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A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS



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SAMPLE DOCUMENT CITATION AND ABSTRACT

Item Number & Title ———— [(171) WHEAT X RYE EQUALS TRITICALE

Document Date & Number of Pages ———— [Wolff, Tony]
[1976, 15p.]

Series Note ———— [CIMMYT (AID/ta-G-1083 GTS)]
[In CIMMYT today, no. 5]

Abstract ———— [Triticale, a new crop bred at CIMMYT, is a cross between wheat and rye. It is the first successful "man-made" cereal grain. It is more than a biological curiosity. For the tropics and subtropics, it offers promise of yields and other characteristics equal to those of wheat, combined with tolerance for drought and poor soil and the resistance to disease typical of rye. The success of triticales encourages the hope that other such intergeneric "wide crosses" will soon follow. Triticale has demonstrated an adaptation to acidic, low pH soils in several areas of the world. Such conditions exist in Colombia, Ethiopia, Northern India, and Brazil. In each of these countries triticales have shown yield performance superior to wheat. The resistance of triticales to bunts and loose smut at higher elevations is an advantage for the crop. Its greater resistance to *Septoria tritici* is an added advantage in areas where this disease is prevalent—Brazil, Argentina, Ethiopia, and the Mediterranean region. In Kenya and some other locations, triticales has outyielded wheat under drought conditions. Experts expect that in fifteen years triticales will be competing seriously with the bread wheats as one of the world's most important food crops.]

Publication Number ———— [PN-AAD-154]

Author(s)

Issuing Office & Contract/Grant Number or Symbol

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

When completing order forms at the rear of this issue, be certain to use the Publication Number.

PART I: POPULAR R&D DOCUMENTS ANNOUNCED IN ARDA

AGRICULTURE

AGRICULTURAL DEVELOPMENT

(001) RURAL DEVELOPMENT AGENCIES AS DECISION MAKERS

Brown, D. W.
1968, 16p.

Tenn (CSD-1927 211(d))

The problem of choice which confront rural development agencies in working out the broader aspects of program content and approach as well as their implementation, suggest various actions that social scientists of all kinds could take to help officials and technicians make more effective decisions. In exploring these problems, the following topics are considered: change-agency decisions as resource allocation, making program choices, operational steps for evaluating program alternatives, clarifying and weighing program objectives, the importance of considering human responses, some complicating realities, and putting plans into action. It was found that more research is needed to determine the success or failure of rural development programs already undertaken, and a study of ways for professional advisers, planners, and researchers to be of more effective help to action programs would be very worthwhile. There also needs to be better communication of research findings and simplification of decision-making concepts for use by the research development staff, and national planners and policymakers must perceive more clearly the realities of program design at operational levels.

PN-AAB-956

(002) DESIGNING AND MANAGING BASIC AGRICULTURAL PROGRAMS

Kulp, E. M.
1977, 269p.

MUCIA (CSD-2958 211d)

A systematic and highly readable workbook of techniques for designing and managing basic agricultural programs. It is dedicated to the 700 members of the Izaula-Igogero Growers Cooperative Society, Busoga District, Uganda, who demonstrated vigorously how very rapidly a two-hectare farmer can acquire a taste for innovation and development. The book has four major parts: Fundamental Concepts (basic systems concepts, agricultural development systems dynamics, policy essentials); Farm-Level Analysis (the farm model, selection of innovations, programming technique); Project Formulation (project policy options, project pacing and outputs, project inputs, project financing); and Implementation Planning and Control (management of field agents, scheduling the organizational dimension). The book is designed for practitioners and prospective practitioners—for agricultural planning specialists, project designers and managers, district and provincial agricultural officers, rural development officers, and students preparing for practical work in agricultural development. The book stresses *techniques*. A serious engagement with it will give the user considerable competence in certain concrete methods of analysis. But techniques have a way of capturing the game, of defining the situation, of diverting the mind from important matters the techniques themselves do not address. Therefore, they have to be

applied carefully, with due regard for the way things work in a particular society and community. With careful application, the techniques can be used to design and implement practical arrangements for improving the conditions of peasant agriculture and its practitioners.

PN-AAC-868

(003) RURAL DEVELOPMENT: THE INTERPLAY OF ANALYSIS AND ACTION

Mann, A. G.; Miracle, Jan
1975, 75p.

MUCIA (CSD-2958 211d)

A collection of five papers on the roles of analysis and action in rural development, by W. J. Siffin, G. Johnson, J. P. Gittenger, P. Lyman, and R. Blue. This publication is both exploratory and experimental. It explores certain themes and concerns that lie along the edges of more conventional statements about aspects of rural development. In practice, a lot of the "thinking" about rural development tends to be much separated from the "doing." Thus one prime concern of those who would promote the development of rural areas in poor countries ought to be in the interplay of analysis and action. Two crucial needs are to strengthen that interplay and to enlarge the ambit and potency of analysis so that it leads toward more effective strategies of action. The material in this publication is drawn from a pilot workshop on rural development conducted under PASITAM auspices at Michigan State University in 1974. The aim of the workshop was to explore the potentials for relating knowledge about "institution building" and "technical assistance methodology" to some central concerns in the field of rural development. Much of what was said at the workshop was conventional, and is not included in this publication. Some of the novel materials are included—the discussion of certain practical problems of the relation between analysis and decision-making. They display such things as the assumptions embedded in certain forms of analysis and some of the working relationships between producers and the sometime consumers of analysis products.

PN-AAC-931

(004) APPROACHES TO THE DESIGN OF AGRICULTURAL DEVELOPMENT PROJECTS

Schaefer-Kehnert, Walter
1977, 16p.

MUCIA (CSD-2958 211d)

A brief and trenchant paper that addresses the question of the best way to organize agricultural development projects. Discussed are the three possible approaches to the design of such projects—by sector, by function, and by area. Those are discussed in terms of which is more likely to work under a given set of circumstances. Six factors that have important effects of a project's success are then presented. The three prospective ways of designing projects are then examined in terms of their compatibility with the factors influencing success. The result is a cogent set of statements to guide those who would design projects, and do so with the opportunity to choose from among alternative approaches. The six project feature determining success are stated as (1) Simplicity and clarity of the objectives; (2) Availability of an economically attractive

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technology to promote the product; (3) Integration of the basic production services, especially those of extension, input supply, credit, and marketing; (4) Access to the necessary specialists and provision for the training of needed personnel; (5) The ability to recognize potential constraints and to design contingency plans to overcome them; and (6) Compatibility of the project with existing administrative structures. Compliance with these criteria does not guarantee project success, since even a well-designed project can fail because of bad management. But it is unlikely that a badly designed project can be made successful only through good management.

PN-AAC-932

(005) AN APPROACH FOR ASSESSING RURAL DEVELOPMENT PROJECTS: PT. 1, BASIC FRAMEWORK AND METHODOLOGY; PT. 2, AN ILLUSTRATIVE APPLICATION

Green, H.A.

1976-1977, 151p.

Census (COM/CEN 3-75 GTS)A

An illustrative framework and methodology designed for projects imbedded in complex systems and characterized by dynamic interrelationships. The analytical approach entails five major steps: 1) delineation of decision points and objectives; 2) delineation of project activities; 3) delineation of socioeconomic and technical structure (i.e. the direct and indirect relationship of project inputs and assumptions to the objectives); 4) determination of key variables (or parameters) and data requirements; and 5) impact analysis and evaluation by dynamic benefit/cost methods. Part I presents the basic framework and methodology of the approach, while Part II presents an illustrative empirical application to the North Shaba (Zaire) Maize Production Project.

PN-AAC-951

(006) ORGANIZING FOR AGRICULTURAL DEVELOPMENT; HUMAN ASPECTS IN THE UTILIZATION OF SCIENCE AND TECHNOLOGY

White, W. F.

1975, 67p.

Cornell (CSD-3158 211d)

Agricultural scientists and behavioral scientists must search together for the solutions to problems of food shortages and rural development. In a review of those problems and the achievements of the green revolution, this report diagnoses the past deficiencies of behavioral scientists' efforts to meet the demands for social and economic knowledge of rural development. After disproving some of the "myths" held by those scientists, the book builds an organizational framework for studies of agricultural development designed to advance both theory and practice. Recognizing the human element, it outlines strategies for research and agricultural development, and in the final section it draws parallels and implications between development and organizational behavior.

PN-AAD-302

(007) MANAGING PLANNED AGRICULTURAL DEVELOPMENT, A REFERENCE BOOK

Waterston, Albert; Governmental Affairs Institute, Washington, D.C.

1976, 624p.

GAI (CSD)-3630 GTS)

(APPEN., 116p.: PN-AAD-679)

A basic problem with planned agricultural development in LDCs is that central planners specify what must be done to achieve targets without specifying how, by whom, and when. A great gap exists between government officials and tradition-bound farmers. The objective of this reference work is to help bridge the gap by providing information for improving the capabilities of planners on the regional and local levels. It concentrates on materials that can improve decision-making in the management of agricultural plans and programs. The materials are derived from an analytic review of more than 1,700 reports and articles describing how agricultural projects were successfully implemented. Sections of the book deal with the following topics: the link between agricultural and overall planning; types of agricultural development; the stocktaking and diagnostic survey; setting targets and allocating resources; selecting agricultural development strategies; policy and policy instruments; financing agricultural plans; design and evaluation of projects; organization for planned development; extension and research; education and training; consultancy services; and monitoring, reporting, and control.

PN-AAD-678

PN-AAD-679 (Appendix, 116p.)

(008) CREATING RURAL EMPLOYMENT, A MANUAL FOR ORGANIZING RURAL WORKS PROJECTS

Thomas, J. W.; Hook, R. M.

1977, 150p.

Harvard (AID/otr-C-1417 Res.)

This manual for policy makers and program administrators organizes the lessons of international experience with rural works programs so that they can be applied to the policy making and implementation process of specific countries. It covers the potentials and limitations of such programs, provides guidelines for deciding the effectiveness of a program in a particular area, and considers the major issues surrounding these programs. It also suggests organizational arrangements that will enhance the chances of success for such programs, and it provides criteria for judging their performance. There are two major sections. The first deals with planning rural works programs and the second with the implementation of programs. The research was based on an analysis of 24 existing programs, and this report summarizes that experience in ways which apply to new and existing programs. This report holds that rural works programs are useful instruments of development policy and should be considered by any country concerned about rural unemployment and poverty.

PN-AAD-892

(009) HOW COMMERCIAL BANKS FINANCE SMALL FARMERS THROUGH AGRICULTURAL CREDIT COOPERATIVES IN INDIA

Ames, G. C. W.
1976, 8p.

Tenn. (CSD-1927 211(d))

A review of how well nationalized commercial banks in India meet the needs of small farmers in Karnataka State by providing financing through cooperatives, and what adjustments are needed. Commercial banks have had mixed success in providing financing through cooperatives for farmers with small landholdings. In Karnataka State, commercial banks financed about 39 percent of the members of their cooperatives. Several reasons account for the failure of lending institutions to provide loans for most small farmers. First, commercial banks are conservative in their loan policies. They have had little previous experience with cooperatives and agricultural financing. Secondly, the lack of resources of most small farmers prevented them from obtaining adequate financing. Finally, to safeguard the rate of loan repayments, lending institutions concentrated their loans in a few cooperatives. Several policy changes could make crop production loans to small farmers through cooperatives more attractive to commercial banks. If commercial banks were provided subsidies for paying the managerial costs of paid secretaries at the cooperative societies, overhead costs of making and collecting small agricultural loans could be reduced. Also, administrative confusion occurs between commercial banks and district cooperative banks over responsibility of financing cooperatives in districts where both banks operate. This leads to delays and higher costs, which discourage farmers from seeking loans. The confusion also adds to repayment problems.

PN-AAB-958

(010) EVALUATION OF FACTORS AFFECTING THE RATE OF ADOPTION OF IRRI SMALL FARM EQUIPMENT

Becker, A. L.; Butcher, W. R.; Feise, C. F.; Ulinkski, C. A.
Washington State Agricultural Economics Department
1975, 125p.

Wash. State (AID/ta-C-1242 GTS)

A study of mechanization on small rice farms in the Philippines. It included all phases of the mechanization process from research and development to manufacturing, distribution, adoption on farms, economic adjustments and adaptations and government policies. Objectives were: 1) to evaluate the extent to which the IRRI agricultural machinery development program is helping to bring about mechanization in the Philippines; 2) to identify political, social, economic, and cultural conditions which have encouraged or inhibited the adoption of small-scale mechanization in the Philippines; 3) to assess the positive and negative socio-economic impacts of mechanization on small farms; and 4) to determine the kinds of problems that may be encountered in both domestic and international transfer of technology. From the findings, recommendations were made to continue the IRRI program in mechanization for small rice farms with more emphasis on: 1) developing and introducing smaller and less expensive implements and machines, 2) integrated systems for producing

more than one crop per year on existing lands, and 3) improving national capability for extension activities. The Philippine government also is encouraged to increase and improve extension/education programs, assistance and supportive policies; conduct manpower and employment analyses; and extend availability of credit to small farms and businesses.

PN-AAC-133

(011) CREDIT FOR SMALL FARMERS IN DEVELOPING COUNTRIES

Donald, Gordon
1976, 298p.

AID/PPC/PDA

A compilation of Spring Review reports and papers commissioned by USAID for its 1972-1973 assessment of credit programs for small farmers in developing nations. Sixty reports and 20 analytic papers were commissioned by USAID in accordance with a design that combined a world-wide survey of credit programs with an exploration of analytical and policy considerations. The introductory section of the book reviews the ways in which small-farmer credit programs have been undertaken in USAID, along with the evolution of thinking within USAID that led to the decision to conduct the comprehensive review. Part II, on the role of credit, contains chapters on the conditions for success of small-farmer credit programs; the relations between technology, profit and agricultural credit; financial management and the small farmer; cultural and social factors in small farmer credit; and credit program goals and evaluation of program results. Part III, on financial institutions and policies, has chapters on rural capital markets, institutional interest rates, banking practices and possibilities for reform; the default question; and the savings component in a credit program. Part IV contains chapters on marketing, farmers' organizations, and technical services in agricultural innovation. Part V, on strategies, has chapters on subsidies and their justification, strategic choices, and experimental innovation and research. Appendices include a reading list, a list of contents of the Spring Review volumes, and an alphabetical index of authors and countries included in the review that led to the contents of this book.

PN-AAC-272

(012) SOME ASPECTS OF LABOUR USE IN INDIAN AGRICULTURE

Mehra, Shakuntla
1976, 32p.

Cornell (AID/ta-C-1131 Res.)

(In Occasional paper no. 88)

An examination of three leading factors of labor use in Indian agriculture: the influence of cropping patterns, technology, and farm size on employment. These three factors in turn influence the variations in cropping intensity — an important source for expanding employment opportunities. The study found that irrigation has a large potential for increasing employment, even where the development of high yield varieties has lagged. Seed-fertilizer technology also has increased labor use, but because its spread has been accompanied by mechanization, the substitution of capital for labor has reduced rather than enlarged the need for labor, in turn offset by a shift from less labor-intensive to more labor-intensive crops.

PN-AAC-793

AGRICULTURE

(013) UNEMPLOYMENT AND UNDEREMPLOYMENT IN THE RURAL SECTORS OF THE LESS DEVELOPED COUNTRIES

Brannon, R. H.; Jessee, D.L.
1977, 94p.

AID/TA/AGR/ESP

(In AID/TA/AGR occasional paper no. 4)

Most poor people in less developed countries live in rural areas and have not been reached by development programs directed primarily toward increasing the Gross National Product. This paper is a comprehensive overview of the problems of unemployment and underemployment in LDCs, with a description of approaches to alleviate this situation. The long-term solution is increased job opportunities; however, short-term solutions are not obvious. The capacity of a country's agricultural sector to absorb labor is affected substantially by land-holding patterns, level of technology employed, physical resources, markets for agricultural commodities, and government agricultural policies. Existing studies suggest that most forms of mechanization tend to reduce on-farm employment. However, better information is needed concerning the long-term impacts of mechanization on cropping patterns, land-use intensity, total output, and net employment under specific social, cultural, and economic conditions. The "green revolution" technology generally increases labor requirements per unit of land. Institutional constraints on increased employment include factor price distortions due partly to tax and/or trade policies that tend to 'underprice' capital and some aspects of labor legislation that have the effect of 'overpricing' labor. Some approaches to increasing rural employment include more investment in rural infrastructure, investment in labor-intensive rural public works programs, industrial decentralization, and promotion of cottage industries.

PN-AAD-129

(014) UNEMPLOYMENT AND UNDEREMPLOYMENT IN RURAL SECTORS OF THE LESS DEVELOPED COUNTRIES, A BIBLIOGRAPHY

Jessee, D. L. ; Brannon, R. H.
1977, 154p.

AID/TA/AGR/ESP

(In AID/TA/AGR/ESP. Occasional paper no. 6)

This bibliography is based on a literature search done for the preparation of papers for USAID and USDA which dealt with rural sector unemployment and underemployment in less developed countries. Four major subject areas are treated: the nature and scope of employment and income problems; technological impacts upon employment and income; agrarian sector policies designed to increase employment and income; and general discussions of the roles of the rural sector and other sectors in regional or national economic development. These four areas are further divided into 13 topical areas arranged by geography. The literature, all written within the last 20 years, is limited mainly to available English language publications and to a selected number of journals, books, and publications of major international organizations. Documents which are not specific to a region and

which have useful information are organized into sections titled "In General" at the beginning of each topic. Some works are cross-listed among topics. The emphasis, in this collection of over 1400 works, is upon those materials which provide economic analyses and interpretations.

PN-AAD-793

AGRICULTURAL RESEARCH

(015) INT. CONF. ON CROP PRODUCTIVITY--RESEARCH IMPERATIVES, HARBOR SPRINGS, MICH., 1975

Mich. State Univ. Agr. Experiment Station; Charles F. Kettering Foundation
1975, 408p.

(AID/ta-G-1216 GTS)

(Executive summary of this volume, 48p. available as PN-AAC-274)

The Conference focused on the fundamental biological processes that control productivity of economically important food crops. It was recognized that increased productivity must come with a husbanding of non-renewable resources and that a reduction in food losses indirectly would improve crop productivity by getting food already produced into use. Six discussion groups addressed issues involving: Nitrogen Input; Carbon Input; Water, Soil, and Mineral Input; Plant Protection from Pests; Environmental Stress (air, water, salinity, temperature); and Plant Development Processes. Issues of common concern to and general recommendations of the six groups were: 1) develop mechanisms for rapid and effective transfer of available technology; 2) provide manpower and fiscal resources on a sustained basis; 3) encourage interdisciplinary education; 4) strengthen support for the basic plant sciences; 5) intensify and expand international efforts toward the preservation, conservation, and interchange of genetic resources; 6) broaden the range of parameters in plant breeding research; 7) determine the most efficient balance between non-renewable energy and human labor in relation to increased food supply; 8) develop integrated pest management systems for stable crop production at high levels suited to various styles of agriculture; 9) establish an international center to investigate the inter-relationships among photosynthesis, biological nitrogen fixation, plant improvement, and plant culture; and 10) establish a temperate zone international institute for improvement and culture of labor-intensive food crops.

PN-AAC-262

(016) FIELD DATA COLLECTION IN DEVELOPING COUNTRIES, EXPERIENCES IN ASIA

Lynch, Frank
1976, 20p.

ADC (CSD-2813 GTS)

(In RTN sem. rpt. no. 10)

Reports on a seminar-workshop conducted in Singapore in October, 1974; with 27 scholars from 10 Asian countries. Five working groups were formed to discuss papers presented and to identify important issues and problems of data collection in developing Asian countries. The groups were charged with considering five subjects: research design, sampling units, data collection procedures and instruments, field management, and intensive studies of the rural community. Group 1 identified three

problems. First, survey researchers are prone to use readily available concepts and instruments without adapting them to the local setting. Second, they need to associate more closely with government and private planners and administrators. Third, they need to consider very carefully their responsibilities toward respondents, to protect their rights. Group 2 discussed several technical questions concerning sampling frames, valid inductive inferences, means of obtaining a representative cross-section of a village, and stratification strategies. Group 3 affirmed the value of group interviews, discussed problems of translation and intercultural equivalents, and the need for caution in using Yes/No questions with respondents among peoples who have a "courtesy bias" against saying "No" to a question. Group 4 discussed and reported on interviewing problems and innovations in interviewing procedures. Group 5 affirmed the value of intensive community studies. It also discussed the expanded role of the modern social scientist. In a session concerned with discussion of future activities, the participants expressed the need for studies aimed at probing and possibly redefining key concepts important for research in Asia, along with development of procedures for applying them.

PN-AAD-078

(017) STATISTICAL PROCEDURES FOR AGRICULTURAL RESEARCH WITH EMPHASIS ON RICE

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

IRRI (AID/ta-G-1074 GTS)

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

PN-AAE-505

PLANT PRODUCTION

(018) GUIDE FOR FIELD CROPS IN THE TROPICS AND THE SUBTROPICS

Litzenberger, S. C.
1974, 321p.

AID/ta/AGR

This Field guide is offered as convenient aid to achieving more efficient production of selected crops in less-developed countries of the tropics and subtropics. It is oriented specifically toward the small farmer rather than toward plantation agriculture, because it is the small farmer who will continue to produce most of the foods

for total consumption in both the urban and rural sectors. The Guide is made up of 40 chapters. The first four are general introductory chapters and treat rather extensively climate, soil, cropping, and farming systems as related to the tropics and subtropics. The other 36 chapters are divided as follows: six on cereal crops, nine on food legumes, six on oil crops, seven on root or tuber crops and bananas, six on major fiber crops, and two on other cash crops. These chapters do not attempt to deal with the factors of providing inputs such as national supplies of fertilizer, insecticides, and fungicides. Credit and marketing also are not covered and at the most, only brief mention is made of the ultimate utilization of the crops. The Guide covers only the physical and biological aspects of production with the intention of providing a sound base for applying the economics and social factors needed for good agricultural development.

PN-AAB-952

(019) ROOT-KNOT NEMATODES, MELOIDOGYNE SPP.: PROCEEDINGS OF A CONFERENCE

North Carolina State, Department of Plant Pathology
1976, 110p.

N.C. State (AID/ta-C-1234 Res.)

At this conference, the six overseas laboratories (Southeast Asia, South America, Central America, and Mexico, West Africa, East Africa, and Brazil) were represented by a regional investigator who reported on his particular area. Several consultants and scientists from the U.S. reviewed the basic aspects of the genus, such as taxonomy, morphology, host studies, ecology, diseases, and breeding. These reports and technical discussions are reproduced here. These cooperative research efforts should provide a better understanding of the biological behavior of one of the world's major crop pests. Such behavior is influenced not only by the genetic and biochemical make-up of the organism, but by pressures imposed by various environmental influences. The more known about the nematode and these environmental influences on disease development, the more likely conditions can be provided favorable to the host plant and less or unfavorable to the nematode.

PN-AAC-129

(020) CROPS OF THE WEST AFRICAN SEMI-ARID TROPICS

Kassam, A. H.
1976, 159p.

ICRISAT (AID/ta-G-1073 GTS)

Diseases and pests affecting 23 crops grown in the West African Semi-Arid Tropics are discussed along with ecology and cultivation practices. This volume is intended to help those concerned with establishing a safe, stable, and prosperous agriculture in the Savanna zone of West Africa. The crops are discussed in six groups: Cereals (sorghum, millet, maize, rice, wheat); Legumes (cowpea, groundnut, soya bean); Roots and Tubers (cassava, yam, sweet potato, cocoyam, potato); Vegetables (tomato, onion, pepper, okra); Fibers (cotton, kenaf, roselle); and Other Crops (sesame, tobacco, sugarcane). Some points made in

AGRICULTURE

the introductory discussion of crop production in the West African Savanna: the productivity per unit area of land is low. In areas of high population density, productivity has decreased in recent years because of a decline in soil fertility, overgrazing, and soil erosion. There appears little room for improvement in productivity without an increase in the resources and services. The application of improved technology will have little impact on production without parallel improvements in support facilities and incentives.

PN-AAD-120

(021) FIELD PROBLEMS OF RICE IN LATIN MAERICA

Cheaney, R. L.; Jennings, P. R.

1975, 98p.

CIAT (AID/ta-C 1177 GTS)

(In Serv. GE-15)

Designed to help farmers and technicians identify the most common insect, disease and soil problems of rice in Latin America, this manual discusses all major field problems of rice production and touches on minor ones. The focus is on 17 insect problems, mites, and both pathogenic and nonpathogenic diseases. Other damaging agents — herbicides, rodents, and birds — and their symptoms are described, and the effects of an undersupply of chemical elements and of chemical toxicity are explained. Several controls and corrective measures are indicated. Illustrated.

PN-AAD-200

(022) FIELD PROBLEMS IN CASSAVA

Lozano, J. C.; Belloti, A.; Van Schoonhoven, A.; Howeler, R.;

Doll, J. D.; Howell, D.; Bates, T.

1976, 127p.

CIAT (AID/ta-G-1269 GTS)

Field production figures for cassava are relatively low due to diseases and pests, nutritional deficiencies and misuse of herbicides. This report responds to the need for information in these areas by describing symptoms of attack by pathogenic agents and physiological problems. Eighteen important diseases, fourteen common pests, and several problems related to nutritional deficiencies and toxicities are described, each illustrated by a color plate. Symptoms of damage caused by herbicides are explained, and recommendations outlined regarding disease and pest control.

PN-AAD-201

LIVESTOCK/POULTRY

(023) COMBINED CROP/LIVESTOCK FARMING SYSTEMS FOR DEVELOPING COUNTRIES OF THE TROPICS AND SUB-TROPICS

Sprague, H. B.

1976, 35p.

AID/ta/AGR

Developing countries should be encouraged to establish farming systems that provide a combination of crop production enterprises and livestock production enterprises. The bulk of the basic food supplies of agrarian nations is produced by many farmers with tiny landholdings. Improved productivity and income for these rural people requires use of new high-yielding, science-based crop and

animal production systems tailored to the unique combination of soil, climate, biological, and economic conditions of every locality in every nation. There is need to more fully utilize national resources available to agriculture, including development of livestock enterprises in farming systems that are now largely devoted to the production of crops. Benefits to be derived from including livestock enterprises in farming systems of the tropics and subtropics are many: This allows for more effective use of natural resources of climate, land, soil, and vegetation. Feeding livestock crop residues and by-products to livestock converts them to food stuffs for human consumption. Livestock produce milk and milk products, meat for sale, and animal power for crop farming. Animal manures provide fertilizer for improving soil productivity. Livestock forage crops grown in rotations to control erosion, weeds, and pests improve soil fertility. And livestock enterprises stabilize seasonal and yearly food production, labor and power requirements, and net farm income. Crop and livestock enterprises should be mutually beneficial when they employ currently available technology. Heretofore the production of grains and certain export crops has tended to monopolize the attention of both country governments and external assistance agencies. However, the current interest in overall agricultural development, with food production as the prime goal or major factor, has improved opportunities for exploiting the advantages of mixed farming systems.

PN-AAC-623

(024) TEACHING GUIDE IN POULTRY MANAGEMENT

Hess, Oleen; Pacariem, R. C.; Kugler, H.L.

1959, 194p.

AID/ASIA/USAID/Philippines

This guidebook is designed to assist teachers in Philippine agricultural schools in preparing lesson materials for training students in better methods of poultry production. Its introductory section discusses such topics as site selection, selecting and obtaining chicks, obtaining chicks suited to one's intended purposes, crosses between types, and setup procedures. The next section, on incubation, turning eggs, testing eggs, putting out the hatch, and natural incubation. Next, the section on brooding discusses selection and management, types of brooders, management of the brooder, types of floor brooding, natural brooding, feeders, waterers, feeding recommendations, and general management of chicks. A section on raising pullets discusses the barrio, range rearing, preparing laying house for pullets, and carrying pullets. An extensive section on the management of a laying flock includes discussions of housing, construction of buildings, roofing, laying house equipment, feeding, determining ration ingredients, proteins, minerals, vitamins, antibiotics, ration mixtures, producing and marketing quality eggs, producing hatching eggs, upgrading, manure handling, and culling. A final section on poultry diseases and their prevention discusses a health program, immunization, parasites, and nutritional disease.

PN-AAB-963

PN-AAG-651 (1978, 119p.)

DEVELOPMENT ASSISTANCE

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

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

NAS (CSD-2584 GTS)

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

(026) EDUCATIONAL ALTERNATIVES IN NATIONAL DEVELOPMENT, SUGGESTIONS FOR POLICY MAKERS

Case, H.L.; Niehoff, R. O.
1976, 64p.

Mich. State (AID/CM/ta-C-73-22 GTS)

(In Program of studies in non-formal education, supplemental paper No. 4)

Background information, questions, and comments about rent trends in development theory and practice and their impact on education. To prepare this monograph, the authors used their personal experience, previous publications in this series, and various studies focusing on educational planning in human resource development. The study examines the drawbacks of the present formal school programs and the fiscal possibilities of expanding them and creating new programs. Non-formal education is discussed in terms of process, teaching method, motivation, appraisal, and other characteristics. It was found that the involvement of urban and rural poor in various educational activities needs to be widened to include improving living standards, political participation, and general development. Non-formal education methods were seen as often better adapted to current needs than are formal methods. An integrated national policy and program of education is essential, with the universities as full partners, as well as with the help of volunteer agencies.
PN-AAB-947

(027) SOME PROBLEMS IN THE ANALYSIS OF URBAN PROLETARIAN POLITICS IN THE THIRD WORLD

Berg, Elliot
1976, 19p.

Mich. (CSD-2547)

(In Discussion paper no. 48)

This paper assesses the link hypothesized by Marx and his

followers between capitalist economic development and the emergence of sizable and politically progressive urban proletariat capable of mobilization for revolutionary change. It pays special attention to issues of definition (who is the proletariat?) and to explication of the mechanisms linking economic development, industrialization, and radicalization of the proletariat, discussing the extent to which these mechanisms are operative in mature capitalist societies and Third World countries today. This study is a development of remarks made at a panel discussion of urban proletarian politics during the 1972 meetings of the American Political Science Association.

PN-AAC-126

(028) A METHODOLOGY FOR INDICATORS OF SOCIAL DEVELOPMENT, FINAL REPORT

Wilcox, L. D.
1977, 92p.

Iowa State (CSD-3642 Res.)

(In Sociology rpt. no. 127)

There is a growing interest in social planning in developing countries where development planning is concerned with instigating social changes considered necessary for self-sustaining economic growth and national development. Most social indicators have been designed for use in statistically advanced countries. It is necessary to design and implement social indicators adapted to the needs of development planning and social policy in less developed countries. This is a review and analysis of recent methodological approaches to social indicator design and development, coupled with a general inventory of operational indicators that are applicable to sector planning in the areas of health, nutrition, education, demography and agriculture. The primary objectives of the review are to identify methodological approaches for the selection, design and use of social indicators applicable to the planning contexts of less developed countries and to assemble a compendium of measures proposed as indicators for sectoral planning. The orientation of this report is toward an analysis of the selection and design of indicators, and it argues that an operational or problem oriented approach to social indicator development may prove more beneficial to less developed countries than the social accounting and social systems approaches advocated for more statistically developed countries. There is a brief description and analysis of current social indicator research and its applicability to the needs of less developed countries. The remainder of the report focuses on the development of some of the basic methodological problems and procedures of an operational or policy-oriented approach to social indicator design.

PN-AAD-270

(029) A METHODOLOGY FOR INDICATORS OF SOCIAL DEVELOPMENT; REPORT 2: AN ANALYSIS OF SELECTED A.I.D. OPERATIONAL INDICATORS AND CONCEPTS

Wilcox, L.D.; McIntosh, W. A.; Byrnes, K. J.; Callaghan, John; Hunter, S. M.; Kim, Song-min; James, Rowena
1973, 86p.

Iowa State (CSD-3642 GTS)

(In Sociology rpt. no. 116)

The major objective of this project was to evolve a methodology

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that could be used by developing countries to construct indicators of social development for monitoring progress of social development as each country defines it. The analysis in this report is based on a taxonomy of six indicator types (policy descriptive, non-manipulatable, output, output distribution, impact and response), and on specific conceptualizations of society, social development, and indicators of social development. Four sectors were specified — agriculture, education, health, and public administration- and the agriculture sector is discussed in this report. Working definitions for the following key concepts were constructed: indicator, social indicator, project achievement indicator, system, subsystem, society, institution and social development. The level of analysis of social development and indicators of social development was designated as the inter-institutional or societal level. An inter-institutional hypothetical model is presented which allows societal analysis through the study of the interchanges among various societal institutions.

PN-AAD-028

(030) A METHODOLOGY FOR INDICATORS OF SOCIAL DEVELOPMENT, SUPPLEMENTARY REPORT 3: THE SMALL FARMER AGRICULTURAL SECTOR

Byrnes, K. J.: Shadi-Talab, Jaleh
1976, 102p.

Iowa State (CSD-3642 Res.)

(In Sociology rpt. no. 127)

Improved social indicator information is needed in order to make and evaluate decisions on program design, priorities, and coordination for the small farm sector. A model of the small farm system is developed here by focusing on socioeconomic and other important variables that affect the decision making of small farmers. On the basis of this model, a number of indicators are recommended for less developed countries to use to monitor social change in the small farm sector. There is also a discussion of ways indicator data may be tabulated. The authors emphasize nine social dimensions of small farm holding as conceptualized in terms of a simple small farm system model. These dimensions are the nutritional quality of farm family's diet, income and cash flow received by farm family, utilization efficiency of commodity disposition resources, production and productivity per unit of operation, productive potential of unit of operation, level of employment in agriculture, utilization efficiency of production input resources, utilization of agri-support system services, and employment in non-agricultural activities. Positive change along one or more of these dimensions would constitute, from the standpoint of national development planning, beneficial change at the level of the small farm holding.

PN-AAD-271

(031) A METHODOLOGY FOR INDICATORS OF SOCIAL DEVELOPMENT; REPORT 4: HEALTH SECTOR INFORMATION SYSTEM

Callaghan, John; Wilcox, L.D.; Byrnes, K. J., Hunter S.M.; Kim, Song-min
1974, 94p.

Iowa State (CSD-3642 GTS)

(In Sociology, rpt. no. 121)

An outline of the initial framework of a health information system

for developing countries. The components of this system are simple indicators which relate to both stocks and flows and incorporate measures of health status based on mortality, life expectancy, morbidity and disability, and malnutrition. Consideration is given also to measure of health facilities, services, finances, and personnel, and to the access and distribution of these from the perspective of various socio-demographic categories of the population. Such health-related factors as population, environmental quality and resources, agriculture and food production, income and consumption, education, housing, and shelter are discussed, and brief mention is made of suitable procedures which may be used to generate simple indicators of health status where demographic and health statistics are incomplete.

PN-AAD-029

(032) SYSTEMS TOOLS FOR PROJECT PLANNING

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 296p.

MUCIA (CSD-2985 211d)

"This volume is a collection of techniques drawn from a variety of disciplines and presented in a standard format in order to bring together various means to a common end—better development project design. The organizing theme is a systems approach to project planning. The techniques are means to developing project designs which are comprehensive, future-oriented, and pragmatically shaped by the realities of power and uncertainty."

PN-AAD-365

(033) GENERATING IDEAS (FOR PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 62p.

MUCIA (CSD-2985 211d)

(In Systems tools for project planning, chart 1, p. 1-26)

Chapter 1 covers six techniques of use to project planners for gathering information from clients, experts, and decision makers and for generating ideas and alternatives. The techniques include interacting group processes (Brainstorming, Synectics, and Nominal Group Techniques). Brainstorming and Synectics are group creative processes used to generate ideas in response to a stated problem. The Nominal Group Technique is a group process for drawing forth opinions about an unstructured problem and ranking the responses in the order of importance. Morphological Analysis is a method of systematically analyzing a problem and synthesizing alternatives. This method involves breaking a problem down into its elements and identifying a number of alternatives for each element. Interview and Questionnaires are formal methods for gathering information, ideas, and opinions from selected persons in a target population.

PN-AAD-366

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

(034) ASSESSING QUALITATIVE FACTORS (IN PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 46p.

MUCIA (CSD-2985 211d)

(In Systems tools for project planing, chapt. 2, p. 27-42)

Chapter 2 describes four methods useful to project planners for assessing quantitative factors and for transforming qualitative attributes into quantitative measures. Two are scaling measures (Rating Scales and Multiple Criteria Utility Assessment). A rating scale is used to quantify factors which may be subjective or qualitative in nature and measures the degree to which an entity possesses or exhibits a specified property, either as an absolute or relative judgment. Multiple Criteria Utility Assessment is a systematic process for providing a common scale for combining judgments of more than one dimension and for assessing the worth of complex alternatives. The other techniques are broadly based assessment procedures having a variety of uses (Surveys and Organization Climate Analysis). Sample surveys are used to gather information from a fraction of a subject population in order to identify and measure the attributes of the whole population. Organizational Climate Analysis aids in identifying the organizational climate needed to achieve desire behavior from a target group within the organization. It is also useful in comparing the climate or internal environment of similar organizations, e.g., secondary schools within a country.

PN-AAD-367

(035) DEFINING OBJECTIVES (FOR PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 51p.

MUCIA (CSD-2985 211d)

(In Systems tools for project planning, chapt. 3, p. 43-63)

Chapter 3 discusses three methods for defining development project objectives. Such objectives are often unspecified or ill-defined. Two of the techniques focus on structuring objectives in a hierarchy (Objective Trees and Intent Structures). Objective Trees aid in defining project objectives and provide a way to rank them in order of importance. An Intent Structure defines project objectives, identifies the persons or organizations who have a vested interest in specific objectives, and describes the logical relationships among the objectives and the interest groups. This technique show where possible conflicts among interest groups can arise. The third technique (Function Expansion) derives from systems engineering and represents a hierarchical view of the functioning of a system. This method helps the project planner to define the various functions of an organization which will aid in achieving project goals; it also helps to identify problems within the existing system.

PN-AAD-368

(036) DESCRIBING COMPLEX RELATIONSHIPS (IN PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 69p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 4, p. 65-103)

Each of the tools discussed in Chapter 4 provides a different method for the project planner to describe variables and relationships in a system, to identify problems, and to prescribe solutions. The System Definition Matrix is a prescriptive model for identifying the conditions and details that need to be specified in developing a plan or design. It is also a descriptive model for understanding and specifying the components of a system in order to communicate and to help understand the system's function in its environment. Three methods (Tree Diagrams, Oval Diagramming, and Interaction Matrix Diagramming) present approaches to structuring complex relationships with visual representations. tree Diagrams illustrate a set of complex relationships through the use of a model which fits the relationships into a hierarchy of related factors. Oval Diagramming presents a model which identifies system variables in ovals and connects the variables together with arrows to diagram complex causes and effects. Interaction Matrix Diagramming provides a technique for first identifying the members of a set of elements, e.g., the objectives for a project, and then systematically examining all the possible interactions among members of the set.

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(037) ANALYZING COMPLEX PROCESSES (IN PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 53p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 5, p. 105-127)

Chapter 5 focuses on four project planning techniques for the dynamic analysis of complex relationships and processes in systems over a period of time. One such technique uses the electronic computer (Computer Simulation Models) to simulate system processes in order to analyze complex interactions and to forecast future behavior of the system. Two methods enable the planner to diagram sequences of decisions or processes performed in a system (Flowcharts and Decision tables). A Flowchart consists of various symbols used to show the sequence of flow of processes or decision situations as a connected sequence of decisions and actions. It breaks down a complex procedure into its identifiable and connected processes. Decision tables document the decision making process by describing actions to be followed under different conditions. A Decision table is a tabular presentation of a decision process where a number of factors affect the choice of action. Gaming consists of a controlled situation where persons or teams compete against each other or against a simulated problems environment to attain predetermined objectives. This technique provides decision makers with experience in a simulated problem environment in order to analyze complex processes.

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DEVELOPMENT ASSISTANCE

(038) ACCOUNTING FOR ALTERNATIVE OUTCOMES (IN PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 53p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 6, p. 129-151)

Chapter 6 describes tools which give the project planner the methods for dealing with uncertainty and aggregating information into statistical data which summarize the variability of the data. The four techniques discussed give the project designer a grasp on the inherent variability of the development process. Histograms diagram alternative outcomes which permit the inspection of patterns and quantification of sample statistics. Subjective Probability Analysis quantifies expert judgments about the chance of specific events occurring. Two techniques (Decision Trees and Contingency Analysis) enable the analyst to deal with alternative outcomes of a project. The Decision Tree technique accounts for alternatives by representing and analyzing the choice of action and the expected outcome for each choice. Contingency Analysis helps a decision maker choose among alternative plans designed for various contingencies.

PN-AAD-371

(039) FORECAST AND PREDICTION (IN PROJECT PLANNING)

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 51p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 7, p. 153-173)

Chapter 7 covers four forecasting techniques which fit into two categories: extrapolative techniques and intuitive techniques. Extrapolative techniques (Exponential Smoothing Forecasts and Regression Forecasting) base predictions of future behavior on past performance data and assumptions about the processes which generated the data. Exponential Smoothing Forecasts provide shorttime forecasts of variables by extrapolating from past data. Regression Forecasting is a mathematical technique for examining the relation between two or more variables based on past data values. Both these techniques are useful in forecasting demands for services or goods and for obtaining economic forecasts. Intuitive forecasting techniques (Scenarios and Delphi) combine observation of past and present conditions with predictions for future performance, constraints, and forces for change. Scenarios forecast the future of a system based upon assumptions about interactions and external conditions. Scenarios help illuminate the interactions of psychological, economic, social, and cultural dimensions in a form that permits understanding many such interactions at once. They are useful for policy decisions. The Delphi is a group process technique for obtaining, collating, and directing expert judgment towards a consensus on a particular topic. The experts involved are able to focus on and debate issues anonymously by mail through several rounds of questionnaires.

PN-AAD-372

(040) ANALYZING PROJECTS

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 80p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 8, p. 177-224)

Chapter 8 presents eight techniques for the financial and economic analysis of development projects. Cash Flow Analysis determines the difference between the incremental costs and the incremental benefits for each year of a project in order to evaluate its financial viability. Discounting provides a basis for analyzing and comparing future streams of costs and benefits by reducing them to their equivalent present worth. Net Present Worth evaluates project net benefits by comparing different time streams of benefits and costs. The ratio of project benefits to project costs (Benefit-Cost Ratio) evaluates the efficiency of project resource use. Internal Rate of Return is a criterion for analyzing projects based on the percentage return on investment. An Impact-Incidence Matrix tabulates the distributions of project costs and benefits to the affected groups in the society. Cost-Benefit Analysis identifies, assesses, and weighs costs vs. benefits to evaluate the financial and economic merits of development projects. Cost-Effectiveness Analysis evaluates the effectiveness relative to the costs of alternative means to the project objectives.

PN-AAD-373

(041) PLANNING, CONTROLLING, AND EVALUATING PROJECTS

Delp, Peter; Thesen, Arne; Motiwalla, Juzar; Seshadri, Neelakantan
1977, 70p.

MUCIA (CSD-2958 211d)

(In Systems tools for project planning, chapt. 9, p. 225-264)

Chapter 9 discusses six techniques which do not fall within the categories of the other chapters. Two (Program Planning Method and IDEALS Strategy) are comprehensive approaches to project design and implementation. Program Planning Method provides ways to identify and define problems, specify program alternatives to solve the problems, and select and detail programs. The Ideal Design of Effective and Logical Systems (IDEALS) Strategy provides approaches for designing systems and planning for their implementation, for studying problems, and for generating alternative solutions to a problem. A formal system for planning and management (Planning, Programming, and Budgeting) is also described; PPB may be used to plan a program with emphasis on its goals, to prepare a budget that lists expenditures and evaluates outputs according to goals, and to choose from among several projects which meet program goals when resources are limited. Two techniques (Critical Path Method and Gantt Charts) are described which aid the planning, implementation, and management of complex projects. The Critical Path Method diagrams the sequence of necessary actions for a project and describes the necessary actions needed to complete a project. The time required for each activity is estimated, and the total time for completion of the project and critical activities in the process can be estimated. Gantt Charts schedule projects according to available resources and staff assignments against the planned project sequence of activities. The final technique (Logical Framework) is

a test approach to planning, documenting, and evaluating projects. Logical Framework has been widely used by USAID Missions to aid in planning a project, to provide measures to evaluate a project, and to state assumptions about causal linkages.

PN-AAD-374

(042) ELEMENTS OF PROJECT MANAGEMENT

Solomon, J.J.; Rizzo, E.E.

1976, 114p.

AID/TA/DA

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

PN-AAE-449

(043) READINGS IN PROJECT DESIGN

Stout, Russell

1977, 78p.

MUCIA (AID/otr-C1421 GTS)

This collection of papers constitutes a module for the study of project design, the study of methods and difficulties of program evaluation, and the application of a logical framework to program evaluation. "Foreign Aid: A Critique" provides an overview of the problems of aid administration and examines the link between project purpose and overall programmatic goals. The World Bank's programming process is examined in "The Project Cycle;" observations made in it are applicable to other institutions. The "Problems of Development Management" are assessed. It notes an increasing need for flexible, adaptive management, and points out that there is a tendency toward centralized decision making. The problem of the political contamination of project goals is also addressed. "Program Management and the Federal Evaluator" focuses on chronic difficulties in evaluating social programs and suggests that these programs often suffer from lack of definition, lack of clear logic, and lack of management. In fact some programs

may not be evaluable and this must be communicated to policy makers and program managers. The same problems are addressed in "Formulating the Question and Measuring the Answer" where it is emphasized that lack of clear definition of program goals is a key problem in evaluating program success. "What Can We Actually Get From Program Evaluation" examines the potential value of evaluation of national programs and reviews the difficulty of meaningful evaluations of specific federal programs. "Principles and Methods of Program Evaluation" suggests a logical framework for program evaluation.

PN-AAE-988

(044) MANPOWER AND EMPLOYMENT FOR ECONOMIC GROWTH AND SOCIAL JUSTICE

Hendricks, J.E.; Schroeder, K.V.; Hall, C.C.; Olsen, M.E.; Boyd, W.S.; Int. Assn. of Personnel in Employment Security;

AID/OLAB

1975, 304p.

IAPES (CSD-2593 GTS)

This is a technical manual, designed for the use of developing country officials and for United States development officials and technicians who have a need for information on how manpower and employment programs can function as an integral part of a total development effort, with the objective of achieving an expansion of employment opportunities, enhancing the well-being of working men and women, improving the level of living of the general population and especially the poor, and economic growth of the economy. It is hoped that this manual will be useful to all development officials as well as those specializing in manpower and employment functions. The manual presents a system for developing goals, programs, administration and program evaluation based upon a careful identification and analysis of social, economic and administrative problems that may exist in the country. A careful application of the system should be of considerable assistance in developing increasingly effective programs. The material emphasizes the fact that the development and execution of manpower and employment programs can be successful only if they are an integral part of an overall development planning and program execution process. Ways in which manpower and employment programs can be made an integral part of the development planning process are suggested in chapter VIII.

PN-AAB-189

PN-AAC-273 (Spanish, 318p.)

(045) AN EDUCATION PROGRAM WITH EMPHASIS ON INDUSTRIALIZATION LEADING TO THE DEGREE, MASTER OF SCIENCE

Ga. Inst. of Technology. School of Industrial and Systems Engineering

1976, 23p.

Ga. IT (AID/CM/ta-G-73-18 211 (d))

This document describes a proposed educational program for a Master of Science degree for students interested in industrialization of developing countries, particularly the generation of employment through creation and development of small industries. The prerequisites for entering students are a bachelor's degree from a recognized institution, preferably with a major in engineering, sciences, or management. The recommended courses for the proposed program include Feasibility Analysis,

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Financial Concepts, Accounting, several Economics courses, Manufacturing Engineering, Facilities Design and Layout, Process Design, Facilities Management, Basic Organizational Concepts, Industrial Psychology, Controlling and Evaluating Personnel, Designing and Evaluating Man-Machine Systems, Manufacturing Management (several courses), Production Planning, Marketing Management, and several courses on the management of improvement and innovation: Sociological Concepts, Business Concepts, Technological Forecasting, Feedback Dynamics, Managing Technical Change, and others. Courses in natural resources include Land Development, Techniques in Land Planning, Environmental Control and City Planning, and others. Courses in the development function include Economic Development, Industrial Development, Research methods, International Marketing, and Case History Studies of Innovation in Developing Countries. In addition to course work, the curriculum proposes a project activity intended to provide the student with a guided experience related to creation and development of small-scale enterprises. The document does not indicate whether this proposed program was initiated at the Georgia Institute of Technology.

PN-AAC-613

NUTRITION

(046) A FIELD GUIDE FOR EVALUATION OF NUTRITION EDUCATION; AN EXPERIMENTAL APPROACH TO DETERMINATION OF EFFECTS ON FOOD BEHAVIOR IN LESSER DEVELOPED COUNTRIES

Synectics Corp., Inc.

1975, 112p.

Synectics (CSD-3358 GTS)

PN-AAC-202

(047) APPLICATION OF A FIELD GUIDE FOR EVALUATION OF NUTRITION EDUCATION IN THREE PROGRAMS IN BRAZIL; AN EXPERIMENTAL APPROACH TO DETERMINATION OF EFFECTS ON FOOD BEHAVIOR

Synectics Corp.

1976, 75p.

Synectics (CSD-3358 GTS)

Nutrition education programs have been conducted for many years in many countries, but their actual effectiveness has not been established, partly for want of a simple and effective set of methods for evaluating them. This is why USAID developed an experimental field guide for conducting such evaluations. From 1973 to 1975 the field guide was tested in Brazil on three kinds of nutrition education programs: person-to-person, group teaching, and mass media. The evaluation methodology was applied to three Brazilian programs: Servico Social da Industria (SESI), the Associacao Brasileira de Credito e Assistencia Rural (ABCAR), and the Superintendencia Nacional do Abastecimento (SUNAB). This report discusses that activity and presents conclusions and recommendations based upon it. The revised Field Guide was published in June, 1975. The recommendations deriving from the development work, conferences with a panel of experts, and experiences in the field demonstration are summarized below:

Further field applications should be carried out to ensure the utility of the methodology for cost-effectiveness comparisons. The under-five target audience should be given priority, and sites selected should be in countries less developed than Brazil. The users of the guide should be oriented and trained. Further applications of the methodology should determine the need for alternative and less sophisticated methods, and should explore possible techniques. Consideration should be given to developing supplements to the Field Guide to provide procedural models for measures of additional food behaviors such as food acquisition, storage, and preparation. A summary handbook should be developed for program administrators and planners. AID should provide technical assistance to governments and to voluntary and international organizations that may request such help in evaluating their nutrition education programs.

PN-AAC-605

(048) NUTRITION EDUCATION IN CHILD FEEDING PROGRAMS IN THE DEVELOPING COUNTRIES

Van Veen, M.S.; Close, A.K.

1976, 44p.

HEW/MCHS (RSSA 12-74 GTS)

This booklet is intended for village workers and others involved in child feeding in the developing countries. By making nutrition education an important part of their feeding program activities, village workers can greatly increase their contribution to the attack on malnutrition among children. This booklet can assist workers to teach mothers and children about the foods children need for growth and health, and how to use local foods to improve their diets. In the long run, this nutrition education may have a more lasting effect and may do as much for the prevention of future malnutrition as the contribution of actual foods. Chapters in the book discuss the double purpose of child feeding programs; what you should know about food; setting goals to fit your community; some general rules for teaching; working with mothers of preschool children; teaching children in school feeding programs. Appendices present an illustrative Preschool Child's Height and Weight Chart; a Questionnaire for Learning Children's Food Habits; and a list of Publications That May Help You Do Your Job.

PN-AAC-747

(049) LOW-COST EXTRUSION COOKERS, INTERNATIONAL WORKSHOP PROCEEDINGS

Harper, J. M.; Jansen, G.R.; Wilson, David; Stumpf, Peggy

1976, 178p.

USDA/ERS (RSSA 1-74 GTS)

Contains the papers and discussions from a workshop held in 1976 at Fort Collins, Colorado, which brought together 50 persons from 15 countries concerned with the development of low-cost extrusion cookers (LECs). LECs are machines which produce nutritious, low-cost foods, and the focus of the conference was on developments in the technology transfer of LECs to the developing countries for use in nutrition programs. The conference papers examine A.I.D.'s nutrition program and the part LECs play in it, LEC research and development at Colorado State University, physical and chemical evaluations of extruded food products, and manufacturers' experiences with the Brady Corp. Cooker and the Insta-Pro Extruder. The editors note that the feasibility of transferring LEC technology to LDCs has been demonstrated, and

a series of the conference papers detail these developments. Extrusion equipment has been or is being tested in India, Indonesia, Kenya, Bolivia, Sri Lanka, Guatemala, and Costa Rica. Other countries interested in or developing programs include Honduras, Chile, Tanzania, Mali, Pakistan, and The Philippines. Extruded food products are being used in nutrition programs in Bolivia ("Maisoy") and Sri Lanka ("Thripasha"), and acceptability tests are underway or planned in Honduras, Ecuador, Panama, Kenya and Tanzania. The workshop served as a focus for sharing experiences and for planning future LEC program directions and needs.

PN-AAD-522

SCIENCE & TECHNOLOGY

(050) THE INDUSTRIAL RESEARCH INSTITUTE IN A DEVELOPING COUNTRY, A COMPARATIVE ANALYSIS

Blackledge, J.P.

1975, 262p.

DRI (CSD-3316 GTS)

To assess the effectiveness of industrial research institutes in the developing countries, the world body of literature was reviewed and many such institutes were visited. In general, the institutes are not nearly as effective as they could be. Their main purpose is to stimulate and assist development and growth of private and public industrial enterprises in their countries. The chief reason why most such institutes are not performing this function very well is a lack of communications and interactions between the institutes, industries, the development banks, and government units. There is need for much more exchanges of views among these entities concerning their needs, capabilities, problems, priorities, etc. Industry, government, and development banks need to develop mechanisms for maintaining a two-way flow of people, so that they can better understand the institute's potential for contributing to industrial growth and economic development. Institutes must acquire or train staff members who are experienced and interested in industrial environment to seek problems, learn about industry's planning, and relate these to the capabilities of the institute staff. Progress in solving these problems is being made at many of the institutes. However, the mechanism of using expert consultants who provide advice and counsel to institute directors is often not effective. The experts make a brief visit, offer advice, leave, and do not make follow-up visits to assist in the process of implementation. In all too many countries, industry is apparently not interested in using the services of research institutes. However, if institutes will follow the approach used by the Singapore Institute of Standards and Industrial Research (SISIR), such industrial reluctance can be overcome. That approach involves pursuing a course of aggressive and frequent industrial contacts, and providing services consonant with industry's needs. Formal linkages between advanced-country and developing-country institutes, established around specific programs and training activities conducted for several years, are most important aids to improving industrial research institutes in developing countries.

PN-AAC-725

(051) APPROPRIATE TECHNOLOGIES FOR DEVELOPING COUNTRIES

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

NAS (CAS-2584 GTS)

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

PN-AAD-298

(052) THE APPLICATION OF TECHNOLOGY IN DEVELOPING COUNTRIES

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

1977, 184p.

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

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

PN-AAE-555

SCIENCE & TECHNOLOGY

(053) HANDBOOK ON MANAGEMENT DEVELOPMENT WORKSHOPS FOR APPLIED RESEARCH INSTITUTES

Denver Research Inst., Denver, Colo.

1978, 106p.

Denver Research Inst. (AID/ta-C-1337)

This handbook provides the reader with a simple step-by-step guide on how to organize and conduct a successful and effective management development workshop. It is based on the knowledge and insights gained by the Denver Research Institute (DRI) while conducting and experimenting with such workshops and on material taken from the general training literature. There are five major sections. Section I focuses on the thought processes and steps prior to any decision to conduct an R&D management development workshop. Section II deals with workshop planning in terms of its structure and organization. Section III describes various workshop techniques and the advantages and disadvantages of each. Section IV is concerned with conducting the workshop for the maximum benefit for all the participants. Section V discusses workshop evaluation — why this is important and how it should be done. The handbook assumes that the reader has at least a rudimentary understanding of management concepts and practices. However, a bibliography at the end of the handbook provides references on general management background if this is needed.

PN-AAF-582

ENERGY

(054) A SURVEY OF THE POSSIBLE USE OF WINDPOWER IN THAILAND AND THE PHILIPPINES

Heronemus, W.E.

1974, 136p.

Heronemus (AID/ta-C-1143 GTS)

Wind-powered pumps could improve the agricultural yields in Thailand. Small windpumpers pumping from dug wells could alleviate pre- and post-season droughts that reduce rice yields. Larger windpumpers beside irrigation canals and ditches in the Central Plain could improve dry-season irrigation and permit expansion of the rice culture from one crop to two. Small and large windpumpers now exist in Thailand and have for centuries, but are primitive, scarce, and often broken down for lack of key metal parts. Larger windpumpers along the Mekong River could accelerate irrigation of the Northeastern Region. Small windpumpers could accelerate the double-cropping of vegetables and fruit in the North East, near Khan Kaen. Electricity generated by windpower systems in the Gulf of Thailand could economically supply electricity to Bangkok, and could produce nitrogenous fertilizer. Electricity generated by the ocean thermal differences process in the Andaman Sea could supply all of the electric power demands of Bangkok, electricity for canal and ditch irrigation pumping, and nitrogenous fertilizer production. Hardware for windpower systems would need to be U.S.-developed and then refined through in-country tests. It could be manufactured in Thailand. Whether individual farmers would benefit economically from the technology is more a political than technical question. A more brief analysis of windpower possibilities for the Philippines was conducted. The same potential uses exist as for Thailand, including power plants based upon ocean thermal differences.

PN-AAB-481

(055) ENERGY FOR RURAL DEVELOPMENT; RENEWABLE RESOURCES AND ALTERNATIVE TECHNOLOGIES FOR DEVELOPING COUNTRIES

National Research Council. Board on Science and Technology for Int. Development

1976, 319p.

NAS (CSD-2584 GTS)

This report focuses on small-scale energy technologies, not based on conventional fuels, that seem to be candidates for rural and village use in developing countries. It also examines the ways in which those small-scale energy technologies may be affected by technological and economic constraints, present and future. The energy technologies considered are those expected to improve the quality of rural and village life in situations where conventional fuels and power systems have not yet penetrated or are too expensive to become a significant factor in the foreseeable future. Considered are direct and indirect uses of solar energy, wind energy, hydropower, photosynthesis, microbiological conversion of plant materials, geothermal energy, and photovoltaic devices. Technical and economic constraints make the prospects for large-scale adoption of most of these technologies in the near future discouraging. The study panel reached three fundamental conclusions:

1. A variety of energy sources and technologies is indeed available as alternatives to conventional power systems.
2. With the exception of a few devices (for example, homemade windmills, solar driers), there are no cheap alternative technologies of significance for either industrialized or developing nations, and there probably will not be any in the near future.
3. It is not enough that an energy be available; the technology to put it to use must also be available. The benefits of any one of the suggested alternatives for producing energy could be multiplied many times if even a small amount of capital were invested in (a) developing the technology needed to use the energy and (b) ensuring that the technology is properly integrated in to the economy and the culture.

The study panel proposed the following activities:

Organization of workshops to evaluate the potential role of decentralized power systems for rural areas in developing countries;

Organization of a pilot energy-oriented development program to assist rural areas in acquiring the needed energy technology and the means to exploit it usefully; and

Establishment of regional institutes for research and development on technologies for exploitation of renewable energy resources.

PN-AAC-663

(056) ENERGY NEEDS, USES AND RESOURCES IN DEVELOPING COUNTRIES

Palmedo, P.F.; Nathans, Robert; Beardsworth, Edward; Hale, Samuel; Brookhaven National Laboratory. National Ctr. for Analysis of Energy Systems

1978, 169p.

BNL (PASA ERDA/TAB-995-18-76)

(In BNL 50784)

Examines the future energy requirements of LDCs which are not members of the Organization of Petroleum Exporting Countries (OPEC). It identifies the energy needs, uses, and resources in these countries and explores the energy options available to them for

CONSTRUCTION

their continued social and economic growth. Traditional patterns of development would increase the oil consumption in the non-OPEC LDCs steadily, becoming comparable with current U.S. consumption between 2000 and 2020. Shortages of capital and technical manpower will limit attempts to exploit indigenous hydrocarbon resources, even in those LDCs with untapped reserves. In the absence of major actions to replace noncommercial fuels or to increase the effectiveness with which they are used, a large fraction of the three to four billion LDC rural population will not be able to raise their energy usage above subsistence level in the year 2000. LDCs have not explored and developed their own local resources adequately; in virtually all energy conversion and use processes, there are opportunities for improvements in every efficiency. The conversion to dependence on renewable energy sources and movement toward national strategies which can accomplish economic and social development with lower energy requirements are difficult to implement, but necessary in the long term. There are opportunities for effective assistance activities in virtually all of these areas.

PN-AAF-300

(057) METHANE GENERATION FROM HUMAN, ANIMAL, AND AGRICULTURAL WASTES

National Research Council. Board on Science and Technology for Int. Development
1977, 146p.

NAS (CSD-2584 GTS)

There is a growing interest in the use, as a fuel, of methane generated by the decomposition of organic matter under conditions where contact with oxygen is eliminated. This report is on the development of an alternative energy resource suitable for individual or village use in a rural environment. The ideal fuel resource should be easily accumulated and store, it should provide more energy than is now obtained from the same materials, and should be practical. The report discusses the means by which the natural process of anaerobic fermentation can be controlled and how the methane generated by this process can be used as fuel. A bibliography of more detailed works on the subject and a list of the panel members to whom technologists in developing countries may turn for direct assistance is included. It includes discussions on the economic feasibility of methane production, the technology of anaerobic fermentation, and research and development needs. The appendices describe construction materials for a biogas plant, comparative costs and benefits of gobar gas plants, comparison of different types of cow dung gas plants, and other sources of information of biogas plants. The use of rural wastes for methane generation, rather than directly as fuel or fertilizer, yields three direct benefits: the production of an energy resource that can be stored and used more efficiently; the creation of a stabilized residue that retains the fertilizer value of the original material; and the saving of the amount of energy required to produce an equivalent amount of nitrogen containing fertilizer by synthetic processes. Indirect benefits include the potential for partial sterilization of waste during fermentation and the reduction of the transfer of fungal and other plant pathogens from one year's crop residue to the next year's crop.

PN-AAF-390

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

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

Carnegie Mellon (AID/ta-C-1174 GTS)
(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

(059) FERROCEMENT, A VERSATILE CONSTRUCTION MATERIAL; ITS INCREASING USE IN ASIA: A REPORT OF A WORKSHOP

Pama, R. P.; Lee, Sing-Iip; Vietmeyer, N.D.; Workshop on Introd. of Technologies in Asia: Ferrocement, Bangkok, 1974-1976, 111p.

NAS (CSD-2584 GTS)

The workshop brought together engineers, scientists, administrators, and businessmen, and gave them an opportunity to exchange their views on ferrocement and their experiences with it. Fourteen workshop papers included in this report discuss ferrocement research, development, and construction applications in India, Korea, the Philippines, Fiji, Thailand, New Guinea, Bangladesh, Sri Lanka, Malaysia, and Singapore. Ferrocement is a highly versatile form of reinforced concrete made of wire mesh, sand, water, and cement. It possesses unique qualities of strength and serviceability, can be constructed with a minimum of skilled labor, and uses readily available materials. It has been proven suitable for boatbuilding, and has many other tested or potential applications in agriculture, industry, and housing. Ferrocement is particularly suited to the developing countries because its basic raw materials are available in most countries; it can be fabricated into almost any shape; its construction does not require heavy plant or machinery; it is more durable than most woods and cheaper than imported steel; its construction is labor-intensive; it is durable, has high impact resistance, and can easily be repaired if damaged. Its main applications in the Asian-Pacific region have been in constructing boats, roofs, and silos.

PN-AAC-648

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PLANT RESEARCH

(060) PRODUCTS FROM JOJOBA: A PROMISING NEW CROP FOR ARID LANDS

NAS Committee

1975, 37p.

NAS (CSD-2584 GTS)

The desert plant jojoba (*Simmondsia chinensis* (Link) Schneider) grows wild over an extensive arid area in the Sonoran Desert that covers parts of Arizona, California, and Mexico. Estimates of the amount of seeds produced each year in jojoba's native habitat are over 100 million pounds. The cultivation of jojoba, the manufacture of products from it, and the utilization of its by-products would greatly improve the economic situation of some native peoples and reservations in the area.

Jojoba seeds contain about 50 percent by weight of a colorless, odorless oily liquid with unusual properties that is commonly referred to as "jojoba oil." The oil is chemically a liquid wax made up of nonglyceride esters having a narrow range of chemical composition; the esters are almost entirely composed of straight-chain acids and alcohols, each with 20 or 22 carbon atoms and 1 unsaturated bond. Jojoba oil is unique: an unsaturated, liquid wax that is readily extractable in large quantities from a plant source. Wax of this type are difficult to synthesize commercially; the only other natural source is the sperm whale, an endangered species.

Waxes are used in many industries for a wide variety of applications in lubricants, paper coatings, polishes, electrical insulation, carbon paper, textiles, leather, precision casting, and pharmaceuticals. Jojoba oil is potentially useful for all these products.

Liquid jojoba oil can be hydrogenated to a hard, colorless solid resembling spermaceti (a solid saturated form of sperm oil also obtained from sperm whales) carnauba wax, and beeswax in both chemical structure and properties.

PN-AAB-372

(061) UNDEREXPLOITED TROPICAL PLANTS WITH PROMISING ECONOMIC VALUE

National Research Council

Board on Science and Technology for

International Development

1975, 200p.

NAS (CSD-2584 GTS)

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 permit 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

(062) MAKING AQUATIC WEEDS USEFUL: SOME PERSPECTIVES FOR DEVELOPING COUNTRIES

National Research Council. Board on Science and Technology for Int. Development

1976, 183p.

NAS (CSD-2584 GTS)

The menace of water weeds is reaching alarming proportions, particularly in tropical nations. The weeds block canals and pumps, interfere with hydroelectricity production, waste water, hinder boat traffic, increase waterborne disease, interfere with fishing, and prevent adequate drainage of rivers and canals. Aquatic weeds spread water snails that cause schistosomiasis; they also foster malaria, encephalitis, and other mosquito-borne diseases. Yet aquatic weeds are a free crop of great potential value. They have great potential for use as animal feed, human food, soil additives, fuel production, and wastewater treatment. This report explores the conversion of aquatic weeds to food, fertilizer, paper and fiber, and energy. The leading possibility for converting them to human food and controlling them at the same time is introduction of the Chinese grass carp and similar herbivorous fish, as well as tropical crayfish. Promising mammals and manatees, capybara, donkeys, pigs, sheep, and water buffalo. Ducks, geese, and swans, if carefully managed, can also clear aquatic weeds well. The weeds are difficult to harvest manually, but some ingenious devices have been developed to do it. Methods of removing much of the water from harvested weeds are being developed. As sources of fertilizer, many aquatic weeds contain appreciable amounts of nitrogen, phosphorus, potassium, and other ingredients. The weeds can also improve the texture of sandy, lateritic, and heavy clay soils. Cattle find dewatered, ensiled water hyacinth high palatable. In Romania, pulp and paper are produced from fibrous, reed-like aquatic weeds. In Mississippi, NASA is fermenting water hyacinth to produce methane gas, a fuel. Researchers have found that the plants can be used to treat sewage effluent so that dissolved nutrients are recovered for reuse.

PN-AAC-821

(063) EDIBLE LEAVES OF THE TROPICS

Martin, F.W.; Ruberte, R.M.

1975, 238p.

USDA/ARS (PASA (AJ)-2-69 GTS)

An extensive description of edible green leaf plants of the tropics. Green leaves in the tropics serve as direct food sources to man. The important species are grown and preserved on both home and commercial scales. Yet these usages hardly touch on the potentials that exist in most environments. Green leaves are underutilized and neglected, or depreciated and destroyed. Reasons for such neglect are ignorance and prejudice. Both conditions are hard to cure. One of the purposes of this book is to reduce the levels of ignorance and prejudice. The introductory chapter includes tables that list the protein, fat, carbohydrate, and amino acid percentages contained in many different edible green leaves of plants in the tropical and temperate zones. Successive chapters discuss the

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principal edible green leaf herbs of the tropics; some fruits, vegetables, and ornamental plants that also bear edible leaves; common weeds with edible green leaves; tropical trees with edible green leaves; tropical leaves as spices and teas; temperate-zone green leaves in the tropics; lettuce in the tropics; tropical leaves that are poisonous; and culture and care of green-leaved vegetables. The book contains 56 illustrations, selected references concerning edible and poisonous leaves, a list of tropical plants with edible leaves, and an index to species mentioned in the text.

PN-AAC-860

WATER AND WASTEWATER

(064) TREATMENT METHODS FOR WATER SUPPLIES IN RURAL AREAS OF DEVELOPING COUNTRIES

Huisman, L.
1975, 38p.

Okla. (AID/CM/ta-C-73-13 Res.)

(Part 2: PN-AAD-285)

Supplying safe water to rural areas of developing countries demands an awareness of more than treatment methods. Although water sources, treatment methods, and a discussion of transport and distribution make up most of this report, it emphasizes other concerns to ensure the safety of drinking water. The success or failure of the adequate operation of a water source depends heavily on the source's operator; his capabilities are often critical, and he should receive intensive training. A public water supply scheme should also be preceded by public education in water safety. The first part of this report is divided into five sections: an introduction, containing general comments on the subject area, water consumption, water sources, water treatment, and water transport and distribution. Part two contains a literature survey.

PN-AAC-284

(063) RURAL WATER SUPPLY IN DEVELOPING COUNTRIES

Gorkum, Willem van; Kempenaar, Kees
1975, 116p.

Okla. (AID/CM/ta-C-73-13 Res.)

(Part 1: PN-AAD-284)

In reaching solutions for the plan and design of water supply systems for rural areas of developing countries, preference must be given to systems which try to use locally available labor and materials and technical systems and treatment methods with few and easily renewable accessories and self-made chemicals. This discussion of factors to consider in planning and designing such plants also includes detailed references which are part of the study titled "Treatment Methods for Water Supplies in Rural Areas of Developing Countries." An annex with diagrams describes 13 types of water recovery, treatment, or distribution systems.

PN-AAD-285

(066) SEWAGE TREATMENT IN DEVELOPING COUNTRIES

Canter, L.W.; Malina, J.F.
1976, 174p.

Okla. (AID/CM/ta-C-73-13 Res.)

Provides an overview of the state of the art of sewage treatment in developing countries focusing on the available treatment technology for sewered wastewaters. Because of the biology of waste stabilization ponds and climatic factors in most developing countries, stabilization ponds appear to be the most attractive wastewater treatment methodology for communities of 10,000 or less. This report focuses on such ponds, and it also presents a comparison of other treatment methods in terms of capital costs, land requirements and energy considerations. An analysis of the costs of sewage treatment in LDCs is based primarily on information from India and Brazil.

PN-AAD-286

(067) PREDICTION METHODOLOGY FOR SUITABLE WATER AND WASTEWATER PROCESSES

Reid, G.M.; Discenza, Richard
1975, 80p.

Okla. (AID/CM/ta-C-73-13 Res.)

This is the first report on a project of the University of Oklahoma to assist in the selection of the most appropriate water and sewage treatment technology for sites in developing countries. It covers the predictive model's format, data requirements, detailed flow, selection of appropriate costs, and computerization. Also included is a test of the model using an actual case study. This model can be operated manually or by computer, and manuals for both methods are available separately.

PN-AAB-419

PN-AAD-291 (Spanish, 90p.)

(068) PREDICTION METHODOLOGY FOR SUITABLE WATER AND WASTEWATER PROCESSES, SUPPL. 1: MANUAL COMPUTATION METHOD

Reid, G. W.; Discenza, Richard
1975, 23p.

Okla. (AID/CM/ta-C/73-13 Res.)

(Main work: English, 80p.: PN-AAB-419; Spanish, 90p.: PN-AAD-291)

To allow planners to select the most appropriate water and wastewater treatment methods for developing countries, a predictive model was published, "Prediction Methodology for Suitable Water and Wastewater Processes." This supplement presents a manual computation method for using that model.

PN-AAD-292

AGRICULTURAL EXTENSION MATERIALS

PART II:

(069) PREDICTION METHODOLOGY FOR SUITABLE WATER AND WASTEWATER PROCESSES, SUPPL. 2: COMPUTER PROGRAM

Reid, G.W.; Discenza, Richard
1975, 38p.

Okla. (AID/CM/ta-73-13 Res.)

(Main work: English, 80p.: PN-AAB-419; Spanish, 90p.: PN-AAD-291)

This supplement includes a computer program for the "Prediction Methodology for Suitable Water and Wastewater Processes" which is a model for the selection of the most appropriate water and wastewater treatment methods for developing countries. The detailed description of the model components is presented in the model publication. The computer version allows a simulation of the future at five year intervals for 20 years.

PN-AAD-293

(070) A MATHEMATICAL MODEL FOR PREDICTING WATER DEMAND, WASTEWATER DISPOSAL, AND COST OF WATER AND WASTEWATER TREATMENT SYSTEMS IN DEVELOPING COUNTRIES

Reid, G.W.; Muiga, M.I.
1976, 147p.

Okla. (AID/CM/ta-C-73-12 Res.)

This study uses mathematical modelling techniques to develop predictive equations for water supply and wastewater disposal models in developing countries utilizing socioeconomic, environmental and technological indicators. Predictive equations are developed for three regions (Africa, Asia, and Latin America) for water demand, wastewater amounts, and construction and operation and maintenance costs of slow sand filter, rapid sand filter, stabilization lagoon, aerated lagoon, activated sludge and trickling filter processes. The primary objective of this study is to provide engineers, planners, and appropriate public officials in developing countries with an innovative technique for more effective use of in-country water resources.

PN-AAD-294

(071) APPROPRIATE METHODS OF TREATING WATER AND WASTEWATER IN DEVELOPING COUNTRIES, DATA REQUIREMENTS

Okla. Univ. Bureau of Water and Environmental Resources Research
1975, 33p.

Okla. (AID/CM/ta-C-73-13 Res.)

The prediction model to help planners select suitable water and waste water treatment processes requires the input of certain types of data. For that purpose data has been formulated by the following categories: 1. basic information necessary to use the predictive model consisting of demographic data and socioeconomic data; and 2. process information used for detailed analyses of specific technology. Modifications and improvements are necessary to keep these data up to date. These data are formatted for completeness, easy comparison, and easy reduction by computer.

PN-AAD-295

(072) USING VISUALS IN AGRICULTURAL EXTENSION PROGRAMS

AID/TA/AGR
1961, 96p.

AID/TA/AGR

(In English and French. French, 152p.: PN-AAE-824)

PN-AAE-823

(073) HOMEMAKING AROUND THE WORLD

U.S. Agr. Extension Service
1973, 179p.

AID/TA/AGR

PN-AAE-910

(In English and French. French, 144p.: PN-AAE-911)

(074) HOMEMAKING HANDBOOK FOR VILLAGE WORKERS IN MANY COUNTRIES

U.S. Agr. Extension Service
1971, 240p.

AID/TA/AGR

PN-AAG-265

(In English and Spanish; Spanish, 213p.: PN-AAG-266)

(Companion vol. to Homemaking around the world, 179p.: PN-AAE-910)

(075) RURAL YOUTH CLUBS AROUND THE WORLD, A HANDBOOK FOR DEVELOPING PROGRAMS

U.S. Agr. Extension Service
1967, 38p.

AID/TA/AGR

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(076) AGRICULTURAL EXTENSION TRAINING, A HANDBOOK FOR TRAINERS

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(077) VISUALS FOR VILLAGERS

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1975, 31p.

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Am. Univ., Washington, D.C. Language Ctr.
1960, 107p.

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(087) A GLOSSARY OF AGRICULTURAL TERMS: ENGLISH-FRENCH AND FRENCH-ENGLISH

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(112) PLANT REQUIREMENTS FOR MANUFACTURE OF PLYWOOD

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(113) PLANT REQUIREMENTS FOR MANUFACTURE OF WOOD TABLES AND CHAIRS

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(114) LATERITE AND LATERITIC SOILS AND OTHER PROBLEM SOILS OF THE TROPICS: AN ENGINEERING EVALUATION AND HIGHWAY DESIGN STUDY, V. 1

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64	8.00				
64	8.00	1.00	200	25.00	3.00
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69	8.63	1.00	219	27.38	3.00
70	8.75	1.00	238	29.75	3.00
72	9.00	1.00	240	30.00	3.00
74	9.25	1.00	262	32.75	3.00
75	9.38	1.00	269	33.63	3.00
78	9.75	1.00	275	34.38	3.00
			286	35.75	3.00
80	10.00	1.00	289	36.13	3.00
82	10.25	1.00	292	36.50	3.00
86	10.75	1.00	296	37.00	4.00
			298	37.25	4.00
90	11.25	1.00			
91	11.38	1.00	318	39.75	4.00
92	11.50	1.00	319	39.88	4.00
93	11.63	1.00	321	40.13	4.00
94	11.75	1.00	322	40.25	4.00
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