to technology-intensive agriculture. Ironically, though, these progressive agriculture practices are accompanied by an increase in the complexity and intensity of pest problems. To solve these problems and to reap the full benefits of modern agriculture, pest management systems thus must be refined even further.

PN-AAB-678 \$2.00

IRRIGATION

WATER USER ORGANIZATIONS FOR IMPROVING IRRIGATED AGRICULTURE: APPLICABILITY TO PAKISTAN

Radosevich, G. E.
1975, 40 p.

Water Management Research Project
Engineering Research Center
Colorado State University
Fort Collins, Colorado 80521

In *Water Management Technical Report No. 44*

The water laws of Pakistan do not encourage cooperative efforts among water users at the farm level, and Pakistan has no formalized pattern of local associations designed to promote the effective distribution and use of water. Such local associations should be developed, for they would support improved irrigation, increased employment, and greater agricultural productivity. Such organizations could involve farmers in local decision-making, resolve disputes, and constitute a legal contact point between the government and water users. The organizations would need to be simply structured and tailored to the religious, social, political, economic, and legal systems of Pakistan. Such organizations function well in other countries studied. The Tribunal of Waters, in Valencia, Spain, is a good model of the type or organization that would be effective in Pakistan. The authors offer 28 recommendations concerning the proposed functions of water user associations in the Indus Basin and means of developing it. These deal with a charter, bylaws, objectives, functions, formulation of rules and regulations, assessments, sanctions, jurisdictions, separation from politics, member representation, member obligations and rights, cost sharing, water course maintenance, extension and training activities, interfaces with government, and other aspects of such organizations.

PN-AAB-584 \$3.20

Please use the publication number in ordering.
Example: PN-AAB-000

OPTIMAL IRRIGATION DECISIONS WITH LIMITED WATER

Blank, H. G.
1975, 254 p.

Engineering Research Center
Colorado State University
Fort Collins, Colorado 80521

(Doctoral dissertation - Colorado State University)

A description of a multiple-crop irrigation planning model developed to determine crop acreages, irrigation timing, and irrigation amounts on a representative farm in the irrigated area near Ft. Morgan, Colorado. The objectives of the study were to maximize the expected crop returns and minimize variances due to random precipitation. Recent experimental data from field trials on corn at Colorado State University were used. An evapotranspiration prediction model was developed to reconstruct soil moisture over the season for varying irrigation treatments. Regression analysis was used to determine parameters in production functions relating evapotranspiration in various time periods to yields. A dynamic programming model, also developed, determined optimal amounts of irrigation at pre-scheduled times for a single crop. The evapotranspiration prediction model and first the multiplicative and then the additive production functions were incorporated into this program. The model was employed to solve several types of case problems, including one involving unlimited water available at a predetermined price, and one involving the water's being limited during various time periods. The results of this latter program simulate the situation involving a crop competing with other crops for the limited water. Deterministic and nondeterministic cases were studied. In the first all variables were assumed to take on their expected values, thus reducing the problem to a deterministic linear program of maximizing return. In the second, probabilistic rainfall was used as a supplement to known surface and ground-water supplies. A simulation program was formulated and run to evaluate the expected return and variance for various precipitation planning policies.

PN-AAB-618

\$20.30

MODELING SEDIMENT TRANSPORT IN HYDRAULIC STRUCTURES

Mahmood, Khalid
1975, 13 p.

Department of Civil Engineering
Colorado State University
Fort Collins, Colorado 80521

(In Proceedings of the Symposium on Modeling Techniques, ASCE/San Francisco) September 3-5, 1975)

A report on the development of three mathematical models of sediment transport in hydraulic structures. These models were developed in the context of sediment routing in surface irrigation systems, and specifically relate to vortex tube sand traps, irrigation turnouts and bed level transients in sand-bed canals. Water resource developments on alluvial streams often involve sediment loads that need to be routed through the systems. This routing depends on the sediment transport characteristics of the constituent hydraulic structures. Small-scale physical modeling of sediment transport through structures is difficult because it generally is impossible to satisfy simultaneously the governing equations for the hydraulic and sedimentation phenomena. Mathematical models increasingly are being developed for these studies. Where possible, the mathematical models have the advantages of low cost, increased generality, and economy of time.

PN-AAB-650

\$2.00

WATER MANAGEMENT FOR SMALL IRRIGATION RESERVOIRS IN NORTHEAST THAILAND

Chotisaitorn, Mongkol; Ward, R. C.
1976, 149 p.

Department of Civil Engineering
Colorado State University
Fort Collins 80521

The method of evaluation used in this report is the synchronization of the cropping time with the probability of rainfall in order to minimize the risk of wet-season cropping and to maximize utilization of the reservoir storage for dry-season cropping. The Huey Si Thon Project was the area studied. During the wet-season cropping, the reservoir storage should remain full for use in the dry-season cropping. If it is not used at that time, much of the water will be lost by evaporation and seepage. Thus the relationship between the irrigable area for the wet-season cropping and the optimal capacity should be determined by the mean rainfall during the cropping period. Increasing reservoir capacity to reduce the risk of wet-season cropping also will increase the service area for dry-season cropping. The irrigable area for wet-season cropping may be enlarged in the future, if further research indicates that watershed runoff successfully can be diverted and stored in the rice paddies.

PN-AAB-670

\$11.90

PHYSICAL AND SOCIO-ECONOMIC DYNAMICS OF A WATERCOURSE IN PAKISTAN'S PUNJAB: SYSTEM CONSTRAINTS AND FARMERS' RESPONSES

Lowdermilk, M. K.; Clyma, Wayne; Early, A. C.
1975, 116 p.

Water Management Research Project
Engineering Research Center
Colorado State University
Fort Collins, Colorado 80521

(In Water management technical report, no 42)

Major problems identified in this study are the accumulations of sediment in the watercourse, excessive watercourse losses, and under-irrigation with canal water during its rationing. Recommendations resulting from this study are: 1) farmers in Pakistan must be informed of watercourse losses with recommendations for improvement and procedures for maintenance of the existing and improved system; 2) Farmers need to be encouraged to organize in order to improve water delivery; 3) An effective extension program must be developed to provide services to the farmer such as seeds, fertilizer, insecticides, and knowledge for improved crop production and proper use of irrigation water; and 4) Legal, administrative, and policy procedures should be reviewed in order to eliminate extra-legal water distribution, to enhance revenue collections through increased water rates, to revise collection practices to reduce bribes and evasion of revenue owed to the Government, and to protect each farmer's water supply while remaining flexible in the legalization of trading and purchase of turns among farmers.

PN-AAB-672

\$9.30

LEGUME CROPS

PERFORMANCE OF THE THIRD INTERNATIONAL MUNGBEAN NURSERY

Poehlman, J. M.; Sechler, D. T.; Watt, E. E.; Swindell, R. E.; Aggarwal, V. D.
1975, 38 p.

Agricultural Experiment Station
University of Missouri - Columbia
Columbia, Missouri 65201

(Special Report 180, December 1975)

AGRICULTURE

This is a report on performance of the Third International Mungbean Nursery program. Mungbeans were grown in 24 test locations in 11 countries. Two new entries, M1133 from Oklahoma and M333 from India, ranked highest in yield. Strain M317, which ranked second overall, and M350, which ranked first overall, ranked third and fourth in yield, respectively. Thus the high yield potential and wide adaptation of M350 and M317 continues to be demonstrated. M4 from India and M408 from Canada were earliest to flower. M317 and M374 (MG50-10A) had highest 1000-seed weight. M411, M412, and M409 had low disease scores. The International Mungbean Nursery was organized to provide information on (a) the range of adaptation of the mungbean species; (b) the range of adaptation of specific cultivars; and (c) characteristics of the mungbean plant influencing adaptation. The IMN also serves as a means of disseminating superior cultivars to mungbean research workers in many countries.

PN-AAB-602

\$3.05

IMPROVEMENT OF TROPICAL PRODUCTION OF BEANS AND COWPEAS THROUGH DISEASE AND INSECT CONTROL: ANNUAL REPORT JAN.-DEC. 1974

University of Puerto Rico - see address below
1974, 197 p.

Department of Plant Pathology and Botany
Agr'l. Experiment Station College of Agr'l. Sciences
Mayaguez Campus, University of Puerto Rico
Rio Piedras, Puerto Rico 00928

(Research summary)

The objectives of this project are to investigate and develop methods for controlling diseases and insects that attack selected food legumes adapted to the tropics, particularly beans and cowpeas. The focus is on improvement of production through control of insects and of viruses, bacteria, fungi, nematodes, and mycoplasma. A summary of accomplishments during the project year: A new bean strain of cucumber mosaic virus (CMV) was fully characterized. Electron microscopy studies showed that the new bean virus was related to CMV. A previously unreported mosaic virus of *Canavalia maritima* was characterized through use of such criteria as host range, indicators, serology, physical properties, vector specificity, and electron microscopy. The whitefly-transmitted mosaic virus of *Jatropha gossypifolia* was found to affect beans, soybeans, and *Jacquemontia tamnifolia*. However, *Bemisia tabaci* race *jatrophae*, the vector, will not survive on the leguminous hosts and *Jacquemontia*. A new virus was discovered to be affecting *Poinsettia geniculata* = *Euphorbia prunifolia* in the Isabela area. The virus will affect beans, soybeans, tobacco, and *Datura stramonium* but is not capable of infecting *Rhynchosia minima*. It also fails to provoke the formation of enations on Virginia 12 tobacco. The virus was transmitted mechanically to *D. stramonium*. This entity seems to be related to the Brazilian mosaic virus of *E. prunifolia*. The fungicides chlorothalonil, mancozeb, dinocap, and benomyl controlled foliar diseases of cowpea, such as powdery mildew (*Erysiphe polygoni*) and leaf spots (*Corynespora cassiicola*, *Cercospora* spp.). Dinocap was very effective against powdery mildew during the dry season, but failed to protect the plants during rainy weather. Dosages of benomyl as low as ¼ #/A applied biweekly were enough to prevent infection by *E. polygoni*, *C. cassiicola*, and *Cercospora* spp. Both basic copper sulfate and copper hydroxide at the rate of 1 #/A controlled common bacterial blight of beans (*Xanthomonas phaseoli*). Bean rust (*Uromyces appendiculatus*) was controlled by mancozeb, Plantvax, and Triforine at 1 #/A. The last two fungicides are systematic and were applied every 14 days. Isolates of *Xanthomonas* from beans and cowpeas displayed the following types of pathogenicity to these two crops: virulent. Isolates of *Xanthomonas phaseoli* var. *fuscans* when inoculated to cowpeas and

beans very frequently lost their capacity to produce pigment. Soil and root samples taken to determine the nematodes associated with beans and cowpeas indicated the presence of several known and suspected plant-parasitic species. The most common genera found were *Rotylenchulus*, *Helicotylenchus*, *Meloidogyne*, *Pratylenchus*, *Tylenchus*, *Aphelenchus*, and *Aphelenchoides*. Field tests on the use of promising insecticides with beans and cowpeas were conducted, but no conclusive results were obtained, sometimes because of low insect infestations, and on other occasions, because of heavy rains after applications. Evidence of plant resistance to the bean leafhopper (*Empoasca fabae*) was found in eight selections of the white bean cv Bonita. Colored cvs (Rayada, Jamaica, Marca Diablo, and Pompadour) were very susceptible to leafhopper attack. Yields of susceptible cultivars were very drastically reduced. Preliminary evidence on the existence of cowpea cultivars resistant to the cowpea weevil, *Chalcodermus ebeninus*, was obtained. A possible varietal resistance was also found on bean cultivars Sin Fibra and Galana to the bean weevil, *Acanthoscelides obtectus* (Say). Rust-resistant bean lines were obtained through naturally occurring cross-pollination in the field. Some of these lines have proved resistant against a wide range of rust races endemic in the tropics. Bean cultivars with multiple virus resistance were developed through field cross-pollinations. Several bean cultivars have been selected for adaptability to warm humid lowland tropics, insensitivity to short daylength, multiple disease resistance, and yield. The screening of the International Cowpea Disease Nursery for cowpea mosaic virus resistance resulted in the selection of several cultivars resistant to the highly pathogenic strain of the virus present in Puerto Rico. The research findings in the virology phase of the Project have been made available to CIAT, Cali, Colombia (the world center for improvements of *Phaseolus*). A central bank of seed of diagnostic plant species is being established at the Institute as a direct result of efforts in the Project, coupled with those of investigators from elsewhere, who met in Puerto Rico in June, 1974, in a workshop on tropical diseases of grain legumes.

PN-AAB-611

\$15.75

EVALUATION OF THE CURRENT SOYBEAN SITUATION IN ECUADOR

Shimon, D. F.; Daniels, Archie
1975, 26 p.

Food and Feed Grain Institute
Kansas State University
Manhattan, Kansas 66506

(In Grain Storage, Processing, and Marketing Report No. 53)

A deficiency of food oil in Ecuador has incited an increase in soybean production, and it has risen from approximately 1700 metric tons in 1973 to an estimated 7500 metric tons in 1975. Projections for 1976 are 15,000 metric tons of soybeans. Farmers are organizing as associations for industrial development and for establishment of a credit base. The available total oil extraction capacity is 365 metric tons/day. It is reasonable to expect that no more than one-half this capacity will be used for soybean extraction. This represents approximately 11,000 metric tons of soybean oil per year. On this basis, Ecuador's extraction capacity is adequate until 1980 at present consumption levels. An additional 240 metric tons/day will be required to supply 1985 needs. In general, the soybean production program appears to be sound and recommendations are made to make it more efficient.

PN-AAB-645

\$2.10

IMPROVING YIELD AND QUALITY OF BEAN SEED PROTEIN AND THE DEVELOPMENT OF SUPERIOR POPULATIONS FOR COOPERATIVE UTILIZATION IN BREEDING PROGRAMS; PROGRESS REPORT, 1975

Department of Horticulture, University of Wisconsin
1975, 44 p.

Department of Horticulture
College of Agricultural and Life Sciences
University of Wisconsin, Madison, Wisconsin 53706

(Research summary)

The ability of a bean strain, BBL 240, to transmit high percentage protein to its offspring is shown by the significant modification of this trait that has been realized in 3 generations of selection. Comparisons between high and low protein selections indicate that the primary effect of selection is manifested through changes in the amount of G1 globulin fraction. This fraction is the major constituent of bean seed protein, but is poor in methionine. Therefore, selection for high protein often results in accompanying low percentage methionine levels. There are exceptions to this negative association, as best exemplified by BBL 240, which is high in both percentage of protein and methionine and by promising selections. Some differences are shown in the structure of one of the polypeptides that constitute the G1 globulin that are due to a single gene (likely a structural gene). The effects of this gene on the quality (amino acid composition) of the G1 fraction are being studied, since BBL (high methionine) carries a variant allele. Considerable variability in tannin levels of different strains have been found. High protein/methionine strains have been intercrossed to high yielding, adapted, and disease resistant germ plasm to form the first generation of a *Composite Open Population* that includes approximately 50 accessions. One cycle of recurrent selection for high yield (family basis) and high protein (individual plants) has been completed, with the selected lines having; 1) intercrossed to form the second *Composite Open Population* generation and; 2) sent to cooperators in Puerto Rico, Colombia, and Brazil for further evaluation.
PN-AAB-707 \$3.50

LIVESTOCK

DESIGN AND EXECUTION OF LIVESTOCK DEVELOPMENT PROGRAMS IN GUYANA; REPORT OF THE A.I.D. 211 (d) CONSORTIUM ON RUMINANT LIVESTOCK PRODUCTION

Consortium on Ruminant Livestock Production (Texas A & M Uni, Uni of Florida, Purdue Uni, & Tuskegee Uni)
1976, 122 p.

Center for Tropical Agriculture
University of Florida
Gainesville, Florida 32601

The results of an evaluation, by the AID 211 (d) Consortium on Ruminant Livestock Production, of the livestock development programs conducted in Guyana by the Veterinary and Livestock Section of the Ministry of Agriculture. A summary of the findings: The Veterinary and Livestock Section has attempted to develop appropriate objectives for immediate and future programs within the livestock sector (research, production, and extension). However, the Ministry has not seriously addressed the problem of producer education through its extension programs, nor have producers made inputs into the design of livestock objectives. New programs involve only the few commercial producers. Government loans are geared to provide additional capital for these producers, and extension efforts will be concerned with supplying technology to them. Thus this may be at the expense of lowering the output of producers with limited resources. The Veterinary and Livestock Section should develop a set of detailed objectives concerned with the following: (1) The type of programs to be supported; (2) Estimates concerning the amount of capital to be invested in support of priority programs (grants, subsidies, loans, etc.); (3) Guidelines concerning the types of producers the program will serve; (4) Procedures for interacting with producers so as to obtain information on their problems and production objectives; (5) Evaluation of the overall

contribution of limited-resource producers to the supply of domestic and export livestock products; and (6) Support of specific research programs designed to generate a technology base for the majority of livestock producers and provide this technology through a dynamic extension program.
PN-AAB-628 \$9.75

EXPANSION OF COMPETENCE IN THE DESIGN AND EXECUTION OF RUMINANT LIVESTOCK DEVELOPMENT PROGRAMS FOR THE TROPICS: ANNUAL REPORT, 1974-75

Purdue University
1975, 232 p.

Department of Agricultural Economics
Purdue University
Lafayette, Indiana

Annual Report

The overall purpose of this project is the development of a computerized model of the Guyanese livestock industry. By the end of this reporting year, a working computer model had been made, some preliminary tuning had been done to reproduce more closely the current status of the livestock industry, and the model had been examined and criticized by other members of the project consortium. Additional field work was conducted in Guyana, Belize, and Mexico to acquire additional production and marketing data relative to the Guyanese livestock industry; to discuss with Guyanese officials policy objectives, instruments, and criteria for valuation of policy; and to evaluate the livestock situation in other countries which are potential competitors in the Caribbean market. In Mexico, data were obtained on the feeding of sugar cane to cattle in confinement, and discussions were held with members of the Mexican Government who have attempted to utilize computerized sector models in policy making.
PN-AAB-715 \$18.55

PASTURE CROPS

THE RETURN OF MEDIC

Breth, S. A.
1975, 16 p.

CIMMYT - Centro Internacional de Mejoramiento de Maiz y Trigo, Apartado Postal 6-641, Mexico 6, D. F., Mexico

(In CIMMYT today, no. 3)

CIMMYT forage experts have been working with Tunisian agriculturalists since 1971 in introducing a rotation of wheat and a forage legume to replace the wheat-fallow rotation most farmers now use. Medic, a forage legume successful in Australia, is being introduced to Mediterranean cereal fields. In cereal-legume rotations, medic boosts cereal yields by raising soil nitrogen and suppressing weeds while providing more and better feed for livestock. In a region where rain is highly erratic, the improved capacity of the soil to keep plants alive during droughts makes the odds on harvesting a crop much more favorable. Moreover, the nitrogen fixed by the medic allows the farmer to benefit from modern nitrogen-responsive wheat varieties without risking cash loss or putting himself in debt. If the weather is good, he reaps extra profits from the effects of the stored soil nitrogen on wheat yields. If the weather is bad, he may lose his crop but he has no cash investment in nitrogen fertilizer to lose as well.
PN-AAB-586 \$2.00

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AGRICULTURE

SOILS

SOIL FERTILITY IN THE HUMID TROPICS; PROGRESS REPORT, 1974/1975

Cornell University, Department of Agronomy
1975, 75p.

Department of Agronomy
Cornell University
Ithaca, New York 14853

(Research summary)

This is a progress report on the first year of a three-year study. The objectives of the work are to determine the effects of various fertilizer and other input treatments on grain yields in acid soils of the humid and subhumid tropics. Field experiments are being conducted in Puerto Rico, Brasilia, and Ghana (Kumasi), along with laboratory studies at Ithaca-Cornell. The work in Puerto Rico has involved experiments with phosphorus applications. In Brazil experiments are being conducted on applications of nitrogen, lime, and phosphorus to different varieties of maize grain, upland rice, and sorghum. In Ghana experiments are being conducted on lime, phosphorus, and nitrogen inputs to maize grain. At Ithaca-Cornell studies are being conducted on development of crop varieties tolerant to mineral stress.

PN-AAB-594 \$6.00

A PARTIALLY ANNOTATED BIBLIOGRAPHY ON SULFUR IN SOILS OF THE TROPICS

Couto, Walter
1976, 22 p.

Department of Agronomy
Cornell University
Ithaca, New York 14853

(In Agronomy mimeo 76-1)

This bibliography lists papers published in specialized journals since 1966. In addition to studies specifically oriented to sulfur, other indirectly related to this subject have been included. Special attention was given to soils of the tropics but papers related to sulfur in soils of the temperate regions were included when considered relevant to the tropics. Titles have been grouped under the following topics: Forms of sulfur in soils; sulfate adsorption by plants; response to sulfur by plants; availability of sulfur in soils; sulfur adsorption by plants; sulfur deficiencies in plants; mobility of sulfur in soils; transformation of sulfur in soils; atmospheric sulfur inputs. About 115 references are annotated.

PN-AAB-599 \$2.00

A WEST AFRICAN SOIL CLIMOSEQUENCE AND SOME ASPECTS OF FOODCROP POTENTIAL

Forbes, T. R.
1975, 172 p.

Department of Agronomy
Cornell University
Ithaca, New York 14853

(Masters Thesis - Cornell University)

Four benchmark sites were selected along a rainfall gradient from Lome, Togo, to Calabar, Nigeria, along the coast of West Africa. Through this climosequence, rainfall increased from 900 to 2600 mm per annum. Soils of the three driest sites were characterized as Paleustalfs, while those at the wettest site were Paleudults. Cropping patterns through the climosequence were studied. Population pressure was found to be as significant a parameter as rainfall in determining the patterns. In a series of field experiments with maize, cassava, and soybeans at the

benchmark sites, it was found that fertilizer at the rates used was not more economic than traditional practices, although more uniform spacing and improved cultural practices increased yields in the absence of fertilizers. Previous results of other workers were used to estimate the productivity of two cultivation systems of differing intensities. The more intensive system appeared to be more productive, the less intensive system appeared to be more favored by local farmers because it produced a more dependable yearly income and was more suitable to the technological resources of the population.

PN-AAB-600

\$13.75

SIMULTANEOUS POLY CULTURE OF TROPICAL FOOD CROPS WITH SPECIAL REFERENCE TO THE MANAGEMENT OF SANDY SOILS OF THE BRAZILIAN AMAZON

Kass, D. C.
1976, 265 p.

Department of Agronomy
Cornell University
Ithaca, New York 14853

(Doctoral Dissertation - Cornell University)

This Ph.D. thesis is based on field experiments conducted by the author during 16 months residence in the village of Tracuateua, municipio of Braganca, state of Para, Brazil, in 1973-1974. A literature review showed that the practice of growing two or more useful plants simultaneously on the same plot is widespread in the tropics, but it provided little indication of why this polyculture leads to increased yields. Experiments were conducted to explore the possibility that the improved soil cover leads to reduced weed growth in pure stands and in simultaneous polyculture, with and without weeding, and with and without potassium fertilization. The results showed that simultaneous polyculture, especially of rice and manioc, produces better soil cover, leading to increased yields. Methods of phosphorus application and varietal evaluation with simultaneous polyculture are described. Application of the experimental findings would improve the nutritional and economic level of the Bragantina region.

PN-AAB-601

\$21.20

CHEMICAL ASPECTS AND MINERAL FORMS OF SOIL PHOSPHORUS IN TROPICAL REGIONS

Kamprath, E. J.
1974, 17 p.

Department of Soil Science
School of Agriculture and Life Sciences
North Carolina State University
Raleigh, North Carolina 27607

The native phosphate in highly weathered soils of the Tropics is primarily in the inert (occluded) form and in iron and aluminum phosphates. Volcanic ash soils have a much higher total phosphorus content than Latosols. The less soils are weathered, the higher the percentage of calcium phosphates in the active inorganic phosphorus fraction. When the native soil pH is 6.1 or above, more than 50% of the active inorganic phosphorus is in the form of calcium phosphates. Distinct wet seasons and dry seasons result in formation of iron phosphates, while impeded drainage results in more phosphorus being present as aluminum phosphates. Fertilizer phosphorus was converted very rapidly into aluminum and iron phosphates. In silicate clays, the added phosphate is initially transformed more into aluminum phosphate, but with time it is gradually converted into iron phosphates. A taranakite-like compound is formed in volcanic ash soils which contain allophane. Greater amount of phosphate reacted with allophane at pH 4 than at pH 7. Phosphate adsorption isotherms are a good method for evaluating the phosphate-buffering capacity and intensity of soils. A soil solution concen-

tration of 0.07 ppm P appears to be an adequate intensity value for soils with an appreciable clay content. Soil solution phosphorus in highly weathered soils is in equilibrium primarily with the aluminum phosphate. Therefore, soil test extractants which selectively remove aluminum phosphates should give a good measure of phosphorus availability.

PN-AAB-633 \$2.00

SOIL MANAGEMENT IN TROPICAL AMERICA, PROCEEDINGS

Published on behalf of the University Consortium on Soils of the Tropics by the Soil Science Department, North Carolina State University, Raleigh, North Carolina 27607
1975, 565 p.

Seminar co-sponsored by Centro Internacional de Agricultura Tropical, Cali, Columbia University Consortium on Soils, Sociedad Colombiana de la Ciencia del Suelo, Sociedad Latinamericana de la Ciencia del Suelo, and A.I.D.

University Consortium: Cornell, Hawaii, North Carolina State, Prairie View, and Puerto Rico. Report edited by Elmer Bornemisza and Alfredo Alvarado

This second Seminar on Soil Management and the Development Process in Tropical America was held for soil scientists and administrators to discuss important research in this area. The seminar was attended by 209 representatives of 23 countries, and the 33 papers presented are published here. The first section of this book covers new data on soil properties in interior South America, correlations of the different classification systems and interpretations of them in terms of land use and fertility limitations. Relationships among soils, plants and water comprise the second section. The third contains studies of nitrogen sources, both symbiotic and inorganic, and the fourth section discusses liming requirements, residual effects, and varietal and species tolerance to soil acidity. Theoretical and practical aspects of soil management in savannas and rainforests are presented in the fifth section, and the sixth treats advances in soil fertility evaluation which have had a significant impact on the region. The seventh and final section describes the suggested mechanisms for closer collaboration and the development of a network of research on tropical soils.

PN-AAB-665 \$45.20

TECHNICAL BULLETINS

The Office of Agriculture, Technical Assistance Bureau, Agency for International Development, is issuing a series of technical papers on subjects of primary importance to developing countries. Each one treats its subject in a general sense and it does not attempt to come to grips with the particular problems of a specific country.

For extended use in any individual country the bulletins should be supplemented by more detailed information on the application of principles to local conditions.

The eighteen bulletins which have been completed to date are listed below. Please note that for some of them free copies are available from the source cited. Otherwise, copies may be obtained by way of the usual procedures explained in this journal.

IMPROVED FORAGES FOR TROPICAL AND SUB-TROPICAL REGIONS, AS FEED FOR RUMINANT LIVESTOCK

AID/TAB, Office of Agriculture
1971, 12 p.

Office of Agriculture, Bureau of Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 1)

Ruminant livestock can make major contributions to productive agricultural systems in the tropics, by effectively utilizing forages suited to grazing but not to crop production, and by utilizing forages and crop residues in diversified farming systems. Toward this goal of making full use of forages as feed, this report very briefly discusses the following factors: 1) managing feed production; 2) improving forage production on grazing lands; 3) improved forage species and cultivars for tropical zones; and 4) field testing of forage species. Attached is a list of tropical forage species worthy of field trials in less developed countries.

PN-AAB-691 \$2.00

GUIDELINES FOR IMPROVING LIVESTOCK PRODUCTION ON RANGE LANDS

AID/TAB, Office of Agriculture
1971, 28 p.

Office of Agriculture, Bureau of Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 2) Free copies available from Eileen Coleman, TA/PPU/EU1, Room NS-2669, Agency for International Development, Washington, D.C. 20523

Brief definitions and discussions of management practices to improve productivity of range lands of less developed countries. Those considered here are: 1) adjusting livestock numbers to forage supplies; 2) periodic grazing and resting of range areas; 3) suppression of undesired vegetation; 4) introduction and establishment of improved forage grasses and legumes; 5) burning as a management practice; 6) improvement of soil storage of rainfall; 7) providing stock water; 8) animal health control measures; 10) timely marketing of livestock; 11) competitive demands for milk to raise calves and to meet home needs; 12) livestock improvement. The conclusion outlines group action to make range improvement possible.

PN-AAB-692 \$2.25

BREEDING FOOD CROPS FOR IMPROVED PROTEIN QUALITY

AID/TAB, Office of Agriculture
1971, 11p.

Office of Agriculture, Bureau for Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 3)

A very brief report on the evaluation of plant proteins for their protein nutritive quality, by the content of certain nutritionally essential amino acids in the protein complex, and the balance between these essential amino acids. The report also provides a short appendix entitled "Perspectives on Breeding for Protein Quality in Crops" which discusses the development of strains or hybrids that possess greatly increased yielding capacity. To achieve these high yields it has been necessary to develop a suitable package of cultural practices including the appropriate place of the crop in cropping systems; improved soil and water management systems; good quality seed; adequate and timely fertilizer usage; satisfactory date of planting; plant populations sufficient to utilize fully potential water and soil fertility; and protection of the crop from diseases, insects, and weeds. Higher yields are of prime importance, but improved nutritive quality is a necessary corollary if the ultimate objective of providing foods to meet basic nutritional requirements is to be realized.

PN-AAB-693 \$2.00

IMPROVING FARM PRODUCTION IN TROPICAL AND SUB-TROPICAL REGIONS OF LIMITED RAINFALL

AID/TAB, Office of Agriculture
1971, 28p.

AGRICULTURE

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 4). Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D.C. 20523.

An examination of dry-land farming practices for the most effective use of available moisture in less developed countries. It is clear that effective application of modern technology to dry-land farming requires first, reliable data on precipitation, and second, reasonable accurate soil mapping to delineate the soil types that are responsive to moisture conservation practices. In the CENTO countries, the season when precipitation occurs is important. Precipitation in the cool season is less likely to be lost by evaporation from the soil, and transpiration losses by leaves of crop plants are reduced because of lower temperatures so that plant responses are more efficient than with the same amount of moisture at higher temperatures. Thus efforts should be made to capitalize on such advantages by growing cool season crops when feasible. Two objectives were emphasized in the project reported here: to conserve rainfall by reducing runoff losses and by storing as much as possible in the soil profile for use by crop roots, and to invoke farm practices to make the most efficient use of the soil moisture by crop plants. Illustrations in this report of these principles deal with research findings believed to apply to CENTO countries.

PN-AAB-694

\$2.25

FOOD GRAIN LEGUMES, AS A MAJOR MEANS OF COMBATting MALNUTRITION IN LDC'S

AID/TAB, Office of Agriculture
1971, 26 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 5) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D.C. 20523

Food grain legumes, comprising one or more of the 10 major crop species grown and consumed in the less developed countries, constitute an important source of dietary proteins in these areas. Although all plant proteins are unbalanced, for human needs, in essential amino acid content, the combination of cereals and food grain legumes in the diet can correct this if enough legumes are used to compensate for cereal deficiencies in lysine and tryptophan. The present yielding capacity of food grain legumes expressed in kg. per hectares generally is low throughout the tropics and subtropics. Since little research has been done on food grain legumes in the LDCs, it may be assumed that yields could be improved greatly if the known principles of plant culture were applied to them and if legumes were given the same attention as that given to cereals. It also is expected that the biological quality of protein could be improved by breeding programs and by increasing the sulphur-supplying power of soils. Research food programs on food grain legumes must be on a species-by-species basis, preferably in the region or countries in which the particular species now have the greatest use.

PN-AAB-695

\$2.10

OIL SEED PRODUCTION IN THE TROPICS AND SUBTROPICS

AID/TAB, Office of Agriculture
1972, 70p.

Office of Agriculture, Bureau of Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 6) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D.C. 20523.

This publication is intended to provide basic information on each of the seven crops that has potential for inclusion in cropping systems. The vegetable oilseed crops considered here are groundnuts, sesame, sunflower, safflower, cottonseed, soybeans, and castorbeans. Choosing an oilseed crop for any specific region is determined by: 1) the expected yields under local climate and soil conditions and with full use of modern technology, and 2) the prices that the various crops can command in the open markets of the country and in world trade. Each oilseed crop is examined here on the basis of its respective plant characteristics; ecological adaptation; uses; cultural practices for higher levels of productivity; world production centers; and world trade in the oil seeds, their extracted oils, and the cake or meal derived from extraction of the oil.

PN-AAB-696

\$5.60

AGRICULTURAL PRODUCTION IN RELATION TO THE ENVIRONMENT

Garman, W.H.
1972, 31p.

Office of Agriculture, Bureau for Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 7)

Near livestock feedlots, cities, and certain types of industrial plants, considerably larger than average amounts of nitrogen in such forms as nitrogen oxides and ammonia occur in the rain. All too often the natural and artificial atmospheric inputs are overlooked and a portion may end up by being incorrectly assigned to the agricultural sector. Also, changes occur from time to time in lakes and reservoirs causing inversions and stepped-up release of nutrients from the bottom deposits. Where situations have worsened in recent years, due chiefly to cities and industry, agriculture has received too much of the blame. To date there is no conclusive evidence that proper fertilizer use has increased the nitrate level of streams or wells in the U.S. Over the past decade many towns, cities and factories have added waste treatment facilities and others have improved their degree of waste treatment before dumping effluents into streams. This has greatly reduced the organic food for bacteria, and in turn reduced the biological oxygen demand (BOD) on the stream. Research programs, although meager, are seeking new techniques for disposing of organic wastes and more effective means of conserving soil and keeping it from blowing and washing away. When land is properly farmed and managed, little sediment gets into streams and lakes. There is yet a long way to go in most countries until all land is properly maintained and protected against soil erosion. Man has greatly accelerated the process of eutrophication by organic waste products from his sewage, factories, livestock and pets. He is learning how to treat and handle waste from such sources. In due course, but at high cost, man's contribution likely will be controlled. Intensive research and extensive action programs will be required, and although these will appear to be costly, in reality they will return untold future dividends. Scientists lack sufficient information to determine agriculture's exact contribution, and several years of tedious work in numerous watersheds will be required by skilled soil scientists and hydrologists to obtain this information.

PN-AAB-709

\$2.50

Please use the publication number in ordering.
Example: PN-AAB-000

INCREASING FOOD PRODUCTION WITH EMPHASIS ON HIGH PROTEIN CROPS

Litzenberger, S.C.
1974, 29p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 8)

The provision of an adequate and nutritious food supply, equitably distributed, continues to be one of the most important problems of the world. Although during the last decade food production has increased considerably on a quantitative basis, the per capita production of food has risen very little in most developing countries and actually has declined in some. Furthermore, nutrition in the diet remains a problem in nearly all developing nations, of which protein deficiency is one of the worst parts. The report here discusses: 1) the inclusion of more animal protein in the diet; 2) protein and amino acid fortification of presently used foods; 3) the utilization of oilseed meal of a protein supplement; and 4) the utilization of higher protein crops. Following the last item is a description of USAID technical assistance and research projects in this area. Cereals, food legumes, and roots and tubers then are examined in some detail. About half the report is devoted to tables of assistance and research projects.

PN-AAB-697

\$2.35

CONTROLLING VAMPIRE BATS

AID/TAB, Office of Agriculture
1971, 12p.

Office of Agriculture, Bureau for Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 9) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D.C. 20523

Vampire bats cost the Latin American livestock industry an estimated \$250 million a year by infecting cattle with paralytic rabies, and they also transmit rabies to humans and to other animals. Numerous methods have been tried for controlling this problem, generally with poor success and sometimes with undesirable side effects. Now, however, two techniques have been developed that are relatively safe and effective. This paper briefly outlines the biology of vampire bats and describes how they can be controlled. After a discussion of conventional control methods, the report examines the two new techniques. Both use diphenadione, an anti-coagulant, applied by two different systems. The first technique takes advantage of the bats' habit of roosting together in close-knit colonies, with much physical contact and mutual grooming; and the second, of the difference in toxicity of diphenadione to cattle and vampire bats — the bats are sensitive to low concentrations while cattle can stand much higher doses. These techniques have been developed not to exterminate vampire bats but to reduce their populations where they have become too numerous.

PN-RAA-463

\$2.00

CLASSIFICATION OF THE SOIL SERIES OF THE STATE OF HAWAII IN DIFFERENT SYSTEMS

Beinroth, F.H. (University of Puerto Rico); Ikawa, H.; Uehara, Goro (University of Hawaii)
1974, 110 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 10)

The placement of all soil series of Hawaii in four different systems of soil classification; the United States Soil Taxonomy, the FAO/UNESCO Legend for the Soil Map of the World, the French Soil Classification, and the United States classification system of 1938. This report provides correlations that should be useful for a comparison of Hawaiian soils with those of other tropical areas. At the local level, the tables offer a quick reference to the classification of Hawaii's soils and are particularly helpful to those familiar with soil series and/or the old classification system but unfamiliar with Soil Taxonomy. In conjunction with the FAO/UNESCO Soil Map of the World, the tables will be useful in teaching. Finally, they should facilitate relating pedology, management requirements, and crop production potential of Hawaiian soils to those of other tropical regions.

PN-AAB-105

\$8.80

CUTTHROAT FLUMES FOR WATER MEASUREMENT

Skogerboe, G.V. (Engineering Research Center, University of Colorado Ft. Collins, Colorado 80521)
1974, 22p.

Office of Agriculture, Bureau for Technical Assistance
Agency for International Development
Washington, D.C. 20523

(In Technical series bulletin No. 11) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523

A description of the "Cutthroat" flume, a single yet accurate method of measuring water. It is suited especially to open irrigation channels on flat terrain, is relatively easy and inexpensive to construct, is self-cleaning, and can be used in a wide range of conditions under which irrigated agriculture is practiced. The most obvious advantage of a "Cutthroat" flume is economy, since fabrication is facilitated by a flat-bottom and removal of the throat section. Another advantage is that every flume length has the same entrance and exit section lengths, which allows the same forms or patterns to be used for any desired throat width. The flume can operate either as a free flow or a submerged flow structure. Methods for obtaining submerged flow calibration curves have been developed, and free flow tables are available for various sized flumes.

PN-AAB-660

\$2.00

THE CONTRIBUTIONS OF LEGUMES TO CONTINUOUSLY PRODUCTIVE AGRICULTURAL SYSTEMS FOR THE TROPICS AND SUBTROPICS

Sprague, H. B.
1975, 47 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 12) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523.

A description of legume species and their utilization in farming practices in the tropics and subtropics. With proper utilization, these species offer great potential for increasing food production and maintaining soil productivity. Three advantageous methods of using legumes are: 1) growing food grain legumes as a regular crop in the farming system, to contribute to soil nitrogen as well as to supply high protein food stuffs; 2) growing leguminous green manure crops that substantially increase the residual soil nitrogen, to improve yields of succeeding cereal or other crops, and also to provide supplementary grazing for livestock; and 3) growing mixtures of adapted forage legumes and grasses for 1 or 2 years in rotation with tilled crops (cereals, grain legumes, and cash crops) as a means of greatly increasing soil structure, soil

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nitrogen, and general fertility, with the forages being available for grazing, hay or silage. The forages may serve as feed for livestock, or provide cash income by sale to livestock producers. PN-AAB-698 \$3.75

SEEDED FORAGES FOR GRAZING AND FOR HARVESTED FEEDS IN TROPICS AND SUBTROPICS

Sprague, H. B.
1975, 41 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 13) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523.

An examination of the effective use of seeded forages in agricultural systems for the tropics and subtropics. Superior forage grasses and legumes are available for seeded plantings which may be included in crop rotations to maintain soil productivity and which also provide feeds for livestock. In exploiting these opportunities, agriculture will acquire new dimensions for increased productivity. This report is intended to facilitate this progress. Based on research and on practical farming experiences in certain tropical and subtropical regions, this paper has collected useful information on the potential role of seeded grasslands. It designates the adapted grasses and legumes successfully used, and summarizes the present knowledge of management practices.

PN-AAB-699

\$3.30

CHARACTERISTICS OF ECONOMICALLY IMPORTANT FOOD AND FORAGE LEGUMES AND FORAGE GRASSES FOR THE TROPICS AND SUBTROPICS

Sprague, H. B.
1974, 113p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington D. C. 20523

(In Technical series bulletin No. 14)

Brief descriptions of four types of economically important species of legumes used for food, green manuring, and forages in the tropics and subtropics. This is a companion to technical bulletins nos. 12 and 13. These descriptions include information on climatic and soil adaptation of each species, on cultural practices for effective production, and on their usefulness in farming systems. In addition to the legumes, similar information is provided for the major perennial forage grasses adapted to the tropics and subtropics. The intent of this report is to provide enough knowledge about each species to facilitate selection of those that appear best suited to particular situations, climates, and soil conditions.

PN-AAB-700

\$9.05

THE BUFFALO GOURD (CUCURBITA FOETIDISSIMA) HBK; A POTENTIAL CROP FOR THE PRODUCTION OF PROTEIN, OIL, AND STARCH ON ARID LANDS

Bemis, W. P.; Curtis L. C.; Weber, C. W.;
Berry, J. W.; Nelson, J. M.
1975, 22p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 15) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523

A review of the history of the Buffalo gourd, its morphology,

genetical, and botanical characteristics, its potential as a food crop and in general, the "State of the Art" regarding this feral species as of 1974. The feral xerophytic Buffalo gourd, *Cucurbita foetidissima*, has evolved in the semi-arid regions of western North America and is well adapted to desert environments. It has abundant yields of seeds rich in edible oil and protein and abundant carbohydrate reserves in the form of starch in the large storage roots. This wild perennial has the potential of being a crop adapted to arid to semi-arid lands, producing additional food critically needed to feed the world population.

PN-AAB-701

\$2.00

THE DEVELOPMENT OF HYBRID CORN TECHNOLOGY IN THE U.S. AND SELECTED COUNTRIES

Sprague, G.F.
1975, 89 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 16) Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523

A presentation of the background and recent developments of the new high-yielding, more nutritive corn types and an explanation of their significance to malnourished populations of countries deficient in food. This new high lysine (an amino acid) corn out-yields native corn types and has more than doubled the nutritive value of ordinary corn with protein quality essentially equal to that of skim milk. Worldwide development and acceptance have been relatively rapid. Unlike ordinary corn, these new types are not deficient in two essential amino acids—lysine and tryptophan. Shortages of these amino acids in the diet of humans (and other monogastric animals) cause serious protein-deficiency diseases, and utilization of the new high-lysine corn types can be a major means of combating this form of malnutrition.

PN-AAB-702

\$7.10

BIBLIOGRAPHY OF THE SOILS OF THE TROPICS; v. 1, TROPICS IN GENERAL AND AFRICA

Orvedal, A.C. (Agronomy Department, Cornell University, Ithaca, New York)
1975, 228 p.

Office of Agriculture, Technical Assistance Bureau
Agency for International Development
Washington, D. C. 20523

(In Technical series bulletin No. 17)

This is the first of three volumes planned. Each will contain, as its first part, those citations relevant to the tropics in general and without emphasis on any single continent or country. The second part will be geographically oriented to tropical parts of continents, to large island groups, and to countries or other geographic entities within these large regions. The second part of this first volume treats tropical Africa and island groups, and to countries or other geographic entities within these large regions. The second part of this first volume treats tropical Africa and islands, such as Madagascar, commonly identified with Africa. The second part of the second volume will deal with tropical Latin America; and the third, to tropical Asia and Oceania. Under geographic headings, the citations are grouped according to texts or maps if such groupings are practical. As many text references contain maps, especially page-size maps, and many map references contain some text materials, the separation is seldom clean-cut. Arrangement within groups is alphabetical by author.

PN-AAB-703

\$18.25

EVALUATION OF THE NATURAL RESOURCES AVAILABLE FOR AGRICULTURAL PRODUCTION AND DEVELOPMENT IN THE TROPICS AND SUB-TROPICS

Sprague, H. B.
1975, 54 p.

Office of Agriculture, Bureau for Technical Assistance
Agency for International Development
Washington, D. C. 20523

In Technical series bulletin no. 18. Free copies available from Eileen Coleman, TA/PPU/EUI, Room NS-2669, Agency for International Development, Washington, D. C. 20523

This report suggests a procedure for making an inventory of the natural resources that are significant to agriculture, and the relation of these to current production as well as to the apparent opportunities for feasible and substantial improvements in the production of crops, forages, and livestock. Toward these ends, a comprehensive estimate of the magnitude of a nation's natural resources endowment (climate, lands and soils, waters and vegetation), is presented here as a basis for prudent and effective plans for their utilization. For many nations, the inventory of its natural resources and their actual and potential values is very incomplete. As a result, development of the agricultural potential is not well planned by either the government or by individual groups or families. Thus a more comprehensive inventory should provide guidelines for this development and also should help to prevent the disappointment and failure of projects unsuited to prevailing conditions.

PN-AAB-718 \$4.30

VEGETABLES

AVRDC, ANNUAL REPORT

The Asian Vegetable Research and Development Center
1975, 160 p.

The Asian Vegetable Research and Development Center
Shanhua, Taiwan

(Research summary)

A research report on the Asian Vegetable Research and Development Center's second year of operation. Significant achievements were made in the cultivation of the Center's six crops (soybeans, mungbeans, tomatoes, Chinese cabbages, sweet potatoes, and white potatoes) and are discussed in detail here. This research focused on increased yields, development of superior varieties, and better methods of crop management. This was done by screening cultivars gathered from genetic resources to identify those resistant to insect and disease attack and those with wide adaptability and superior yielding ability. The individual cultivars selected then were utilized as parents in an intensive breeding program seeking to combine in new varieties the best qualities derived from many sources.

PN-AAB-666 \$12.80

VETERINARY SCIENCE

ECONOMIC LOSSES FROM FOOT AND MOUTH DISEASE: A CASE STUDY ON A PIG FARM IN COLOMBIA

Rubinstein, E. M. de; Beltran, L. E.
1975, 3 p.

CIAT - Centro Internacional de Argicultura Tropical,
Cali, Colombia

(In Tropical Animal Health Production, V. 7, p. 149-151)

This note presents the methodology and results of a study of the effects of foot and mouth disease on a pig farm in the Cauca

Valley of Colombia in 1973. This case study concerns one of 14 pig farms from which data were collected. The virus types of the disease were A and O. At the time of the outbreak the herd consisted of 104 breeding sows in a single building holding a total of 922 pigs. Ninety-eight percent of the herd became infected. Considering both direct and consequential effects, the economic loss was calculated at U.S. \$37,200. This is equivalent to 44 percent of the expected net income over the two-year period in which the disease has exerted and will continue to exert an economic effect.

PN-AAB-587 \$2.00

WATER MANAGEMENT

CID INFORMATION NETWORK: PROCEEDINGS

Workshop for the Development of Consortium for International Development Information Network. University of Arizona,
1975

1976, 199 p.

School of Renewable Natural Resources
University of Arizona
Tucson, Arizona 85721

The twofold purpose of the workshop was (1) to allow CID members concerned with information activities to become familiar with each other's programs; and (2) to set up an organizational structure for an information network among various universities receiving support from AID. These workshop proceedings should be of interest to United States and foreign professionals engaged in agricultural development activities, including administrators, project leaders, research scientists, extension leaders, training specialists, information specialists, librarians, documentalists, engineers, and experiment station directors. The proceedings include presentations that describe the AID-supported programs at the CID universities (Colorado State, Utah State, University of California, Oregon State, University of Arizona), as well as the information sources and retrieval systems available at those universities. Also included are the results of a survey of user needs for particular forms of information, depending on their international location and professional specialty. The participants agreed that the Consortium for International Development Information Network (CIDNET) would be formed to facilitate exchange of information problems related to CID or AID-sponsored projects or information needs of persons in developing countries. CIDNET member universities agreed to exchange copies (in microfiche or computer printout form) of their serial holdings, and to publish an informational brochure on CIDNET services. Also agreed was that the University of California at Riverside would serve as the central contact point for persons interested in obtaining CIDNET Services.

PN-AAB-537 \$15.90

WATER MANAGEMENT RESEARCH IN ARID AND SUB-HUMID LANDS OF LESS DEVELOPED COUNTRIES; ANNUAL PROGRESS REPORT, 1974/1975

Colorado State University, Engineering Research Center
1975, 628 p.

Colorado State University
Engineering Research Center
Fort Collins, Colorado 80523

(Research Summary)

The objectives of this program are to develop knowledge of how best to conserve and use rain water; design and construct effective irrigation systems; prevent surface flooding, high water tables, and salt in groundwater; and integrate those water use factors into a productive cropping system consistent with farm size and available farming practices in the heavy clay soils of the

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Mekong Delta and in the Indus Basin, Pakistan. Several field studies were well underway in the Mekong Delta when the project there was terminated with the fall of the S. Vietnamese government on April 30, 1975. With support of the U.S. AID mission for Pakistan, several large-scale research and demonstrations field studies covering a wide range of on-farm water management practices have been undertaken at several locations in Pakistan. These include (1) continuation of field studies with WAPDA at the Mona Reclamation Experimental Project; (2) continuation of field studies with IRDP at Shadab and Lar; (3) undertaking of watercourse surveys, including physical and socioeconomic aspects; (4) completion of a report on water management alternatives for Pakistan; (5) completion of studies on alternatives for organizing farmers to improve on-farm water management; and (6) beginning development of training materials pertinent to on-farm water management.

PN-AAB-596

\$50.25

WATER CONSERVATION PRACTICES FOR DRYLAND FARMING

Brengle, K. G.
1975, 32 p.

Department of Civil Engineering
Colorado State University, Fort Collins
Fort Collins, Colorado 80521

A discussion of methods of conserving water in soil of semi-arid farming regions such as those in the Great Plains area of the U.S. For regions that have summer rainfall and no irrigation systems, these are farmlands that receive 500mm or less of annual precipitation. The most common practice in semi-arid regions of the U.S. is to leave the land fallow—unplowed and unplanted—for a period long enough for it to store enough water-holding capacity. This practice is called "summer fallow," but actually the land may be left fallow for 14 or 15 months, with the moisture buildup occurring mainly during the fall and winter months. To protect fallow land against wind erosion, water erosion, and water evaporation, stubble mulching is practiced. The crop residue is undercut with a subsurface instrument, and left in the ground. This decreases surface water runoff and reduces the rate of evaporation of moisture from the sub-surface of the soil. If the soil grows weeds during the fallow period, these must be tilled, because the weeds will use up the moisture in the subsoil. Other methods of conserving moisture include shaping the soil surface into water-conserving structures. These include ridge terraces, level-bench terraces, parallel-bench terraces, level pans, and the practice of pitting. Those practices are described. Still other methods involve strip-cropping, wind breaks, and particular crop rotations. Depending on particular temperature and precipitation conditions in various regions of the U.S. Great Plains, various practices are used: wheat-fallow, wheat-sorghum-fallow, or wheat-millet-fallow. Fallow is generally not used with corn or oats. If land that has lain fallow has conserved or accumulated enough moisture, nitrogen fertilizer will increase yields of wheat or grain sorghum. Applications vary, depending upon how much nitrogen has built up in the soil during the fallow period. Applications in the Great Plains of the U.S. vary from 34 to 90 kg/hectare.

PN-AAB-669

\$2.55

ORGANIZATIONAL ALTERNATIVES TO IMPROVE ON-FARM WATER MANAGEMENT IN PAKISTAN

Rasadovich, George E.; Kirkwood, Craig
June 1975, 258 p.

Colorado State University
Water Management Project
Fort Collins, Colorado 80523

Water Management Technical Report No. 36

This report presents conclusions and recommendations drawn

from a study of water use laws and the status of local water user organizations in the Indus Basin in Pakistan. The water laws of Pakistan, static for many years, need to be changed to support development of local water user associations. Present laws and regulations, as well as operation of the water delivery system, do not encourage creation of cooperative efforts among water users at the farm level. Specific new legislation needs to be adopted. The needed local associations would allow farmers to be directly involved in local decision-making, allow improved water delivery, solve disputes between users, offer opportunities for increasing labor-intensive agriculture and, in general, constitute a legal contact point between the government and water users. The Tribunal of Waters, in Valencia, Spain, is an excellent model of a local water control organization of the kind that could provide effective water control and management in Pakistan. Included in this report are 28 recommendations, including guidelines for developing and institutionalizing the concept of water users associations in Pakistan.

PN-AAB-671

\$20.65

WATER MANAGEMENT RESEARCH IN ARID AND SUB-HUMID LANDS OF LESS DEVELOPED COUNTRIES; ANNUAL PROGRESS REPORT, 1972/1973

Engineering Research Center, Colorado State University
1973, 192 p.

Engineering Research Center
Colorado State University
Fort Collins, Colorado 80521

(Research summary)

A report of the annual accomplishments of this continuing project, using Pakistan as the study area. They are outlined as follows: 1) The development of knowledge and data on how best to conserve and use rainwater and the most efficient means of supplementing needed soil moisture. 2) The development of knowledge and data that can be used for the economic design and construction of water conveyance and delivery systems including structures for control and measurement of irrigation water. 3) Development of surface and subsurface water removal systems to minimize hazards resulting from surface flooding, high water tables, and salt in the ground water. 4) Identification of important factors to be considered in land preparation and leveling of the various irrigated soils in the major climatic zones and the relationship of these factors to water management, erosion, water infiltration, and good land use and cropping practices. 5) Development and adaptation of water application methods suitable to and efficient for soils of varying physical properties (water-holding capacities, intake rates, etc.) with major crops. 6) Integration of these water use factors into productive cropping systems consistent salinity, and exchangeable Na are problems, studies included soil amendments, soil and water management procedures, and use of salt-tolerant crops. 8) Identification of institutional and policy factors (legal, social, economic, religious, manpower, credit, education, etc.) which influence efficient distribution, management, and utilization of water on farm level.

PN-AAB-728

\$15.35

WATER MANAGEMENT RESEARCH IN ARID AND SUB-HUMID LANDS OF LESS DEVELOPED COUNTRIES; ANNUAL PROGRESS REPORT, 1973/1974

Engineering Research Center, Colorado State University
1974, 489 p.

Engineering Research Center
Colorado State University
Fort Collins, Colorado 80521

(Research summary)

With some exception, the Delta area of South Vietnam primarily

is engaged in single season, monocrop, agriculture. Historically, and to a great extent presently, the area produces but one rice crop per year. It is thought a greater and more stable farmer income could result from a diversified multiple cropping system which includes upland crops in both the wet and dry seasons; such a goal requires water control. The feasibility of diversification has, to a limited extent, already been demonstrated. As a by-product of the war, the migration of people to the cities and the previous requirements of the U.S. Armed Forces created a demand for vegetables which could not be completely satisfied from the vegetable production centers at Dalat, etc. Consequently, vegetable production in the Delta greatly increased; particularly near My Tho and Cantho. Similarly, a previous USAID Protein Production Program stimulated production of feed grains such as corn, grain sorghum, and soybeans. Despite this limited progress in diversification, information is lacking on the changes necessary to allow the Delta farmers to shift from the traditional rice agriculture to an intensive year-round production based on water control. The irrigation system of Pakistan represents one of the largest modern conveyance systems in the world and is a marvel of engineering skill and technology. There is however a paucity of information and a lack of understanding of that portion of the irrigation system with which the farmer deals. The procedures, rules, resources, and constraints at his disposal determine his on-farm water management practices, which in turn determine the crop production per unit of irrigation water. Many experts agree that the farming practices, including irrigation water management, must be modernized in order to achieve higher production. There are important reasons for the low crop yields and lack of agricultural production, including insufficient water supply, lack of proper land leveling, lack of irrigation water control, lack of salinity control, lack of water management extension services, use of ancient cropping systems with ancient tools, or, in other words, a much improved on-farm management system. The potential for increasing production through improved water management is great. Among the most significant accomplishments during the year reported in South Vietnam are the development of research facilities, including personnel and contract support and research achievements. The accomplishments during the year reported in Pakistan are the actual contraction of watercourse linings at two locations; and leveling is being carried out and agronomic demonstrations are being conducted on the fields being served by these watercourses. The Colorado State University Field Party also is working with the major agricultural research centers in Pakistan on very important research on wheat, rice, cotton, and corn.

PN-AAB-729 \$39.00

ECONOMICS

GENERAL ECONOMICS

SHADOW PRICING, INFORMATION, AND STABILITY IN A SIMPLE OPEN ECONOMY

Warr, Peter
1975, 34 p.

Center for Economic Research
Department of Economics, University of Minnesota
Minneapolis, Minnesota 55455

(In Discussion paper no. 75-62)

This discussion paper addresses the question of whether it is possible to increase welfare by basing production decisions in the

public sector on some alternative set of prices. This is the essential question of shadow pricing. Since market distortions are assumed to exist, and are taken as given, shadow pricing is a problem in the economics of the second-best. The author considers what should be done when the informational requirements of determining the second-best optimal shadow prices of non-traded commodities are judged to be prohibitive. If the shadow prices of these commodities are set at their domestic market prices, the question arises whether it is still desirable to shadow price traded commodities at their international prices, rather than their tariff-distorted domestic prices. For an important class of examples, the author shows that this is so, provided the tariffs concerned are the only distortions present. But he also shows that there exist reasonable cases where even this result does not hold. In such cases, when non-traded commodities are shadow priced at their domestic producer prices, shadow pricing traded commodities at their international prices is actually worse than shadow pricing them at their tariff-distorted domestic prices, even though these tariffs are the only distortions present in the economy.

PN-AAB-591 \$2.70

FOREIGN TRADE REGIMES AND ECONOMIC DEVELOPMENT: INDIA

Bhagwati, J. N.; Srinivasan, T. N.
1975, 284 p.

National Bureau of Economic Research, Publications
Department
261 Madison Avenue, New York, New York 10016

Volume 6 of a series published by the National Bureau of Economic Research. Entire series listed in this journal, Volume 3, No. 4, April, 1976

This book analyzes the impact of India's foreign trade regimes since the postwar period on her economic performance. The authors depart from earlier studies of the subject in two respects: They examine in considerable depth the June, 1966, devaluation and import liberalization episode and subsequent developments; and they systematically analyze the dynamic aspects of the consequences of India's restrictive foreign trade regime. The June, 1966, policy package is demonstrated to have been far more successful than is generally believed. The exploration of savings, investment, and other dynamic effects leads to the conclusion that the static inefficiencies of Indian trade and exchange rate policies cannot be shown to have been offset by dynamic advantages. The analysis therefore leads to the conclusion that a departure from the restrictive trade regime is both desirable and feasible.

PN-AAB-604 \$22.70

FOREIGN TRADE REGIMES AND ECONOMIC DEVELOPMENT: SOUTH KOREA

Frank, C. R.; Kim, Kwang-suk; Westphal, L. E.
1975, 288 p.

National Bureau of Economic Research, Publications
Department
261 Madison Avenue, New York, New York 10016

Volume 7 of series published by the National Bureau of Economic Research. A list of the titles within this series, and prices, printed on inside front cover of ARDA, V. 3, No. 4

The economic development of South Korea is examined from the end of World War II through the early 1970s. Among the author's conclusions: The remarkable growth of the South Korean economy, particularly since 1963, can be attributed to several special factors that are not likely to be replicated in other countries. First, the country received abundant foreign assistance, particularly during reconstruction after the Korean War. Sec-

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ECONOMICS

ond, Korea was unable to maintain high and growing levels of government savings. This is probably achievable only in countries where political leaders are powerful and secure. Third, Korean industrialists did not intensely resist gliding-peg currency evaluations until 1972, when Korea abandoned this practice. Fourth, government policies toward labor in Korea prevented real wage from rising except in response to labor shortages in the late 1960s. This lack of pressure from organized labor is partly historical accident—a carryover from Japanese suppression of labor organizations when Korea was an annex of Japan (1910-1945). Fifth, Korea underwent a thoroughgoing land reform, first under the United States military government and later under an indigenous Korean government. Sixth, Korean culture places a very high value on education; parents spend their own funds to support a vigorous system of high-quality private schools, thus freeing public funds for channeling into other productive investments. Those factors alone, however, are not sufficient to explain the success of the South Korean economy. Economic policies also made important contributions: tax and government expenditure reforms, the interest rate reforms, the exchange rate reforms, and the general emphasis on export promotion and reliance on international prices. Unfortunately, the economic gains have been accompanied by much political repression, including repression of labor unions. However, the South Korean experience does illustrate the effectiveness of price-oriented economic policies in initiating and sustaining rapid economic growth.

PN-AAB-610 \$23.00

CONSUMPTION AND EARNINGS PATTERNS AND INCOME REDISTRIBUTION

Ballentine, J. G.; Soligo, Ronald
1975, 28 p.

Program of Development Studies
121 Sewall Hall, William Marsh Rice University
Houston, Texas 77001

(In Program of Development Studies paper no. 67)

Examines the interrelationship between the consumption and earnings patterns of different income classes, using data for Colombia. The hypothesis tested is that the poor tend to consume goods and services produced with factors of production owned primarily by the poor, while the rich consume those produced by factors owned primarily by the rich. The methodology employs an input-output table which is closed to the household sector but which disaggregates that sector in terms of both the consumption of final goods and services and the allocation of value added in each producing sector. Consumption data are grouped by three income classes: roughly the bottom 70%, the middle 24%, and the 6% of the work force. Value added is disaggregated further into factor source of income and sectoral source (agricultural vs. nonagricultural). The interrelationship of consumption and earnings patterns is analyzed by stimulating a tax-transfer scheme in which a tax of 10% of factor earnings is levied on the top 6% and the revenue allocated equally among the bottom 70%. The results of the study show no support for the hypothesis tested; expenditures by the poor tend to increase factor earnings by the rich more than those of the poor. This conclusion is at variance with those of other studies for Colombia and other countries. Those studies generally show the effect of a tax-transfer scheme to be an increase in the demand for labor and a decrease in the demand for capital. This study shows that the distribution of factor earnings is little affected by a redistribution of income. There are three possible reasons for the discrepancy. The data employed may not be reliable enough. Secondly, studies which have looked only at factor demand have typically used a highly aggregated services sector, while the input-output table used in this study separates out personal services. Thirdly, because of wage differentials, changes in employment may not

correlate very strongly with changes in labor earnings. Finally, it is important to remember that the results of this study reflect the effects of a tax-transfer scheme on the distribution of factor earnings, given the present distribution of wealth among the different income groups. Policies which attempt to alter the distribution of income by changing the distribution of wealth will have different effects. For example, if the distribution of land ownership were changed in favor of the poor, the second-round effects of this policy would reinforce the initial change. The increased expenditures by the poor would generate a larger increase in the earnings of the poor from their now larger wealth holdings, in addition to the increase in labor earnings from increases in employment.

PN-AAB-619 \$2.25

INCOME REDISTRIBUTION AND ITS EFFECT ON FACTOR AND IMPORT DEMAND IN TAIWAN: A SIMULATION APPROACH

Ho, Yhi-min
1975, 34 p.

Program of Development Studies
121 Sewall Hall, William Marsh Rice University
Houston, Texas 77001

(In Program of Development Studies paper no. 68)

The methods and results of a simulation study of income redistribution and its effects on factor and import demand in Taiwan. The purpose of the paper is to (1) examine the empirical content of the factor-differentials hypothesis, and (2) evaluate the impact of income redistribution on factor demand and on imports. The analysis of consumption patterns of different income groups is based on data drawn from the *Report on the Survey of Family Income and Expenditure in Taiwan: 1966*. One major finding was that the capital content of the consumption mix by households in the lower half of the income scale is higher than that by households in the upper half. The pattern of the consumption mix in terms of capital/labor ratio is reversed if major service items and other miscellaneous items are excluded. Another major finding was that growth in employment and an equitable distribution of income are consistent goals. Thus the findings do not support the hypothesis that the consumption pattern of the rich has a higher capital content than that of the poor. The simulation results indicate the feasibility of integrating the redistribution element into the overall development planning by emphasizing the growth of labor-intensive industries, the small-scale sector, and other similar programs to benefit the poor. Growth and equity are not only consistent but also attainable without resorting to politically unpopular and unfeasible means.

PN-AAB-620 \$2.70

THE INTERNATIONAL TIN AGREEMENT: A REASSESSMENT

Smith, G. W.; Schink, G. R.
1975, 21 p.

Program of Development Studies
121 Sewall Hall, William Marsh Rice University
Houston, Texas 77001

(In Program of Development Studies paper no. 69)

The International Tin Agreement is widely viewed as having provided a respectable and fairly successful mechanism for stabilizing the international tin market. This paper draws upon simulations of the Wharton EFA world tin model to argue three basic points: (1) the Tin Agreement has only marginally reduced the instability of prices and producer incomes. Of far greater importance in this respect have been United States government stockpile transactions of tin made outside of the International Tin Agreement; (2) the ITA has endured while other agreements

have failed, partly because the United States strategic stockpile of tin has deprived it of the effective power to make the critical price decisions which would have intensified producer-consumer conflicts; (3) if the ITA had been designed from the beginning as an effective market stabilizer, along the lines currently envisaged for other products, there is a good chance the ITA would have fallen apart. A side implication of the analysis is that meaningful reductions in price fluctuations for the more volatile metals may require far larger buffer stocks than have been suggested up to this point.

PN-AAB-621

\$2.00

FOREIGN TRADE REGIMES AND ECONOMIC DEVELOPMENT: EGYPT

Hansen, Bent; Nashashibi, Karim
1975, 388 p.

National Bureau of Economic Research, Publications
Department
261 Madison Avenue, New York, New York 10016

Volume 4 of series published by the National Bureau of Economic Research. A list of the titles within this series, and prices, printed on inside front cover of ARDA, V. 3, No. 4

In 1961, Egypt's economy underwent some fundamental changes. Arab socialism replaced free enterprise through a series of measures that put most big businesses and nearly all foreign trade into government hands and imposed controls over the remaining private sectors. Prices became subject to regulation with a view to income redistribution and stabilization, and resource allocation became a matter of administrative decision. Within this new context, Egypt's foreign trade regimes and economic development are evaluated here. The study is divided into three parts. Part One analyzes the regimes at an aggregate level from World War II to the sixties. Part Two examines cropping patterns in agriculture, using an econometric technique that permits measuring deviations from optimal acreages, ascribable to price distortions as well as to direct government controls. Finally, Part Three analyzes ten important industries (traditional and new) during the fifties and sixties for their efficiency and international competitiveness.

PN-AAB-647

\$31.00

EXCHANGE POLICIES FOR LESS DEVELOPED COUNTRIES IN A WORLD OF FLOATING RATES

Black, S. W.
1975, 81 p.

Economic Growth Center
Yale University
New Haven, Connecticut 06520

An analysis of less developed countries' exchange policies, either pegged or floating, under the assumption that the world's major currencies will continue to float for the foreseeable future. Part I of this study contains a review of the theory and institutional structure of exchange markets and international money markets in developed countries, and a discussion of the institutional structure of money markets and exchange markets in LDC's, with appropriate modifications in the theory to allow for their special characteristics. Part II analyzes the macroeconomic implications in the choice between different types of exchange policies for the adjustment problems of LDC's in a framework of internal and external balance. Finally, Part III combines the institutional analysis of Part I with the macroeconomic analysis of Part II in a cost-benefit framework. The major thrust of the paper is that present exchange rate policies should be reevaluated by less developed countries to determine whether or not the policy should be changed.

PN-AAB-679

\$6.50

EMPLOYMENT

RURAL EMPLOYMENT IN TROPICAL AFRICA, A NETWORK APPROACH; ANNUAL REPORT, 1974/1975

Michigan State University
1975, 69 p.

Department of Agricultural Economics
Michigan State University
East Lansing, Michigan 48824

(Research summary) (In Working paper no. 8)

Achievements during the reporting year can be outlined as follows: In Sierra Leone the research program concentrated on primary data collection, the components of which included: 1) farm-level study of 500 farmers, 2) consumption study, 3) small-scale industry study, 4) rural-urban migration study, 5) processing, 6) marketing, and 7) choice of technique in fish processing. In Ethiopia, attention was directed toward developing a work plan and toward beginning primary data collection in the Ada District. In February 1975 a sample of baseline study respondents was drawn from 5 service centers in the district, and in March and April a stock questionnaire was filled out on 119 households in 4 centers. Collection of weekly data began on April 21, but it was not until June 9 that all farmers were being interviewed systematically. In Nigeria the research program completed field work in the Kwara State. The data will be processed and the results will be included in the final report.

PN-AAB-714

\$5.50

AGRICULTURAL ECONOMICS

THE SOCIAL COST OF A CHEAP FOOD POLICY, THE CASE OF ARGENTINE CORN PRODUCTION

Peterson, Willis
1975, 19 p.

Institute of Agriculture
University of Minnesota
St. Paul, Minnesota 55108

(In Staff paper P75-28)

This paper discusses the social cost of a price policy which has made it unprofitable for Argentine farmers to use nitrogen fertilizer in the production of corn. The price of corn relative to the price of nitrogen remains unfavorable to Argentine farmers, compared to American farmers. Moreover, U.S. hybrid corns are capable of responding to nitrogen fertilization to a much larger extent than Argentine varieties. Thus one might conclude that little is to be gained by applying nitrogen to corn in Argentina. However, use of nitrogen would be productive if the population of corn plants per hectare were significantly increased, as they have been in the U.S. (by 33 percent from 1964 to 1974). By maintaining an unfavorable nitrogen/corn price ratio to farmers, the Argentine government in effect decided to reduce Argentine corn production by millions of bushels over the 1950-1974 period. This meant, of course, a savings in domestic resources or foreign exchange not put into production or purchase of nitrogen fertilizer. But the value of corn given up by not allowing the use of nitrogen greatly exceeded the total cost of the nitrogen, thus resulting in a substantial social cost to the country. The net gain after paying for the nitrogen would have been over 1.1 billion bushels of corn. This could have been used for foreign exchange, or converted to meat and poultry products.

PN-AAB-589

\$2.00

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Example: PN-AAB-000

ECONOMICS

FRENCH EXPERIENCE WITH GROUP FARMING, THE GAEC (GROUPEMENTS AGRICOLES D'EXPLOITATION EN COMMUN)

Raup, P. M.
1975, 36 p.

Institute of Agriculture
University of Minnesota
St. Paul, Minnesota

(In Staff paper P75-22)

This paper describes group farming in France under a 1962 law relative to formation of Groupements Agricoles d'Exploitation en Commun (GAEC), or Agricultural Groups for Farming in Common. The law represents a determination to give group farming efforts a clear-cut legal foundation for a new structural form in agriculture. The purpose is to promote enlargement and modernization of farms while preserving the social values of the family farm unit, the principle of private property, and the rewards of communal activity. GAECs are recognized legally as corporations but are exempt from the fees and charges levied upon the creation of conventional corporations. Tenants and leaseholders can be members of a GAEC, but there can be no silent or nonparticipative members. To illustrate capitalization and operational details, two case histories are presented. The typical GAEC is predominately a family affair. In 1973 there were a total of 3,500 GAECs involving 9,100 members, occupying an area of 316,000 hectares, or just under one percent of the agricultural land area in France. The average GAEC farm is 99 hectares, compared to 20 hectares for other small French farms. Problems confronting GAECs include the conflict between increased mechanization and the need to provide work opportunities for all members; questions of inheritance and capital gains; and the question of part-time farming and off-farm work. Financial returns have been no better than those from comparably sized non-GAEC farms.

PN-AAB-590

\$2.90

THE CENTRAL AMERICAN AGRARIAN ECONOMY, A BIBLIOGRAPHY (PT. 1: REGIONAL, BELIZE, COSTA RICA, EL SALVADOR)

Wis. Univ. Land Tenure Center Library
1975, 100 p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

(In Training and Methods Series, no. 26) Contact above address for Inter-library loans of citations.

A bibliography of materials in the Land Tenure Center Library of the University of Wisconsin. Organization is as follows: General; Agriculture; Bibliographies; Foreign and Domestic Commerce; Economic Affairs; Economic Integration; Foreign Aid and Investments; Foreign Relations; Human Resources; Industry; Infrastructure; Land Tenure and Reform; Money, Finance and Banking; Natural Resources; Politics and Government; Social Affairs; and Statistics. Most entries are in English; some are in Spanish or Portuguese.

PN-AAB-606

\$8.00

THE CHANGING STRUCTURE OF AGRICULTURE IN JAPAN: EFFECTS ON RICE FARMING

Kalhara, Motosuke
1976, 28 p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

(In Land Tenure Center special paper) Copies available from address above for \$1.50

This paper describes developments in rice farming in Japan from World War II to the early 1970s. Land reform after WWII distributed ownership of farm lands to family units. In 1970, 79 percent of the farm households in Japan owned 90 percent of the total cultivated land. As of 1971, 82 percent of the 5.2 million farm families were growing rice on farms that averaged 1.06 hectares (2.6 acres) in size. The farm work has been gradually mechanized. In 1945, only 8,000 power tillers were being used in Japan; in 1972, 3.5 million of them were in use. The use of power threshers and power sprayers has similarly increased. Those laborsaving developments, along with the desire of farm-household members to increase their income, have significantly altered the percentage of farm families who derive their income solely from the family farm. In 1950, this was 50 percent of all farm families; in 1972, this was 14.4 percent of all farm families. One result of this is that Japanese agriculture has become more specialized in rice production. Since 1960, domestic production of wheat, soybeans, and feed grains (corn and sorghum) has decreased, relative to the amounts imported. An estimated 50 percent of the total food supply in Japan is now imported.

PN-AAB-609

\$2.25

THE LONG-RUN OUTLOOK FOR WORLD FOOD PRODUCTION

Martin, L. R.
1975, 37 p.

Department of Agricultural and Applied Economics
University of Minnesota, Institute of Agriculture
St. Paul, Minnesota 55108

(In Staff paper P75-21)

It is unrealistic to assume that maximizing agricultural production is the only or even the highest priority goal for each developing country. Four goals need to be considered, and they need to be weighted quite differently in different countries. The four goals are (1) efficiency—maximizing agricultural production economically; (2) equity—managing the economy so as to distribute the benefits of additional production equitably among the nation's families; (3) conservation—using renewable agricultural resources so that their potential productivity—using natural resources for food production in such a way that environmental attributes entering the quality of life are not impaired. If farmers in the developing nations could achieve annual rates of increase of harvested area and yields per hectare suggested in the FAO Indicative World Plan, total cereal grain output could be at least doubled by the year 2000. It is likely that cumulative growth rates in food production will be about 75 or 80 per cent of the IWP goals. Thus developing countries will need an increased volume of grain exports from the developed countries, particularly during the 1975-1985 period. High prices for agricultural products would provide strong incentives in developed and developing countries for increases in harvested area, as well as in yield per hectare. Other essential conditions include adequate supplies of fertilizers and other inputs at reasonable prices, adequate supplies of capital for economical land and water investments, adequate budgetary resources for institution building, manpower training, adaptive research and resource investigations, and continued progress in improving agricultural technology by international agricultural centers.

PN-AAB-613

\$2.95

AGROCLIMATIC REGIONS IN THE PHILIPPINES

Antiporta, D. B.
1975, 77 p.

Department of Agricultural and Applied Economics
Institute of Agriculture, University of Minnesota
St. Paul, Minnesota 55108

(In Staff paper P75-29)

The methods and results of a study that focuses on the influence of agroclimatic characteristics on regional agricultural productivity in the Philippines. The study seeks to identify, measure, and take account of relevant agroclimatic characteristics for purposes of better understanding problems of increasing agricultural output. It delineates agroclimatic regions in the Philippines and characterizes the regional profiles. A "region" is made up of a group of provinces that are not necessarily contiguous but are internally homogeneous with respect to a given set of agroclimatic variables. Also addressed is the question of how the regional groupings relate to rice productivity. Rice was chosen because of its importance as a major food crop, because of government emphasis on the rice sector and the availability of data, but a similar analysis could be made of other crops. The variables employed in the mathematical model include rice production, input factors, technology variables, an environmental variable, and a random error term. To delineate variables, six sets of criteria are defined: land resource characteristics, agricultural infrastructure, population characteristics, soil types, rainfall, and rice productivity (yield per unit of land). The model showed that the inter-year variability in land productivity is quite substantial, and that yearly changes overshadow the regional differences in productivity. Among the author's conclusions: the model would work more precisely if better information could be obtained at the provincial and lower levels.

PN-AAB-615

\$6.15

THE ECONOMIC POTENTIAL FOR INCREASING VEGETABLE PRODUCTION IN THE ZAPOTITAN DISTRICT, EL SALVADOR

Zimet, D. J.
1974, 115 p.

Department of Agricultural Economics
North Carolina State University
Raleigh, North Carolina 27607

(Masters Thesis - University of Florida)

Greater production would decrease the reliance of El Salvador on vegetable imports from Guatemala. Two linear programming models emphasizing vegetable production were used to compute the annual net return to management and resident labor of the Zapotitan District. One model used vegetable imports implicitly and then specified an optimum enterprise combination for the District. A second model explicitly included vegetable imports to determine the ability of the District to compete with Guatemalan imports. Demand specification in both models for crops grown in the District included upper limits for vegetables equal to current production plus imports; upper limits for fresh corn, tobacco, and citrus equal to present production; and no limits for milk and grains. All of the solutions included large increases in the land used for pastures for dairy production, along with a more even distribution of vegetable production over the year. The results suggest that (1) increases in vegetable production, particularly during non-traditional production periods, would augment employment and income, but that limited domestic demand prevents vegetable production from having a major impact on employment, income, and the agricultural trade surplus; (2) sugarcane production in the District adversely affects employment and income; and (3) increasing pastureland for dairy production by about 2,000 manzanas would have the greatest positive effect on the balance of trade by eliminating imports of dairy products.

PN-AAB-624

\$9.20

PHILIPPINE ACCELERATED RICE PRODUCTION PROGRAM, FINAL REPORT OF AN EVALUATION

Bernhart, R. V.; Borton, R. L.; Dancil, Arturo; Leon, Manuel de; Delgado, David; Tombong, Mario
1975, 112p.

American Technical Assistance Corporation
General Research Corporation
Westgate Research Park
McLean, Virginia 22101

(In Contract report, OAD-A-CR-100)

The objective of this study was to establish the validity of the Masagana 99 approach to increasing rice production in the Philippines, with special emphasis on the original nine emergency rehabilitation provinces. Other items included evaluating the efficacy of the overall delivery system, the effect on the farmer, and the effect on the rural credit system. A basic question was whether the program is sufficiently useful to encourage the farmers and the banks to continue with it. Interviews were conducted with some fifteen government departments or agencies, as well as with municipal action teams, provincial action committees, mayors, governors, production technicians, farmers, rural bank managers, fertilizer dealers and suppliers, dealers and suppliers of appliances and farm equipment, grain buyers, and millers. The researchers conclude that the Masagana 99 program is achieving its goals. The long-range goal of producing 99 cavans of palay per hectare has not yet been met, but the increases reported are significant. The delivery system set up to accomplish this is working quite well. Fertilizer supplies are satisfactory, though its price is not low enough. Quality HYV seeds are available and being distributed more equitably. Credit is flowing from the banks. The price support system is working. The farmer's income and purchasing power is greatly improved over a few years ago, before the start of the program. All of those improvements are not solely attributable to the Masagana 99 program. They stem also from real progress in agrarian reform, improvements in irrigation systems, construction of new roads, maintenance of peace and order, and the continuing strong demand for rice and corn buttressed by increased commodity floor prices.

PN-AAB-625

\$8.95

RURAL COOPERATIVES IN GUATEMALA; A STUDY OF THEIR DEVELOPMENT, AND EVALUATION OF A.I.D. PROGRAMS IN THEIR SUPPORT

Rusch, W. H.; Mann, F. L.; Braun, Eugene
1976, 92 p.

American Technical Assistance Corporation
General Research Corporation
Westgate Research Park
McLean, Virginia 22101

(In Contract report, OAD-A-CR-132)
Vol. 1. Summary and general evaluation)

The results of an evaluative study of Guatemalan rural cooperatives receiving assistance through AID. The objectives were to determine more precisely the characteristics of beneficiaries of the programs; the kinds, qualities, and impacts of services provided; the relevance and viability of the institutions operating the programs; the cost/benefit relations of project achievements; major issues relevant to present and future success of programs; and recommendations for future program development. The report presents six general findings of the study: (1) In six years Guatemala has developed a large and strong cooperative movement serving some 50,000 farmers. This is 10 percent of all farmers, and 18 percent of farmers in the altiplano, where the bulk of effort has been concentrated. (2) Rural cooperatives supported by AID are reaching almost exclusively individuals within the low-income target group. (3) The AID investment in grant and loan funds has been generally well utilized. (4) The programs have been meeting the AID objectives of assisting small farmers to increase production, improve living standards, participate in national development, and increase rural incomes; and of assisting rural cooperatives to become viable, self-

EDUCATION

sufficient institutions. (5) The principal shortcomings have been over-concentration on supplying credit and fertilizer, with under-concentration on technical assistance, crop diversification and marketing improvements. (6) Guatemalan cooperatives have a large potential for further growth in membership and for broadening the range of services offered. They also enjoy for the first time in Guatemalan history the strong support of the national government.

PN-AAB-626

\$7.35

COSTS AND RETURNS OF ALTERNATIVE RICE PRODUCTION SYSTEMS IN NORTHERN GHANA: IMPLICATIONS FOR OUTPUT, EMPLOYMENT AND INCOME DISTRIBUTION

Winch, F. E.
1976, 208 p.

Department of Agricultural Economics
Michigan State University
East Lansing, Michigan 48824

(Doctoral dissertation - Michigan State University)

The objective of this study was to obtain more quantitative data on the rice industry through a survey of 161 rice farms in Ghana's Northern Region. The Cost Route Survey Method was used to collect farm level data by continually interviewing 161 farmers from May 1973 through February 1974. The costs and returns for five bottomland production systems and one upland rice system then were analyzed from both the financial (private) economic, or national, point of view. Financial rice enterprise budgets were prepared for each of the six production systems. A net cash return to operating capital, family labor and management was derived for each system. The budget data also were used to derive financial returns to family labor, operating capital expenditures, and management, as well as cost of production. Each production system then was analyzed economically, and employment and income distribution implications of alternative rice production strategies were compared. The study concludes that present production strategies are providing rice producers with high financial returns but at a high cost to the Ghanaian economy. The key policy issue now facing Ghana is how to develop a low-cost production strategy in light of growing foreign exchange constraints and the need to reduce government subsidies to the rice industry.

PN-AAB-649

\$16.65

AGRICULTURAL MARKETING

THE TUNISIAN FERTILIZER DISTRIBUTION SYSTEM: STRUCTURAL AND POLICY CONSIDERATIONS

Good, D. L.; Hammond, J. W.
1975, 97 p.

Economic Development Center, Department of Economics,
Minneapolis
Department of Agricultural and Applied Economics, St. Paul
University of Minnesota, Minneapolis, Minnesota

(In Bulletin No. 2)

This report describes a study designed to investigate past price and use patterns for fertilizer in Tunisia, investigate the structure of the supply, marketing, and distribution system for fertilizer; and analyze government policies and programs that affect distribution and level of fertilizer use. Fertilizer consumption increased 109 percent from 1966 to 1973 in Tunisia. Three fertilizers account for 90 percent of the fertilizer consumption: ammonium nitrate, normal superphosphate (NSP), and triple superphosphate (TSP). In the past two years, the Ministry of Agriculture estimates of national fertilizer consumption have exceeded actual consumption, in some cases by over 50 percent.

The government levies taxes on the sale of agricultural products at the farm level and on the manufactured and imported fertilizers. Both of these policies counteract those designed to expand fertilizer use, because they lower the farmer's production incentives. Among the report's recommendations: The fertilizer production taxes should be reduced. The use of TSP in place of NSP should be encouraged. More timely importation of nitrogen fertilizer supplies should be encouraged. A credit program may be necessary to encourage development of storage facilities for fertilizer in the major cereal growing areas. Further research should be conducted to assess the potential for expanding credit and extension programs.

PN-AAB-588

\$7.75

THE INSTITUTIONAL BASE OF AN AGRICULTURAL MARKET ECONOMY

Parsons, K. H.
1974, 22 p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

(In Journal of economic issues, v. 8, no. 4, p. 737-757) Printed by Land Tenure Center as "LTC Reprint No. 127," copies of which are available free from above address.

This essay explores the processes of institutional innovation relevant to problems of economic development in less developed countries, particularly the development of agricultural economies through market arrangements in an economy which honors the Anglo-American values of freedom, equality, and related social purposes. It traces the evolution of market relationships in England since the Norman Conquest, and comments on tenure and credit relations in Nigeria. The author emphasizes that the Anglo-American path toward individualism over the centuries is not a model for social and economic development in tropical African countries, and that the modern specialization of scholars has left economists ill equipped to understand a system of economy as a human organization. Consequently, modern economists leave the larger tasks of institutional innovations to revolutionaries, or to the common sense of natural leaders strong enough to rise to positions of power and influence.

PN-AAB-605

\$2.00

EDUCATION

GENERAL EDUCATION

THE IMPACT OF PARTICIPANT TRAINING ON THE ATTAINMENT OF DEVELOPMENT GOALS: ANALYSIS OF TWO SECTORS

Krug, R. E.
1976, 50 p.

American Institutes for Research
3301 New Mexico Avenue, NW
Washington, D.C. 20016

(In Report No. 4)

In March 1974, a study was made of whether techniques could be devised to measure the effectiveness of participant training by the impact of returned participants on the development of their countries. The conclusion to this was affirmative and took the form of a prototype methodology for carrying out such assessments. This report is of the methods and procedures designed for future field assessments. Two sectors (agriculture and economic planning) were examined, and the substantive findings for each are presented here. It is important to note, however, that the real objective of these findings was methodological, not substantive. That the participants in these training programs have had a

significant impact on their countries' development is not surprising, and it is the overwhelming consensus in both the United States and abroad, that the USAID participant training effort has been a very productive form of technical assistance. Rather, what is new in this study is the specificity of the definition of impact and the demonstration of specific linkages to training.
PN-AAB-652 \$4.00

THE IMPACT OF PARTICIPANT TRAINING ON THE ATTAINMENT OF DEVELOPMENT GOALS: THE METHODS AND PROCEDURES FOR ASSESSMENT OF IMPACT

Schubert, J. G.
1976, 128 p.

American Institutes for Research
3301 New Mexico Avenue
Washington, D.C. 20016

(In report No. 5, Final Report)

A report on the assessment materials used in studying the impact of participant training on the attainment of development goals in Ghana and Thailand. This study is part of the second phase in the development of a methodology useful for conducting impact assessments. This second phase was designed to test the methodological design in live, operational settings and to produce an assessment package that local evaluators could use for impact assessments of other training activities. This "assessment package" consists of two main tools: 1) the instruments that were used to evaluate the impact that former AID participants had on their country's national goals, and 2) suggested procedures for local evaluators who will use these instruments to conduct impact assessments. Among the sections of this report are those on the *Practical Applications of the Methodology*; *Issues of Sample Selection* (a list of the criteria used in selecting the samples for the impact assessment of participant training); *Training the Interviewers* (a step-by-step procedure to prepare the interviewers responsible for data collection); *Data Collection Procedures*; and *Data Classification and Analysis*.

PN-AAB-653 \$10.25

EDUCATIONAL TECHNOLOGY

NFE-TV: TELEVISION AND NONFORMAL EDUCATION

Gunter, J. F.
1975, 7 p.

Academy for Educational Development, Inc.
1414 22nd Street, N.W.
Washington, D.C. 20037

(In Educational Broadcasting International, V. 8, No. 4., p. 172-178)

This article suggests circumstances under which television may serve nonformal education as a mass medium. During the 1960s international funding agencies relied heavily on television to stimulate educational change in non-industrial countries, but the costs of 16mm equipment and production studios were a deterrent. However, 8mm TV cameras, film, and production equipment have rapidly evolved into high-quality, light, portable, low-cost systems highly suited to the needs of nonformal educators. All of the equipment needed to create a basic film production unit with TV broadcast capabilities costs less than a total of \$6,500. Non-formal educators need to be aware of the potential uses of TV so as to be able to convey the developmental information and values that formal educators do not convey and commercial television does not convey. Non-formal educators can play a crucial role in the development of world television if they confront existing and developing options. In the next thirty years, the globe will most certainly become blanketed with video communication. Whether its effects achieve much beyond cul-

tural homogenization will depend on the initiative and commitments of nonformal educators.

PN-AAB-593 \$2.00

DEVELOPMENT OF SPECIAL MULTIDISCIPLINARY COMPETENCE FOR ANALYSIS OF EFFECTIVE ALTERNATIVES TO PROCESSES OF TRADITIONAL EDUCATION; FINAL REPORT; 1970-1975

University of California - Los Angeles, Latin American Center
1975, 212 p.

University of California - Los Angeles
Latin American Center
Los Angeles, California 90024

(Research Summary)

The objectives of this five-year grant were (1) to develop instruments and procedures for analysis of alternatives to traditional educational processes in Latin America; (2) to isolate and examine sociocultural considerations in educational development; (3) to investigate economic considerations in mass education; (4) to examine the application of systems of educational technology as related to educational productivity; (5) to relate rural-urban considerations to the process of educational developments; and (6) to provide a project focus within the Latin American Center at UCLA which will guide research and provide training for professional staff members of domestic, international, and foreign agencies through seminars, symposiums, and regular University course work. The 211(d) grant-in-aid funded 67 research and development projects over the five years, involving investigators drawn from 17 units of the University and institutions and personnel from Venezuela, Colombia, Mexico, Bolivia, Guatemala, Brazil, Peru, Panama, Costa Rica, Trinidad-Tobago, Ecuador, Argentina, and Chile. Several courses and seminars were developed. Service was provided government-supported programs in six Latin American countries. The results of the research projects are being published in research papers, monographs, and anthologies. The fifteenth, sixteenth, and seventeenth editions of *The Statistical Abstract of Latin America*, published by the Center, includes more than 50 pages devoted to educational issues and problems. Through combined University and grant resources, some 3,000 volumes have been purchased during the grant period for the Education/Psychology Library and the Latin American section of the University Research Library.

PN-AAB-595 \$16.95

PUBLIC HEALTH

INTEGRATED DELIVERY SYSTEMS

The American Public Health Association, under a contract with the Agency for International Development, has designed a program in public health improvement which is called the *Development and Evaluation of Integrated Delivery Systems (DEIDS)*. The activity is designed to assist countries to demonstrate how to establish health delivery systems within seven years. Such projects include, but are not limited to, Maternal and Child Health and Family Planning and Nutrition. The projects are to cover large populations in predominantly rural areas. They are to utilize in-country resources for the service component, although external assistance organized by DEIDS is available for planning, evaluation, training, and limited amounts of essential equipment. It is expected that successful health delivery systems can be subsequently replicated in the country or in the region.

These are phases through which DEIDS projects proceed:

- a) *Phase I* — reconnaissance within a specific country or region, to gather information about disease patterns, health services as currently organized, local resources,

PUBLIC HEALTH

cultural aspects, community involvement, the potential for integration of various parts of public health, opportunities for innovation, current and potential staffing, training, supervision, emphasis upon preventive services, outreach, cost, and evaluation

- b) *Phase II* — Detailed planning. This phase begins if the survey in Phase I recommends it, and involves experts from the host country as well as experts assigned by DEIDS.
- c) *Phase III* — Pilot Project Operations, which continue for as long as eight years.

The reports listed herein are organized into these categories:

- a) Guidelines for DEIDS planning, describing the basic principles which guide information gathering, project planning, and evaluation of systems which are established.
- b) Reconnaissance surveys in the countries listed.
- b) Special reports, including some proposals for development planning in selected countries, reports on various subjects in several countries, and field studies of the role and contribution of voluntary health organizations.

American Public Health Association, Division of International Health Programs, 1015 Eighteenth Street, N.W., Washington, D.C. 20036

FAMILY PLANNING, MATERNAL AND CHILD HEALTH, AND NUTRITION

(100) Rice, D. T.
(101) APHA
1973, 43 p.
PN-AAB-557 \$3.45

EVALUATION (A HANDBOOK)

Rice, D. T.
1973, 43p.
PN-AAB-558 \$3.45

NIGERIA: DEIDS RECONNAISSANCE, SEPT. 26-OCT. 7, 1973

Merrill, M. H.; Lythcott, G. I.; Dupuis, Theresa;
Bernhart, R. V.
1973, 16p.
PN-AAB-559 \$2.00

NIGER: DEIDS RECONNAISSANCE, OCT. 8-20, 1973

Lythcott, G. I.; Dupuis, Theresa; Bernhart, R. V.
1973, 10p.
PN-AAB-574 \$2.00

GHANA: DEIDS RECONNAISSANCE, MARCH 19-23, 1973

Rice, D. T.
1973, 18p.
PN-AAB-565 \$2.00

PAKISTAN: DEIDS RECONNAISSANCE VISIT, AUGUST 30-31, 1972

Hood, T. R.; Rice, D. T.; Gerletti, John; Florio, L. J.
1972, 61p.
PN-AAB-566 \$4.90

THAILAND: DEIDS RECONNAISSANCE, JAN. 29-FEB. 9, 1973

Hood, T. R.; Doege, T. C.; Izutsu, Satoru; Florio, L. J.
1973, 35p.
PN-AAB-567 \$2.80

KOREA: DEIDS RECONNAISSANCE, MARCH 22-APRIL 6, 1973

Hood, T. R.; Izutsu, Satoru; Lee, R. K. C.; Park, Chai-bin
1973, 70p.
PN-AAB-583 \$5.60

THE PHILIPPINES: DEIDS RECONNAISSANCE, APRIL 9-19, 1973

Hood, T. R.; Dalmat, H. T.; Izutsu, Satoru; Smith, Roy;
Lynch, J. M.
1973, 75p.
PN-AAB-568 \$6.00

PANAMA: DEIDS RECONNAISSANCE, SEPT. 23-29, 1972

Hood, T. R.; Dalmat, H. T.; Royo, R. M.; Wilson, D. E.
1972, 52p.
PN-AAB-569 \$4.15

ECUADOR: DEIDS RECONNAISSANCE, OCT. 24-NOV. 2, 1972

Rice, D. T.; Dalmat, H. T.; Royo, R. M.; Wilson, D. E.;
Lynch, J. M.
1972, 41p.
PN-AAB-570 \$3.30

HONDURAS: DEIDS RECONNAISSANCE, NOV. 29-DEC. 6, 1972

Hood, T. R.; Cloner, Alexander; Wilson, D. E.; Lynch, J. M.
1972, 33p.
PN-AAB-571 \$2.65

PARAGUAY: DEIDS RECONNAISSANCE, DEC. 10-12, 1972

Hood, T. R.; Dalmat, H. T.; Bennett, S. W.; Lynch, J. M.
1972, 34p.
PN-AAB-572 \$2.70

NICARAGUA: DEIDS RECONNAISSANCE, NOV. 29-DEC. 6, 1972

Rice, D. T.; Dalmat, H. T.; Bennett, S. W.; Hewes, L. I.
1972, 74p.
PN-AAB-573 \$5.90

PROPOSAL FOR DEVELOPMENT AND EVALUATION OF AN INTEGRATED HEALTH DELIVERY SYSTEM IN THAILAND (DEIDS)

(101) APHA
1973, 158p.
PN-AAB-538 \$12.65

PROPOSAL FOR DEVELOPMENT AND EVALUATION OF AN INTEGRATED DELIVERY SYSTEM (HEALTH, FAMILY PLANNING, AND NUTRITION) IN ECUADOR (DEIDS)

(101) APHA
1974, 165p.
PN-AAB-539 \$13.20

PROPOSAL FOR DEVELOPMENT OF AN EVALUATION SYSTEM FOR THE MINISTRY OF HEALTH, PANAMA

(101) APHA
1974, 51p.
PN-AAB-560 \$4.10

REPORT ON SELECTED ECONOMIC ASPECTS OF 1974 HEALTH PLAN, HONDURAS

(100) Davis, J. E.; Nesbit, O. (101) APHA
V.; Ruderman, A. P.
1974, 46p.
PN-AAB-554 \$3.70

LAOS EVALUATION OF SITES FOR DEIDS, REPORT

French, D. M.
1974, 21p.
PN-AAB-550 \$2.00

RURAL HEALTH SERVICES EVALUATION PROJECT, GUATEMALA

Boostrom, E. R.; Spruyt, Dirk
1975, 56p.
PN-AAB-552 \$4.50

RURAL HEALTH DELIVERY SERVICE REPUBLIQUE CENTRAFRICAINE (CAR), FEASIBILITY STUDY

Eason, J. C.; Lucas, J. L.; Anderson, Janet
1975, 72p.
PN-AAB-564 \$5.75

REPORT ON VISIT TO SWAZILAND

Yergan, L. H.
1975, 34p.
PN-AAB-563 \$2.70

PRIMARY HEALTH NURSE CONCEPT IN INDONESIA, REPORT

Racz, Margaret
1975, 23p.
PN-AAB-548 \$2.00

FIELD STUDY OF VOLUNTARY HEALTH ORGANIZATIONS IN THAILAND, TAIWAN, THE PHILIPPINES, INDONESIA, AND KOREA

Morgan, R. E.; Leavell, H. R.; Merrill, M. H.
1972, 89p.
PN-AAB-540 \$7.10

FIELD SURVEY REPORT OF NATIONAL VOLUNTARY HEALTH ORGANIZATIONS IN ARGENTINA, BRAZIL, AND CHILE

Morgan, R. E.
1974, 62p.
PN-AAB-545 \$4.95

FIELD SURVEY REPORT OF NATIONAL VOLUNTARY HEALTH ORGANIZATIONS IN IRAN

Morgan, R. E.
1974, 18p.
PN-AAB-544 \$2.00

FIELD SURVEY REPORT OF NATIONAL VOLUNTARY HEALTH ORGANIZATIONS IN ETHIOPIA, KENYA, NIGERIA, DAHOMEY, AND TUNISIA

Morgan, R. E.
1972, 169p.
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THE ROLE OF NATIONAL VOLUNTARY HEALTH ORGANIZATIONS IN SUPPORT OF NATIONAL HEALTH OBJECTIVES, PHASE II REPORT

Morgan, R. E.; Baldwin, B. R.; Jezowski, Terrance; Teasdale, Cathryn
1974, 226p.
PN-AAB-542 \$18.10

MISSION TO CENTRAL AND WEST AFRICA, JAN. 23-MARCH 5, 1972; CONSULTANTS' REPORT, PUBLIC HEALTH TEAM

Dyar, Robt.; Anderson, Janet; Henderson, Ralph; Lythcott, G. I.; Yergan, L. H.
1972, 62p.
PN-AAB-541 \$4.95

HEALTH SECTOR OF LESOTHO, A REVIEW

Gish, Oscar; Boostrom, E. R.; Franks, J. A.; Powell, R. N.
1974, 68p.
PN-AAB-551 \$5.45

U.S. VOLUNTARY AND PRIVATE SECTOR STRATEGY CONFERENCE ON INTERNATIONAL HEALTH, CONFERENCE REPORT

(101) APHA
1975, 115p.
PN-AAB-561 \$9.20

GENERAL PUBLIC HEALTH**REPORT ON THE HEALTH, POPULATION AND NUTRITION ACTIVITIES OF THE AGENCY FOR INTERNATIONAL DEVELOPMENT, FY 1973 and 1974**

U.S. Department of Health, Education, and Welfare
1975, 460p.

Office of International Health
U.S. Department of Health, Education and Welfare
Washington, D.C.

Outlines of the health, population, and nutrition activities undertaken during the fiscal years 1973 and 1974. Included are amounts of money obligated or committed for projects and to the extent possible, the progress made in achieving project goals during the reporting years. Funding data for and analysis of activities during both fiscal years, as well as fiscal data on dollar grants and loans, also are covered. Information on the professional and administrative personnel engaged in these projects is limited to those on duty between June 30, 1973 and June 30, 1974.
PN-AAB-746 \$36.80

MANPOWER DEVELOPMENT**MEDEX PROJECT PLANNING, QUARTERLY REPORT, SEPT. 1975 to DEC., 1975**

Hawaii Univ. School of Medicine, Health Manpower Dev. Staff
1975, 26p.

School of Medicine, University of Hawaii
1960 East-West Road,
Honolulu, Hawaii 96822

(Research summary)

This is the second quarterly report for the second year of a health manpower development project conducted by the School of Medicine, University of Hawaii, under sponsorship of USAID. The principal objective of the program is to recruit and develop a health manpower development staff to serve as a resource and response capability for LDCs designated by AID in the planning and development of mid-level (MEDEX-type) health manpower programs. During the project period, staff members consulted with the DEIDS/Thailand program in the areas of preceptorship training, evaluation, and module development; participated in the first annual review of the DEIDS project; consulted in Seoul in response to a request from USAID/Korea; participated in an HMDS-led curriculum development workshop in Pakistan; addressed Asia Foundation representatives in Manila; in response to a request from USAID/Philippines, provided a week of consultation to the government of the Philippines; worked with representatives of the Ministry of Health of Guyana to develop a proposal for MEDEX in Guyana, for submission to the Kellogg Foundation regional office in Rio De Janeiro; held discussions with TOMKIRP in Amsterdam and WHO's Manpower Training Group in Geneva pursuant to locating additional audiovisual material to be used in the STEM modules as they are developed; held further discussions with the Inter-Mountain and Northwest MEDEX programs regarding collaboration in the development of programs overseas; co-produced a five-minute film on MEDEX in Micronesia; and provided three days of briefing to the visiting Associate Director of Health Sciences, International Development Research Centre, Ottawa, with the expectation of future collaboration.

PN-AAB-603 \$2.10

NUTRITION**ENERGY EXPENDITURE CUTTING SUGARCANE**

Spurr, G. B.; Barac-Nieto, M.; Maksud, M. G.
1975, 7p.

SCIENCE AND TECHNOLOGY

Department of Physiology
The Medical College of Wisconsin
Milwaukee, Wisconsin 53233

(In Journal of Applied Psychology, V. 39, No. 6, p. 990-996)

A report of the methods and results of a study of energy expenditures by sugarcane cutters in a region of Colombia where sugarcane is harvested 12 months a year. This study is part of a larger one dealing with the influence of nutritional repletion on the physical work capacity of chronically undernourished workers in Colombia. The heart rate, oxygen consumption, and ventilation rate of 61 Colombian sugarcane cutters were measured while they harvested cane and also in the laboratory during a test of maximum oxygen consumption. Productivity and sweat rates were also measured in the field. The subjects had an estimated dietary intake of 2,970 kcal/day, which was lower than the calculated daily energy expenditure. During the work measurements the oxygen consumption was 1.5 l/min., the ventilation 48 l/min., and the heartrate 135 beats/min., with no differences between A.M. and P.M. values. The subjects sustained about 35% of maximum oxygen consumption during the 8-hour workday, but worked at 57% of maximum oxygen consumption during the tests. Measured energy cost was 7.4C1.5 kcal/min. during work. The estimated sustained energy cost was 5 kcal/min. during the workday. Sweat rates were higher P.M. than A.M. (5 kg/8 h day). Grouping of the men according to productivity demonstrated that taller, heavier men were better producers and had lower calculated heart rates at oxygen consumption of 1.5 l/min. Efficiency of cane cutting was higher (9%) in the P.M.
PN-AAB-616 \$2.00

REFERENCES IN NUTRITION AND RELATED SUBJECTS, INDIA: 1967-1974

Jain, D. P.
1975, 438p.

Food and Agriculture Division
Agency for International Development Mission
New Delhi, India

A compendium of abstracts of the more well-known Indian research in nutrition and related subjects published from 1967 through 1974. The abstracts are quite brief, averaging under 100 words each, and often consisting of but two or three sentences presenting the major finding of the study cited. The abstracts are arranged within the following chapter headings: Anemia, Anthropometry, Biochemical and Biological Indicators, Child Growth, Diet and Nutrition Surveys, Dietary Factors and Heart Disease, Disease, Food, Food Contaminants, Health Surveys, Infant Feeding and Rearing, Malnutrition, Morbidity and Mortality, Newborn Babies, Parasites, Perinatal and Neonatal Mortality, and Prematurity and Premature Babies. The volume begins with a seven-page statistical article, "Population, Agriculture and Food," by D. P. Jain.
PN-AAB-627 \$35.00

EFFECT OF SODIUM ALKALIS AND SALTS ON pH AND FLAVOR OF SOYMILK

Bourne, M. C.
1976, 5p.

New York State Agricultural Experiment Station
Cornell University
Geneva, New York 14456

(In Journal of Food Science, V. 41, p. 62-66)

Sodium hydroxide, sodium carbonate, and sodium bicarbonate were added to soymilk made by the "boiling-water grind" process. NaOH caused a rapid increase in pH; Na₂CO₃ a moderate increase and NaHCO₃ a slight increase in pH. After sterilization in bottles the pH of the soymilks containing alkali decreased,

with the decrease least with the NaHCO₃ treatment and greatest with the NaOH treatment. The pH of the untreated soymilk did not change during sterilization. An experienced taste panel showed greater acceptability for soymilk adjusted to pH 7.0-7.5 with NaOH but noted a soapy flavor and gave lower scores to milks with pH greater than 7.5. Soymilks adjusted to pH 7.0-7.5 with Na₂CO₃ or NaHCO₃ were disliked by the panel. It was theorized that the improved acceptability with NaOH could be due to the increase in sodium ion concentration rather than in the change in pH. Soymilks prepared in Na₂CO₃, NaHCO₃, NaNO₃, Na₂SO₄, Na acetate and Na citrate additions at the same levels as that amount of NaOH required to raise the pH to 7.2 were given approximately the same scores by the panel as the NaOH-treated sample even when the pH was not in the range of 7.0-7.5. This evidence supports the theory that the sodium ion concentration is the effective mechanism in improving the flavor of soymilk rather than the change in pH.
PN-AAB-677 \$2.00

SCIENCE AND TECHNOLOGY

GENERAL SCIENCE AND TECHNOLOGY

THE PROBLEMS OF SCIENCE AND TECHNOLOGY, DISCUSSION PAPERS

Georgia Institute of Technology
1975, 135p.

Economic Development Laboratory
Engineering Experiment Station
Georgia Institute of Technology
Atlanta, Georgia 30332

Symposium held by AID's Office of Science and Technology, where papers were presented on Education, Employment, Rural Housing, Environmental Concerns, Energy, Food, and Employment/Energy. The Working Group on Education discussed needs for both formal and nonformal means for improving educational opportunities for the poor, providing education institutions which are relevant for development of employment skills as well as general education, and assuring that higher education is not promoted at the expense of rural education. The Working Group on Employment agreed that the rural poor have some technology of their own that needs developing, and need introduction of science and technology. Further, Agricultural development cannot be isolated from industrial development; rural people need to participate in problem identification and planning. The Working Group on Rural Housing concluded that science and technology can increase utilization of local resources for construction, such as local bricks for roofing rather than imported galvanized iron sheets. A.I.D. should undertake demonstration studies to encourage local skills and technologies. The Working Group on Environmental Concerns said science and technology inputs would be related to local conditions. The Working Group on Energy proposed that A.I.D. should support local research group's investigations of appropriate energy technologies, and encourage their ties with similar institutions in the United States. The Working Group on Employment/Energy said that increasing supplies of energy in rural areas would increase employment and production, and added that community participation in development and design of energy systems would ensure acceptance and use.
PN-AAB-629 \$10.80

Please use the publication number in ordering.
Example: PN-AAB-000

WORLDWIDE DISASTER WARNING AND ASSESSMENT WITH EARTH RESOURCES TECHNOLOGY SATELLITES

Robinove, C. J.
1975, 69p.

Office of International Geology, Geological Survey
U.S. Department of the Interior
12201 Sunrise Valley Drive
Reston, Virginia 22092

(In Project report (IR) NC-47)

Based on experimental results, this report discusses the potential use of Earth Resources Technology Satellites (ERTS) for worldwide disaster monitoring, the techniques for applications of ERTS data to disaster monitoring and analysis, and the methods for achieving an operational disaster monitoring capability. Floods, fire, glacier movement, and drought are the disasters most amenable to satellite sensing and analysis. Other disasters to which applications are promising, but not yet completely feasible are earthquakes, volcanic eruptions, crop failures, and water pollution. Practical application of satellite images to disaster assessment requires the continued and reliable operation of satellites and data reception stations, rapid distribution of data to interpretive teams and to affected countries, and the rapid analysis and dissemination of maps and other results.

PN-AAB-664 \$5.50

COMPARATIVE ANALYSIS OF UTILIZATION OF RESEARCH REACTORS IN A NUMBER OF DEVELOPING ASIAN AND LATIN AMERICAN COUNTRIES

Guinn, V. P.
1975, 64p.

Department of Chemistry
University of California
Irvine, California 92717

An assessment of the present degree of utilization of research-type nuclear reactors in the Philippines, Thailand, Korea, Indonesia, Singapore, Taiwan, Hong Kong, Venezuela, Colombia, Argentina, Brazil, Chile, Mexico; and the various factors either stimulating or inhibiting their optimum utilization. Less-detailed assessments of other related nuclear programs in these countries also are made. The various reactor and related nuclear centers visited varied widely according to size, quality of support, and utilization. Lacking an established tradition of scientific research and development, nuclear progress could be accelerated by continuing effective help and encouragement from developed countries. To really flourish, the nuclear centers will have to be less academic and develop applications that are more closely meshed with overall national plans that attack real, present-day programs. Areas covered in this report are: 1) problems of staffing, 2) degree of reactor utilization, 3) contacts with other groups within the country, 4) contacts with nuclear groups and activities in other countries, 5) practical applications of nuclear methods, and 6) specific needs. In addition, there are summaries of individual countries.

PN-AAB-681 \$5.10

INDUSTRIAL DEVELOPMENT

INDUSTRIAL STANDARDS; EVALUATION OF PROJECT 910

Hubbell, R. L.
1975, 80p.

Office of Science and Technology
Technical Assistance Bureau
Agency for International Development
Washington, D.C. 20523

The Industrial Standards Project 910 was an experiment to test

both procedural and substantive elements of technical assistance. As an experiment, the project may not have been expected to solve a problem (or achieve a purpose) but rather to demonstrate that the type of assistance probably could solve the problem if applied on a larger scale. General conclusions and recommendations are detailed at the end of this evaluation. This evaluation of the Industrial Standards Project is based on a sampling of its extensive ramifications. The sampling was determined by reading most of the reports issued during the period and some of the general files; interviewing some of the many officers in the National Bureau of Standards and AID associated with the project; and visiting Ecuador, Bolivia, and Ethiopia. In each country there was an extensive round of interviews and in the first two visits to laboratories of the standards institutions. A bibliography and list of interviewees are included in this report.

PN-AAB-659 \$6.40

TESTING AND CERTIFICATION FOR EXPORT PRODUCTS IN INDUSTRIALIZING COUNTRIES: PROCEEDINGS

Peiser, H. S.; Marvin, R. S.
1975, 178p.

Office of International Relations, National Bureau of Standards
U.S. Department of Commerce
Washington, D.C. 20234

(In NBS special publication No. 438)

Proceedings of a regional seminar sponsored by the Singapore Institute of Standards and Industrial Research, the National Bureau of Standards, and the USAID. The participants represented most of the countries in South Asia concerned with increasing their exports, and covered such issues as testing and certification, metrology and testing, and product marketing and certification. Discussions during the seminar centered on the new testing techniques themselves, their use in quality control and inspection, and methods of instilling confidence in both the exporter and importer. The papers given at the seminar and the remarks following them are presented here, as well as two papers contributed but not read.

PN-AAB-682 \$14.25

REPORT ON AN NBS/AID/OAS WORKSHOP ON STANDARDIZATION AND MEASUREMENT SERVICES IN INDUSTRIALIZING ECONOMIES: PROCEEDINGS

Peiser, H. S.; Marvin, R. S.; McNeil, M. B.; Mejeur, Joanne
1975, 226p.

Office of International Relations, National Bureau of Standards
U.S. Department of Commerce
Washington, D.C. 20234

(In NBSIR 75-769)

This report contains texts of the special lectures and presentations by the Workshop participants. The latter covers activities of NBS, other federal and local government agencies, universities, research institutes, and private industry and commerce. Four aspects of the national administration standards are given special attention: 1) maintenance of national standards of measurements compatible with SI (the international system of units of measures) and transference of these standards to local institutions; 2) field surveillance of weights and measures in the market place; 3) procedures for the development of standards, including standards of safety, consumer protection, building codes, etc., as well as compatibility standards for such items as pipe threads; and 4) inspection and quality control of production (sampling, tolerances, control charts). This report also includes short summaries of some of the material presented by the various NBS representatives.

PN-AAB-706 \$18.10

SOCIAL SCIENCES

HOUSING

FEASIBILITY TEST OF AN APPROACH AND PROTOTYPE FOR ULTRA LOW COST HOUSING, FINAL REPORT

Goodspeed, C. H.; Hartkopf, V. H.
1975, 93p.

Interdisciplinary Working Party
Carnegie Mellon University
Pittsburgh, Pennsylvania 15213

(In TA/OST 75-26)

Over the past two years, an interdisciplinary team of architects, engineers, planners, and sociologists have developed a prototype ultra-low-cost housing unit for use in a variety of relief and rural development situations, especially in the disaster-prone areas of developing countries. The structure is an "A" frame modular housing system which can use a wide variety of indigenous materials. It is very cheap, easily constructed without equipment and is wind and flood resistant. This is a report of the continued research on the structure and of tests on the unit in actual field conditions. All the various design constraints on the structure — 1) cost, 2) use of local materials, 3) environmental problems, 4) ease of administration, 5) ease of construction, and 6) behavior constraints — were incorporated into the design program and each was met.

PN-AAB-662

\$7.45

SOCIAL SCIENCES

GENERAL SOCIAL SCIENCES

LOW COST DATA AND TEXT COMMUNICATION FOR THE LESS DEVELOPED COUNTRIES

Pool, I. de S; Friedman, Elliot; Warren, Colin
1976, 151p.

Center for Advanced Engineering Study
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

A presentation of the results of a cost-benefit study of the usefulness of certain advanced communications technologies for the less developed countries. The specific technologies examined concern non-voice, non-video electronic communication of text and data via telex, facsimile, computer polling systems, computer time-sharing networks, packet switched computer networks, satellites, or multiple-access satellite systems. To examine the needs and costs of such communication systems, the author focused on the telecommunications needs of the International Agricultural Research Centers located in less developed countries. Their communication needs are acute. The authors conclude that an estimated \$150,000 per year would cover the communication and equipment costs of telephone-based computer polling system for all IARCs, and would enable each to send and receive about 75 typewriter pages a day at a cost of a quarter to a half-dollar a page. The general conclusion of the study is that high-technology systems of data communication are manageable in and appropriate to the needs of the less developed countries. The use of such technologies can markedly reduce costs for some important services, and give the LDCs access to the best and most advanced technical information bases. The result of such participation by the LDCs will be their quicker achievement of independence.

PN-AAB-585

\$12.10

A BIBLIOGRAPHY OF SELECTED PERIODICALS FOR SOCIAL SCIENTISTS

Deseran, F. A.
1975, 120p.

Department of Civil Engineering
Colorado State University
Fort Collins, Colorado 80521

This bibliography focuses on documents needed for macro-level research, especially in the areas of technology assessment, planning and decision-making, natural resources policy, population studies, social and economic development, and urban and regional analysis. The periodicals listed in this bibliography are mainly American or English-language, although some foreign-language periodicals are included. Even within these limitations, this bibliography is by no means complete, but rather represents the materials available as a basis for further literary research.

PN-AAB-648

\$9.60

WOMEN IN NATIONAL DEVELOPMENT IN GHANA

North, Jeanne; Fuchs-Carsch, Marian; Bryson, Judy; Blumenfeld, Sharna
1975, 213p.

Agency for International Development
AID/AFR/CWA
Washington, D. C.
(Prepared for the USAID Mission in Ghana)

(In Development assistance program, FY 1976-FY 1980, Ghana, v. 6)

This study provides a background picture of the social, economic, and legal status of Ghanaian women, including their importance in the commercial system as traders and as employees of commercial and industrial concerns. It then focuses on agriculture; health, population, and nutrition; and education in an attempt to determine both the effects of these systems on women and their contributions to them. Voluntary organizations also are examined to find their potential use in providing educational opportunities for women. An annotated bibliography including books, journal articles, reports and other documents on the role of Women in Ghanaian development is included.

PN-AAB-683

\$17.00

FIELD DATA COLLECTION IN THE SOCIAL SCIENCES: EXPERIENCES IN AFRICA AND THE MIDDLE EAST

Kearl, B. E.
Conference on Field Data Collection in the Social Sciences,
Beirut, 1974
1976, 221p.

Agricultural Development Council, Inc.
1290 Avenue of the Americas
New York, New York 10019

A discussion of research methods — practical field procedures — based on papers submitted by 20 social scientists from a variety of academic disciplines. Areas covered include: 1) research approaches; 2) familiarization and reconnaissance or basement studies; 3) considerations in sampling; 4) local support and cooperation; 5) developing and using data collection instruments; 6) problems with specific variables; 7) recruitment and qualifications of interviewers/enumerators; 8) training interviewers and directing their work; 9) interviewing techniques and problems; 10) winning cooperation of respondents; and 11) pre-coding, and some preliminary steps in analysis. Despite its rather formidable format, this publication is intended to be a progress report or a partial contribution rather than a comprehensive reference or text.

PN-AAB-723

\$17.70

Please use the publication number in ordering.
Example: PN-AAB-000

DEVELOPMENT PLANNING

GOVERNMENT POLICIES AND THE WORLD FOOD SITUATION

Abel, M. E.
1975, 35p.

Department of Agricultural and Applied Economics
Institute of Agriculture
University of Minnesota
St. Paul, Minnesota 55108

(In Staff paper P75-25)

This paper discusses the current and prospective world food situation, how domestic policies affect trade in agricultural products, and how some recent trends in national policies are affecting the global state of affairs with respect to food and agriculture. The world food situation in the 1950s and 1960s was fairly comfortable. Developed countries were producing and exporting surpluses, and production in most less developed countries was keeping slightly ahead of population increases. But the situation changed in the 1970s. The United States and Canada reduced production and lowered their surplus stocks. In 1972 the Soviet Union unexpectedly began massive purchases in the world market. Demand for grain has continued to grow, so that now the supply/demand situation in grains is teetering on a razor's edge with respect to surplus or shortage. An important permanent change affecting food supplies is that mass starvation is no longer tolerable. Thus droughts, floods, and other food crises increase demands upon world food supplies and exert pressure on food prices. Another change is that more countries are relying on world markets for their food supplies. Population growth rates have accelerated, while the 1960s spurt of increased food production in many less developed countries is leveling off. Only new and improved inputs in fertilizers, irrigation, seed varieties, and pricing policies will keep the yields rising. Domestic and foreign trade policies concerned with agricultural production, export, or import are closely interrelated. Countries try to protect their domestic producers. This produces price distortions and misallocation of resources. GATT was unsuccessful in liberalizing agricultural trade, but within GATT and other international organizations, serious consideration is being given to development of rules for dealing with nontariff barriers most countries employ, without requiring abandonment of national food and agricultural policies. Most industrialized countries employ price supports to protect producers and consumers against wide variations in supply and pricing of agricultural products. The net effect of this is to reduce production in countries that compete at world prices, as with Canada and Australia in the case of grains. In many less developed countries, the opposite policy is followed; food prices for urban consumers are kept below world prices, and this depresses producer prices. Many countries do not assign high priority to agricultural development. India is an example. Also, the protectionist policies followed by most developed countries depress world market prices. This has had serious repercussions for the less developed countries—mainly reduced incentives to develop their agriculture. Many less developed countries are not producing nearly as much food as they could. However, we do not yet have an adequate empirical base for drawing conclusions about the effects of agricultural policy liberalization in the developed countries. Yet much can be done. An international reserve of grains should be established. The United States and other countries are wary of this; they fear that international reserves might be managed in ways contrary to national policy objectives. In general, the chaos in world food management arises from economic/political limitations based upon nationalism. International development assistance activities need to work within those limitations in focusing more sharply on food, agriculture, population, and income distribution problems. The difficult and long-term nature of agricultural and

economic development should be more widely recognized and incorporated into development assistance programs of national governments and international agencies.

PN-AAB-614

\$2.80

INFORMAL SMALL-SCALE ENTERPRISE SECTOR OF THE URBAN ECONOMY: PROBLEMS AND SUGGESTED APPROACHES

Developing World Industry and Technology
1976, 97p.

(DWIT) Developing World Industry and Technology
Suite 800, 919 18th Street, NW
Washington, D.C. 20006

A study of the development of concepts and approaches to action programs aimed at expanded employment and income opportunities for the urban poor. Emphasized are an appraisal of the key problems and major difficulties encountered, and an identification of potentially useful activities that could be undertaken by international development agencies. A series of networks based on field experience is described and analyzed as guidelines for action programs. These networks focus on small, labor-intensive enterprises, marketing systems for small producers, and financial and other institutions. Research for this study included a field visit to Peru to survey urban-poor, small-scale enterprise development in the Lima area, for four network profiles, and a brief visit to Bogota and Medellin, Colombia, for one network profile.

PN-AAB-657

\$7.75

ASSESSMENT OF IMPACT OF AID PROGRAMS ON THE URBAN POOR; PRELIMINARY REPORT

Rose, T. H.; Carnes, Y. M.; Eckert, R. J.; Bernhart, R. V.; Gakenheimer, R. W.
1976, 75p.

American Technical Assistance Corporation
General Research Corporation
Westgate Research Park
McLean, Virginia 22101

An introductory view of the consequences of AID programs on the urban poor. To identify the explicit effects of these programs on families, this study evolved a methodology which included a set of program components which could trace any AID project from research to infrastructure construction. These components were applied to a nine-country sample covering 138 sorts of projects. Illustrative cases from all countries, sectors, and funding sources were chosen for a second level of analysis. The major conclusions expressed as tentative observations are the important effects of increased food production in urban hinterlands on the urban poor, of AID rural development projects on migration to the cities, of family planning and health programs on the demographic profile of the urban poor, and of food brought directly to urban residents as the most easily measurable contribution of AID programs for this group.

PN-AAB-658

\$6.00

SYSTEMS ANALYSIS AND OPERATIONS RESEARCH: A TOOL FOR POLICY AND PROGRAM PLANNING FOR DEVELOPING COUNTRIES

National Research Council - National Academy of Sciences
1976, 106p.

Commission on International Relations
National Academy of Sciences
National Research Council
Washington, D.C. 20418

A report on Systems Analysis/Operations Research (SA/OR). SA/OR workers are technicians whose job is to point out to the

SOCIAL SCIENCES

administrator the various alternative policies and to work out with him ways in which a chosen policy can be implemented. Improvement in and efficiency of the planning process is achieved through the development of models and analogues, thus providing an understanding of the relevant factors and their interactions; by calculation and simulation, predicting the possible consequences of alternative actions and policies; and by calculation, planned experimentation, and simulation, assisting in the selection of the best path to the desired goal. SA/OR is particularly valuable when limited resources must be used to maximum effect. Its application is within reach of most developing countries, and it can be developed and used by local scientists and technicians. Nonetheless, SA/OR is not a panacea for the problems of less developed countries; its limitations must be taken into account.

PN-AAB-685 \$8.50

NATURAL PRODUCTS FOR SRI LANKA'S FUTURE: REPORT OF A WORKSHOP 2-6 JUNE 1975

National Research Council - National Academy of Sciences
1975, 59p.

National Academy of Sciences
National Research Council
Washington, D.C. 20418

This report presents a number of suggestions for improving continuing programs, for marshalling latent resources, and for experimenting with new food and export crops. These ideas have resulted from the pooled knowledge and experience of all the Workshop participants. Of the nearly forty plants found to warrant greater attention or use, eight are listed as projects for immediate implementation: 1) pastures and intercropping under coconuts, 2) passion fruit, 3) floriculture, 4) kenaf, 5) citronella, 6) lemongrass oil, 7) patchouli oil, and 8) vetiver oil. Also strongly recommended are the increase and expansion of research projects and areas, improved library facilities, a central laboratory for scientific instrumentation, a proposal for a Sri Lanka International Chemistry Program (SLICHEM), and preservation of plant germ plasm.

PN-AAB-686 \$4.70

THE ROLE OF LOW-INCOME RURAL COOPERATIVES IN COMMUNITY DEVELOPMENT

Williams, T. T.
1974, 6p.

Departments of Agricultural Economics and of Economics
Southern University, Baton Rouge, Louisiana 70813

(In American Journal of Agricultural Economics, Dec., 1974, p. 913-918)

A discussion of low-income, rural cooperatives, or "Emerging Cooperatives," which act as catalytic agents for community development between the people and the political machinery. The cooperatives are analyzed here from two dimensions—civic sophistication of the leadership, and economic thrust of the activities and educated awareness of the membership. Members, numbering over two million, are predominantly black, educationally disadvantaged, economically poor, and politically dispensable. Nevertheless, the Movement has proved to be an effective weapon against poverty, a motivator of community pride, and an instrument for the members' involvement in community development activities.

PN-AAB-716 \$2.00

LAND TENURE

LAND REFORM IN BANGLADESH

Zaman, M. A.
1976, 54p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

(In Land Tenure Center research paper no. 66) Free copies available from address above, *except* for request from United States, Canada, and Western Europe where copies cost \$1.00

This study describes the history of the status of landlords and tenant farmers in Bangladesh (formerly Bengal, then East Pakistan) from prior to the East India Period (pre-1765) to 1970. It presents a detailed analysis of the failure of the State Acquisition and Tenancy Act of 1950, and proposes tenancy reforms still needed to legitimize ownership of land, make rewards specific to efforts, and maximize productivity of owner-operated farms. The chief element in the proposed reform is for the government to eliminate ownership of land by noncultivators—as has largely been done in Japan, Taiwan, South Korea, and Burma—and provide each tenant farm family with ownership of at least three acres per family. Approximately two million acres are available for redistribution. Also proposed is a rate structure for government dues, graduated according to size of holdings, and a Land Reform Commission to implement the reforms. The reforms would, argues the author, increase agricultural productivity and government revenues, decrease economic injustices, and greatly diminish the possibility of "a violent course of reform" triggered by food shortages as population growth continues to outstrip agricultural production.

PN-AAB-607 \$4.30

AGRARIAN REFORM IN SOUTHERN HONDURAS

Parsons, K. H.
1976, 127p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

(In Land Tenure Center research paper no. 67) Free copies available from address above, *except* for requests from United States, Canada, and Western Europe where copies cost \$1.00

This report presents the results of a study of agrarian reform programs in southern Honduras, with emphasis on the period 1960 to 1975. The work entailed reviewing the history of Honduran land policies, interviewing officials of the National Agrarian Institute (INA), and conducting in-depth interviews with small farmers in cooperatives and asentamientos (recent agrarian reform settlements). Honduran progress in providing land for impoverished campesinos during the 1960s and 1970s has been limited. In 1962 the INA was given legal authority to distribute national land. However, the problem for campesinos and the INA has been uncertainty concerning whether unworked land invaded and planted by campesino groups is legitimately owned private land or national land appropriated by private landowners and added to their haciendas. Lucky campesino invaders are those who eventually learn that they can claim title to the land they have planted. The less lucky are those eventually evicted from land found to be indeed privately owned. The Agrarian Reform Law No. 170 of January, 1975, is more comprehensive and progressive than earlier laws. It provides for sanctioning of various types of farm settlements, and is expected to support a more aggressive and productive INA agrarian reform program.

PN-AAB-608 \$10.15

SOURCES FOR DEVELOPMENT STATISTICS, A BIBLIOGRAPHY

University of Wisconsin, Land Tenure Center, Library
1974, 142p.

Land Tenure Center
University of Wisconsin
Madison, Wisconsin 53706

SOCIAL SCIENCES

(In Training and methods ser., no. 25) Contact address above for inter-library loans.

Besides the major statistical works (current and retrospective) available in the Land Tenure Center Library, this bibliography also lists other statistical publications, such as those on specific commodities or topics, which can be located through the LTC Library card catalogue. The bibliography is arranged by continent and then alphabetically by country. Within each country the

entries are arranged in order of importance, with works containing a large number and variety of statistics cited first. Each entry has a complete bibliographical citation, listing author, title, series, place of publication, publisher, date, paging, and call number. Following each citation is a descriptive paragraph listing the type of statistics found in the work, and these also are contained in the index, which is arranged by subject.

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Journal: *Journal of the Faculty of Architecture*, a journal concerned with environmental issues ranging from man-environment relationships to architectural, city and regional planning problems, in Turkish and English. Free in exchange for other journals.

Wanda Rokicka, IERS Documentalist, UNESCO, International Bureau of Education, Palais Wilson 1211 Geneva 14, Switzerland
Journal: *Innovation*, a bimonthly newsletter for educational practitioners, especially in developing countries, reviewing innovations in education. Free to practitioners in the developing world who are willing to explain and document their educational activities.

Ms. Helen K. Kolbe, Acting Project Director, Population Information Program, George Washington University Medical Center, 2001 S Street, NW, Washington, DC
Population and Family Planning Information. USDA/USAID Reports & Technical Inquiries Staff, USDA/ERS/FDD, Room 3918 - South, Washington, DC 20250

Summary of Ongoing Research and Technical Assistance Projects in Agriculture.

Ms. Maria Cecilia P. Pinheiro, Medical Librarian, Instituto Brasileiro de Estudos e Pesquisas de Gastroenterologia - IBERPGE - (Brazilian Institute for the Studies and Research in Gastroenterology) - Rua Dr. Seng, 320 - 01221, Sao Paulo, Brazil

Journal: *Arquivos de Gastroenterologia*, a quarterly publication on digestive diseases, psychosomatic medicine, and nutrition, in Portuguese, English, French and Spanish. Free upon request or in exchange for journals on similar subjects.

Editor, Technical Studies Department, Instituto Linguistico de Verano, Casilla 2492, Lima 100, Peru, S.A.

Journal: *Comunidades Y Culturas Peruanas*, a series on Spanish folklore, ethnographic studies, and articles on bilingual education and community development, in Spanish. Free in exchange for other journals.

Registrar, The Indian Institute of Economics, 3-6-213, Himayatnagar, Huderabad, 500029, India.

Journal: *The Asian Economic Review*, a journal concerned with economic problems and inter-disciplinary writings on development issues, in English. Free in exchange for other journals on a selective basis.

Dr. Rafiq Ahmad, Editor, Faculty of Economics, University of the Punjab, New Campus, Lahore, Pakistan.

Journal: *Pakistan Economic and Social Review*, a quarterly devoted to the publication of articles concerned with the economic and social problems facing Pakistan as well as other emergent nations; is intended to serve as a means of communication among teachers, research workers, planners and administrators. Free in exchange for other journals, and in some cases may send free copies for a year.

Editor, The RDN Bulletin, Overseas Liaison Committee, One Dupont Circle, Washington, D.C. 20036.

Journal: *Rural Development Network Bulletin*, issued three to four times a year, focusing on wide range of rural development activities, emphasizing applied research and action programs, in English, French, and Spanish, free upon request.

Mr. S. Varma, Editor, Haryana Agricultural University, Hissar-125004, Haryana, India.

Journal: *Thesis Abstracts*, a quarterly abstracting journal of Masters and Doctoral theses approved for award of degrees in India, in agriculture, veterinary sciences, animal sciences, basic sciences, humanities and home science, in English. Free in exchange for abstracting journals in similar subjects.

Dr. Jock Gunter, Director, Information Center on Instructional Technology, Academy on Instructional Technology, Academy for Educational Development, 1414 22nd St., NW, Washington, D.C. 20037.

Journal: *ICIT Report*, a newsletter on uses of educational technology for formal and non formal education in Latin America, Africa and Asia. Free upon request. The Center also answers individual requests for information on the uses of educational technology for development education.

Artur Isenberg, Editor, Israel Chapter, Society for International Development, 3 Moshe Wallach Street, Jerusalem 94385, Israel.

Journal: *KIDMA Israel Journal of Development*, a periodical appear three times per year on economic, social and cultural aspects of development, with special but not exclusive reference to Israel, news briefs, book reviews, calendar of development-related events taking place in Israel. Offered in exchange for other journals. Subscription: \$9.00 for four consecutive issues, sea mail, or \$15.00 for airmail, sample copies sent gratis.

The Librarian, International Development Research Center, Geology 541, Indiana University, Bloomington, Indiana 47401.

Journals: *PASITAM Newsletter: The Design Process in Development*, a monthly newsletter announcing activities and materials of particular interest to those concerned with the application of design process to development efforts, in English. *Design Notes*, irregular publications featuring practical lessons on organizational and managerial arrangements, and other subjects relevant to the design process, in English. Both publications free upon request but exchanges are preferred and encouraged.

Hari Mohan Mathur, Director and Editor, The HCM State Institute of Public Administration, Jaipur 302004, India.

Journal: *Development Policy and Administration*, a biannual on developmental problems confronting Third World countries, India in particular, in English. Free in exchange for journals on development.

Dr. K.I. Vasu, Professor of Metallurgy, Editor, Indian Institute of Science, Bangalore-560012, India.

Journal: *Journal of the Electrochemical Society of India*, a quarterly devoted to promote the science and technology of metal finishing, surface treatments, corrosion and oxidation, electrohydro-metallurgy, batteries and general electro-chemistry, in English. Offered in exchange for other journals in metallurgy, chemistry, and electrochemistry.

Rosalvi Monteagudo, Librarian, Instituto Florestal, Coordenadoria da Pesquisa de Recursos Naturais, Secretaria da Agricultura, Caixa Postal, 1322 - 01000 Sao Paulo, Brazil.

Publications: *Silvicultura em Sao Paulo*, a biannual, *Boletim Tecnico I.F.* and *Publicacao avulsa I.F.*, in Portuguese. Free or in exchange for other journals.

Mr. Mario R. Argueta, Hemeroteca, Sistema Bibliotecario, Universidad Nacional Autonoma de Honduras, Tegucigalpa, Honduras.

Journal: *Boletin del Instituto de Investigaciones Economicas y Sociales de la Universidad Nacional Autonoma de Honduras*, a publication dealing with economics and political science, in Spanish. Free in exchange for other journals.

Hamilton Nonato Marques, Instituto de Planejamento Economico e Social (IPEA/INPES, caixa Postal 2.672, ZC-00 - CEP 20.000, Rio de Janeiro, Brasil.

Journal: *Brazilian Economic Studies - BES* a periodical on the economy of Brasil, including international trade, public sector, industrial growth, agricultural modernization, training and absorption of manpower, and urban and regional development, in English. Free in exchange for other journals.

General Secretary, Dr. Alam Singh, Indian Society of Desert Technology, Civil Engineering Block, Faculty of Engineering, University of Jodhpur, Jodhpur, India.

Journal: Semi-annual transactions, in English, free in exchange for publications dealing with desert technology, aridzone, and allied subjects.

DONATIONS OF PUBLICATIONS SOLICITED: The recently formed Indian Society of Desert Technology solicits donations of publications or research reports regarding desert problems of arid and semi-arid zones. Dr. Alam Singh, Indian Society of Desert Technology, Civil Engineering Block, Faculty of Engineering, University of Jodhpur, Jodhpur, India.

Mrs. B. Chopra, Xavier Labour Relations Institute, Post Box 47, Jamshedpur 831001, Bihar, India.

Journal: *Management and Labour Studies*, a bi-annual publication devoted to professional and academic knowledge on problems of management and labour, ranging widely from "Production" to "Communication", in English. Offered free in exchange for journals in relevant areas.

K.G. Tyagi, Documentation Officer, Indian Council of Social Science Research (SSDC), 35 Ferozshah Road, New Delhi-110001, India.

Journals: *ICSSR Research Abstracts Quarterly*, a quarterly supplying abstracts of research reports in the social sciences (subscription-US\$2.50); *Indian Dissertation Abstracts*, quarterly synopses of PhD theses in the social sciences (subscription-US\$3.00); *Indian Psychological Abstracts*, bi-monthly abstracts of research work done in the discipline on Indian themes (subscription-US\$18.00); *ICSSR Journal of Abstracts and Reviews: Sociology, Social Anthropology, Criminology, and Social Work*, half-year reviews of publications in the broad fields indicated in the title (subscription-US\$18.00); *Journal of Abstracts and Reviews*, about Geography; ICSSR Newsletter and *ICSSR Annual Report*. All ICSSR journals available free for exchange for journals in the social sciences. Contact Mr. Tyagi for details.

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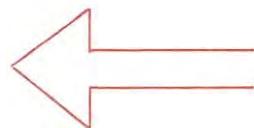
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