A.I.D. RESEARCH & DEVELOPMENT ABSTRACTS

UNITED STATES AGENCY
FOR INTERNATIONAL
DEVELOPMENT (A.I.D.)
Volume 9, Number 3, 1981
TN-AAA-033

FROM THE EDITOR

Health and Nutrition

United States development assistance is applied in a world where:

- more than half a billion people—one out of every eight men, women and children—live under the crush of absolute poverty;
- average per person Third World income is $543 per year versus $8,070 in developed countries;
- fewer than 400 million children in developing nations attend school;
- roughly 20% of the world's population lack access to schools;
- more than 90% of all people lack clean water;
- only 16 million of the 80 million children born each year are immunized against preventable disease;
- 100 million children are always hungry and nearly 20% of all children die before the age of five;
- 500 million people suffer from malnourishment, which shortens their lives, stunts their growth, dulls their mental abilities, and leaves them susceptible to even more debilitating disease; and
- more than one billion people—25% of the world's entire population—receive no health care whatsoever, while another billion have only the most rudimentary and ineffective care.

These statistics mask misery of an appalling magnitude.

To the handful of people comprising the development assistance community, the repetition of these figures numbs with familiarity. To that larger composite of developed country people attempting to comprehend—perhaps for the first time—the poverty of existence experienced by so many, these statistics seem literally beyond belief. But numerous and expert sources testify that daily degradation is in fact the reality for just this enormous number of human beings.

The causes of such poverty and debilitation are inextricably intertwined. The interrelatedness of malnutrition, ill-health, infant mortality, unclean water, lack of education, overpopulation, and a host of other conditions is all too clear to development planners and practitioners. Despite the staggering complexity of these intertwined problems, integrated assistance strategies devised by A.I.D. and other development donors are helping to alleviate their individual and combined impact on the world's poor. As described in item numbers 091 and 092, A.I.D.'s low-cost health delivery system (LCHDS) projects integrate health services, family planning, and nutrition interventions using health auxiliaries to provide preventive and simple curative health care to primarily rural populations. Alone, a single intervention has little effect; combined with others in an integrated program, it leads to notable improvements. For example, since poor nutrition reduces the body's ability to defeat disease and disease changes the need for and the ability to use nutrients, it would be self-defeating to combat poor nutrition while ignoring debilitating disease.

With this in mind, integrated health service programs seek not only to increase available food but also to improve sanitation and education in personal hygiene and to reduce parasitic infestation and contagious diseases. Similarly, health and nutrition programs promote acceptance of family planning interventions, since parents are more likely to limit their families if they perceive that children will survive to adulthood. Between 1979 and 1981, A.I.D. applied nearly 50% of its health assistance funds in some 50 LCHDS projects with a total target population of roughly 50 million people. Item number 091 in this issue of ARDA contains summaries of 39 of A.I.D.'s LCHDS projects, while item 092 provides analyses of these projects.

Worldwide hunger is a central component of the overpopulation-malnutrition-poor health-poverty cycle. Hunger (chronic undernutrition) alone affects between 450 million and one billion people each year. But hunger has two often forgotten effects—a lowering of work capacity and an increased susceptibility to disease. For these and other reasons, the Report of The Presidential Commission on World Hunger (item number 115) admonishes the United States, as a nation with a "special capability and hence a special responsibility" to lead the campaign against hunger and to "make the elimination of hunger the cornerstone of our relationship with the developing world." The Commission's findings support the contention that the most basic human right is the right to food.

For its part, A.I.D. has developed a wide-ranging strategy operating in 40 developing nations and the United States, seeking new and creative ways to reduce worldwide hunger through cooperative programs in emergency food relief; increased food production; nutrition, agriculture, health, and family planning research and services; and application of available resources to meet basic human needs.

This issue of ARDA announces nutrition and food supply reports which describe protein-enriched foods for Paraguay (item 111), food fortification programs (112), school feeding programs in Kenya (113), Vitamin A research findings (114), and the implications of nutrition-fertility interactions for achieving low net reproduction rates (116). Reports related to technological change and food security (002), reducing post-harvest grain loss (003), food problems in Africa (008), fisheries development (016–019), food and crop research (033–041), and expanded agricultural purchasing power and enterprise development (069–076) indicate ways A.I.D eases hunger by strengthening food and agricultural economies. The health section of this issue contains additional reports on integrated health services while the science and technology section includes reports on solar and extrusion cookers, water pumps, and energy-related improvements in the food system.

The next issue of ARDA will include a review of issues in nutrition program evaluation and a description by A.I.D.'s Technical Program Committee for Agriculture, in response to the Report of the Presidential Commission on World Hunger, of the Agency's anti-hunger programs.

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ARDA is published quarterly by the United States Agency for International Development, Washington, D.C.

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SUBJECTS AND DOCUMENTS OF SPECIAL INTEREST

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DOCUMENTS AVAILABLE IN SPANISH AND FRENCH: **Item No.**

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QUESTIONS AND ANSWERS ABOUT ARDA

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ARDA, "A.I.D. Research and Development Abstracts", is a quarterly abstract journal issued by the Division of Documentation and Information, Office of Development Information and Utilization, Bureau for Science and Technology.

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The goal of ARDA is to transfer development and technical information to active practitioners in development assistance.

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ARDA presents abstracts of AID-funded current and less recent research studies, state-of-the-art reports, sector analyses, special evaluations, and other documents which, taken together, describe a broad spectrum of international development experience.

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¿Cuál es el objectivo de ARDA?

El objectivo de ARDA es el de transmitir información técnica y de desarrollo a trabajadores activos en asistencia de desarrollo.

¿Para quién se publia ARDA?

La audiencia blanco de ARDA consta de los funcionarios de A.I.D. en el mundo entero y de los instituciones, claves seleccionadas en los países en desarrollo. Tales instituciones son agencias de gobierno, universidades, bibliotecas, organizaciones de investigación y otras organizaciones del sector público y privado.

¿Qué materiales son condensados en ARDA?

ARDA presenta extractes de estudios de investigación corrientes y menos recientes consolidados por A.I.D., informes del estado del arte, análisises del sector, evaluaciones especiales, y otros documentos que, juntos, describan un espectro ántlio de experiencia de desarrollo internacional.

¿A quién dirijo yo preguntas adicionales tocante a ARDA?

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USER'S GUIDE TO ARDA CITATIONS

Item number
Numéro de l'article
Número de articulo

Publication number
Numéro de la publication
Número de publicación

133 **PN-AAH-900**

Title
Titre
Titulo

A REFERENCE COMPILATION OF SCIENCE AND TECHNOLOGY OFFICIAL DEVELOPMENT ASSISTANCE FURNISHED BY A.I.D. FOR THE LESS DEVELOPED COUNTRIES (LDCs)

Author(s)
Auteur(s)
Autor(es)

Reynolds, A.; Gaithwright, T.

Issuing Organization(s)
Organisme(s) de distribution
Organismo(s) distribuidor(es)

Logical Technical Services Corporation.

Document date and page numbers
Date et nombre de pages du document
Fecha y número de páginas del documento

1980, 88 p.

Supplementary note
Nota supplémentaire
Nota suplementaria

Prepared for the United Nations Conference on Science and Technology for Development

Abstract
Résumé
Sumario

This research report, summarizing official development assistance provided by A.I.D. to LDCs, was produced to meet the needs of participants in the United Nations Conference on Science and Technology for Development. It represents a synthesis of A.I.D.'s economic assistance philosophy, which is characterized by a two-fold thrust: (1) a "basic human needs" approach to bilateral development assistance, which combines the furthering of U.S. interests abroad with U.S. humanitarian interest in that quarter of the world's population condemned to live at a substandard level; and (2) a refocussing of A.I.D.'s assistance to LDCs from sophisticated technology to light capital, labor-intensive applications of scientific and technological developments. The report concentrates on development assistance in the fields of health, nutrition, and population; energy and natural resources, employment, trade and industrialization, and access to technology; food, climate, soil, and water; and urbanization, transportation, and communication. In each case, the relevant technologies and means of technology transfer are discussed in conjunction with a statement of the development problem addressed by these technologies and with illustrative examples of A.I.D. programs. The report concludes that comparatively little U.S. technology can be transferred to LDCs without significant adaptation. The LDCs have become aware of the need for technologies tailored to fit their resource endowments and absorptive capacities, and stress is being placed on the development of more appropriate technologies as well as on devising policies and institutions permitting LDCs to make better technological choices. An extensive subject index is included in this report.

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AID/DSCAN-C-0021 931023200

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Disponible en idiomas extranjeros

Also available in French: PN-AAG-000, 88 p.

Price: Paper Copy/Microfiche (U.S.$)
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001 PN-AAH-055

A STUDY OF THE DEVELOPMENT OF THE UNIVERSITY CENTER FOR AGRICULTURE AT DSCHANG, CAMEROON: AGRICULTURAL MANPOWER NEEDS ASSESSMENT AND IMPLICATIONS FOR PARTICIPATORY DEVELOPMENT

Busch, L.; Dalrymple, W.; Zuidema, L.
Cornell University, Department of Agricultural Economics.
1979, 100 p.

The USAID Mission in Yaounde, Cameroon has offered to assist the Cameroon Government to develop its new University Center for Agriculture (UCA) at Dschang. To prepare for this assistance project, USAID conducted a brief study of Cameroon's agricultural manpower needs and of the potential impact of the Center on rural development in the country. The results of that study are presented in this report. Background information is provided on the government ministries, research institutes, educational institutions, and private organizations related to Cameroon's agricultural sector. Detailed information on the curriculum, staff, alumni, and current student body of the National School of Agriculture, the sector's current primary source of trained manpower, is also provided. An examination of factors likely to influence future manpower demands reveals that an increase in government intervention will require additional civil servants highly specialized in agricultural fields. Quantitative future employment needs for agricultural researchers and university faculty are included. A discussion of the planned development of the UCA proposes improvements in the Center's teaching, research, and extension activities. The authors discuss other factors likely to influence the success of the UCA's development efforts, such as government food price policies and several proposed integrated rural development projects supported by the World Bank. The study concludes with a list of recommendations concerning the location, size, curriculum, and staff of the new UCA. A list of persons contacted and documents consulted by the study team are appended.

AID/ta-BMA-8 931113700

Paper copy $13.00 Microfiche $ 2.16

002 PN-AAH-117

LONG-TERM CONSEQUENCES OF TECHNOLOGICAL CHANGE ON FOOD SECURITY; THE CASE FOR CEREAL GRAIN

Barker, R.; Gabler, E.C.; Winkelmann, D.
Cornell University, Department of Agricultural Economics.
1979, 29 p.

Cornell International Agriculture Mimeograph No. 72

During November 1978, the International Maize and Wheat Improvement Center and the International Food Policy Research Institute sponsored the International Food Security Conference held in El Batan, Mexico. Presented at that conference, this paper examines whether the introduction of new crop technology results in greater stability or instability in cereal production—specifically, corn, wheat, and rice—over the long term. By way of introduction, current views on long-term world food grain production and demand trends are summarized. It is expected that increasingly intensive production strategies involving new technologies will be necessary to keep abreast with world population growth. The next four sections of the paper discuss those factors which influence stability/variability in crop yield, with emphasis on the role of technological change. The influence of yield-increasing technology on the stability of crop yield is a disputed matter, the conventional wisdom supposing an inverse relationship having been challenged in recent years. The potentially stabilizing and destabilizing characteristics of three specific technology components—water control, agronomic practices, and plant breeding—are singled out for evaluation in an attempt to resolve this debate. Trend line and lagged regression analyses are used in comparative case studies of different crop-producing areas around the world. The study concludes that technological change is not likely to cause a decline in crop-yield variability. Indeed, research results show a tendency for absolute variability to increase, even though the relative variability may remain constant or even decrease. While this should not serve as a deterrent to the use of modern inputs, it does suggest the need to increase investment in developing insect and disease resistant varieties if the inherent instability associated with new technology is to be minimized. Appended to the paper are the regression analysis results and a 20-item reference bibliography (1965–78).

AID/ta-BMA-8 931113700

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003 PN-AAH-136

PROCEEDINGS OF THE WORKSHOP ON GRAIN POST-HARVEST TECHNOLOGY, BANGKOK, THAILAND, 1978

Southeast Asia Cooperative Post-Harvest Research and Development Programme.
1978, 511 p.

Sponsored by the Thailand Department of Agriculture and the Southeast Asia Cooperative and Post-Harvest Research and Development Program

Many national and international organizations working in Southeast Asia consider grain post-harvesting technology to be critically important in reducing grain losses, producing more and better food for a growing population, and improving the standard of living for the millions of small farmers. This report presents twenty-two studies on the milling, drying, and storage of grain in various countries in Southeast Asia. The milling studies treat grain flow through an 800 kg/hour rice mill in Thailand, along with various methods of hulling such as rubber roll hullers and stone-disc hullers; the use of different Engelberg-type single pass rice mills at the village level in the Bicol

Region of the Philippines; and small rice milling units and an integrated rice processing complex in Thailand. In the drying studies, discussion is given to various kinds of dryers, such as aeration, simple corn-husk fueled mechanical dryers, and flatbed, solar, and farm dryers; pre-drying handling of high moisture paddy; farm-level rice post-production systems in the Bicol Region; effects of various grain handling methods on the drying process in a small flatbed dryer; a systems approach to selective mechanization on rice processing in Indonesia; and post-harvest rice technology activities of BULOG in Indonesia. The storage studies cover on-floor bulk drying and storage at a specially modified warehouse in Indonesia; corn storage; the effects of propionic acid on wet paddy; chemical screening studies on stored grain insects in the Philippines; effects of insect infestation on milled rice; high temperature/high humidity grain storage; village rice threshers; and post-production losses on a small farm in Sri Lanka. Abstracts and brief bibliographies accompany many of the studies. A list of workshop participants, the workshop's program and welcoming and keynote addresses, and minutes of various workshop discussions are included.

Paper copy $66.43 Microfiche $ 6.48

004 PN-AAH-569

GOVERNMENT SPONSORED AGRICULTURAL INTENSIFICATION SCHEMES IN THE SAHEL: DEVELOPMENT FOR WHOM?

Waldstein, A.S.
1978, 115 p.

Prepared for USAID's "Papers on Sahelian Social Development" Series

The question, "Development for Whom?", is fundamental to the evaluation of development assistance programs. This paper specifically considers the extent of benefits accruing to the rural poor from large-scale agricultural/irrigation projects in the Sahel. The Senegal River Valley has been the locale of a series of such projects, including the Richard Toll Colony, the Gezira Scheme, and the Office du Niger. A common characteristic of these efforts has been the subjugation of the overall welfare of farmers to institutional or national interests, removal of farmers from their native lands, and/or reliance on migrant workers. In one instance, the Mossi (from Upper Volta) were conscripted to work on government farms in the interior delta. During the 1960's, the Mossi left the project in large numbers. Project management never understood the Mossi's ties to their homeland or their distress over the breakup of extended families and loss of secure positions in a stable society. Another drawback has been the exclusion of the farmers from all decisionmaking processes. In many instances the farmers were forced as tenants to cede their own individual economic interests to the interests of the overall project. In addition, few of these projects have offered the participants incomes substantially greater than otherwise current among farmers in the area. Perhaps the greatest irony is that the quality of diet for the participants has declined—all while providing burgeoning grain supplies to urban populations. Expulsion of cattle and a sharp reduction in fish production coupled with the increase in human population necessary for field labor are responsible for this decline. The author concludes that the majority of project troubles are related to social management factors; and recommends, among other changes, greater attention to and respect for social ties among the participating groups, representation of the villagers in decisionmaking processes, and increased emphasis upon labor-intensive cultivation.

AID/REDSO/WA-78-139

Paper copy $14.95 Microfiche $ 2.16

005 PN-AAH-641

A SOCIOTECHNICAL SURVEY OF GUAYULE RUBBER COMMERCIALIZATION; A STATE-OF-THE-ART REPORT

Foster, K.E.; Tayor, J.G.; Mills, J.L.
University of Arizona, Office of Arid Lands Studies; Midwest Research Institute.
1979, 432 p.

The U.S. rubber supply—both natural and synthetic—is precarious due to extensive worldwide demand, rising petroleum costs, and limited production of natural rubber. This preliminary state-of-the-art report assesses the potential commercialization of the U.S. desert shrub guayule as a domestic source of natural rubber and the agricultural and industrial aspects of guayule technology. With alternative rubber supplies (*Hevea brasiliensis* and petroleum) threatened by political and economic instability in Southeast Asia and the Middle East, guayule commercialization is being promoted as a natural rubber source in the U.S. Southwest, where up to 1–2 million acres of land may be devoted to guayule production by the end of the century. This report finds no insurmountable difficulties in growing guayule in the Southwest and Mexico, as guayule is highly suited to mechanized agriculture, makes good use of arid lands, does not require much water, is a prolific seed bearer, and will produce wood fiber, resins, and leaves as economical byproducts. New kinds of elastomers (plastics, silicones, leather goods) and reclaimed rubber are possible competitors to natural or synthetic rubber, but neither currently offers any comparative physical or economic advantages. The first part of this study provides an indepth review of current guayule technology including: (1) regional climatic and agricultural conditions; (2) plant modification and manipulation, i.e., plant breeding and genetic configuration; (3) methods for plant propagation, i.e., nursery and greenhouse techniques; (4) alternative agronomic practices for use in arid regions; (5) harvesting techniques specific to guayule; (6) alternatives for processing, handling, and storage; (7) rubber quality, chemical

structure, processing characteristics, performance, research needs and use; (8) conceivable byproducts and byproduct use; (9) and projected production yields. Also reviewed are the economic, institutional, and environmental prospects for guayule commercialization. A 230-item list of references (1941–79), agricultural statistics, and a list of team members and consultants are included, along with numerous tables.

AID/ta-G-1111 931015900

Paper copy $56.16 Microfiche $ 5.40

006 PN-AAH-760

AGRICULTURE SECTOR ASSESSMENT: JORDAN

Jordan University, Faculty of Agriculture; A.I.D., Bureau for Near East, USAID/Jordan.
1980, 65 p.

In order to plan for future agriculture programs in Jordan, USAID commissioned the University of Jordan (UOJ) to review the country's agriculture sector. This report presents the results of that review, along with USAID's perception of opportunities and constraints on future strategies for agricultural change. In Part I of the report, data on crop and livestock production and on labor and import levels in the country are presented. Differences in upland and valley topographies and agricultures, especially those of land under cultivation, along with rainfall, crop distribution, land holdings, and livestock are discussed; and upland watershed development and protection and the valley's irrigation needs are analyzed. Part I also describes changes in valley agriculture (such as increased reliance on plastic tunnels and mulch), current institutional support systems, and the manpower development activities of the UOJ and the Ministry of Education. Part II states USAID's conclusions and recommendations. Because Jordan's rapid economic and employment changes make its situation so unique, no clear indications of an overall agriculture sector strategy exist. USAID will focus on helping to reduce the country's dependence on foreign subsidies by increasing production of high value crops for export; a secondary goal will be to lower food prices for the poor, most of whom are urban. At Jordan's request, USAID efforts will be concentrated in the Jordan Valley, which has the greatest potential for increased yield and incomes, and where the availability of capital, high farmer motivation, and attractive market prices favor sector development. USAID will emphasize the removal of sector constraints by encouraging the adoption of higher productivity technology, more efficient use of current technology, improvement of technology and information transfer to farmers, and strengthening of agricultural services, especially through support of valley organizations. A review of watershed protection and development activities to determine the potential for increased irrigation will be encouraged.

Paper copy $ 8.45 Microfiche $ 1.08

007 PN-AAJ-013

CONSTRAINTS ON SMALL FARMERS IN THE PRECISION LAND LEVELING PROGRAM IN THE PAKISTANI PUNJAB

Renfro, R.Z.H.; Niazi, M.I.A.; Ghaffar, A.
Colorado State University, Engineering Research Center.
1979, 128 p.

Water Management Technical Report No. 54

A Precision Land Leveling Program (PLLP) undertaken as part of the On-Farm Water Management (OFWM) Project in Pakistan has failed to reach the small farmer. This report summarizes results of a farmer survey conducted to determine the causes of this failure and offers suggestions to improve the program. A questionnaire was administered to a cross-section of 120 farmers in the Punjab to test groups of hypotheses regarding farm size and farmer categorizations (i.e., large, small, and very small farmers), the impact of the PLLP, and constraints to farmer participation. The PLLP's main benefits, according to farmers, were reduced irrigation time, higher yields, easier and more effective use of farm equipment (especially modern equipment), reduced hired labor costs and family labor time, and improved status. Despite the difficulty in defining the small farmer in Pakistan due to lack of reliable records on land ownership caused by land subdivisions within wealthy farm families, the authors were confident that the survey was accurate in showing that non-PLLP farmers tend to have smaller and more fragmented farms and to be poorer, less educated, and less influential than PLLP farmers; and to be unaware of the full PLLP. The major constraints to participation, in order of importance, were: (1) loss of a cropping season and lack of available land; (2) lack of knowledge and mistrust of PLLP or OFWM personnel; (3) costly equipment rental; (4) low subsidies and difficulties in receiving checks; and (5) a lack of access to the OFWM project. It was also found, however, that almost all nonparticipants were interested in the PLLP. To improve the PLLP's outreach to small farmers, the farmers stressed the importance of increased subsidies and OFWM effectiveness in contacting farmers and convincing them of PLLP benefits. The consultant team recommends improved determinants of land ownership, increased training and equipment for OFWM personnel to meet increasing demand for PLLP, increased use of private agencies and contractors to perform PLLP, and higher subsidies with simplified check cashing. The questionnaire and the survey's design and methodology are included.

AID/ta-C-1411 931048900

Paper copy $16.64 Microfiche $ 2.16

008 PN-AAJ-159

FOOD PROBLEMS AND PROSPECTS IN SUB-SAHARAN AFRICA; THE DECADE OF THE 1980's

U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, International Economics Division.
1980, 431 p.

Sub-Saharan Africa (SSA) is the only region in the world where per capita food production declined in the last 20 years. This report analyzes the dynamics underlying agricultural production and consumption in this region between 1965–79 to predict food prospects for the 1980's. The consumption patterns, retail policies, potential for food production, and food supply policies in SSA countries are analyzed and a quantitative model projecting 1990 supply and demand is described in eight scenarios. If 1975 per capita income levels and producer price patterns prevail into the 1990's, SSA will have an import imbalance of 11.5 million metric tons. Moreover, to bring diets up to minimal calorie consumption levels—2,300 calories per person per day—will require an additional 0.9 million tons of food. These grim figures reflect low indigenous productivity. While land tenure patterns vary, most food production occurs at the subsistence level. Commercial inputs which can improve yields are not used and cultivation is done with simple hand tools. The natural environment also affects production. Tropical soils are fragile and weather cycles can vary dramatically. Knowledge of African food production systems is spotty, inhibiting development of new agricultural technology. Nevertheless, better use can be made of existing resources to improve productivity until research efforts can be exploited. Part of the problem lies with the structure of demand. Wheat and rice are in demand in urban areas, yet many African countries cannot produce wheat, while rice production is too expensive in others. To reduce imports, governments must shift dietary preferences to domestic crops (possibly with adverse political consequences). There is also a need to change the agriculture sector's traditional emphasis on developing cash crops for export while the high distribution costs of domestically produced foods make internal urban centers rely on food imports. A price policy encouraging domestic crops, timed with improvements in transportation facilities and food trade policies, is essential to reforming the system. Appendices include a 112-item bibliography (1962–80) in English, French, and German.

Paper copy $56.03 Microfiche $ 5.40

009 PN-AAJ-430

INTERNATIONAL BIBLIOGRAPHY ON CROPPING SYSTEMS 1978

Ramos, M.M.
International Rice Research Institute (IRRI).
1980, 347 p.

Supplements International Bibliography on Cropping Systems 1973–74: PN-AAC-913, 333 p.; 1975: PN-AAF-460, 114 p.; 1976: PN-AAG-493, 193 p.; 1977: PN-AAG-967, 253 p.

Increasing food production in order to arrest hunger in developing countries depends, in large part, on improvements in agricultural research. To assist researchers in their efforts, this bibliography supplements and updates the International Bibliography on Cropping Systems, 1973–74 by providing 2,857 references (1973–78) written in English, Russian, Spanish, German, and French. Entries follow a classified arrangement and author and keyword indices are appended. Subject areas include the following: general works; physiology and biochemistry; crop ecology and meteorology; crop varieties and breeding; agronomy (general references, planting and harvesting, and cropping patterns, i.e., monoculture, ratooning, fallowing, intercropping and mixed cropping, rotation of crops, and shifting cultivation); soils (general references, soil chemistry and physics, fertility, management and tillage, soil biology and microbiology); fertilizers; irrigation; mechanization; plant protection (general references, diseases, insect pests, nematodes, and weeds); economic aspects (general entries, costs and returns, farm management and policy, statistics and statistical methods, marketing, trade, prices, credit, labor, land, and other resources); and social aspects.

AID/ta-G-1074 GTS

Paper copy $45.11 Microfiche $ 4.32

010 PN-AAJ-485

ADOPTION OF MODERN AGRICULTURAL TECHNOLOGY BY SMALL FARM OPERATORS: AN INTERDISCIPLINARY MODEL FOR RESEARCHERS AND STRATEGY BUILDERS

Leagans, J.P.
Cornell University, Department of Education.
1979, 56 p.

Cornell International Agricultural Mimeograph 69

Over one billion small farmers remain unaffected by even the most basic agricultural innovations. This study outlines a new model explaining small farmer innovation. Behavioral theories such as the human needs theory and Piaget's theory of structural change are reviewed to support the premise that farmer adoptive behavior is influenced by the cumulative valence of perceived incentives and disincentives. Several functional models such as the technology, institution-building, equilibrium, communication, conflict, and problem-solving models are then reviewed to establish a framework to correlate the complexity of factors affecting this behavior. Finding these models inadequate to explain small farmer innovation, the report develops the interdisciplinary behavioral differential model which considers the mental, behavioral, and environmental factors influencing technology adoption/nonadoption. The paradigm begins with a static phase in which incentives and disincentives to change are equal and behavior remains unchanged. The introduction of influence variables (e.g., technology, education) results in a dynamic phase in which the greater incentives to change trigger innovative responses. A

Students at Morogoro Agricultural College in Tanzania master modern farming methods while learning the age-old techniques upon which many Tanzanian farmers still rely.

semidynamic phase follows during which changes are increasingly adopted and innovation reaches an optimum level from which further innovation requires new behavioral influences. In summary, data suggest that small farmers remain low producers not because they are hostile to technical innovations, but because of system-associated barriers, i.e., they lack vital inputs. Innovation requires that farmers understand the new technology, that a complex infrastructure support system exists, and that farmers are able to combine these two complex sets of variables. It is precisely in combining these factors that farmers require outside assistance. Thus, the optimum degree of adoption occurs when a farmer is persuaded to adopt a technical input which, for him, is technically sound, economically feasible, physically possible, and politically and socially compatible. Studies to identify system-associated bottlenecks and analyze farmers' reactions to new technology are recommended. A 35-item bibliography (1953–77) is appended.

AID/ta-BMA-8 532004630

Paper copy $ 7.28 Microfiche $ 1.08

011 PN-AAJ-498

RICE GRAIN PROPERTIES AND RESISTANCE TO STORAGE INSECTS: A REVIEW

Juliano, B.O.
International Rice Research Institute (IRRI).
1981, 9 p.

IRRI Paper Series, No. 56

Postharvest rice losses, a problem which is worsening as more and more countries achieve rice self-sufficiency, can be reduced by growing rice varieties resistant to rice storage insects. This report reviews the current state of research on a still largely neglected approach to developing resistant rice varieties—namely, by correlating varietal resistance with the grain's physicochemical properties. Research has shown that breeding characteristics such as intact tight hulls, a high degree of grain hardness, the presence of bran layers, high amylose content, high endosperm starch gelatinization temperature, low oil content, small and lightweight grain proportions, and low moisture content contribute to impeding a variety of storage insects—the rice weevil, the lesser grain borer, the Angoumois grain moth, the confused flour beetle, the Indian mill moth, the red flour beetle, and the almond moth. Processing techniques such as a high degree of milling and parboiling or heating the wet grain at 100° Centigrade also impede insect infestation. The report briefly analyzes the resistant characteristics of several varieties developed for U.S. production. The report suggests future research be conducted on the interrelationship between grain hardness and grain quality (as measured by protein and amylose contents, alkali spreading value, and gel consistency) and that varietal resistance to major storage insects be investigated using pairs of sister lines differing in the property in question. A 51-item bibliography (1946–80) is appended.

AID/492-1310-T 497019800

Paper copy $ 1.17 Microfiche $ 1.08

012 PN-AAJ-522

PROCEEDINGS OF THE INTERNATIONAL WORKSHOP ON SOCIOECONOMIC CONSTRAINTS TO DEVELOPMENT OF SEMI-ARID TROPICAL AGRICULTURE, HYDERABAD, 1979

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).
1979, 444 p.

New technologies cannot be disseminated in developing countries without an understanding of local socioeconomic conditions. Such is the view adopted by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in sponsoring the International Workshop on Socioeconomic Constraints to Development of Semi-Arid Tropical Agriculture, held February 19–23, 1979 in Hyderabad, India, of which this report comprises the proceedings. The Workshop's primary aim was to consider ways and means of overcoming the various socioeconomic constraints to agricultural development in the semi-

arid tropics (SAT) and emphasis was focused on the role new technologies and/or policies could play in alleviating development constraints in SAT. The subject matter sessions addressed the analysis of existing farming systems and practices, socioeconomics of prospective technologies, field assessment of prospective technologies, issues in foodgrain marketing, the nature and significance of risk, rural labor markets, and the economics of improved animal-drawn implements and mechanization. Among the important observations, it was noted that larger farmers were earlier and more frequent adopters of new technology and that lack of capital is a major constraint to adoption. Research indicates that the sum total of current agricultural policies reduces farm income so that the incentive for increasing cereal production is probably nil. One common recommendation emerging from all sessions was the need to improve the methodological and empirical bases on which policy judgements are made. There is particular need for data on the importance of risk and uncertainty in determining farmer behavior in SAT regions as well as on labor bottlenecks and on the degree to which new technology constrains labor and affects wage rates. It was also recommended that greater emphasis be placed on understanding the nature of consumer preferences and that policy initiatives in foodgrain marketing consider the economic policies of SAT countries as well as the political situation of both donor and host government agencies. Appended are texts of papers presented in French and lists of country papers and of all workshop participants and observers.

AID/ta-G-1406 931078600

Paper copy $57.72 Microfiche $ 5.40

013 PN-AAJ-526

PLANNING TECHNOLOGIES APPROPRIATE TO FARMERS: CONCEPTS AND PROCEDURES

International Maize and Wheat Improvement Center.
1980, 77 p.

A key reason preventing farmers in developing countries from adopting fully the technologies recommended to them by researchers and extensionists is the inappropriateness of the technologies themselves. This manual was prepared to present procedures and guidelines to assist agricultural researchers in formulating technologies truly appropriate to farmer needs and is divided into three parts. Part I presents an overview of a research program aimed at developing appropriate technologies. Included are descriptions of on-farm and experimental station research—the key research procedures involved—and the government policy context in which research must occur. It is emphasized that successful research must proceed from knowledge of the farmer's circumstances, that is, the factors, both natural (e.g., climate and soils) and socioeconomic (e.g., farmers' goals, markets, national policy) that affect farmers' decisions on crop technologies. Part II describes procedures for obtaining information on these circumstances, with stress laid on the need to make the process a true collaboration between researchers and farmers. Specific procedures detailed are: gathering and analyzing pertinent background data from government and research reports; conducting an exploratory survey, that is, informal interviews with farmers and other knowledgeable individuals; and conducting a formal survey or questionnaire. Individual chapters treat how to develop questionnaire guidelines, sampling methods, and practical ways to make the survey truly collaborative. In Part III, methods are discussed for gleaning from survey results the information pertinent to planning crop research. In particular, the authors present guidelines for prescreening a few—two or three at most are recommended—"best-bet" technologies for research. A final chapter exemplifies use of these guidelines in two on-farm programs and one on-station program. The authors note that those who think reseachers should only go to farmers with finished technologies for demonstration will find this manual less useful than those who support on-farm research. Graphs, charts, and a 25-item glossary of terms are included. Short bibliographies are appended to each chapter.

AID/DSAN-G-0216 931084000

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014 PN-AAJ-639

DEVELOPMENT OF LIVESTOCK, AGRICULTURE AND WATER SUPPLIES IN BOTSWANA BEFORE INDEPENDENCE: A SHORT HISTORY AND POLICY ANALYSIS

Roe, E.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 61 p.

Occasional Papers No. 10

Colonial Botswana's subordination of its water supply and agricultural sectors toward increasing livestock production resulted in stagnant agricultural production levels lasting until its independence in 1966. This report serves as a policy context for rural development efforts in Botswana, formerly Bechuanaland, by listing and analyzing the major factors from 1895 to 1965 that affected its livestock, water supply, and agricultural sectors. During this period, livestock production was the Batswana's major source of trade income, despite the problems of disease, limited grazing areas (due to water scarcity), and a lack of sustained sales—the latter due largely to periodic South African cattle embargoes and weight/supply restrictions. A skewed distribution of livestock holdings occurred as droughts and the overuse of communal water sources led wealthier cattle owners to install private boreholes and cattle posts, thereby ensuring their herds' access to water while smaller herds (and their owners) suffered disproportionately. There were also problems facing the agricultural sector, namely water scarcity, labor shortages, a lack of high-yield/drought-resistant grains with low cultivation/harvesting requirements, and a lack of economic incentives for sustained production. As a result, agricultural

production never increased beyond subsistence levels. The following contradictory economic dynamics contributed to the the livestock sector's prevalence over the agricultural sector: (1) a low agricultural output which caused workers to migrate to higher-paying jobs, the resultant labor shortage reinforcing subsistence-level production; (2) a negative relationship of children's school attendance to agriculture and livestock management; (3) a negative relationship of cattle sales to grain production, resulting in greater grazing pressures at water points; (4) a substantially greater allocation of research, innovation, and funding in livestock than in agriculture—enhancing the livestock sector's investment attractiveness; and (5) a subsidization of the livestock sector, especially in large-scale water programs. Appended are a 45-item (1920–79) bibliography and a 22-item (1905–79) list of table and data sources.

AID/ta-BMA-8 931113700

Paper copy $ 7.93 Microfiche $ 1.08

015 PN-AAJ-640

ICTA IN GUATEMALA: THE EVOLUTION OF A NEW MODEL FOR AGRICULTURAL RESEARCH AND DEVELOPMENT

Gostyla, L.; Whyte, W.F.
Cornell University Center for International Studies, Rural Development Committee.
1980, 53 p.

Special Series on Agriculture Research and Extension

Agricultural research can have no impact upon small farmers' cultivation practices unless it understands farmers' real problems and defines efficiency in farmers' terms. Traditional research and development efforts—unilateral flows of initiative and information directed by national planners, executed by technicians through commodity programs, and imposed upon farmers—often result in production techniques that are rejected by small farmers. This report describes the development of Guatemala's Institute of Agricultural Science and Technology (ICTA), which is dedicated to a decentralized research methodology designed to make research programs responsible for the adoption of appropriate agricultural techniques by including the contributions of farmers and social scientists. Under ICTA's interdisciplinary research program, mainly developed by its Socio-Economic Unit (SEU), natural and social scientists survey farmers to identify homogeneous groups and their production constraints. The farmers then record their cultivation practices, supplying data about annual crop labor/resource investments. Experimentation with specific treatments, such as agronomic practices or crop varieties, is based on farmer information and the results of controlled tests at production centers. Using the farmers' traditional techniques, an agronomist and farmer test the selected treatments and then apply them to larger areas at different sites. In the next phase, the farmer tests the treatments alone; ICTA personnel visit to record information and conduct evaluations. Problems arose in the initial implementation of this approach, as technicians deprecated farmer input and SEU's low-level regional presence was often erratic. The situation improved as technicians began to realize the benefits of farmer participation and as SEU sent adequate personnel into needed areas. The use of leadership farmers to monitor recordkeeping and test sites also has been helpful. An indication of the obstacles facing those introducing such innovations is provided in the authors' histories of ICTA and SEU, including the latter's conflicts with external and internal proponents of traditional methods and relations with similar institutions.

AID/ta-BMA-8 931113700
Also available in Spanish: PN-AAJ-641, 108 p.

Paper copy $ 6.89 Microfiche $ 1.08

016 PN-AAH-369

MARKETING FIN FISH FROM THE PACIFIC COAST OF GUATEMALA

Lesser, W.; Weaver, T.
Cornell University, Department of Agricultural Economics.
1980, 32 p.

Cornell International Agriculture Mimeograph No. 67

As a partial remedy to the current lack of specific information needed to plan the development of Guatemala's fishing sector, this bulletin analyzes the marketing structure for ocean fin fish from the country's Pacific Coast. Marketing follows two distinct channels, one for the artisanal, the other for the industrial sector. Artisanal fishing is labor-intensive and its products are traditionally sold in the public markets. Fishermen are limited to a small catch due to difficulty in ocean access and primitive fishing technology. Market margins within the artisanal sector are not high. The marketing system is competitive, and individuals are socially constrained from increasing the size and profitability of their business. Although this sector supplies the bulk of fresh fish consumed domestically, it is limited by its failure to transport fish to remote, potentially protein-deficient areas. The industrial sector, primarily a shrimping industry which handles fresh fish as an incidental catch, has a more highly developed market system. This sector deals almost exclusively with supermarkets, specialty stores, and institutional buyers. Retail prices for fish supplied by this sector are comparable with those charged in the public markets supplied by the artisanal sector. It was not possible to make reliable estimates of the marketing margins for fish supplied through the industrial sector, because industrial firms do not keep separate facilities or accounts for shrimp and fin fish and because their capture and marketing operations are highly integrated. However, fin fish do appear to be a profitable product line for the sector. The study concludes with nine suggestions aimed at stimulating production or expanding markets: (1) establish a small trawl fishery; (2) market the bottom fish in cake form; (3) promote underutilized species such as bonito and shark; (4) acquire improved equipment; (5) increase artisanal fishermen's incomes; (6) develop access to credit markets; (7) penetrate more remote interior markets; (8) promote the use of more efficient containers for transporting fish; and (9) reduce the

number of retailers in the public markets. A 22-item Spanish-language bibliography (1967–73) is appended.

AID/ta-BMA-8 931113700

Paper copy $ 4.16 Microfiche $ 1.08

017 PN-AAJ-627

STOCK ASSESSMENT FOR TROPICAL SMALL-SCALE FISHERIES: PROCEEDINGS OF AN INTERNATIONAL WORKSHOP HELD SEPTEMBER 19-21, 1979, AT THE UNIVERSITY OF RHODE ISLAND, KINGSTON, RHODE ISLAND

Roedel, P.M.; Saila, S.B.
University of Rhode Island, Center for Marine Resource Development.
1979, 204 p.

As developing nations increasingly turn to the sea for food and export products, coastal artisanal fisheries threaten to deplete area aquatic resources. This report outlines the results of an AID-funded workshop conducted by the University of Rhode Island on the use of stock assessment for small-scale tropical fisheries. The workshop sought to create a dialogue between fishery administrators from developing countries and theoreticians to enable the latter to more effectively propose new approaches to assessment. The report consists of the 15 papers (most with bibliographies; some of which have German titles) presented at the workshop by experts from Belize, Canada, Italy, Malaysia, New Guinea, Nigeria, the Philippines, Thailand, and the United States. The two key problems regarding stock assessment among small-scale fisheries are the lack of effective structures to allow an information flow from fishery biologists to planners and policymakers, and the inadequate attention given to the economic and sociocultural aspects of small-scale fisheries. Additional data collection and interpretation difficulties include the harvesting of many different species, complicated species interactions, unpredictable growing seasons, sensitivity of tropical ecosystems to perturbations, and the use of numerous landing points and different varieties of fishing gear. Further, stock assessment procedures used for industrial, temperate, or cold water fisheries are not applicable. The workshop recommended that: (1) yields in different locations and environments be studied to estimate resource levels and formulate development and management strategies; (2) the use of several types of small-scale fishing gear in various locations be studied to determine relative stock densities and to establish a basis for correlating data on fish caught with different equipment in the same location; (3) fisheries models showing population growth rates concurrent with depletion rates be altered for use in multi-species, multi-equipment environments; and (4) research be done to provide policy analysis studies of management and development options for small-scale fisheries. A list of the workshop participants and support staff are included.

AID/ta-G-1404

Paper copy $26.52 Microfiche $ 3.24

018 PN-AAJ-653

SMALL-SCALE FISHERIES IN CENTRAL AMERICA: ACQUIRING INFORMATION FOR DECISION MAKING

Rhode Island University, International Center for Marine Resource Development.
1979, 612 p.

Fish, up to 75% of which is supplied by small-scale fisheries, provide well over 30% of the animal protein intake in many African and Asian countries. According to the Food and Agricultural Organization, the annual growth rate of developing country marine food fish production can be increased 35–50%. Small-scale fisheries thus have an obvious potential for alleviating developing world hunger problems, especially given the new opportunities for fish production opened up by the international acceptance of the extended marine economic zone during the 1970's. To help provide decisionmakers with the extensive information base they need to plan and develop small-scale fisheries, A.I.D. financed a 4-year investigation of small-scale fisheries in Costa Rica, El Salvador, and Guatemala. This study, the results of which are presented in this report, was multidisciplinary in nature, involving specialists in fish biology, food science, resource economics, anthropology, and development administration. To establish the context of the research, the initial section of the report describes the structure and role of information systems, the general nature of developing country small-scale fisheries, and the research setting in the above-named countries. The next two sections contain, respectively, the data collected by specific discipline field tests of various fishery sectors and the analyses of these data. Included are biological surveys of fisheries resources, economic and anthropological surveys of the harvesting sector, food science and technology surveys of handling and processing methods, economic surveys of marketing and consumption, and a survey of fisheries administrators in government. A final section makes recommendations regarding data collection, with emphasis on specifying the quantity and quality of data to be collected in advance; and discusses policy implications in the areas of resource assessment, the fish capture sector, marketing and distribution, fish handling, fish consumption, and fisheries development adminstration. Included are 380 Spanish and English references (1934–79), plus diagrams, maps, and questionnaires.

AID/CSD-2455 931011300

Paper copy $79.56 Microfiche $ 7.56

019 PN-AAJ-655

AN EVALUATION OF THE FISHERIES SECTOR IN OMAN

Roedel, P.M.
Omani-American Joint Commission for Economic and Technical Cooperation.
1981, 50 p.

No reliable data exist on the size of Oman's fish catch—estimates vary from 46,000 to 200,000 metric tons. This and other problems that the Omani Government (OG) must overcome to successfully promote fishing as a source of food and income for its citizens are the subject of this report. Currently, there is a strong demand for fish, both for consumption and for export, and the catch is high quality, e.g., tuna, mackerel, sea bass. The OG has provided fishermen with substantial support, including vessels, motors, and repair and cold storage facilities, all at subsidized prices. However, handling, preservation, and distribution are characterized by poor sanitation and quality control; the only industrial-scale operation is run by a Korean firm under a concession agreement; a comprehensive fisheries law has not been enacted; the OG lacks the scientific competence to establish the planned marine science center; operation of a formal extension program has been delayed; and there is a striking lack of trained people to administer and manage the growing fishing industry. The author analyzes the relevancy and feasibility of projects in fishery statistics, training, extension, and marine science and recommends them for OG funding. Although the data are inadequate, the gap between current catch and a safe level of potential harvesting must be estimated to be at least 25%. For the OG (or any developing country) to effectively and successfully exploit such potential, the author concludes that the following are necessary: (1) a long-range, regularly updated national fisheries policy with supporting laws; (2) trained administrators, scientists, and support personnel and an internal training program; (3) an up-to-date statistical system; (4) an adequately equipped scientific research office; (5) extension services; (6) a fish culture program; (7) participation in regional and global fishing organizations; (8) a program to finance capital development and provide loans to fishermen; (9) concern for the environment and other marine resource users; and (10) competence in product utilization, food technology, and quality control. A 25-title bibliography (1950–81) is appended.

NEB-0101-S-00-1035-00

Paper copy $ 6.50 Microfiche $ 1.08

020 PN-AAG-788

SUGGESTED FERTILIZER-RELATED POLICIES FOR GOVERNMENTS AND INTERNATIONAL AGENCIES

Hignett, T.P.
International Fertilizer Development Center.
1977, 65 p.

Technical Bulletin IFDC-T-10

To provide an adequate food supply for their growing populations, developing countries should plan to increase their use of fertilizer at least five-fold by the year 2000. Achieving this goal will require that a high priority be assigned to increasing fertilizer production, distribution, and use with maximum efficiency. This report suggests several policies that may be employed and steps individual countries may take to pursue such goals. Exploration of the extent and quality of raw materials needed for fertilizer manufacture can be stimulated through attracting investment capital and providing tax incentives to invest. Fertilizer production and distribution systems, emphasizing increased production capacity at reduced costs, should be planned for maximum efficiency and economy using technology appropriate to the needs and abilities of the countries. Stimulation of fertilizer use should emphasize agroeconomic research and farmer education. Manpower utilization and development should be given due consideration in the selection of level of technology, in training programs, and in personnel policies that reward efficiency and achievement. Possibilities for integrating fertilizer manufacture with other industries should be sought and pursued when advantageous. International organizations can assist in increasing the quantity and efficiency of fertilizer use through promotional activities; development and use of improved forms of fertilizer materials; improved application and proper balance of nutrients; development of new varieties that use fertilizer more efficiently or supply part of their fertilizer requirement through symbiotic nitrogen fixation; and provision of investment capital when none can be obtained elsewhere. Studies on efficient use of organic waste materials and other studies on the economics of manufacture, distribution, consumption, and demand of fertilizers and related environmental aspects should be performed to determine the best use of resources to meet the present and future needs. International agencies should also be responsible for the dissemination of this information. Eight bibliographic entries (1973–76) are cited for further reference.

AID/ta-G-1218 GTS 931005400

Paper copy $ 8.45 Microfiche $ 1.08

021 PN-AAH-333

EVALUATION OF IRRIGATION ACTIVITIES IN BOLIVIA

Harvatin, J.F.
Devres, Inc.
1980, 44 p.

Two-thirds of Bolivians are farmers, yet due to the low level of agricultural productivity caused largely by inadequate irrigation techniques, agriculture constitutes only one-third of the nation's GNP. This study, written in Spanish, evaluates current irrigation practices and the potential for improving irrigation in Bolivia. Although Bolivia has adequate subterranean and superficial water supplies as well as marked rainy seasons, a lack of funds, few trained personnel, and difficult topography have permitted only a few irrigation projects to be developed. Additionally, farmers use primitive irrigation techniques, such as flooding, which are ineffective and promote soil erosion. While large reservoir projects have been slightly more successful, they also lack adequate soil maintenance techniques and are responsible for higher soil salinity levels. The use of river water in a number of projects threatens to contaminate crops and spread

disease as the water often contains sewage and human wastes. The viability of irrigation systems in Bolivia is unascertainable without: (1) accurate data on rainfall, water levels, climate and soil content; (2) educational outreach programs on soil maintenance and irrigation uses; (3) increased numbers of engineers and technicians; (4) reliable data on current farm production; and (5) increased management effectiveness and resources. Although a full cost-benefit analysis of levels of production with irrigation is impossible without these data, existing data indicate well-run irrigation projects could increase farm output 50–100%. Due to limited resources for implementing irrigation projects, priority should be given to vineyards in Tarija, vegetables and alfalfa in Cochabamba, and corn, potatoes, and fruit in the valleys. New projects in marginal areas will be more difficult due to the steep slopes, narrow valleys, adverse weather conditions, and poor soil content. There is little hope of quick improvement in the Bolivian irrigation system, but if large-scale projects are emphasized, management, training, and extension efforts can be developed simultaneously. A bibliography (1973–77), terms of reference, and a list of interviewees are included in English and Spanish.

AID/SOD/PDC-C-0223 511000001
Also available in English: PN-AAH-332, 53 p.

Paper copy $ 5.72 Michrofiche $ 1.08

022 PN-AAJ-009

MATCHING CROPPING SYSTEMS TO WATER SUPPLY USING AN INTEGRATIVE MODEL

Reuss, J.O.
Colorado State University, Engineering Research Center.
1980, 217 p.

Water Management Technical Report No. 62

Matching cropping systems to available water supply is a major element in the complex process of choosing a suitable cropping system. This manual, using examples from studies conducted in Pakistan, describes an integrative mathematical model to assist in this process. The first step in evaluating cropping systems relative to water supply is to determine the climatic potential for crop water use, or "potential evapotranspiration" (E_{tp}). E_{tp} may be defined as the water use of some standard reference crop growing as if water were not limiting. (The Penman and the Modified Jensen-Haise methods of calculating E_{tp} are used.) The next step is to estimate actual evapotranspiration that will occur in the field; that is, the crop evapotranspiration that would normally occur plus the excess transpiration that would occur from crop and soil surfaces that may temporarily be abnormally wet from irrigation or rainfall. A computer program has been developed to calculate consumptive use for eight common crops in Pakistan—citrus with a cover crop, citrus without cover, cotton, berseem (Egyptian clover), maize, rice, sugarcane, and wheat. The input required for these calculations is a file of weather data containing the necessary information for calculating E_{tp}. Next, calculations of crop consumptive use (for both single crops and crop mixes) are integrated with the irrigation supply requirements by use of a simulation model. The model is programmed in the HPL language for use on the Hewlett Packard model 9825A desktop calculator. In a less technical final section, use of the linear programming (LP) technique for crop selection and/or water pricing is explained. Possible strategies include combining crops whose peak irrigation demands are complementary, selectively stressing some crops in order to stretch a fixed supply of water, and substituting more or less water-intensive crops for one another. It is shown that the LP technique complements the simulation model, with the latter providing essential data for LP optimization. The manual includes a list of references (13 entries, 1948–79) and two appendices (methods for calculation of important model parameters and a program guide, documentation and listings).

AID/ta-C-1411 931048900

Paper copy $28.21 Microfiche $ 3.24

023 PN-AAJ-010

FIELD EVALUATION OF METHODS FOR MEASURING BASIN IRRIGATION PERFORMANCE

Kundu, S.S.; Skogerboe, G.V.
Colorado State University, Engineering Research Center.
1980, 136 p.

Water Management Technical Report No. 59

Even though basin irrigation methods have been practiced for millenia and are used today to irrigate more of the world's land than any other method, little research has been conducted to evaluate the hydraulic performance of basin irrigation or to develop criteria for improving present basin irrigation practices. To promote more systematic investigation, this report describes field procedures for evaluating basin irrigation performance. The procedures, tested in the Grand Valley area of Western Colorado, entail organizing a basin into a grid system. Calculations are made for each area and average figures are computed to represent the basin as a whole. In the experiment, the ground was leveled, planted with sweet corn, and irrigated five times. Each plot was monitored for inflow, discharge, depths, and corresponding times. Three methods for calculating infiltrated water depths are then described and compared. The adjusted infiltration equation and split-time infiltration methods require an infiltrometer test and the infiltration opportunity times of each grid area. The accuracy of these methods depends essentially on the accuracy of the infiltration equation developed by the cylinder infiltrometer tests. The modified volume balance technique is based on measured volumes of inflow and water surface storage at several times during the water front advance and represents the actual infiltration characteristics of the entire basin. This method's accuracy depends on the observer's visual judgment and the levelness of the basin. Although data were insufficient for extensive conclusions, analysis indicates that the modified volume balance method is highly reliable in the sense that the infiltration equations thus developed include all the attributes of both the soil and irrigation conditions. A 7-item bibliography (1942–78), a list of 68 related publications, and tables and graphs on station area,

infiltration functions, advance and recession contours, applied water depths and infiltration opportunity times, estimates of applied water depths by the modified volume method, and sweet corn yield, are appended.

AID/ta-C-1411 931048900

Paper copy $17.68 Microfiche $ 2.16

024 PN-AAJ-011

WATERCOURSE IMPROVEMENT RESEARCH IN PAKISTAN

Kemper, W.D.; Clyma, Wayne; Skogerboe, G.V.; Trout, T.J.
Colorado State University, Engineering Research Center.
1980, 106 p.

Water Management Technical Report No. 56

In 1971, Colorado State University (CSU) Water Management Field Party and Pakistani investigators discovered that 45% of all the water in Pakistan's man-made irrigation systems was lost before ever reaching arable land. In 1977, A.I.D. funded a water management research program to provide the basis for future development and redesign of Pakistan's national irrigation system. This report outlines the investigation of and reasons for water loss and the ensuing development of an alternative water management program. The primary causes of water loss were identified as high porosity of upper portions of banks due to burrowing animals and insects; thin, fragile banks near watercourse junctions due to soil borrowing for dams; rising levels of water in the watercourse due to vegetative growth and sedimentation; and difficulty in organizing farmers to perform regular maintenance. Experimental masonry and concrete watercourses were built by the Government of Pakistan (GOP) and given to farmers, but the costs were prohibitively high, the quantity of cement needed was too great, and farmers, having no investment in the system, failed to maintain the watercourses. Other lined watercourses constructed by local farm labor using GOP-provided materials were better appreciated and maintained but took too long to build and still required too much cement. Cooperative improvements of earthen channels by farmers using government materials and design, though, had a favorable benefit/cost ratio (3:1) and were eagerly accepted by farmers. Although subsequent studies showed that regular maintenance of existing canals would have saved almost as much water and at a lower cost, the new system was preferred by farmers and, as a result, both GOP and USAID officials asked the CSU/GOP team to implement the plan nationally. Since full benefits were realized only by those farmers who organized themselves to regularly maintain the system, the report recommends that an education program be established to clearly demonstrate the cause and effect nature between maintenance and reduced losses and that laws be passed to enable local leaders to organize farmers and penalize those not contributing. A 26-item bibliography (1965–80) is appended.

AID/ta-C-1411 931048900

Paper copy $13.78 Microfiche $ 2.16

025 PN-AAJ-012

WATERCOURSE IMPROVEMENT MANUAL

Trout, T.J.; Kemper, W.D.
Colorado State Unversity, Engineering Research Center.
1980, 266 p.

Water Management Technical Report No. 58

In the arid and semiarid regions which comprise 50% of the world's arable land, water is the critical input on which food production increases depend. This manual discusses processes (of interest to planners) and techniques (of use to engineers, economists, and sociologists) to improve the efficiency of tertiary irrigation conveyance systems (ditches, laterals, and other small watercourses) which convey water from large canals to individual farms. Although the procedures outlined in the manual were developed on the basis of conditions in Pakistan, they are applicable where similar conditions obtain. The manual suggests the following procedure. (1) Analyze the extent and causes (e.g., permeable soils, poor maintenance, excess water supply) of channel losses and evaluate channel improvements in terms of the lost water's value to other users and its marginal value to crop production. (2) Develop specific remedies (including physical changes to the channels and conveyance system or changes in operation and management), test them under controlled conditions, and cost them realistically. (3) Package successful techniques, test these on a larger scale, and adjust the package as practical constraints arise. (4) Test the final version of the package in a full-scale pilot project. (5) Study local social and organizational structures and, where necessary, work to make these local structures receptive to new guidelines and policies regarding channel improvement, utilization, and maintenance. (6) Finally, apply the successful improvement package to the entire target area. The authors note in conclusion that despite any channel improvements, it is afterwards, when the channels must be maintained and the supplemental water put to good use, that the most difficult part of the process begins. A 30-item bibliography (1947–80), sample data collection sheets, and information on field, watercourse, and topographic mapping, differential leveling, channel design, choice of cross-sectional shapes, allocation of alternative improvement techniques, and overviews of two Pakistani training programs are appended.

AID/ta-C-1411 931048900

Paper copy $34.58 Microfiche $ 3.24

026 PN-AAJ-014

SUMMARY OF SKIMMING WELL INVESTIGATIONS

McWhorter, D.B.
Colorado State University, Engineering Research Center.
1980, 87 p.

Water Management Technical Report No. 63

Exploitation of groundwater supplies for agricultural, municipal, and industrial uses is severely hampered in many regions of the

world by the encroachment of unusable salt water following fresh water withdrawals. Perhaps the most important example of salt water encroachment in inland aquifers is in the Indus River Basin of the India-Pakistan subcontinent. This report summarizes research on water flow in fresh-saline water aquifers, with particular reference to Pakistan, conducted at Colorado State University (CSU). Because a high water table underlies the country's extensive irrigated surface area, Pakistan suffers widespread problems of waterlogging and salinity, necessitating the installation of drainage and reclamation programs. Drainage is complicated by the presence of highly saline water underlying virtually all of the relatively fresh water throughout the aquifer. The only conceivable long-term solution is to "skim" the fresh water from the aquifer with minimal disturbance to the saline zone. Research has been conducted at CSU on the mechanisms of fresh-water flow above a saline zone and procedures have been tested for exploiting the fresh water zone without entraining (carrying along) the underlying salt water. A laboratory model study of salt-water upconing beneath pumping wells has also been designed and theoretical studies have been undertaken in which a fresh-water system was treated as two zones with distinct densities. Flow in both isotropic and anisotropic aquifers was modeled to design criteria for wells and for horizontal drains capable of skimming the fresh water without substantial entrainment of salt water. In addition, a mathematical model was developed that treated the system in terms of flow of a non-homogenous liquid. Field experiments on actual system behavior and on the practicality of skimming wells were carried out in Pakistan. In designing wells, the authors recommend that the salinity profile be done first to estimate the thickness of the fresh water layer, that the screened portion be located in the upper part of the fresh-water zone, and that good well construction practices be used to minimize well losses. Appended is a 17-item bibliography (1935–75).

AID/ta-C-1411 931048900

Paper copy $11.31 Microfiche $ 1.08

027 PN-AAJ-015

TRAINING MANUAL FOR AGRICULTURAL WATER MANAGEMENT SPECIALISTS

Westfall, D.G.
Colorado State University, Engineering Research Center.
1980, 675 p.

In Water Technical Report No. 60

Improved on-farm water management (OFWM) is a vital area for improving agricultural production in developing countries. This training manual contains the lesson plans and outlines the course of study given to water management extension specialists ("agricultural officers") in the OFWM Development Project in Pakistan before they are assigned to the field team. The course's major objectives are to develop the participant's confidence in his ability to work with farmers; provide him with the skills needed to convince farmers to undertake a watercourse improvement or a cleaning and maintenance program and how to supervise these programs; and equip him with knowledge and skills so that he can demonstrate to farmers how more efficient use of irrigation water can increase crop production. This interdisciplinary training program encompasses seven professional areas: (1) Irrigation and drainage studies outline courses on the evaluation and improvement of irrigational practices. In addition, classes on watercourse improvement, design, cleaning, and maintenance are provided. (2) Agricultural extension training involves organizing and implementing a watercourse cleaning and maintenance program. Also, methods on agronomic and irrigation improvement are illustrated. (3) Agronomic studies provide training on crop production guidelines, the implementation of field demonstrations, and field trips. (4) Soil science studies discuss areas such as water quality, and soil and fertilizer components. (5) Farm power and machinery courses cover the operation of farm equipment under field conditions. (6) Farm management studies include classes on farm budgeting and economic principles of farm management. (7) Rural sociology training demonstrates how to organize a watercourse committee and implement a watercourse cleaning and maintenance program. The lesson plans are developed for an audience with B.S. degrees. Graphs and tables are provided throughout the lessons to facilitate the learning process. The course is 103 days in length, of which 71 days are spent in practical fieldwork. In addition, 60 water management technical reports presented by Colorado State University are listed and priced.

AID/ta-C-1411 931048900

Paper copy $87.75 Microfiche $ 7.56

028 PN-AAJ-308

THE CITANDUY RIVER BASIN DEVELOPMENT PROJECT; PANAWANGAN PILOT WATERSHED IMPLEMENTATION AND EVALUATION REPORT

PRC Engineering Consultants, Inc.
1980, 134 p.

Severe erosion of irreplaceable topsoil in Indonesia decreases agricultural productivity, requiring annual rice imports amounting to 2.6 million metric tons. The Panawangan Pilot Watershed Project was designed to reverse this trend by establishing soil and water conservation practices capable of maintaining high production levels in the dryland farms of the Citanduy River Basin. This report evaluates the project in terms of its soil conservation practices, agricultural and community development programs, economics, and participating agencies. To reverse topsoil erosion in dryland areas caused by poor land use and increasing population pressures, the Panawangan Project has promoted improved soil conservation practices such as bench terraces, waterways, gully plugs, cutthroat flumes, and sediment traps, and has begun collecting soil erosion data. The project has also initiated an agricultural development program consisting of improved agronomic practices such as variety and fertility trials and multiple and mono-

culture cropping; a grass revegetation program; planting of trees as cash crops and for lumber and fuel; and livestock, beehive, and fish pond production programs. Besides providing technical assistance to farmers in the above and other areas, the project has actively engaged farmers in project implementation through community and farmer training programs, including special sessions to inculcate the project's basic concepts, especially by convincing farmers that the project will help increase farm production. Consultants have coordinated the activities of the wide range of local and national Indonesian agencies and research institutes involved in implementing this USAID-supported project. The project's most recent development (3/79) has been the establishment of nine mini-watershed demonstration sites. Government use of these pilot sites as a means of extending the Panawangan Project's successes is recommended. Also recommended is a low-interest loan program to enable dryland farmers to finance the inputs such as improved crop varieties and access to cooperatives and technical assistance which are required to increase production. A 31-item bibliography (1954–78) is appended.

AID/SOD/PDC-C-0215 497024500

Paper copy $17.42 Microfiche $ 2.16

029 PN-AAJ-413

REPORT OF A PLANNING WORKSHOP ON IRRIGATION WATER MANAGEMENT

International Rice Research Institute (IRRI).
1980, 177 p.

Irrigation expansion has become vital to agricultural development in the major rice-growing countries over the last 10–15 years. As part of its efforts to increase irrigation efficiency and eliminate the technical, economic, and socioinstitutional problems that impede rice production, the International Rice Research Institute (IRRI) hosted a workshop on Irrigation Water Management held at IRRI, March 26–30, 1979. The topics covered at the workshop, the proceedings of which are here presented, were: (1) managing canal irrigation in the 1980's; (2) hardware and software combinations in irrigation management; (3) an economic analysis to support irrigation investment and management decisions; (4) solving irrigation system management problems; (5) studies in water management economics at IRRI; and (6) selected research findings in water allocation, distribution, and use criteria for irrigation system design and management. Among the workshop's recommendations in engineering- and management-related research were: (1) identify data needed to improve irrigation system design and management; (2) find efficient alternatives to effect irrigation water savings; (3) find ways to justly divide responsibility between agency personnel and farmers; and (4) study the relative benefits of small, medium, and large systems. Socioinstitutional research recommendations included: (1) continuing on-the-job training in research; (2) creating a data base available to individuals, organizations, and governments; and (3) coordinating economic consequences programs with water management programs to determine the effect of irrigation on future population growth in rural areas, the man-land ratio, on-farm employment, the environmental impact of irrigation, and inequities between rainfed and irrigated areas. Lastly, recommendations regarding economics- and investment-related research were to develop: (1) a postproject evaluation handbook; (2) methodologies for estimating employment and income effects of irrigation projects; (3) a cost/benefit analysis of different distributional and on-farm irrigation facilities; and (4) a procedure to determine the economic and operational factors for conjunctive use of surface and groundwater.

AID/DSAN-G-0083 931082600

Paper copy $22.10 Microfiche $ 2.16

030 PN-AAG-904

A WORLD BIBLIOGRAPHY ON GOATS

Sands, M.; McDowell, R.E.
Cornell University, Department of Animal Science.
1979, 117 p.

Cornell International Agriculture Mimeograph No. 70

Ninety-five percent of the world's 410 million goats are found in developing countries. The vast majority of them are multipurpose animals, contributing 1.65% to the world's milk supply in 1974 and—since most goats are slaughtered at the village level—far more than the estimated 5.7% of the 17.9 million metric tons of 1976 world production of edible protein from slaughterhouse animals. Exporting of mohair from Angora goats in such countries as Turkey and Namibia and of goat skins in Nigeria attests to the foreign exchange importance of goats. Of the four major systems of goat production—intensive commercial production herds; large nomadic herds; large sedentary herds found on the outskirts of urban areas; and small household units kept mainly for subsistence needs—the first system is found mostly in developed countries (La Comerca Lagunera in Mexico being a notable exception). The other three systems are practiced in various combinations throughout most of the tropics and subtropics. Because they are cheaper and easier to use than cattle, goats are often used in nutrition research, and 13 U.S. institutions are currently engaging in collaborative research programs using goats (as well as sheep) to increase animal products on small farms in developing countries. International centers working on goat research include the Consultative Group on International Agricultural Research (CGIAR), the International Livestock Centre for Africa (ILCA), and the International Laboratory for Research on Animal Diseases (ILRAD). In response to the growing importance of and worldwide interest in goats, this 90-page, alphabetically arranged and numbered bibliography on goats has been compiled. Entries are drawn from all over the world, but are listed almost exclusively according to English titles. A topical index facilitates use of the bibliography, correlating bibliographic items with goat breeds and origins; the role of goats in developing world agriculture; the countries in which

goats are found; and biological data such as behavior, birth weight, growth rate, health, management, meat production, milk composition and yield, milking machines, nutrition and feeding efficiency, physiology, and reproduction.

AID/ta-BMA-8 931113700

Paper copy $15.21 Microfiche $ 2.16

031 PN-AAH-316

REPORT ON THE DEVELOPMENT OF GOATS IN ASIA

Devendra, C.
Animal Production and Health Commission for Asia.
1979, 77 p.

Recent interest in goats by Asian countries has led the Regional Animal Production and Health Commission for Asia, the Far East, and Southwest Pacific (APHCA) to initiate a program on goat development. This report presents a state-of-the-art paper on Asian goat husbandry presented at the March 1979 APHCA seminar on Asian goat development, along with a summary of the seminar itself. After brief background sections, the paper discusses goat population and distribution within the APHCA region. Findings indicate that goats represent 25.6% of the total grazing ruminants in the countries east of Iran and that between 1965 and 1977 the goat population increased 3.5 times faster than sheep. The next section treats the important functions of goats, such as their contributions of meat, milk, manure for fertilizer, and skins. After a brief section on goat ownership, five categories of goat production systems are discussed: tethered, extensive, intensive, semi-intensive, and integrated (with cropping systems.) Next, breeding practices and constraints to goat production, such as lack of understanding of the value of goats and inadequate control of diseases harmful to goats, are discussed. Strategies for developing and exploiting the characteristics of goats are presented in a concluding section of the paper. The objectives of the APHCA seminar were to examine systems of goat production and constraints to development; suggest improvements in the present system; formulate national and regional goat development programs; and indicate socioeconomic benefits of such programs. The major topics covered at the seminar, which included country statements from 10 APHCA nations, were breeding, nutrition, physiology, and health. Final conclusions and recommendations were to: (1) hold regular meetings of goat production specialists; (2) establish an advisory committee to coordinate programs; (3) provide graduate, technical, and extension training in program development; and (4) make each APHCA country responsible for submitting projects based on the action programs developed at the seminar. Appended to the paper are a 23-item bibliography (1970–78), a list of seminar participants, and nine of the country papers.

AID/DSAN-G-0032 931115500

Paper copy $10.01 Microfiche $ 1.08

032 PN-AAH-958

AGRICULTURAL SECTOR ASSESSMENT; LIVESTOCK SUBSECTOR FOR HAITI

Conrad, J.H.
Florida University, Department of Animal Sciences.
1979, 72 p.

Livestock production, although often studied independently of other agricultural activities, is closely linked to cropping systems and to the use of land and labor resources. This report assesses the livestock subsector in Haiti as an integral part of the country's crop/farming system and suggests strategies for Government of Haiti (GOH) action. The first section examines the diversity of livestock types in Haiti's five departments and the four most commonly used management methods—free roaming, staking out, open range herding, and fenced pasture. The author advocates the inclusion of livestock enterprises in farming systems to improve farm efficiency, food production, and profitability. Potential advantages of livestock development, such as improved soil structure from the growth of forage legumes and use of crop residues, are listed. The author next discusses policy reformulations which should be undertaken by the GOH, especially the need for a national livestock policy. GOH interventions should focus on adapted technology, appropriate training, and improved infrastructure. A further recommendation is to conduct an in-depth review of GOH livestock programs to analyze the reasons for their many failures. The GOH should support breed improvement activities of the private sector rather than attempt to manage a national network of breeding stations. Five alternate strategies for GOH livestock interventions (and the specialists needed for GOH implementation) are presented: (1) research into the role of livestock in diverse small farm systems; (2) improvement of livestock nutrition and management, especially use of agricultural byproducts; (3) encouragement of genetic improvement and selection; (4) research of appropriate technology for small farm livestock management; and (5) provision of technical assistance and credit in support of livestock enterprises. Appendices on proposed livestock-related projects, rainfall/soil information, development of beef cattle production, an analysis of liver and rib bone samples, use of sweet potato residues as cattle feed, and a paper on swine nutrition conclude the report, along with a 29–item bibliography (1955–74) and 10 supporting tables.

AID/la-C-1261

Paper copy $ 9.36 Microfiche $ 1.08

033 PN-AAH-139

PLANNING AN INTERNATIONAL NETWORK OF LEGUME INOCULATION TRIALS: THE PROCEEDINGS OF A WORKSHOP HELD AT KAHULUI, MAUI, HAWAII, JANUARY 15-19, 1979

Harris, S.C.
University of Hawaii, College of Tropical Agriculture and

Human Resources, Department of Agronomy and Soil Science.
1979, 248 p.

Farmers inoculate legumes with *Rhizobium* because they expect to obtain high crop yields less expensively than by applying nitrogenous fertilizers. In the developing countries of Latin America, Asia, and Africa, however, little awareness exists of the usefulness of biologically furnished nitrogen for crop plants. Because there has been little financial support for nitrogen fixation involving rhizobia legume symbiosis, only a few studies with tropical legumes have conformed to criteria considered essential for a definitive inoculation trial. In addition, scientists recognize that individual trials would be more meaningful if coordinated in an international network. Therefore, an international planning workshop, attended by 29 agricultural and social scientists, researchers, administrators, and management experts, was conducted by the Nitrogen Fixation in Tropical Agricultural Legumes (NIFTAL) Project managers with the dual purpose of producing: (1) a design for an experimental program to define the value of inoculating tropical legumes with *Rhizobium*; and (2) a strategy to implement an international network of legume inoculation trials. The proceedings of that workshop are contained in this document. Included are the keynote and introductory addresses and short reports on biological nitrogen fixation research in the tropics which constituted the material of the two plenary sessions; summaries of the six working sessions and the two task group meetings; and the resolutions of the final review session. Topics of the working sessions included strengths and constraints of research programs in developing countries; institutional networking; facilitating communication, coordination, and evaluation; expectations for the network experimental program; procedures for the network experiments; and strengthening rhizobiology through networks, conferences, and training courses. The workshop participants succeeded in attaining the workshop's two above-noted objectives and declared unanimous support for the NIFTAL Project. Appended to this document are the workshop program, list of participants, and experimental procedures for testing *Rhizobium* strains.

AID/ta-C-1207 931061300

Paper copy $32.24 Microfiche $ 3.24

034 PN-AAH-147

STATE OF THE ART: "ACACIA ALBIDA" AS A COMPLEMENTARY PERMANENT INTERCROP WITH ANNUAL CROPS

Felker, P.
University of California at Riverside, Department of Soil and Environmental Sciences.
1978, 143 p.

Acacia albida, a leguminous tree, has substantially increased the well-being of small farmers in the Sahelian desert region of West Africa by increasing soil fertility and crop yields and by providing pods for animal food. Although the available literature does not allow a completely accurate analysis of its actual and potential capabilities, it is reported that use of *A. albida* for foliage cover in intercropped systems on infertile soils has nearly doubled yields of millet and peanuts. Such use also reportedly increases the soil's organic matter and nitrogen content, soil microbiological activity, and water holding capacity beneath the trees. It has also been suggested, though not proven, that *A. albida* has increased the capacity of the land to support people from about 10–20 to 25–40 persons per square kilometer. By making unnecessary the continual process of letting mineral-depleted land lie fallow and clearing new land, *A. albida* is also credited with making possible permanent agricultural settlements. These are the major findings of the state-of-the-art review of the *A. albida* literature presented in this document. The text begins with the extensive literature review itself and then summarizes the effects of *A. albida* on crop yield and soil properties, the causes for *A. albida*-induced soil fertility, its pod yields and food values, and its growth cycle characteristics. The paper concludes with a discussion of ten areas in which, in the opinion of the author, research is urgently needed, either to anticipate and solve *A. albida* problems before they arise in the field, or to develop better agricultural practices and *A. albida* cultivars. Two appendices containing interviews with Senegalese farmers and with researchers in Paris and in Senegal concerning *A. albida* are also included. A foreward describes the method in which the documents (copies of which are now all deposited at the University of California, Riverside Library) contained in this literature review were obtained.

AID/afr-C-1361 625092600

Paper copy $18.59 Microfiche $ 2.16

035 PN-AAH-216

SWEET POTATO "IPOMOEA BATATAS L."; ABSTRACTS OF SELECTED RESEARCH AND DEVELOPMENT LITERATURE, 1949-1979

Ibekwe, G.O.
International Institute of Tropical Agriculture, Library and Documentation Centre.
1979, 268 p.

Information Series No. 6

World production of over 138 million metric tons from 14 million hectares and its use as a food crop in many tropical countries attest to the importance of sweet potatoes as a world crop. The International Institute of Tropical Agriculture has compiled the present volume of abstracts of publications on the sweet potato from selected research and development literature. The referenced publications cover the period 1949-1979 and are of interest primarily to scientists, agriculturalists, policymakers, extension workers, farmers, storage and processing experts, and nutritionists. The volume is arranged in the following sections: geographical distribution; research priorities and pro-

grams; genetics; breeding; production physiology; culture; pests, diseases, and their control; curing, chilling, and storage; food processing; and chemical composition and nutritive values. The sections on breeding, disease and pest control, food processing, and chemical composition and nutritional value are subdivided. Most of the referenced publications are in English. Documents in Japanese lacking an English summary were excluded. Detailed author and subject indices are appended.

AID/DSAN-G-0078 931030900

Paper copy $34.84 Microfiche $ 3.24

036 PN-AAH-370

NITROGEN FIXATION BY LEGUMES IN THE TROPICS

Bouldin, D.R.; Mughogho, S.; Lathwell, D.J.; Scott, T.W.
Cornell University, Department of Agronomy.
1979, 41 p.

Cornell International Agriculture Mimeograph No. 75

Spiraling costs and the impracticality of transporting nitrogen fertilizers in developing countries have encouraged increased research on the capacity of legumes to build and conserve soil fertility. This paper summarizes the estimated amounts of nitrogen fixed by legumes and the conditions which maximize the symbiosis of *Rhizobium* bacteria with legume host plants to fix nitrogen from the atmosphere and provide nitrogen for succeeding non-legume crops in the tropics. The *Rhizobium*-legume symbiosis contributes 40 million tons of nitrogen annually to grain legumes and thus offers great opportunities for increasing inputs of nitrogen in food production. Although nitrogen fixation in the tropics with tropical legumes is comparable in quantity to that obtained in temperate regions with temperate legumes, the deliberate use of tropical legumes for nitrogen fixation is not extensive. Legumes may be intercropped with non-legumes or grown in rotation whereupon legume residues furnish organic nitrogen to the succeeding non-legume crop. The economic value of the organic nitrogen to succeeding non-legumes rests on its amount and on the rate of its mineralization. The authors present tables on the net annual accretion of nitrogen in the soil-plant system by several legumes and discuss the contributions to nitrogen fixation of green manures and legume fallows, pasture/forage legumes, and grain legumes. Increased use of the latter should be encouraged as they appreciably increase the nitrogen available to succeeding non-legumes while protecting the soil from erosion. Grain legumes are an essential source of dietary protein in tropical regions, and larger protein yields can be obtained through polycropping with a non-legume grain, provided the proper *Rhizobium* is present. Three conditions are essential for optimum symbiotic nitrogen fixation: (1) compatibility between the *Rhizobium* strain and the host plant; (2) soil and environmental conditions which favor *Rhizobium* survival; and (3) increasing yield of the host plant as an essential condition for high symbiotic fixation. An 86-item list of references (1921–76) is appended.

AID/csd-2834 931012700

Paper copy $ 5.33 Microfiche $ 1.08

037 PN-AAH-600

A RAPID METHOD OF HAND CROSSING COWPEAS

Rachie, K.O.; Rawal, K.; Franckowiak, J.D.
International Institute of Tropical Agriculture. (IITA)
1978, 6 p.

Technical Bulletin No. 2

Cowpeas are generally easier to cross than other grain legumes. Their flowers are large and easy to manipulate, the keel is straight, beaked, and not twisted. There are only a few floral nodes per raceme, which tend to have a low abortion rate, and 8–12 seeds are usually produced per cross. This report presents an effective and rapid method of hand emasculating and crossing cowpeas which was developed at the International Institute of Tropical Agriculture (IITA). The normal crossing technique consists of removing the upper half of the petals starting with a partial cut opposite the stylar and staminal section. Following pollination with a freshly opened flower, the crossed bud remains uncovered. Normally, the emasculation-/pollination process can be accomplished at the rate of 1–2 per minute with a success rate of only 10–20%. The IITA technique, however, increases the rate of success to 50%, with attempts on male sterile plants (ms_2 ms_2), which require no emasculation, attaining a 70–80% success rate on the average. The IITA technique is performed in a greenhouse or mesh house which effectively eliminates major pests and important diseases and nematodes and facilitates watering, staking, and applying of nutrients. Since *Vigna* germplasm is day-length sensitive, flowering can be synchronized so that emasculation can occur the evening before the flower buds open. The bud for emasculation is grasped firmly but gently and a cut is made about two-thirds the width of the unopened bud in its center starting from its straight edge. The upper portion of the folded petals is then lifted out by the thumb and index finger and torn free, facilitating removal of the anther sacs with a scissors or forceps. Pollination can begin the next morning. Another technique involves removal of the mass of pollen grains from the hairy-necked style with a thumb nail, but great care is needed to prevent damage to the stigma and to avoid contamination. The success of the cross can usually be determined within 3 days of anthesis since the unfertilized ovary can remain attached for 2 days after anthesis. Moderate temperature and humidity will help enhance the success of the procedure. Pods are ready to harvest 18–22 days after pollination.

AID/ta-G-1491 931030900

Paper copy $ 0.78 Microfiche $ 1.08

038 PN-AAJ-327

GENETIC IMPROVEMENT OF PRODUCTIVITY AND NUTRITIONAL QUALITY OF WHEAT: FINAL REPORT OF RESEARCH FINDINGS

University of Nebraska, College of Agriculture.
1980, 112 p.

Food to nourish the world's population, which will reach 6.5 billion by the year 2000, transcends all other problems confronting countries and governments. To help increase world food production, A.I.D. funded a research project to genetically engineer high protein wheat (HPW) at the University of Nebraska from 1966 to 1979. This final report summarizes the project's research findings. Analyses of 20,000 wheat cultivars showed that genetic variation for HPW of at least 5% exists in hexaploid wheat; genetic variation for lysine (LYS) amounts to only 0.5%; LYS, as a percent of HPW, correlates negatively with HPW at protein levels up to 15%; and a strong positive correlation exists between LYS per unit weight and grain protein content. Major genes affecting grain HPW content were identified in Atlas 66 and Nap Hal. Genes modestly affecting LYS were found in CI13449 and Nap Hal. Hybridized genes were transferred to productive short-statured winter and spring wheats. High-yield varieties developed included Lancota (a hard winter variety), Sava and Partizanka (Yugoslavia), Kavkaz and Aurora (the Soviet Union), and Centurk (Nebraska). Genetic studies indicate that Atlas 66 carries two or more major genes for HPW. Genetic increases in LYS provided by CI13449 and Nap Hal, while limited, are great enough for use in breeding programs and for overcoming the decrease in the fractional percent of LYS in HPW due to HPW's overall increase. Laboratory procedures were developed to streamline the large-scale screening of HPW and LYS samples. Tests showed that Atlas 66 and its HPW derivatives, when consumed whole-grain, are significantly more nutritional than ordinary wheat. Significant associative nitrogen fixation could not be shown for Nebraska wheat. Other project activities included establishment of an international winter wheat evaluation network; the holding of four international wheat conferences and an international workshop on seed HPW; and the provision of degree and nondegree training to 29 researchers, 14 of them from developing countries. The report concludes by noting that, since yields will soon regress without ongoing breeding programs, A.I.D.'s decision to cease funding the project is regrettable.

AID/ta-C-1093 931047100

Paper copy $14.56 Microfiche $ 2.16

039 PN-AAJ-378

BLUE-GREEN ALGAE AND RICE

Roger, P.A.; Kulasooriya, S.A.
International Rice Research Institute (IRRI).
1980, 118 p.

Rising costs of the chemical fertilizers used to provide the combined nitrogen needed for rice production have prompted rice researchers to turn their attention to biological nitrogen sources such as blue-green algae (BGA). Although BGA produced nitrogen when inoculated into paddy rice crops in India, uncertainties about the ecology of BGA and their mode of action on the rice plant limit their practical use. To orient agronomic research on this subject, this report presents a compilation of the relevant international research on the ecological, physiological, and agronomic aspects of BGA in flooded rice paddies. A section on descriptive ecology covers BGA occurrence in paddy fields, description of its several species, quantitative estimation studies, and accounts of its growth patterns relative to the cycles of rice cultivation. Sections on soil properties and on physical and biotic factors describe the effects on BGA of light, temperature, desiccation and rewetting, pathogenic organisms, and soil pH. A section on agronomic practices treats the effects on BGA of land preparation and management, inorganic and organic fertilizers, and pesticides. A section on the physiology of BGA in rice fields includes information on photosynthesis and nitrogen fixation. The next section, on BGA and the rice plant, covers the availability of fixed nitrogen for rice, other positive and negative effects of BGA on rice, and epiphytism. Sections on algalization describe BGA's effect on crop yield and on soil properties and microflora and its significance in the selection of rice strains for breeding, as well as the factors limiting algalization and current algalization technology (inoculation) and economics. A concluding chapter details specific questions in the two key areas on which future research should be focused—the ecology of BGA in rice fields and their modes of action on the plant, and the ways in which BGA favor rice growth. A 369-item list of references (1924–80) cited in Arabic, Chinese, English, French, Italian, Japanese, Korean, Portuguese, Spanish, and Russian, is appended.

AID-492-1310-T 497019800

Paper copy $15.34 Microfiche $ 2.16

040 PN-AAJ-414

INNOVATIVE APPROACHES TO RICE BREEDING: SELECTED PAPERS FROM THE 1979 INTERNATIONAL RICE RESEARCH CONFERENCE

International Rice Research Institute.
1980, 187 p.

The wide range of ecological conditions under which rice grows around the world is evidence of the equally wide genetic variability found among cultivars of this crucial food crop. A primary objective of today's rice breeders is to use this variability to develop high yielding, resistant varieties which can tolerate adverse environmental conditions. However, to provide significant advances quickly will require development of new breeding techniques. This report, therefore, offers innovative rice breeding techniques as presented by Swedish, American,

Chinese, Japanese, Austrian, Russian, and Indian rice geneticists at the 1979 International Rice Research Conference. The report's 10 papers outline global efforts to develop new varieties by means of such specialized breeding techniques as hybrid breeding, distant hybridization, modified bulk population methods, and mutation breeding, as well as by means of faster-working methods such as protoplast, cell, and tissue culture techniques. It is hoped that these newer and faster techniques will result in the timely development of cultivars adapted to such adverse conditions as low temperature, saline soil, and drought. Most of the conference papers in the report are accompanied by supporting data, tables, charts, diagrams, and pictures; and all are thoroughly referenced, including citation of selected French, German, and Japanese titles.

AID/492-1310-T 497019800

Paper copy $24.31 Microfiche $ 2.16

041 PN-AAJ-497

IMPROVEMENT OF NATIVE RICES THROUGH INDUCED MUTATION

Mahadevappa, M.; Ikehashi, H.; Noorasyamsi, H.; Coffman, W.R.
International Rice Research Institute (IRRI).
1981, 7 p.

IRRI Paper Series No. 57

In large areas of the rice-growing world, adverse soil and other conditions limit rice yields and prevent nations from fully exploiting their productive capacities. Mutagenesis, or induced mutation, has proven to be an effective tool for improving the height, maturity, and grain characteristics of cultivars growing under adverse conditions. This report outlines the results of an experiment, conducted by the International Rice Research Institute, in which mutagenesis was used to induce cultivars from the tidal swamps of South Kalimantan, Indonesia to be early-maturing and short-statured without losing their tolerance of tidal swamp conditions. Dry seeds of eight cultivars were treated with ethyleneimine at 0.2% and 0.4% concentrations for 1 and 3 hours to induce mutation. The positive correlation between germination of M1 seeds and spikelet fertility was used to identify optimal treatments for future experiments. Single panicles selected from M1 plants from two effective treatments (0.2%, 3 hours; and 0.4%, 3 hours) produced 1,844 M2 progenies for further screening. Screening of the M2's in natural long day length in the 1979 dry season facilitated selection of photoperiod-insensitive types from Siyam Halus mutations (IR29386) and of intermediate-statured but photoperiod-sensitive mutants from Siyam Kuning (IR30446). Early-maturing mutants, grown in the wet season as M3 plant progenies, bred true for earliness—even with short day length they matured about 1 month earlier than the parents. Intermediate-statured plants were about 35 cm shorter but otherwise the same as their parents. Tillering was improved; spikelet number per panicle was slightly reduced. Initial evaluation in the tidal swamps indicated that the mutants were well adapted but matured later than Siyam Kuning. Further investigation using several planting dates is planned in 1981. The report concludes that if ethyleneimine is specific in altering culm length it should be emphasized as a future tool for improving specifically adapted traditional rice varieties. A 19-item bibliography (1952–80) is appended.

AID/492-1310 497019800

Paper copy $ 0.91 Microfiche $ 1.08

042 PN-AAH-199

SOIL RESOURCE INVENTORIES AND DEVELOPMENT PLANNING; PROCEEDINGS OF A WORKSHOP

Cornell University, Department of Agronomy.
1978, 340 p.

Soil Resource Inventories (SRI) are maps that accurately record the geographic distribution of soil bodies and identify soil conditions for given land use objectives. This document contains the proceedings of the 1978 workshop sponsored by the SRI study group at Cornell University. In seven sessions, the workshop examined the methodologies used to effectively plan, present, and evaluate SRI information. After an introduction on the aims and rationale of the Cornell group's study of SRI's, section one of the proceedings reviews the 1977 SRI workshop and provides an introduction to guidelines used in the appraisal of SRI's. Section two discusses the objectives of SRI's in development planning and includes a standardized map checklist used to record soil and map data from which SRI's are compiled. Section three outlines the use of simplified response curves to illustrate the cost/benefit relationships of SRI's and reports on an evaluation of rice lands in Sri Lanka. Sections four and five, which treat the appropriate interpretation and clear presentation of SRI data to meet the individual needs of development planners, include reports on the use of SRI's by ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer), the World Bank, and the Comprehensive Resource Inventory and Evaluation System (CRIES) in the Caribbean, along with reports on the use of SRI's in Thailand, Peru, and India in regional and national development planning. Section six discusses quality control in the gathering, analysis, and presentation of soil survey data and the responsiveness of soil survey organizations to government legislation. Recommendations on the use of SRI's by development planners, the subject of section seven, include developing a comprehensive soil classification system in the lower categories for each subcontinent and developing international technology transfer training programs to assist individual countries to better inventory their resources and to create or improve their information systems on land use and natural resources. Appended are a list of workshop participants and summaries of workshop discussions, including a special summary of discussions on the use of SRI's for paddy rice.

AID/csd-2834 211(d) 931012700

Paper copy $44.20 Microfiche $ 4.32

043 PN-AAH-138

A SELECTIVE ANNOTATED BIBLIOGRAPHY OF RURAL POVERTY IN COLOMBIA

Thirsk, W.R.
A.I.D., Bureau for Latin America and the Caribbean, Rural Development Division; University of Waterloo.
1977, 15 p.

A.I.D. Working Document Series: Colombia, General Working Document No. 1

Since 1950, rural poverty in Colombia has drawn an increasing amount of scholarly attention. This 56-item bibliography (1951–78) of selected English and Spanish language titles is thought to be the most comprehensive attempt yet made on the subject. Document types include censuses, surveys, and other primary data sources which describe much of the analytical work that has been done on Colombia. Major topics of discussion include employment and income distribution; the relation of education to rural development; rural tax policy; characteristics and decisionmaking processes of small farmers; land tenure, reform, and redistribution; crop and livestock production; and characteristics of rural-to-urban migrants. Each entry is followed by a brief annotation indicating the entry's contents.

Paper copy $ 1.95 Microfiche $ 1.08

044 PN-AAH-847

RAPID RECONNAISSANCE APPROACHES TO ORGANIZATIONAL ANALYSIS FOR DEVELOPMENT ADMINISTRATION

Honadle, G.
Development Alternatives, Inc.
1979, 62 p.

Strong political and organizational pressures often require administrators to make decisions based on information that has not been collected and analyzed according to the rigorous methods recommended by social scientists. To help administrators in this situation from employing information that is not only less than optimal but actually inaccurate, this paper suggests ways to improve quick, impressionistic data collection methods. When employing rapid reconnaissance methods, social scientists discard the usual questionnaire and subsequent quantitative analysis. Instead, reconnaissance practitioners use proxies for complex dynamics and perform spot checks of the proxies. This technique was used to measure the success of a campaign against illegal lumbering in an Asian country. Typical indicators (reported encounters, arrest rates, conviction rates, and confiscated lumber) were discarded as unreliable. The researcher chose instead to monitor the price of elephants—the assumption being that since the major use of elephants was in lumbering, their going rate in the local market would reveal the campaign's effectiveness. Advantages of these strategies include timeliness, low cost, and flexibility. Major disadvantages are the difficulty of judging either the accuracy of the data or the investigator's performance (due to the lack of standardization). Also, simple proxies can be misleading. For example, it would seem that a spit-and-polish department of agriculture packed with highly paid Ph.D.'s would be a good indicator of an organization's effectiveness. However, this assumption does not consider the typical unwillingness of highly qualified personnel to travel to rural areas and train farmers. Thus, it is important to articulate and test one's assumptions. The author recommends that studies be made to determine the contingencies that tend to invalidate different types of indicators. Also, social scientists should study tradeoffs between reconnaissance approaches and indepth methods and try different combinations. The author emphasizes that reconnaissance methods are not a panacea for budget constraints or deadlines, but sometimes provide a practical alternative to costly orthodox approaches.

AID/DSAN-C-0065 936530000

Paper copy $ 8.06 Microfiche $ 1.08

045 PN-AAH-938

APPROPRIATE TECHNOLOGY FOR DEVELOPMENT: A DISCUSSION AND CASE HISTORIES

Evans, D.D.; Adler, L.N.
Denver Research Institute.
1979, 508 p.

Westview Special Studies in Social, Political, and Economic Development

The failure of development assistance efforts to lessen poverty, especially for the 800 million, mostly rural people living below the minimum subsistence level, forces consideration of the ability of the technologies used in these efforts to achieve economic development. This book explores recent thought on this question and illustrates the economic effect of technology with 22 case histories drawn from all over the world. Technology is the means used by human beings to change their environment. The term "appropriate technology" (AT) is used when culturally congenial, least-cost, labor-intensive means are used to meet essential development goals. After summarizing the principal issues involved in AT—environmental limitations, population growth, the inequitable distribution of wealth, and the often negative role played by technology in the past—the study addresses the advantages and disadvantages of different development theories and imported technologies. The study defends the humanistic/conservator ethic personified by E.F. Schumacher (*Small is Beautiful*) who contends that our age's rampant materialism uses technology to perpetuate a cycle of ever-increasing wants and not to meet the world's modest absolute material needs. Gearing AT away from maximizing consumption to long-term productivity gains is difficult, however, and research on a given country's environment, development goals, and technology is needed. The following

criteria should be considered in choosing between technological variables: (1) recognition of a problem in the project area; (2) public attitudes; (3) domestic social and economic structures; (4) possibility of adapting imported technology; (5) the volume of replication and market conditions; (6) availability of materiel and other resources; and (7) government policy. After analysing AT's growing importance in U.S. development assistance efforts, the 22 case studies are examined in terms of their human and material resources, the means used to develop these resources, and the environmental effect of this use. Examples of AT provided range from converting automotive fuel from gas to butagaz to developing lime kilns. A 144-item bibliography (1972–79) is attached.

AID/DSAN-C-0062

Paper copy $66.04 Microfiche $ 6.48

046 PN-AAJ-319

REGIONAL PLANNING FOR INTEGRATED DEVELOPMENT IN THE DOMINICAN REPUBLIC

University of Wisconsin, Regional Planning and Area Development Project.
1981, 36 p.

Consulting Report No. 5

Development initiatives in areas where poverty is absolute and infrastructure virtually non-existent require careful planning efforts. In this study, the University of Wisconsin, in response to a request from the Oficina Nacional de Planificacion (ONAPLAN), analyzes in-country USAID/Dominican Republic and ONAPLAN possibilities for a Regional Planning and Area Development Project (RPADP) in the Dominican Republic with specific reference to the country's southwestern and southcentral areas. The team notes that an integrated strategy for area development requires a multisectoral approach in a specific geographical area where the government is committed to decentralization, i.e., to creating and maintaining an institutional infrastructure invested with decisionmaking authority. To date, despite the Dominican Republic's commitment of administrative and financial resources to regional programs, decentralization efforts have often been disorganized and diffused. Within this context, the prospects for developing agriculture, agroindustry, manufacturing, and marketing are reviewed in terms of physical and institutional resources. The Southwest possesses a sufficiency of both types of resources to offer genuine development potential in agriculture and industry and could serve as a model for decentralization efforts elsewhere. Improved irrigation, a research facility, and increased agricultural inputs could strengthen cotton, castor beans, grapes, and grain sorghum production; while manufacturing possibilities exist in export assembly operations and food processing. By contrast, the Southcentral region is still recuperating from the damage inflicted by Hurricanes David and Frederick in 1979 and lacks sound institutional infrastructure. Consequently, long-term development efforts should be deferred in this area until immediate needs are met. It is recommended that USAID link RPADP to efforts of the Instituto para el Desarrollo del Suroeste (INDESUR); coordinate technical assistance in specific sectors under the umbrella of an RPADP program; and engage in institution-building efforts to increase the capacity of ONAPLAN and other Dominican agencies to engage in regional planning, development, and decentralization.

AID/DSAN-C-0060 931113500

Paper copy $ 4.68 Microfiche $ 1.08

047 PN-AAJ-467

INTEGRATED RURAL DEVELOPMENT: MAKING IT WORK?

Honadle, G.; Morss, E.R.; VanSant, J.; Gow, D.D.
Development Alternatives, Inc.
1980, 266 p.

Executive Summary Published Separately: PN-AAJ-468, 45 p.

As part of an A.I.D. project to assist managers of integrated rural development (IRD) projects, in which success depends as much on effectively mobilizing complex resources as on technical expertise, this report, based on a 2-year experience in 10 developing countries, presents the state-of-the-art in IRD project management. Around the two key factors of organizational design and managerial tactics, the report details a wide range of perennial problems and choices faced by IRD project managers in delivering goods and services, eliciting local response, and effecting self-sustaining improvements. The resulting practical guide, in which the need for choices involving trade-offs is continually noted, stresses the following elements as essential: For the delivery of goods and services, effective organizational design requires choosing an appropriate level of centralization or decentralization and a capable host agency and in establishing a clear and coordinated chain of command. Managers, who should possess management skills prior to the project's inception, need to base decisions in these areas—particularly regarding technical assistance strategies—on sound data and know-how to exercise authority in informal, collegial, and motivative ways. To elicit local response to development initiatives, a sound organizational design should incorporate the use of local organizations to include villagers in the decisionmaking processes, while managers should use flexible strategies in coordination with local leaders. The persistence of unforeseen negative side effects of IRD efforts and lack of a clear concept of welfare itself make measuring self-sustaining welfare highly uncertain. Such welfare seems best attainable in projects which are small-scale and deal with critical constraints; require local resource commitments and build local organizational and management capabilities; share implementation responsibilities between villagers and project staff; and create and use a management information system. A 518-item bibliography in English, French, and Spanish (1955–80) is included.

AID/DSAN-C-0065 936530000

Also available as "A Preliminary Review of the State-of-the-Art" in French: PN-AAJ-470, 66 p.; and in Spanish: PN-AAJ-469, 63 p.

Paper copy $34.58 Microfiche $ 3.24

048 PN-AAJ-518

DECENTRALIZATION FOR DEVELOPMENT: THE FORM AND SUBSTANCE OF INTERNATIONAL DEVELOPMENT STRATEGIES

Morgan, T.E.
Wisconsin University, Regional Planning and Area Development Project.
1981, 51 p.

Occasional Paper No. 3

Dispelling the ambiguities surrounding the current theory and practice of decentralization, widely touted as the key to development strategy, this study develops a clearer and more appropriate view of decentralization. The author first argues that decentralization is inherently limited both because it presupposes a stabilized environment (the alternative would be anarchy) and because of unavoidable conflicts of interest between the main types of governmental field administration—by geographical prefecture and by development sector. The author then notes that, in general, organizations move towards greater or lesser degrees of decentralization either for organizational reasons (the organization's "environment", available technology, and goals) or because they are spurred on by movements for social and behavioral reform. In the author's view, most development strategies calling for political or administrative decentralization derive from the latter causes: decentralization and its corollary, popular participation, are deemed necessary to reverse the rigid social and governmental structures that exploit the poor. Actually, however, the substance of these strategies belies their rhetoric; for in practice they deny local entities real power and promote participation to reinforce rather than to reform existing central power structures. In the author's view, this is because these "decentralization" strategies are ultimately aimed at satisfying the basic needs of the poor and in effecting a more equitable distribution of wealth—a process impossible without a centralized power. Despite their contention that Third World development is an endogenous process unrelated to Western models, all such strategies have arisen in the West and reflect Western philosophy and Western experiences of industrialization and mass society. The author concludes by proposing a more modest approach in which decentralization in selected areas is coupled with structured participation. He advocates a turning from the social and behavioral reform viewpoint which, confusing means with ends, provides little guidance, towards the more sober and flexible viewpoint of organizational theory. A 92-item bibliography (1945–79) is appended.

AID/DSAN-C-0060

Paper copy $ 6.63 Microfiche $ 1.08

049 PN-AAJ-523

ASSUMPTIONS UNDERLYING THE REGIONAL PLANNING AND AREA DEVELOPMENT PROJECT—A CRITICAL APPRAISAL

Nair, K.
Wisconsin University, Regional Planning and Area Development Project.
1981, 46 p.

Occasional Paper No. 2

How valid are the assumptions underlying the regional planning and area development (RPAD) approach to the U.S. bilateral development assistance program? Using several RPAD projects as examples, this issues paper argues that these programs often fail to reach their targeted beneficiaries because of unrealistic basic assumptions. For example, the poor are identified statistically according to degree or rate of caloric intake, infant mortality, access to broadly defined health services, and per capita income, but human factors such as needs, aspirations, caste, and creed are ignored. The poor are assumed to be concentrated in areas of arid or otherwise vulnerable ecosystems when many are, in fact, often found in fertile areas and in urban centers. Administrative decentralization is supposed automatically to ensure participation by the poor in the planning and decisionmaking process, but no account is taken of the critically important areas of physical infrastructure, social systems, financial resources, availability of trained personnel, or the nature of the political process among the target group. The author attributes these faulty assumptions to two sources: frequent changes in foreign aid policy and focus made in deference to domestic and international politics; and the reluctance of universities competing for A.I.D. projects and funds to question program assumptions, along with the failure of these universities to study the complex socioeconomic problems of developing countries. To make regional planning more effective, the author recommends: macro studies realistically accessing the potential for achieving participation of the poor and outlining minimum policy and structural reforms and amounts of foreign aid necessary to ensure project success; rigorous, independent analysis of underlying concepts and premises prior to program adoption; ongoing evaluation of assumptions in the course of project implementation; and greater emphasis at the universities on intra- and inter-disciplinary teaching and research in the theory, methodology, and problems of development. A 32-item bibliography (1967–80) is appended.

AID/DSAN-C-0060 931113512

Paper copy $ 5.98 Microfiche $ 1.08

050 **PN-AAJ-632**

PEASANTS, OFFICIALS AND PARTICIPATION IN RURAL TANZANIA: EXPERIENCE WITH VILLAGIZATION AND DECENTRALIZATION

Formann, L.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 162 p.

Special Series on Rural Local Organization, RLO No. 1

Tanzania has failed to realize its goals of participatory socialism and collective agricultural production. The fault lies with the definition and implementation of these policies by a central government bureaucracy structurally and attitudinally similar to its colonial antecedents. This report examines Tanzania's colonial and post-independence bureaucracies in relation to the two conflicting driving forces of rural development: the need for genuine local decisionmaking to ensure a commitment to development programs and the need for central control to allocate scarce resources in a coherent nation-building strategy. The degradation of local government begun under German and British rule has continued into the present, with the peasantry excluded from all decisionmaking and subjected to programs encouraging only passivity and surplus production—to the bureaucracy's benefit. Efforts to ensure government accountability, such as decentralizing the bureaucracy, have had no impact. The peasantry has no voice in the development process, as the government ignores village councils and leaders and allows no debate on its policies. Peasant participation is thus gained through largesse or coercion, with the latter exemplified under Operation Vijiji, where the government forcibly relocated 11 million people to nucleated settlements. The peasantry can only bargain with officials; actively or passively resist unpopular policies; initiate local projects, forcing the government to finish them; or petition individual government leaders. The negative impact of this situation upon self-help projects and the ujamaa village program (which emphasizes communal agricultural production) has been substantial. Self-help project participation has fallen sharply, increasing project costs, and the ambitious ujamaa program has not worked, as the non-participatory cycle nurtured self-fulfilling prophecies of failure. The bureaucracy's recent emphasis upon surplus production over the ujamaa program's socialist aims and its reactivation of the hated colonial by-laws mandating development participation suggest that the aspirations which sustained Tanzania's drive for independence have yet to be realized.

AID/ta-BMA-8 931113700

Paper copy $21.06 Microfiche $ 2.16

051 **PN-AAJ-634**

ANIMATION RURALE AND RURAL DEVELOPMENT: THE EXPERIENCE OF SENEGAL

Gellar, S.; Charlick, R.B.; Jones, Y.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 221 p.

Special Series on Animation Rurale No. 2

After 20 years (1959–79), the theory of "Animation Rurale" (AR), which emphasizes cooperative village control of economic institutions, has been discarded as a basis for rural development planning in Senegal. To explain this abandonment, this study traces, in the light of Senegal's rural development context and AR theory/methodology, the history of AR in Senegal, the AR techniques used, and AR's use in specific regions. The study concludes that AR, being based on an egalitarian/communitarian view of society, was theoretically unsuitable for use in Senegal, which has a patriarchical/hierarchical rural society structure and a central government with a limited will to create popularly controlled institutions. AR implementation also was impeded by the lack of widespread local discontent presupposed in AR theory; the antagonism of entrenched party and bureaucratic interests; and the small size of the AR agency (100 people). Yet, AR did enlist popular participation to implement government programs, involve people in cooperatives, and organize village women in service/behavioral activities, e.g., day care centers and nutrition programs. In general, AR succeeded best where contextual and organizational factors were favorable. The use of AR has taught that: (1) AR will fail when a government cannot or will not alter local power infrastructures or when it subordinates political reform to economic growth; (2) the government is more likely to use AR to induce local involvement in government projects than to promote social reform; and (3) most importantly, there is a need to integrate AR into an overall policy and implementational framework. Finally, the use of AR in Senegal should be judged in comparison to other approaches, such as that of the Maisons Familiales Rurales (MFR) program, and not in light of the utopian, socialist goals of AR theory. While basically similar to AR in philosophy and methodology, MFR differs in that well-educated, paid technicians operate locally under close professional/state supervision to form and nurture village organizations and to develop youth training programs in such practical areas as carpentry. In fact, the MFR style may be the successful AR approach during the coming decade.

AID/ta-BMA-8 931113700

Paper copy $28.73 Microfiche $ 3.24

052 **PN-AAJ-635**

PARAPROFESSIONALS IN VILLAGE-LEVEL DEVELOPMENT IN SRI LANKA: THE SARVODAYA SHRAMADANA MOVEMENT

Moore, C.
Cornell University, Center for International Studies, Rural Development Committee.
1981, 73 p.

Special Series on Paraprofessionals, No. 4

Despite increasing worldwide interest in the use of paraprofessionals as frontline workers to provide services to the rural poor, knowledge needed to plan and conduct paraprofessional programs remains scant. To remedy this lack, model programs in six countries were studied. This report, the fourth of the series, details Sri Lanka's Sarvodaya Shramadana Movement (SSM), a private voluntary organization that began in 1958 and has since gained national status (involving 2,500 villages) and international acclaim for its holistic development approach. In SSM, development starts at the village level with 3–6 day initiation camps in which village volunteers, directed by SSM district leaders, work to meet some felt need such as building a village access road. Afterwards, with enthusiasm high, village groups are formed, SSM workers (considered paraprofessionals) are selected, and programs such as preschool/day care, health, and community development are begun. Several variables affect worker performance: (1) Since workers are often selected by local village or SSM authorities with the village simply concurring, they may not be perceived as community representatives. (2) SSM workers are adequately trained to perform basic services but lack skills for more complicated or long-term projects. (3) District workers often lack the materials, money, time, and/or skills to adequately support and supervise inexperienced SSM workers. (4) SSM stipends cannot compete with regular job earnings, but other factors, including gaining recognition and increasing job skills, often motivate villagers to join. On the whole, SSM's success in attracting wide support among rural populations has been limited by two ongoing problems: the very poor remain largely uninvolved and villagers tend to lose their initial level of interest. Recommendations include: improve training so workers can better design and implement projects; upgrade the quality of district/regional workers who supervise and train local workers; and create more leadership roles to allow for greater specialization and to lessen burdens. Appendices include a village health survey form and training course outlines.

AID/ta-BMA-8 931113700

Paper Copy $ 9.49 Microfiche $ 1.08

053 PN-AAJ-637

PARAPROFESSIONALS IN RURAL DEVELOPMENT

Esman, M.J.; Colle, R.; Uphoff, N.; Taylor, E.; et al.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 154 p.

Special Series on Paraprofessionals, No. 1

The reluctance of developing country professionals to work in remote rural areas and the prohibitive cost of delivering the social services so sorely needed there attests to the need for effective paraprofessionals (PP's) as agents of rural development. This report, based upon a study of PP programs in six nations, describes the role of PP's in rural development, as well as the factors which spell success or failure for development efforts employing such personnel. The PP is active mainly in health or agricultural roles and performs a wide variety of tasks, from delivering services or information to serving as community organizer. Sponsors of development programs, however, often undermine their efforts by wrongly assuming that volunteer or underpaid PP's will perform efficiently ad infinitum, with community support assured and without adequate supplies or inspection. Three factors are thus crucial to PP: (1) an adequate program design; (2) an appropriate support system; and (3) strong community participation. PP program design must base the PP's duties, selection, and compensation upon the targeted area's needs and social context. Moreover, PP tasks and accountability must be well defined. Insufficient supervision and support are usually the major flaws of PP programs. Adequate supervision ensures the PP's discipline, local prestige, continued training, and increased morale. Inadequate support in terms of supplies and equipment often separates programs that are only initially successful from those that are continually viable. To ensure the program's continuity, community participation must be included in it from beginning to end, especially regarding PP selection and support for and evaluation of the program. Donor agencies should promote PP activities in the areas cited above. Appended to the report are an assessment of PP agricultural roles; a 132-item bibliography (1902–80); and summaries of case studies in Bolivia, Guatemala, Senegal, Sri Lanka, Upper Volta, and the Philippines.

AID/ta-BMA-8 931113700

Paper copy $20.02 Microfiche $ 2.16

054 PN-AAJ-642

LOCAL ORGANIZATION AND PARTICIPATION IN INTEGRATED RURAL DEVELOPMENT IN JAMAICA

Goldsmith, A.A.; Blustain, H.S.
Cornell University Center for International Studies, Rural Development Committee.
1980, 153 p.

Special Series on Rural Local Organization, No. 3

Local organizations (LO's) perform a critical role in agricultural development projects by facilitating communication among farmers, legitimizing a project in the eyes of local farmers, mobilizing farmers in support of project activities, and encouraging community self-reliance. Following a growth in agricultural production of only 0.7% per year from 1972–77, this report investigates the role of LO's in Jamaican agriculture in order to improve planning and implementation of the joint A.I.D.-Government of Jamaica Second Integrated Rural Development Project (IRD). The impoverished Two Meetings and Pindar River watersheds are emphasized, but because these areas epitomize Jamaican agriculture and because most of the LO's examined—the Jamaica Agricultural Society (JAS), commodity organizations, a cooperative bank, and civic groups—are national, the results apply to Jamaica as a whole. Non-agricultural LO's, primarily concerned with community and social well-

being, attracted few members unless commercial advantages were offered. Most agricultural LO's had very narrow responsibilities and major economic decisions were made by non-local administrators, but membership, primarily a function of the type of crops grown, was higher and was used to gain access to crop marketing channels. The report concludes that Jamaican farmers will need to be more fully engaged in LO's to facilitate cooperation and the future spread of new technologies. It is therefore recommended that: (1) established LO's, particularly the JAS, be encouraged to take on new functions and embark on more vigorous development work; (2) LO's provide tangible benefits (e.g., seed capital) to convince their membership of the importance of participation in project efforts; (3) LO's tailor their activities and benefits to meet varying farm and community needs in different localities; and (4) LO leaders and members be allowed meaningful input into project activities to prevent feelings of powerlessness and bureaucratic domination from discouraging support of rural development projects. The survey sample and methodology are appended.

AID/ta-BMA-8 931113700

Paper copy $19.89 Microfiche $ 2.16

055 PN-AAJ-643

LOCAL INSTITUTIONS AND PEOPLE'S PARTICIPATION IN RURAL PUBLIC WORKS IN NEPAL

Pradhan, P.P.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 107 p.

Special Series on Rural Local Organization, No. 4

Local participation through local institutions is the key to the future of rural development in Nepal. So concludes this study of the dynamics underlying three successful cases of local participation in public works projects in Nepal. Nepal's sociopolitical history is traced from its unification under the Saha kings in 1769 to the emergence in 1951 of a constitutional form of government under which local people were promised active participation in the country's development. Government efforts to make that promise a reality are detailed. Three rural public works projects undertaken jointly by the government and local people are then analyzed: construction of the Banglung suspension bridge and of the Illam-Charali trunk road, and efforts of the National Development Service to promote infrastructure development by mobilizing local labor and resources. Although implementation of all three projects differed on the organizational level, all made use of ad hoc committees besides those established by statute (local and district Panchayats), thus allowing a flexibility that encouraged local people to select locally suitable alternatives. Local ability to express local need also abetted the success of these projects, as was strikingly shown in the Illam-Charali road project, in which local leaders elicited and obtained support for the project from the King of Nepal himself. The three projects also showed that local participation is limited by local technological capability (the simpler the technology employed, the greater the participation), so that government introduction of a new technology into an area requires systematic preparation. The projects also showed, however, that participation increased with the degree of local technological expertise. Finally, all three projects used tremendous amounts of local materials and labor—all of it freely given, generally in accordance with local ability to make project decisions and the feeling that the resources would be used to match local needs. The vast need for infrastructure in Nepal and the country's current financial condition clearly show the importance of such extensive contributions. Appendices include a 35-item bibliography (1952–79).

AID/ta-BMA-8 931113700

Paper copy $13.91 Microfiche $ 2.16

056 PN-AAJ-647

REACHING THE ASSETLESS RURAL POOR: PROJECTS AND STRATEGIES FOR THEIR SELF RELIANT DEVELOPMENT

Lassen, C.A.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 72 p.

Special Series on Landlessness and Near-Landlessness, No. 6

The only assets the landless and near-landless (LNL) possess are their labor and their capacity for collective action. This report questions whether restricting the LNL's participation in development efforts to implementation and reception of benefits without allowing them to participate in the decisionmaking, management, and evaluation processes produces the structural changes needed for long-run, self-reliant development. Because developing country governments often extend only to the district level, lack concrete knowledge of the LNL's situation, and rely on intermediary institutions which favor local elites, the LNL must form themselves into clientele groups to effectively seek public goods and services. To spur this organizing process, catalyst agencies are needed to motivate, inform, and organize the LNL. Based on the case studies included in this report on selected programs to assist the LNL in Bangladesh, Bolivia, India, Guatemala, the Philippines, El Salvador, Haiti, Mexico, and Upper Volta, those techniques employed by catalysts which have been most successful are: (1) creating community consensus through nonformal adult education; (2) changing people's views of themselves and their social environment in order to motivate change; (3) building organizations for group action; and (4) generating employment and increasing income through labor-intensive activities. To assist catalyst agencies to expand their efforts in order to effectively meet the demands placed upon them, the report recommends that: (1) catalyst agencies increase the use of networking among themselves to overcome their shortage of technical skills; (2) major assistance agencies assign personnel to their field missions to

help small indigenous organizations make assistance proposals; (3) donors make grants available to build up the ability of indigenous consulting firms to conduct feasibility studies; (4) increased support be given to "super-networks" such as Private Agencies Collaborating Together (PACT) and Coordination in Development (CODEL); and (5) donor personnel be immersed into the totality of village life. Criteria for evaluating antipoverty projects are also included.

AID/ta-BMA-8 931113700

Paper copy $ 9.36 Microfiche $ 1.08

057 PN-AAJ-654

COUNCILS FOR DEVELOPMENT; AN INTERNATIONAL DIRECTORY OF COUNCILS AND ASSOCIATIONS OF VOLUNTARY AGENCIES AND OTHER ORGANIZATIONS IN DEVELOPMENT ASSISTANCE

Technical Assistance Information Clearing House;
International Agricultural Development Service.
1981, 76 p.

Worldwide development assistance programs are thriving, and their efforts are being amplified, focused, and enhanced through membership in councils. Councils, as defined in this directory, are international, national, or regional associations of voluntary or private organizations, each of which is involved in some aspect of assistance to developing countries and their people. A council's functions include: joining groups that share common concerns; advancing the members' operating capabilities, helping them avoid duplication of efforts; expediting consultation and information exchange among council members and between the council and governments; providing a forum through which groups can be collectively represented; and promoting some degree of collaboration, cooperation, and/or coordination among member organizations. This directory presents profiles of 18 councils, representing a total collective membership of more than 1,325 organizations involved in a wide range of activities including agriculture and food production; communications and publications; urban and rural community development; construction and housing; cooperatives and credit unions; development policy and development education; disaster relief and rehabilitation; education at all levels; family planning; industry and craft development and management; legal services; material aid; medicine and public health; nutrition; public administration; social welfare; social justice; vocational training and employment; water resource development; and women's programs. Each entry is listed alphabetically by common country name and details the council's name, address, origin, objectives, activities, relationship to government and other organizations, structure, funding, publications, sources, and member and associate membership lists. The names and addresses of 11 additional councils are also given. Appendices include a glossary of council name acronyms, a sample questionnaire for council profiles, and a directory response form.

AID/SOD/PDC-G-0093 932001300

Paper copy $ 9.88 Microfiche $ 1.08

058 PN-AAJ-699

RURAL DEVELOPMENT IN BOTSWANA; A SELECT BIBLIOGRAPHY 1966-1980

Eicher, S.F.
African Bibliographic Center.
1981, 155 p.

Southern Africa Development Information/Documentation Exchange (SADEX)

A tool intended to assist researchers, teachers, government officials, and rural development personnel working in Botswana, this annotated, 1,280-item bibliography (1966–80, i.e., since independence), was prepared by the Southern Africa Development Information/Documentation Exchange (SADEX) project team in partial fulfillment of its purpose to provide a development information network for rural development in Southern Africa. Publications are grouped according to the following categories: general and reference; agriculture; development; education and training; employment, labor, and migration; geography, natural resources, and ecology; health and nutrition; housing; industry, commerce, and mining; land tenure and use; livestock; marketing, cooperatives, and credit; politics and government; society and culture; transport and communications; urbanization; and women in development. The source of each publication varies widely from individual authors to such institutions as U.S. and foreign universities and governmental departments and the International Bank for Reconstruction and Development. Major sources for Government of Botswana publications include originating ministries, the National Archives, the National Institute of Social and Economic Research, the University of Botswana and Swaziland, and the Institute of Development Management. With the exception of a relative few, documents are published in English. Concluding the bibliography is an author index.

AID/afr-C-1538 698013500

Paper copy $20.15 Microfiche $ 2.16

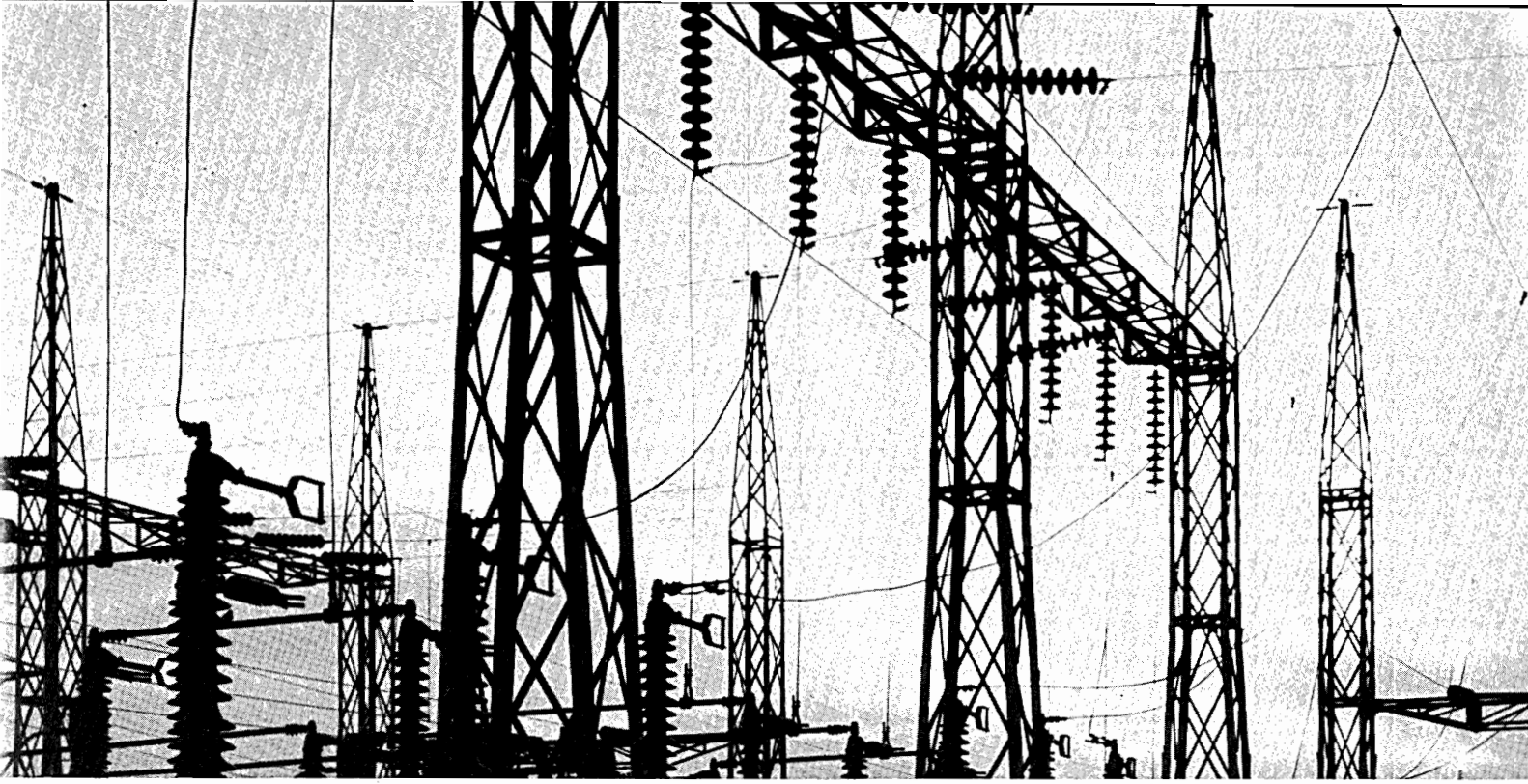
059 PN-AAH-979

ECUADOR: RURAL ELECTRIFICATION

Kessler, J.L.; Ballantyne, J.; Maushammer, R.; Simancas, N.R.
U.S. Agency for International Development.
1981, 65 p.

A.I.D. Project Impact Evaluation Report No. 21

The direct and indirect benefits of rural electrification in Ecuador warrant A.I.D.'s continued sponsorship of such programs. This assessment of A.I.D.'s 1964–75 sponsorship of four electri-



Rural electrification--large returns for a relatively small investment.

fication projects in Ecuador concludes that, although implemented along with other development projects such as road construction, the program was a key factor in upgrading the towns of Santa Elena, Santo Domingo de los Colorados, Daule, and Ambato into regional market and service centers. The main benefits of this program, which was not originally designed to benefit the poor, were job creation, access to agricultural product processing facilities, and increased opportunities for small commercial enterprises. The growth of Santa Elena into a successful summer resort, with tourism and its related services the major economic activities, was made possible by electricity. Santo Domingo now features small industries of metal mechanics and automotive repair, as well as 67 crop processing plants for coffee, hemp, and milk. Electricity in Daule also led to local processing plants, as it led to the growth of small industry/artisanry activities in Ambato. Residential electricity has been mainly used for appliances of convenience and recreation, which is not to diminish its importance to those who made sacrifices for this luxury. The direct impact of electricity upon agricultural production has been nil, however, as has been its effect upon delivery of social services to rural areas. Since, in the absence of the development potential provided by a market town or service center, rural electrification has a low cost-benefit ratio, it should be designed as part of an integrated development process. The issue for A.I.D. is not whether electrification is worthwhile, but whether A.I.D. should alter its role from funding the purchase of equipment to providing technical assistance and training. In addition, A.I.D.'s marginally successful use of cooperatives did not correspond to local conditions and improperly employed a top-to-bottom approach. In future impact evaluations, local scientists should conduct advance field surveys. Appendices include a description of the evaluation's methodology and a 24-item bibliography (1972–80).

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Paper copy $ 8.45 Microfiche $ 1.08

060 PN-AAJ-175

THE PRODUCT IS PROGRESS: RURAL ELECTRIFICATION IN COSTA RICA

Goddard, P.O.; Gomez, G.; Harrison, P.; Hoover, G.; et al.
U.S. Agency for International Development.
1981, 83 p.

A.I.D. Project Impact Evaluation Report No. 22

Because Costa Rica had abundant hydroelectric potential and a government which was strongly committed to equitable growth, a considerable return was reaped from a relatively small investment in rural electrification (RE). This report details this success and A.I.D.'s contribution (1965–69). Aiming to diversify agriculture, increase income, expand agroindustry, and develop replicable RE cooperatives (REC's), the project produced positive but not wholly anticipated results—small sugar and rice processers benefitted more than larger enterprises in Guanacaste; San Carlos' dairy industry grew markedly but at the expense of agricultural diversification; and coffee production quadrupled and in-migration increased in San Marcos. In general, RE had the greatest impact on agricultural processing and less impact on farm-level production, partly due to the absence of outreach programs to enlist farmer participation. RE had a clearer impact on expanding health care and educational opportunity—the availability of electric lighting led to creation of an extensive night school system. In terms of quality, quantity, and cost of service (fees are based on the size of customers' property), REC's were rated highly by users. The project's success has shown that: (1) income and ability to utilize electricity are interrelated; (2) accurate forecasting in RE projects is difficult; (3) RE can be financially risky until a certain degree of growth occurs in a project area; (4) supportive government policies and funding of educational programs to motivate participation contribute to REC success; (5) RE's impact on agroindustry can be partially predicted based on existing patterns of productive activities; (6) where

RE costs can be minimized and the rural poor are concentrated, electricity can become the favored type of household energy, although firewood stoves may still be preferred for cooking; (7) RE alone does not affect rural-urban migration, but combined with other interventions it enhances rural life and stems migration. Descriptions of the REC's, RE clients, RE's value and use, the role of RE in migration, household survey methodology, and a 65-item English and Spanish bibliography (1965–80) are appended.

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061 PN-AAG-908

RURAL DEVELOPMENT, WOMEN'S ROLES AND FERTILITY IN DEVELOPING COUNTRIES: REVIEW OF THE LITERATURE

Javillonar, G.V.; Zivetz, L.; Thomason, S.G.; Griffith, J.
Research Triangle Institute; South East Consortium for International Development.
1979, 298 p.

Fertility has long been a development concern, but planners have usually focused on women as targets of family planning rather than on the wider interplay between women, fertility, and development. This report, part of a series of state-of-the-art papers prepared under A.I.D.'s Rural Development and Fertility Project, examines how development changes rural women's roles and the impact these changes have on fertility. The report focuses on the role of economic, demographic, cultural, psychological, political, and family planning variables in regard to six specific development activities—participation of the rural poor, particularly women, in designing and implementing development projects; female off-farm employment; extension of rural social services; rural marketing; rural finance; and area development. The report hypothesizes that: women's participation in subsistence agriculture, cash cropping, and home-based industry are compatible with high fertility; off-farm industrial employment, access to resources, literacy training, and vocational training, which strengthens women's income-generating capacity, decrease fertility; and employment in trade and commerce is not necessarily incompatible with high fertility. By viewing each hypothesis in relation to the situations in different areas of the developing world, the report concludes that: (1) African women's status has declined and their fertility has remained high because they have not been brought into the cash economy. (2) Among the diverse group of Asian women, adoption of the Western division of labor has weakened women's traditional role in the subsistence economy and fertility continues to be high. (3) In Latin America, the machismo attitude, the Catholic Church, the extolling of motherhood, and limited participation in education and the labor force have all contributed toward high fertility. (4) In the Middle East and North Africa, male out-migration and greater educational opportunity for women have changed rural life, but because children are still valued for labor and security, fertility is high. A 58-item annotated bibliography (1960–78) and a 106-item bibliography (1965–79) are appended.

AID/ta-CA-1 931117000

Paper copy $38.74 Microfiche $ 4.32

062 PN-AAH-910

THE SECOND SEX IN THE THIRD WORLD: IS FEMALE POVERTY A DEVELOPMENT ISSUE?

Birdsall, N.; McGreevey, W.P.
International Center for Research on Women.
1978, 36 p.

Most development assistance is directed toward the poor but largely ignores the status and needs of women who may be the poorest of the poor. Little is known, however, about the participation of poor women in socioeconomic development or the hidden value of their household contributions. This report summarizes proceedings of an AID-sponsored workshop conducted by the International Center for Research on Women in Elkridge, Maryland, April 30–May 2, 1978. The report focuses on women's productivity in the household and in the marketplace; the relationship between women's productive ability in the household and household welfare; production and consumption patterns of households headed by women; and the adequacy of current socioeconomic indicators to grasp work patterns and wants of poor women. Previous employment surveys barely implied the economic contribution women make to the real income and well-being of the poor, whereas surveys of market/home time budgeting accurately portray its magnitude. To measure this contribution, full (as opposed to market) income should be evaluated. Full income is a woman's total contribution of child care, food preparation, and other home production activities to a household, expressed as services meriting monetary payment. The development of women's market productivity is limited by their nearly total responsibility for child care and menial home duties, forcing them to choose low paying work in the economy's informal sector to maintain schedule flexibility. Many daughters quit school to assist their mothers, limiting their own future access to formal employment and perpetuating the cycle of underdevelopment. Female-headed households are likely to be poorer than those headed by a male. In one study, 41% of female-headed households had incomes graded as too low to satisfy most basic needs, while only 27% of male-headed households received the same assessment. This report recommends the implementation of development projects specifically addressing the needs of women among the poor, as opposed to trickle-down efforts to assist females by improving the condition of males. Appended are 27 footnotes and a list of the 18 papers submitted at the workshop.

AID/otr-G-1592 930003000

Paper copy $ 4.68 Microfiche $ 1.08

063 PN-AAJ-323

SUCCESSFUL RURAL WATER SUPPLY PROJECTS AND THE CONCERNS OF WOMEN

Roark, P.
A.I.D., Office of Women in Development.
1980, 73 p.

The International Decade on Drinking Water and Sanitation, 1980–90, designed to bring clear water and sanitation to 1.5 billion people in developing countries, will fail unless community participation, with special emphasis on women, is incorporated into all rural water supply projects. So concludes this A.I.D. study of the meaning of community participation, how it relates to project success, and why women must be central participants. The author maintains that projects should be classified as "service" or "development" projects according to user perceptions. "Service" projects require no social change of the community in order to receive project outcome, have the assent of the local people, and can be implemented with the help of local leadership. A "development" project, however, is perceived by the community to require reorganization of social beliefs and organizations. To be effective, such projects require community participation, defined by Paulo Freire as a learning process of reflection/action/reflection through dialogue. Since women are traditionally responsible for water management and family education in most developing countries, their contribution to this learning process and dialogue is essential. The author develops a four-point operational framework for such local learning systems (LLS): (1) comparison of proposed technology to the technology currently used in terms of type and amount of change; (2) defining the learning process as one of community participation; (3) gathering pertinent information; and (4) decisionmaking. Current "development" projects fail when they attempt to use minimal community participation strategies suitable only for "service" projects rather than follow the entire participatory learning process and the LLS operational framework needed for their successful implementation. It is noted that the continued use and maintenance of a water system 5 years after project support has ended is a sure sign of genuine community participation—and hence of project success. A 99-item bibliography (1966–79) and an overview of A.I.D. activity in water supply projects are included.

AID/otr-147-80-53

Paper copy $ 9.49 Microfiche $ 1.08

064 PN-AAJ-332

WOMEN AND ENERGY: PROGRAM IMPLICATIONS

Tinker, I.
A.I.D., Office of Women in Development.
1980, 13 p.

Although women are the primary providers and consumers of household energy in subsistence societies, the effect of current energy shortages in increasing their workloads and threatening their ability to care for and feed their families is often overlooked. Development programs have typically benefitted men, replacing human and animal energy with all manner of machines—usually powered by some form of oil. As oil costs rise, human and animal energy will once again be used, inefficient though they may be. On the other hand, there can be no human or animal substitute for the fuels used in cooking and other household tasks. Thus, in the design of future programs, the distinction between substitutable and necessary energy will be critical. Furthermore, the design of new technologies to meet these necessary energy needs must take into account several important considerations: (1) Do the new alternatives serve the same multiple needs that current methods do? (2) Do alternative stoves accommodate local cooking methods and food preferences? (3) Have the substantially large waste requirements of biogas digesters been taken into consideration and are the benefits of the digesters obvious to the local community? (4) Can long-held biases against combining human and animal wastes as fuel be overcome? Additional information is needed about the variety of fuels used in cooking and about which human and animal tasks could be carried out more efficiently with other forms of energy. The energy crisis among the developing country poor (and the consequential lessening of their standard of living) can be alleviated only if women's needs and concerns become an integral part of the planner's framework and strategy.

AID/otr-C-1808 498024900

Paper copy $ 1.69 Microfiche $1.08

065 PN-AAJ-464

WOMEN IN MAURITANIA: THE EFFECTS OF DROUGHT AND MIGRATION ON THEIR ECONOMIC STATUS AND IMPLICATIONS FOR DEVELOPMENT PROGRAMS

Smale, M.S.
U.S. Department of Agriculture, Office of International Cooperation and Development.
1980, 192 p.

What effects did the drought of the 1970's and male migration have on the lives and income-generating ability of Mauritanian women? This report, based on a study of selected sites in Mauritania, answers that question. A Mauritanian woman's ability to earn an income is largely dictated by her ethnic group. A Peulh woman, for example, can earn a small income by selling crops grown on a portion of her husband's land, while a Bidan woman proves her status and wealth through inactivity. As self-proclaimed cultivators, Soninke women earn cash for family or personal needs by farming. Drought and migration are not new to Mauritania, but the drought of the last 10 years increased and lengthened male absences. Women have responded and adapted in their own characteristic way. Peulh women have become increasingly dependent upon agriculture

for income, growing new dry-season crops. Many Toucouleur women have sought new occupations, traveling to and from urban centers to buy and sell small goods. Bidan women, lacking skills and hindered by social stigma, engage in only sporadic leatherworking and matmaking. Many Bidan families have found themselves subsisting entirely on charity. In the past, assistance to drought-stricken areas has concentrated on providing food, medical services, and goods. Investment in income-earning activities for women has been limited to establishing educational centers to promote the preservation of sewing and artisan skills. Recommendations to increase women's income from productive activities are: (1) provide women with plots, seeds, fertilizers, tools, and wells or pump use; (2) encourage the growing of crops that can be staggered over a long season, easily stored or dried, and have greater market value than the vegetables currently produced; (3) subsidize and monitor women's savings and investment associations, providing training in accounting, marketing, or small enterprise; (4) include women in crop experiments and demonstrations; (5) promote the raising and improved tending of household animals; and (6) explore the use of forestry byproducts and seedlings as sauce, food, and/or sales sources. Appendices include a 52-item bibliography (1952–80) and English footnote translations.

PA/AG/MAU-300-1-80 930030000

Paper copy $24.96 Microfiche $2.16

066 PN-AAJ-465

INCOME GENERATING ACTIVITIES WITH WOMEN'S PARTICIPATION: A RE-EXAMINATION OF GOALS AND ISSUES

Hoskins, M.W.
A.I.D., Office of Women in Development.
1980, 48 p.

At the Mid-Decade of the Woman conference held in Copenhagen, Denmark, women from developing countries with diverse economic, social, and political backgrounds expressed a common, vital interest in income-generating projects (IGP). This paper addresses three key issues raised at the conference regarding women's IGP's: IGP goals, women's participation in IGP's, and the need for illustrative case studies of the first two issues. Women's IGP's are defined as including all self-supporting and profit-making projects in which economic, social, and political benefits accrue to and are controlled by women. Economic benefits are particularly appropriate for women, who are increasingly responsible for family support, and help increase women's stature in male-oriented home, economic, and social structures. Social benefits accrue through the formation of women's groups which enable women to control their personal safety, wages, and working conditions, and to obtain increased legal representation. Through membership in local, national, and international groups, women have become increasingly aware of their political rights and responsibilities. Such awareness can lead to increased access to government services. In practice, however, social and political benefits are often unobtainable due to prohibitions on women's organizations, while many women's IGP's are economically exploitative and dead-end as they are geared to crafts and manual skills which are soon supplanted by new technology or leave the revenue in male hands. To avoid these shortfalls as well as the false expectations arising from non-viable IGP's, women's participation in choosing, planning, implementing, and evaluating IGP's is essential. Such participation, however, can only occur within women's traditional social and familial roles. In addition, women's IGP's should be tied into larger national development programs in which funding, technical assistance, and training opportunities are more accessible. The report concludes by assessing the benefits of nine women's IGP's based on different organizational strategies. A 12-item bibliography (1978–80) and tables of project participation and impacts are included.

AID/OTR-147-80-76

Paper copy $ 6.24 Microfiche $ 1.08

067 PN-AAJ-466

CREATING A "WOMEN'S COMPENENT"; A CASE STUDY IN RURAL JAMAICA

Chaney, E.M.; Lewis, M.W.
A.I.D., Office of Women in Development.
1981, 38 p.

To incorporate women into an ongoing integrated rural development project (IRDP) in central Jamaica, USAID's Office of Women in Development (WID) designed and implemented a women's component for the project. This case study documents the genesis of this component and offers suggestions for its potential replication. After a year of operation, IRDP staff were concerned that unless women were involved in project planning and implementation, the IRDP's scope would be restricted to the soil conservation activities which are its main focus and not address the larger concerns of improving the lives of the area's 5,000 families. A WID inquiry found that the daily nutritional needs of the target families were being overlooked because of governmental emphasis on export crop production. To counteract this emphasis, the women's component was designed to increase the production of crops which not only fulfilled IRDP goals, but also addressed people's nutritional deficiencies. The Family Food Production Program emerged to help women set up family vegetable gardens that were well-suited to the land available and produced nutritious foods complementary to the local diet. Young women from the project area were recruited as home extension officers to teach participants the techniques of gardening and underwent a month's training in the use of nonformal extension teaching techniques, the principles of nutrition and health, and vegetable gardening. Despite initial logistical problems and negative attitudes on the part of project staff and the people at large, the women's component was a success—in only 9 months, 20

home extension officers had made 4,207 home visits, and 540 gardens were started. To replicate this model, the authors suggest that it be added to IRDP's during their first year, when there is still flexibility and available funding. They also stress the need to institutionalize the component's gains by linking it to original IRDP objectives, employing local women in its design and implementation, and enlisting the support of project staff. Appended are an 8-item bibliography (1975–80) along with descriptions of the women's component's goals and guidelines and a list of its training faculty.

AID/otr-147-80-94

Paper copy $ 4.94 Microfiche $ 1.08

068 **PN-AAJ-636**

WOMEN PARAPROFESSIONALS IN UPPER VOLTA'S RURAL DEVELOPMENT

Taylor, E.
Cornell University, Center for International Studies, Rural Development Committee.
1981, 66 p.

Special Series on Paraprofessionals, No. 3

In 1967, the Government of Upper Volta, one of the world's poorest countries, began the Equal Access Project to promote the participation of rural women in socioeconomic development by increasing their access to educational opportunities and skills training. A central feature of the project is the recruiting and training of local women as village organizers and motivators (animatrices) and as midwives. These paraprofessionals work as volunteers under the supervision of a project-paid extension agent (monitrice) who lives in the same or a near-by village. This 3-month case study documents why and how these women paraprofessionals are being used in several villages and their significance for promoting women's participation in development. Many factors within the communities influence the paraprofessionals' effectiveness. Their effectiveness is increased by appropriate support from the village chief, adequate development and resources (especially water) within the village, development of a viable local committee to supervise project activities, and approval by local men. Their effectiveness is hindered by the existence of other near-by sources of income or services and previous paternalistic projects which have created expectations of gifts rather than self-help. To be successful, a paraprofessional must be dynamic, hard-working, and able to influence others. The village selection process, when representative, usually results in paraprofessionals with these qualities. Because the animatrice's role is not well defined, training, when given, is often inappropriate and of little value; training for midwives has proven more effective. Paraprofessional effectiveness is also improved by effective project administration including adequate supervision and on-the-job training by an interested monitrice, coordination with other programs, selection of project activities suitable to community needs and of technology appropriate to enhancing women's participation in development, and adequate financing. This project has shown that rural women can serve as capable paraprofessionals in rural development. Their effectiveness could be even greater with appropriate supporting administrative and financial resources.

AID/ta-BMA-8 931113700

Paper copy $ 8.58 Microfiche $ 1.08

069 PN-AAG-805

KENYA—SMALLHOLDERS PRODUCTION SERVICES AND CREDIT PROJECT BASELINE SURVEY, AGRICULTURAL YEAR 1975-1976; EXECUTIVE SUMMARY AND ANALYSIS

Rusch, W.H.; Rose, T.H.
American Technical Assistance Corporation.
1977, 179 p.

The need for accurate baseline data is fundamental to the design and implementation of development assistance programs. Such data are provided in this survey of 778 small farmers in the Eastern, Western, and Southern Nyanza Provinces of Kenya, most of them participants in the Smallholders Production Services and Credit Project (SPSCP). This survey covers the agricultural year 1975–76, and contains detailed analyses of the following topics: small farmer income; overall farm production; production of individual and combined crops; land tenancy and use; labor; capital; impact of credit on income; credit demand; technical assistance; cooperatives; innovations in farming practices; participation in community activities; satisfaction with government services; indicators of economic progress; and agricultural constraints. Basic data concerning participants in the SPSCP program are also presented. Discussion is then focused upon the agricultural characteristics of each province through comparative analyses of SPSCP participants and non-participants in terms of cropping patterns, area of cultivation, off-farm income, family versus paid labor, the impact of technical training, the use of credit, the availability of water, and presence of soil erosion. For example, in South Nyanza, in contrast to the Western and Eastern Provinces, farming credit did not translate into improved performance. This situation was attributed to losses of animal holdings—which are high in the region due to death, straying, or stealing. Cropping patterns in all provinces were important in determining the profitability of a farm enterprise, with coffee producers generally earning the highest rate of return. In contrast to the Eastern province, the Western province, whose crops included only cereals and other basic foodstuffs, did poorly in animal farming because farmers in the Western Nyanza Provinces maintained a small animal stock and were therefore unable to achieve economies of scale. Findings of particular relevance for future planning of SPSCP, which is being well-received in these provinces, are noted.

AID/afr-C-1213

Paper copy $23.27 Microfiche $ 2.16

070 PN-AAH-669

RURAL NON-FARM EMPLOYMENT: A REVIEW OF THE STATE OF THE ART

Chuta, E.J.; Liedholm, C.
Michigan State University, Departmennt of Agricultural Economics.
1979, l05 p.

Michigan State University Development Paper No. 4

Rural non-farm employment's (RNFE) potential for increasing employment and incomes and improving income distribution in developing countries has roused considerable international interest. This report, part of Michigan State University's Off-Farm Employment Project, helps fill an information gap by identifying key programs and policies to generate RNFE. RNFE activities in developing countries employ 30–50% of the rural labor force in various manufacturing, commercial, and service activities; account for 20% of rural household income; offer higher wages than those earned in farming; are generally labor-intensive; and use capital more efficiently than larger enterprises. Although some specific types of RNFE appear to have declined in recent years, empirical evidence indicates that, overall, RNFE has increased in most developing countries. Future patterns of RNFE are conditioned on the forces of supply and demand. Demand for RNFE is a product of rural consumers' income, backward and forward linkages between the agricultural and industrial sectors, and urban and international demand for exports. The supply, as well as the efficiency, of RNFE depends on labor intensity, capital and labor productivity, profitability, savings, reinvestment, entrepreneurship, and economies of scale. Direct governmental assistance can significantly enhance RNFE by affecting the environment in which these activities occur, but misguided national policies regarding such variables as interest rates, tariffs, foreign exchange rates, fiscal policy, and minimum wages often distort input prices and benefit large-scale urban enterprises. To support RNFE, donors and developing country governments should provide financial, technical, production, management, and marketing assistance and, where infrastructure is adequate, establish rural industrial estates. In determining which form of intervention is most appropriate, however, planners must identify the key constraints, especially underlying constraints, which rural enterprises face and then decide which mechanisms and institutions provide the most effective means of delivering this assistance. A 160-item bibliography (1955–79) is included.

AID/ta-CA-2 931119100

Paper copy $13.65 Microfiche $ 2.16

071 PN-AAH-905

AGRICULTURAL CREDIT IN THAILAND

Meyer, R.L.; Baker, C.B.; Onchan, T.
Ohio State University, Department of Agricultural Economics and Rural Sociology; Kasetsart University, Center for Applied Economics Research.
1979, 100 p.

Revised version of "Rural Financial Markets in Thailand: Assessment and Recommendations", 1978

Thailand has sought, since 1975, to expand substantially the flow of institutional credit to its agriculture sector. This report discusses Thailand's agricultural credit system by identifying the components and the policy instruments of Thailand's rural

financial markets. The performance of the agricultural credit system is discussed and the impact of credit is assessed. Various types of formal credit delivery systems are also evaluated and statistical tables are provided throughout the report. From 1975 to 1977, the Bank for Agriculture and Agricultural Cooperatives (BAAC), the country's predominant agricultural credit institution, and the commercial banks doubled their outstanding loans to farmers, Cooperative Societies (CS), and Farmers' Associations (FA). The Government of Thailand directed this activity by mandating credit methods, e.g., imposing a quota upon commercial lending which stipulated lending either through the BAAC or directly to farmers. While encouraging credit demand, these procedures have been costly to the public and paternalistic to farmers. Apparent arrears and potential defaulting are high and threaten the system's viability. Group lending has also been encouraged in order to assist farmers lacking collateral. CS's and FA's have been reduced and consolidated to improve their operation, particularly in terms of reducing the burdens on managerial responsibilities. The authors do not see a current need for massive external assistance. Institutional credit has grown rapidly in Thailand and the credit system must be improved and consolidated before additional expansion occurs. To determine specifically what is required to assure the system's viability, studies are needed on a wide range of topics including the factors influencing the rate of returns; lending costs; the functional scope of the CS's and FA's, particularly in respect to their managerial requirements; and the effects of increased credit on agricultural productivity and rural income. These recommendations, which Thailand has the resources to implement, suggest the need to establish an evaluation and monitoring system to analyze and coordinate agricultural credit. A 25-item bibliography (1967–78) is appended.

AID/ta-BMA-7 931116900

Paper copy $13.00 Microfiche $ 2.16

072 PN-AAJ-086

ENTERPRISE BUDGETS: A MULTIPLE USE DATA BASE FOR AGRICULTURAL BANKS IN DEVELOPING COUNTRIES

Parks, L.L.; Rockeman, K.A.; Walker, O.L.
Oklahoma State University, Department of Agricultural Economics.
1980, 74 p.

International Development Series, No. 80–1

Enterprise budgets—statements of the particular physical and financial inputs needed to obtain a specified amount of output—play an important role in institutions that finance agricultural production by providing an ex ante estimate of production costs and returns. This report focuses on developing and using standard enterprise budgets to aid agricultural development banks, specifically, the National Agricultural Development Bank of Honduras, to evaluate loans. The Bank's previous budget system had several faults. Budgets were not uniformly prepared, excluded fixed costs and some other variables, ignored regional differences, and were not prepared for livestock loans. The new budget system provides basic data required for economic analyses (e.g., farmer's loan repayment capacity, cash flow, capital needs). It is designed to be simple for Bank personnel to use, accurate yet low cost, rapid, and flexible. To assist budget preparation, Honduras was divided into 13 regions according to ecological homogeneity and Bank branches. A loan officer and staff from each area were trained. Region-specific budgets with sections on labor, contracted services, materials, other costs, total cost, detailed other costs, and profitability were prepared for all Bank-financed crops. Livestock production budgets were similarly designed but were more difficult to implement because livestock analysis was a new concept for Bank employees. Problems occurred regarding definition of terms; verification; determination of yields, wages, and livestock value; inclusion of noncommercial enterprises; rounding-off numbers; and using farm records to verify budget coefficients. The report concludes that the following contributed to the new system's success: (1) providing intensive training to branch office loan officers; (2) experimenting with different methodologies in one area to gain experience and limit errors in other regions; (3) establishing a rapport between Bank and field personnel; and (4) working from the bottom up to design a theoretically sound as well as a practicable system. Three references (1980) in English and Spanish, a training program, sample computer coding sheets, and crop budgets are appended.

AID/ta-BMA-2 931113400

Paper copy $ 9.62 Microfiche $ 1.08

073 PN-AAJ-087

RECORDS FOR SMALL FARMS IN HONDURAS: A DEVELOPMENT AND CRITIQUE

Parks, L.L.; Rockeman, K.A.; Williams, J.E.; Hardin, M.L.
Oklahoma State University, Department of Agricultural Economics.
1980, 89 p.

International Development Series, No. 80–3

Farm records measure and monitor the heartbeat of a farm business and are a farm manager's primary tool in determining farm profitability, measuring progress, and gaining information for decisionmaking. This report, part of the Small Farmer Credit Project, summarizes the design and implementation of a small farmer recordkeeping system in Honduras. The record system was designed to obtain information needed to identify production coefficients, prices, farm resources, and borrowed resources; determine each crop/livestock enterprise's profitability, source and cost of labor, source and amount of cash flow, and consumption of farm products; and develop financial statements. Since farm management data collection was nonexistent, a record book based on the Oklahoma Looseleaf Enterprise Record Book was developed. It included sections

for receipts, farm and home expenses, labor records, crop/livestock production summaries, farm inventories, and financial statements. A local paraprofessional was trained to assist individual farmers to make entries. The program was implemented on private farms in Jutiapa, where much valuable experience was gained; in Las Playitas, where farmers were uncooperative and the program was abandoned; and in Ajuterique, the most successful site. The program was also quite successful on a cooperative farm, El Matazano. Based on the program's Honduran successes, the authors recommend that in future programs: (1) the recordkeeper, rather than the farms, be selected first and work to gain farmers' trust since he/she is the key determinant of success; (2) recordkeepers take a technical course early in the program; (3) the group of targeted farms be small enough for the recordkeeper to walk his/her rounds and be within a half-day travel from the project headquarters; (4) project personnel visit each area twice monthly and recordkeepers visit each farmer weekly; (5) farmers be presented crop summaries immediately after the crop is harvested and sold; and (6) incentives such as lending privileges be provided to encourage farmers to join the record program. A 3-item reference list (1979–80) and sample small farm data collection and farm account books are appended.

AID/ta-BMA-2 931113400

Paper copy $11.57 Microfiche $ 1.08

074 **PN-AAJ-340**

ANNOTATED BIBLIOGRAPHY ON AGRICULTURAL CREDIT AND RURAL SAVINGS: IV

Adams, D.W.
Ohio State University, Department of Agricultural Economics and Rural Sociology.
1980, 164 p.

Policies directed toward the extension of agricultural credit and the augmentation of rural savings are currently being studied by A.I.D.'s Office of Rural Development and Development Administration (DS/RAD) to determine their effectiveness. This bibliography, the fourth in a series of annotated bibliographies prepared for A.I.D. by Ohio State University, is divided into two parts. The first section contains 335 English and Spanish language titles (1957–78) concerning the growth, application, and consequences of agricultural credit. The second section presents 92 English titles (1963–78) pertaining to studies on rural savings. While both sections cite studies pertaining to developed countries (England, France, Switzerland, Canada, Japan, and the United States), the vast preponderance of studies cited pertain to developing countries in Europe (Yugoslavia); Africa (Cameroon, Ethiopia, Ghana, Kenya, Malawi, Nigeria, Zimbabwe, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, and Upper Volta); the Caribbean (Dominican Repub-

The Dizon family dinner table is improving thanks in part to "miracle rice" resulting from agricultural research and to scientific farming made possible by agricultural credit.

lic, Jamaica, Trindad, and Tobago); East Asia (China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Taiwan, Thailand, and Vietnam); South Asia (Bangladesh, Sri Lanka, India, and Nepal); South America (Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay); and the Near East (Jordan, Pakistan, and Yemen). Every entry is accompanied by a synopsis to assist the reader in making appropriate selections. Author, organization, and geographical indices are appended.

AID/csd-2501

Paper copy $21.32 Microfiche $ 2.16

075 PN-AAJ-387

ANNOTATED BIBLIOGRAPHY ON RURAL OFF-FARM EMPLOYMENT

Meyer, R.L.; Alicbusan, A.
Ohio State University, Department of Agricultural Economics and Rural Sociology, Agricultural Finance Program.
1979, 68 p.

As developing nations still face major impediments to large-scale, capital-intensive industrialization, developing country governments and donor agencies are paying increased attention to the importance of rural off-farm employment and small-scale industries when designing rural development strategies. Researchers have contributed to this trend by pointing out the problems many countries have encountered in pursuing large-scale, capital-intensive industrialization. Research has also demonstrated the importance of rural off-farm activities in total employment and the significant role of off-farm work in farm household time allocation and total household earnings. This 166-item, annotated bibliography summarizes some of the important recent work in this area, both published and non-published, between 1956 and 1979. Written in English and concerning English-language documents, the bibliography focuses on the results of long-term research such as investigative trips by engineers, sociologists, and resource management experts to rural development sites throughout the developing world; major scholarly papers presented at international symposia; papers published by Rand Corporation and other non-profit foundations and organizations; and rural development articles published in scholarly and technical journals. The bibliography largely ignores the substantial number of consultant reports and project documents available which deal with specific projects and programs. Although emphasis is on research conducted in developing countries, many other items of general methodological and theoretical interest are also included. The abstracts of the bibliographic items are approximately 100 words in length and cover the theme of the paper, its important factual data, and, in case there has been a research experiment or survey conducted, its methodology and overall success or failure is included. All cataloging information is provided, including the location of unpublished documents.

AID/TA-BMA-7 931116900

Paper copy $ 8.84 Microfiche $ 1.08

076 PN-AAJ-502

THE ECONOMICS OF COWPEA MARKETING IN NIGERIA

Ejiga, N.O.O.; Robinson, K.L.
Cornell University, Department of Agricultural Economics.
1981, 77 p.

Cornell International Agriculture Mimeograph No. 82

The traditional system of marketing cowpeas, one of Nigeria's most popular legumes, is typical of West African marketing procedures. In light of the accepted view that the Nigerian cowpea market is inefficient in distributing goods to consumers and inputs to producers, this study, based on sample surveys at two representative production-consumption sites in Northern Nigeria, clarifies that market's shortcomings and positive characteristics. To this end, the study describes cowpea marketing channels and the role of intermediaries; determines temporal and spatial price relationships and the costs and returns of cowpea storage; and examines farm-retail price relationships for evidence of exploitation of farmers or consumers by traders or middlemen. The study found, surprisingly, that cowpea distribution throughout Nigeria is well organized, effectively linking surplus-producing areas to deficit areas; and that storage capacities for cowpeas are adequate, if not always of the best quality. Storage was found to be not profitable unless cowpeas were held for at least 6 months, with storage for 8 months yielding maximum gains. The uncertainty of future harvests and the high variability in cowpea prices, however, tend to discourage farmers and traders from attempting to store from one season to the next. To calculate price efficiency, price differences between markets were compared with transfer costs and correlated with distance. Wholesale and retail prices showed a high degree of correlation between prices at different stages of marketing and between nearby rural and urban markets. Estimates of marketing margins accruing to various middlemen showed a fair degree of consistency in the margins of the same class of traders in different locations. The study concludes that the traditional food grain marketing system has an efficient and competitive pricing mechanism, but is operationally inefficient because of storage and transfer losses. It is recommended that efforts to upgrade the latter area, e.g., by improving transport, storage, and processing facilities and by standardizing weights and measures, receive high priority. A 46-item bibliography (1958–75) and three statistical appendices are included.

AID/ta-BMA-8 931113700

Paper copy $10.01 Microfiche $ 1.08

077 PN-AAJ-503

ECONOMIC FEASIBILITY OF IMPORT SUBSTITUTION OF LIVESTOCK FEED IN THE CARIBBEAN COMMUNITY

Charles, C.F.; Blandford, D.; Boisvert, R.N.
Cornell University, Department of Agricultural Economics.
1980, 52 p.

Cornell International Agriculture Mimeograph No. 80

Widespread use of import substitution (replacing imported with domestic goods) in the Caribbean Community (CARICOM) makes CARICOM an ideal focus for evaluating the viability of this strategy. This study examines the economic feasibility of import substitution for livestock feed (corn and soya) in CARICOM, with emphasis on the associated costs and implications for land and labor use, sugar production and exports, and foreign exchange balance. Two major conclusions are reached. First, had a corn/soya industry existed in 1975 under a free trade regime, CARICOM corn imports could have been reduced 45%, soya meal imports 46%, and soya oil imports 34%. Secondly, CARICOM land and labor resources are adequate to achieve self-sufficiency in either feed (corn and soya meal) or soya oil, but not in both. Because soya meal and oil are joint products, self-sufficiency in feed is economically more beneficial because it would reduce soya oil imports by 40% over 1975 levels. However, the implications of self-sufficiency differ significantly among CARICOM countries. Feed grain production increases employment in Guyana, but reduces it in Trinidad, Tobago, and Jamaica. Although CARICOM's overall foreign exchange position improves, it deteriorates in some individual countries, e.g., Trinidad, Tobago, and Jamaica (due to losses in sugar production when land is diverted to corn or soya). The use of trade restrictions to achieve self-sufficiency does not appear to be a viable alternative. Quotas, the simplest way to achieve import substitution, are not well accepted internationally and effective tariffs would be excessively high (50%), while a common tariff would excessively protect individual countries. The authors conclude that while import substitution of corn and soya is economically feasible for CARICOM as a whole, particular countries benefit at the expense of others. While this makes achievement of regional self-sufficiency difficult, the competitiveness of some countries under free trade suggests that promoting the corn/soya industry could be worthwhile. An explanation of the study's analytical framework, programming results for labor-intensive technology, and a 24-item bibliography (1964–79) are appended.

AID/ta-BMA-8 931113700

Paper copy $ 6.76 Microfiche $ 1.08

078 PN-AAJ-657

STUDY OF TRANSPORT INVESTMENT AND IMPACT ON DISTRIBUTION OF INCOME IN REMOTE AREAS, PHASE I FINAL REPORT

Louis Berger International, Inc.
1979, 449 p.

Sponsored by Southeast Asian Agency for Regional Transport and Communications Development

Public transport investment is a classic approach to stimulating economic development, but success has traditionally been measured in terms of overall contribution to a nation's economy. Little attention has been given to the distribution of economic or less easily quantifiable social costs and benefits. This report describes Phase I of the AID-funded Southeast Asian Agency for Regional Transport and Communications Development (SEATAC) RR-2 Project to develop and test a theoretical model of the distributive impacts of transport investment. Four types of transport investment were studied. Data was collected and 1,200 households and other individuals were interviewed from Indonesia, Malaysia, the Philippines, and Thailand. The model was adjusted to reflect the project's limited resources; some indicators were changed, and components such as environmental and short-term employment-generation analyses were dropped. Although only partly attributable to transport investment, all areas experienced significant yearly growth rates in economic activity (5–6%) and per capita income (2.5–3.5%). The report concludes that public transport investment: (1) usually improves travel time, comfort, and convenience significantly; (2) substantially increases the number of vehicles in use; (3) provides an incentive for private transport and communications investment; (4) encourages cash crop production and marketing of perishables but does not affect subsistence crop production patterns; (5) expands the nonfarm sector but does not induce establishment of agro-processing industries; (6) draws subsistence farmers into the cash economy by increasing the number and circulation of traders; (7) is likely to encourage a net migration of settlers, including government officials, into remote areas; (8) increases the opportunity for service delivery and use; (9) raises incomes and widens the range of incomes; and (10) in general, is positively viewed by the residents affected. Field work survey forms, a list of relevant weights and measures, the methodology for assessing income distribution impacts and measuring accessibility, and a list of RR-2 workshop participants are appended.

AID/otr-C-1788

Paper copy $58.37 Microfiche $ 5.40

079 PN-AAJ-701

DETERMINANTS OF FOOD CONSUMPTION IN RURAL SIERRA LEONE: APPLICATION OF THE QUADRATIC EXPENDITURE SYSTEM TO THE CONSUMPTION-LEISURE COMPONENT OF A HOUSEHOLD-FIRM MODEL

Strauss, J.; Smith, V.; Schmidt, P.
Michigan State University, Department of Agricultural Economics.
1981, 48 p.

The unintentional, yet frequent effects of developing country policies on the nutritional well-being of their citizens fall particularly on business people who can adjust outputs, inputs, labor, and consumption in response to price and other socioeconomic variables. This paper reports the estimation of a quadratic expenditure system for a proposed "household-firm" model for measuring allocation of total household resources between consumption and leisure. (The household is treated as a "firm" or business in that account is taken of the effect of socioeco-

nomic variables on household production and labor supply.) The data were gathered from a cross-section of rural households in Sierra Leone during the 1974–75 cropping year. Of significance for development efforts is the general proposition resulting from the study that food demand is responsive to price (except for root crops and other cereals). Price, as an important short-term allocator of food consumption and hence caloric consumption, has been stressed recently by Mellor (1975) and Timmer (1978). Mellor focused on the effect of price on real income, and this study supports his view. However, this study also found, contrary to what was expected, that own-price substitution effects are also important. This was partly due to the commodity disaggregation used (five food groups, including two of staples). Information important to the nutritional planner is also provided. For example, the negative uncompensated effects on root crops with respect to rice price mean that decreases in rice price are not likely to be compensated by increases in cassava consumption; rather, the opposite occurs. Since people shift their production and sales patterns when faced with relative price changes, there is a need to estimate the household-firm model's production side, something which will be done in future work. Investment in fixed production and human capital variables as well as changes in household size and composition were deemed outside the scope of the study. A list of 54 Michigan State University rural development papers and working papers (1964–80) is appended.

AID/DSAN-C-0008 931131500

Paper copy $ 6.24 Microfiche $ 1.08

080 PN-AAJ-702

JOINT DETERMINATION OF FOOD CONSUMPTION AND PRODUCTION IN RURAL SIERRA LEONE: ESTIMATES OF A HOUSEHOLD-FIRM MODEL

Strauss, J.; Smith, V.E.; Schmidt, P.; Whelan, W.
Michigan State University.
1981, 88 p.

Working Paper No. 17; Consumption Effects of Economic Policy Project Report No. 6

In predicting the unintended effects of government policies on the availability of nutrients to the household, it makes a difference whether a household is also a "firm", that is, it can adjust its production activities in response to changed circumstances (e.g., changes in prices). To determine differences in consumption response concretely, a cross-section of households in Sierra Leone were surveyed during the cropping year 1974–75 in terms of the consumption response of five food items, nonfoods, and labor supply to prices, total income, and certain demographic variables when household firm profits (and hence production) were held fixed. For estimation purposes, a recursive household firm model was derived, i.e., the household's production decisions are made first and then used in allocating available "total income" between consumption of goods and leisure. The model's production side is estimated and the results from the demand and production sides are integrated through use of functional forms that permit (given certain simplifying assumptions that enable the proper statistical handling of zero outputs) a wide variety of behavior in regard to several commodities. Next, the effects of constant and variable profits on caloric intake are estimated. A finding of particular importance for Sierra Leone—where malnutrition among children under five is the greatest nutritional problem—is that while the very poor can use increased household net income to increase caloric intake from rice, given constant prices, total income would have to increase 88% to raise caloric intake from the current 1,200 calories per capita per day to the minimum daily requirement of 1,900 calories per capita. A trade-off between long-term production increases and short-term improvement in nutritional status thus seems necessary. It is suggested that production increases can benefit the lowest-expenditure households if they participate in the technical changes causing these increases. The study concludes by discussing trade-offs in terms of efforts to obtain rice self-sufficiency and to promote exports of cash crops such as palm oil, coffee, and cocoa. A 73-item bibliography (1961–81) is appended.

AID/DSAN-C-0008 931131500

Paper copy $11.44 Microfiche $ 1.08

081 PN-AAH-413

FOTONOVELAS AND COMIC BOOKS; THE USE OF POPULAR GRAPHIC MEDIA IN DEVELOPMENT

Parlato, R.; Parlato, M.B.; Cain, B.J.
1980, 247 p.

The fotonovela and the comic book have long been popular forms of entertainment in many parts of the world. But they have also had more substantive purposes. During the last 25 years, comic books have been used in the United States to reach children and adolescents regarding important social problems. In addition, within the last few years population planners have discovered the melodramatic fotonovela as an ideal format to address the highly emotional problems of unwanted pregnancies and changing sexual attitudes and social roles. This study, comparing fotonovelas and comic books as tools in delivering family planning and other development messages, revealed the following strengths and weaknesses of each: (1) Fotonovelas appear to be more effective in reaching literate and semi-literate audiences. (2) The fotonovela has a visual, highly emotional quality which appeals more to larger audiences than does the comic book. (3) The comic book is better suited to delivering messages involving external action. (4) The comic book is highly culture-sensitive and can present the same information in a variety of ways. (5) The comic book remains an ideal medium for communicating social messages to children and adolescents. (6) Both the fotonovela and the comic book have a certain negative social stigma attached to them. Examples of "family planning" fotonovelas and comics from throughout the world are reproduced and critiqued in this report. Overall, these educationally oriented productions lacked the vitality and spirit of their commercial counterparts. Their lack of success stems from an incomplete appreciation of the traditional conventions and generic structure which give comic books and fotonovelas their inherent appeal. Problems involving distribution, cost, and production are also discussed in the report. Appendices include an evaluation of eight fotonovela and comic book series currently distributed by private voluntary organizations and developing country governments, a review of psycho-perceptual research (with bibliography), a list of persons and institutions contacted during the preparation of this report, and a general bibliography (35 entries, 1965–77).

AID/CM/ta-C-147-594

Paper copy $32.11 Microfiche $ 3.24

082 PN-AAJ-088

TRAINING PROGRAMS FOR AGRICULTURAL DEVELOPMENT BANK PERSONNEL: THE HONDURAS EXPERIENCE

Parks, L.L.; Badger, D.D.
Oklahoma State University, Department of Agricultural Economics.
1980, 133 p.

International Development Series, No. 80–2

Agricultural credit institutions in developing countries are often responsible for providing a variety of services within the banking sector, many of which they are unqualified to perform. This report outlines and analyzes a training program designed and used by Oklahoma State University in the Small Farmer Credit Project to train personnel at the National Agricultural Development Bank of Honduras. Based on criticisms of earlier training programs, it was decided that participation and practical exercises should be stressed; courses should be limited to 30 participants and should not exceed one week; subject matter should clearly relate to Bank and employee needs; and ample material should be on hand to ensure adequate coverage in rapidly taught courses. Timing of the courses was constrained by the need to first develop and test the methodologies to be institutionalized. The subject matter was organized into two courses focusing on traditional farm management. The first course covered such topics as the concept of fixed and variable costs, synthesis of enterprise budgets, and the use of budgets in farm financial analysis. Graduates of the first course were offered a second course which covered the same topics on a deeper level and included basic economic concepts. Follow-up sessions pertaining to specific questions which arose during either course were conducted. A one-day seminar on preparing farm records was also offered. Loan officers and credit analysts were targeted due to their direct contact with loan recipients and their general inadequacy in economics, accounting, and finance. The report recommended that future programs: (1) include managerial personnel from the outset; (2) schedule courses and confirm attendance far in advance; (3) not plan courses back-to-back; (4) have more complete syllabi; (5) eliminate coverage of cash flow and present value and place greater emphasis on livestock analysis and partial budgeting; and (6) use more thoroughly developed teaching methodologies. Outlines and selected materials from the two courses and sample forms from the farm records training course are appended.

AID/ta-BMA-2 931113400

Paper copy $17.29 Microfiche $ 2.16

083 PN-AAJ-168

U.S. AID TO EDUCATION IN NEPAL: A 20-YEAR BEGINNING

Sellar, P.O.; Sprague, D.; Miedema, V.
U.S. Agency for International Development.
1981, 90 p.

A.I.D. Project Impact Evaluation Report No. 19

Primary education is alive, if struggling, in Nepal. This report measures the impact of A.I.D.'s educational projects in Nepal over a 20-year period (1954–75). After briefly describing the genesis of Nepal's education modernization program, to which A.I.D. has been the only major donor, the authors evaluate the program's successes and shortfalls. Successes include dramatic increases in the numbers of primary schools (PS) (from

321 to 8,708), PS students (0.9–59% of that age group), PS teachers (640–17,728), secondary schools (11–2,809), secondary school enrollment (0.15–24%), an increased literacy rate (2%–17%), and development of a cadre of 310 trained educational administrators (a key area of A.I.D. assistance), a totally Nepali curriculum, and a superior textbook production and distribution system. Nevertheless, severe problems remain. Stressing quantitative expansion has led to low quality and levels of learning (especially in writing and mathematics), a 50% rate of student dropout before functional literacy is attained, and schools that are isolated (in rural areas), overcrowded (in urban areas), and unhealthy. Due to advancement opportunities for trained teachers—the largest area of A.I.D. assistance—and increases in the number of PS's, qualified teachers are still in short supply. The vocational training (VT) system has failed due to insufficient training levels, lack of employment incentives, and student use of the system as a springboard to college. At the same time, as in other countries, the development of basic education in Nepal has impacted positively on economic and agricultural development, fertility rates, health, and women's role and societal status and has generated attitudes conducive to overall development. The success of A.I.D.'s assistance, which should motivate further A.I.D. education assistance efforts, demonstrates that significant impact is possible when consistent support is given over a sufficient period of time and when local as well as U.S. costs are financed. Other lessons learned include the need to develop innovative educational approaches and to improve VT programs by correcting the above deficiencies. Appendices include a 61-item bibliography (1954–80).

367005900; 367006000; 367006100; 367022800

Paper copy $11.70 Microfiche $ 1.08

084 PN-AAJ-169

KOREA ELEMENTARY-MIDDLE SCHOOL PILOT PROJECT

Witherell, R.A.; Morgan, R.M.; Hyung-Won, Y.; Son-Ung, K.; Chong-Jae, L.
U.S. Agency for International Development.
1981, 81 p.

A.I.D. Evaluation Special Study No. 5

Although the value of Instructional Systems Design (ISD) had been proven, ISD had never been applied on a large-scale in a developing country until A.I.D. funded such an effort in the Republic of Korea (ROK) from 1972–77. This report draws several conclusions based on this success. Although converging factors—deep cultural respect for education, a growing cadre of trained educators, an urgent need for educational reform, and a motivated government—made the setting ideal, the project clearly proved the value of ISD to a developing country's educational system. In seeking to provide cost-effective education to prepare Korea's youth to enter the working world, the project, implemented by Florida State University, established the Korean Educational Development Institute (KEDI) to orchestrate reforms, including a modernized curriculum reflecting Korean culture and the technical needs of a growing economy; development of guides to upgrade instructors' capabilities; the introduction of Instructional Radio, Educational Television, and correspondence high schools; a rapid increase in higher education enrollment; abolition of private tutoring which had favored the wealthy; and creation of an Educational Research Information Clearinghouse and a 14–year Educational Development Plan. The report concludes that: (1) many countries need institutions such as KEDI, staffed by committed and purposeful people, to invent functionally useful educational practices; (2) flexible project execution is essential to meet changing circumstances and maintain host country support; (3) A.I.D. programs should give priority to proven technologies in which the United States leads; (4) continuity of technical assistance from a qualified source strengthens a donor's contribution; (5) in any potentially controversial project, selling the project concept is as important as good implementation; and (6) donors often attempt too much without providing adequate time and money. The evaluation methodology and a list of interviewees; notes on the authors; a 12-item bibliography (1971–81); project and education sector data; an overview of KEDI; lists of KEDI publications and visitors to KEDI; and recommendations for the ROK are appended.

489069600

Paper copy $10.53 Microfiche $ 1.08

085 PN-AAJ-171

THAILAND: RURAL NONFORMAL EDUCATION—THE MOBILE TRADE TRAINING SCHOOL

Giovanni, R.S.; Armstrong, L.T.; Jansen, W.H.
U.S. Agency for International Development.
1981, 43 p.

A.I.D. Project Impact Evaluation Report No. 25

Each year Thailand's Mobile Trade Training Schools (MTTS's) teach employable skills to 30,000 rural men and women who might otherwise move to the cities and join the ranks of the urban unemployed. This report traces the history and analyzes the impact of MTTS's. In 1960, despite a 30% literacy rate among the 87% of Thailand's population which was rural, educational change came slowly and favored the cities. Based on the belief that peasants valued education, the MTTS's were designed in the early 1960's to operate from provincial polytechnic schools, using portable tools and travelling instructors, to teach employable skills to drop outs. Under USAID assistance (1966–72), the 45 MTTS's became more permanent and expanded their courses to include skills upgrading and skills for personal use in traditional subjects (e.g., auto mechanics, dressmaking) and newer fields (air conditioning, radio repair). Of the 80,000 students enrolled, 56,000 graduated, and many non-graduates acquired employable skills. Since 1972, MTTS's

have had a lasting impact on the Thai educational system and on the lives of the rural poor, supporting and diversifying rural values and offering a local alternative to the traditional apprentice system. About one-half of the MTTS's are still operating, but many others have been absorbed by a broader nonformal education system of Lifelong Education Centers which are modelled on the MTTS's, employ many MTTS teachers, and, together with the MTTS's, annually enroll 40–45,000 students. The success, popularity, and endurance of MTTS's has shown that: (1) Providing short-term vocational training to a large number of marginally educated people can positively effect rural development. (2) Nonformal education can integrate the rural poor into the mainstream of national life and thus aid national unity. (3) Projects conceived to serve a limited purpose can sometimes become a catalyst to broader development efforts. (4) Projects which appeal to the perceived needs of beneficiaries can succeed—contrary to conventional wisdom—even without beneficiaries participating at the design stage. MTTS enrollment and staffing data, a course listing, and profiles of six graduates are appended.

493016200

Paper copy $ 5.59 Microfiche $ 1.08

086 PN-AAJ-173

NORTHERN NIGERIA TEACHER EDUCATION PROJECT

Mitchell, R.E.; Seymour, J.M.; Tuckman, H.F.
U.S. Agency for International Development.
1981, 51 p.

A.I.D. Project Impact Evaluation Report No. 23

Although the design and perspective of the Northern Nigeria Teacher Education Project (NNTEP: 1965–69) were deficient, and little progress was made toward end-of-project objectives, NNTEP was nonetheless a success. This document describes the lessons provided by NNTEP for the design and implementation of future participant training programs, especially those in the education sector. The authors' major conclusion is that NNTEP's unanticipated effects had a more important and longstanding impact on the leadership and institutional development of the Nigerian education system than did the negligible progress made in improving the quality and efficiency of primary teacher training. After describing the project's history and original objectives, the paper discusses several impediments to the achievement of A.I.D. expectations. For example, the University of Wisconsin (UW), which implemented the project, had insufficient experience and time to devote to curriculum development, despite A.I.D.'s emphasis on this particular component. Nevertheless, the collaborative work on curriculum development between UW and the Ahmadu Bello University Institute of Education (IE) contributed substantially to IE's growth as a major educational resource and influence in the region. Another of NNTEP's major achievements was the development of a regional consensus on examinations and curriculum. A key lesson taught by NNTEP is that the training program's success was largely due to highly motivated trainees, committed mid-career professionals, and host country recognition of the contracted U.S. university as a superior institution. NNTEP also demonstrated, however, that curriculum reform cannot be achieved overnight and, more generally, that technical assistance projects must be designed with realistic implementation schedules and carefully delineated supervisory responsibilities. A.I.D. should show host governments alternative, least-cost solutions to stated policy goals, including one of the most effective of such strategies, participant training. Appendices on evaluation methodology, NNTEP curriculum development, and the expansion and financing of the Nigerian educational system are included.

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087 PN-AAJ-275

IS THE SCHOOL THE ENEMY OF THE FARM? THE AFRICAN EXPERIENCE

Hanson, J.W.
Michigan State University, Department of Agricultural Economics.
1980, 106 p.

African Rural Economy Paper No. 22

It is often assumed that the primary school (PS), the educational institution which reaches the greatest number of African people, has reinforced attitudes in school children which promote migration in search of urban employment, thereby failing to encourage modernization in farming. According to the author of the present report, however, field studies indicate that general societal and economic factors, rather than the schools themselves, are the sources of these attitudes. Field studies also indicate that PS's have an untapped potential to combat farm attrition and to promote updated farming methods. The following results of surveys from various locations are cited in support of this thesis: (1) Preferred and adjusted occupational aspirations of PS students and PS drop outs show high acceptance of farm occupations. (2) One sample of farm settlement workers recommends farm work to school drop outs because "it gives you money, food, and a good future." (3) Secondary school respondents list occupations in modern agriculture as first choice. (4) The percentage of respondents who had migrated to cities at some point in their lives increased with their educational levels. However, many of these respondents migrated for further schooling only and returned as soon as they could. (5) High return rates to interrupted primary education show that primary school is not necessarily a dead-end enterprise. One survey provides data which refute the author's thesis, since it shows that although farmers located near innovative agricultural institutions are willing to adopt innovations suggested by these institutions, this willingness does not vary by educational level. In conclusion, the author recom-

mends that a greater percentage of education funds be allocated to PS's; that PS curricula in rural Africa be tailored to local needs and not merely duplicate typical "Western" schooling; and, in particular, that PS's concern themselves with portraying modernized agriculture as a lucrative future occupation. A 126-item bibliography (1960–79) of French and English titles, a list of 22 African Rural Employment/Economy Papers, and a list of 22 African Rural Employment/Economy Working Papers are appended.

AID/afr-G-1261 625090700

Paper copy $13.78 Microfiche $ 2.16

088 PN-AAJ-333

AUDIO-VISUAL TECHNIQUES FOR RURAL DEVELOPMENT: A WORKING BIBLIOGRAPHY

Van Dyk, D.
Michigan State University, Department of Agricultural Economics.
1980, 21 p.

African Rural Economy Working Paper

An understanding of the mentality and cultural traditions of developing country peoples is a requisite for the success of even the most up-to-date rural development strategies. This bibliography of English and French publications on the relation of communication to development, with special emphasis on the use of audiovisual techniques, thus provides those designing and implementing rural development programs with a valuable working tool. The bibliography includes 11 subject areas: (1) a 14-item overview (1963–76) of communication and development literature; (2) a 14-item section (1953–75) on the socioanthropological aspects of communication and development; (3) eight titles (1966–74) on the importance of art and symbolism in communication and development; (4) 36 references (1963–74) on media's role in development; (5) a 17-item overview (1962–77) of educational technology literature; (6) 38 titles (1962–78) relating to audiovisual techniques; (7) a list of 14 items (1954–77) on the use of film and video techniques; (8) a 40-item section (1946–76) on the use of radio in development; (9) 15 titles (1968–78) on education and development; (10) a 30-item listing (1969–77) regarding nonformal education and literacy programs; and (11) a list of seven bibliographic guides (1972–77). Because the bibliography was prepared as part of Michigan State University's African Rural Economy Program, a significant number of entries relate to issues pertinent to African rural development.

AID/AFR-G-1261

Paper copy $ 2.73 Microfiche $ 1.08

089 PN-AAJ-433

READING BY RADIO; A POSITION PAPER ON THE USE OF RADIO IN TEACHING READING SKILLS FOR EDUCATIONAL DEVELOPMENT

Imhoof, M.
Academy for Educational Development.
1981, 35 p.

Radio has significant potential for teaching language skills, especially reading, critical to the progress of developing countries. To support this thesis, this paper discusses the importance of language skills for developing country educational development and the usefulness and appropriateness of radio in advancing these skills. Language learning is basic to educational development, because language helps increase literacy rates in both the vernacular, thus enhancing national identity and pride, and in international languages, thus facilitating the country's entrance into international business and politics. Despite this importance, language planning has only recently been integrated into educational planning (itself a latecomer in development planning). As a tool in the general educational process, radio possesses several advantages: it is low in cost, has immediate appeal, combines easily with other instructional modes, and is suitable for non-literate audiences. These factors allow radio to improve educational quality and relevance, reduce educational costs, and improve access to education, especially in rural areas. Radio has been widely used for language instruction specifically and has proven especially helpful in upgrading the skills of unqualified teachers. After outlining the profound causal relationship between reading and the development of personal awareness of self and the world, as revealed in contemporary psycholinguistics, and the particular problems inherent in learning to read a second language, the author shows that radio is ideally suited for language instruction since it provides the opportunity to master new and different sounds, to repeat new grammatical devices in a variety of ways, and to practice new vocabulary in entertaining but extensive contexts. The use of radio for language instruction is particularly recommended in developing countries short on finances and long on language arts deficiencies. Such use will be successful, however, only if programs are continually funded, address the specific needs of the audience, and are professionally produced. Appended are a 14-item reference list (1970–80), the titles of six bibliographies, and a 30-item reading list.

AID/DSPE-C-0051 931101700

Paper copy $ 4.55 Microfiche $ 1.08

Education's impact upon the development process cannot be fully assessed, as half of the world's population can neither read nor write.

090 **PN-AAJ-460**

A.I.D. ASSISTANCE TO EDUCATION: A RETROSPECTIVE STUDY

Method, F.J.; Shaw, S.K.
Creative Associates.
1981, 231 p.

Was the $3.8 billion A.I.D. spent on educational assistance (EA) between 1960 and 1980 effectively used? Based on a study of EA structure, funding, and distribution, the authors of this report conclude that A.I.D. implemented EA programs as directed, but that the programs did not meet developing nations' perceived needs. From 1960 to 1966, A.I.D. concentrated on projects in Africa, but lacked clearly formulated educational objectives. From 1966 to the early 1970's, A.I.D. responded to Congressional and budgetary strictures and developed a strategy to provide teacher training programs rather than increased teacher supply and shifted its regional emphasis to the Near East/South Asia and Latin America. In the early 1970's, A.I.D. began a period of reassessment due to a more clearly articulated Congressional mandate emphasizing nonformal education, educational media and technology, training in health/nutrition, population, agriculture, and the participation of women and the rural/urban poor. While A.I.D. continues to lead in the latter areas, EA recipients, during the 1970's, began expressing a need for upper-level, institutional EA. Because A.I.D. did not respond to these needs, its role as the leading EA donor has declined markedly over the last 10 years. Another contributing factor to A.I.D.'s eclipse among EA donors has been the 50% drop in real A.I.D. spending for EA since the late 1960's. To aid and clarify the EA policy debate underway now in A.I.D., an improved project classification system is necessary. Future A.I.D. EA program effectiveness appears to depend upon the degree to which: (1) a consensus can be reached on an EA strategy and on the educational requirements of programs in other sectors; (2) clear criteria are developed for EA allocation among recipients; (3) EA resource levels are raised and made predictable for long-term planning; (4) complex programming guidelines are relaxed to respond to locally assessed needs rather than just to centrally mandated programs; and (5) the centrality of EA and human resources in all development programs is officially recognized and encouraged. Appended is a 44-item bibliography (1962–81) of A.I.D. official policy papers, working papers, airgrams, annual statistical reports, and non-AID papers bearing on EA.

AID/DSPE-C-0075 931030000

Paper copy $30.03 Microfiche $ 3.24

091 PN-AAH-444

A.I.D. INTEGRATED LOW COST HEALTH DELIVERY PROJECTS: VOLUME I PROJECT SUMMARIES

Baumslag, N.; Cox, K.; Laskin, M.; Sabin, E.
U.S. Department of Health, Education, and Welfare, Office of International Health.
1978, 300 p.

Volume II: PN-AAH-445, 101 p.

Prior to the introduction into development assistance projects of strategies aimed at meeting basic needs, nearly half the world's population received no, or at best rudimentary, health care. Since 1976, A.I.D. has steadily increased funding of its health assistance projects, with emphasis on developing integrated low-cost health delivery systems which combine health, family planning, and nutrition interventions targetted primarily at rural populations. This report, the first of two volumes, summarizes 39 of A.I.D.'s integrated health delivery projects, either ongoing or planned for implementation by 1979, in Africa, Asia, Latin America, and the Near East, as described in A.I.D. project papers (PP) or project identification documents (PID's). Project summaries describe the project purpose, outputs, and inputs; planned health, nutrition, and population components; host country and other donor involvement; financial requirements; and project cost, duration, area of coverage (regional or national), and target population. Also summarized are pertinent issues, as discussed in the PP or PID, such as level of host-country commitment and requirements, personnel selection and training, local community acceptance of a project, and coordination of multidonor efforts so as to avoid duplication. In general, two-thirds of the projects, which in toto encompass a target population of 45 million, are aimed at regional populations. Nutrition components tended to be weaker than other components. For example, provision of iron and vitamin supplements to diets is infrequent; promotion of breastfeeding occurs in only six projects; the content and organization of nutrition education is not clearly defined; and many tasks associated with nutrition components are delegated to the lowest level worker (often village volunteers) with the least education, training, or pay—implying a low priority to nutrition intervention. The innovative feature of these projects is the use of health auxiliaries who will provide preventive and simple curative health care on a large scale—an approach previously successful at experimental levels—although many of the personnel, training, and organizational issues remain to be resolved.

RS/HEW/OIH-01-77 931119800

Paper copy $39.00 Microfiche $ 4.32

092 PN-AAH-445

A.I.D. INTEGRATED LOW COST HEALTH PROJECTS: VOLUME II ANALYSIS

Baumslag, N.; Roesel, C.; Sabin, E.
U.S. Department of Health, Education, and Welfare, Office of International Health.
1978, 101 p.

Volume I: PN-AAH-444, 300 p.

A.I.D. has been a pioneer in advocating low-cost, integrated primary health care systems to alleviate the dire health conditions of the rural poor in developing countries. This contractor's report, the second of two volumes, analyzes the nutrition interventions in 39 A.I.D. primary health care projects in Africa, Asia, Latin America, and the Near East. The first volume provided a general review of the individual projects. Introductory sections provide an overview of A.I.D.'s primary health care projects in terms of the health background of AID-assisted countries, target populations, project funding, health care personnel (especially village health care workers), and degree of integration of health, nutrition, and family planning services. In regard to nutrition interventions, it was found that only 18 of the 39 projects utilize, in varying degrees, the minimum nutrition activities suggested by the World Health Organization (WHO): nutrition surveillance and education, control of infectious diseases, nutritional supplements, and nutrition recuperation. A number of the 18 projects lack even these minimum interventions. At the same time, A.I.D. projects do involve a broader range of nutrition interventions than those listed by WHO. These include breast-feeding, use of mass media to promote nutrition education, development of garden projects, and improving sanitation. Several areas in which the nutrition component of A.I.D. primary health care projects can be improved are specified: weight charts, supplemental food, anemia, breast-feeding, weaning, immunization, disease control, and family planning. General and specific recommendations are made to implement these improvements by tapping the knowledge, motivation, and organizational/communication skills of implementing personnel. Results of two other studies of small, privately-funded, low-cost primary health and nutrition projects are included for comparison. Also included are tables illustrating the report's findings.

RS/HEW/OIH-01-77 931119800

Paper copy $13.13 Microfiche $ 2.16

093 PN-AAJ-176

PERU: CARE OPG WATER HEALTH SERVICES PROJECT

Haratani, J.; Viveros-Long, A.M.; de Gonzalez, A.M.
U.S. Agency for International Development.
1981, 52 p.

A.I.D. Project Impact Evaluation Report No. 24

Where piped water is a local priority, A.I.D. should be willing to authorize projects aimed solely at improving the accessibility, quantity, and quality of water to the exclusion of other health interventions. This and other lessons found in this report were learned in an AID-funded CARE project to provide piped water, vaccinations, health education, and sewers in Peru's Ancash Department. For a $20 fee and less than 15 cents per month, 2,600 households in the smallest villages received piped water from 29 gravity-fed water systems which supplied 60 liters of

potable water per day. The impact was pronounced. Not only did use of piped water for drinking, cooking, and bathing increase, but because women no longer needed to spend 3 hours each day collecting water, there was more time for productive activities such as weaving. Unexpectedly, women also made inroads into the male-dominated social structure by participating in the village juntas which conducted many project activities. Because the project produced lasting tangible benefits, villagers' predisposition to community action was stimulated. On the other hand, the vaccination program was cancelled; there was no indication that health education improved health, and, because of higher installation costs and fewer perceived benefits, only five sewer systems were built. The project also showed that: (1) development projects often upset the status quo and cause conflict among implementers; (2) private voluntary organizations can be a valuable resource in specialized projects; (3) when a project's purpose is to provide drinking water, perfunctory evaluations attempting to attribute health impacts to the project should not be conducted; (4) since imported materials often become a limiting factor, use of local construction materials, even when more expensive, should be encouraged to enhance a project's sustainability and to support local industry; and (5) where voluntary participation in community projects is traditional, food for work can be counterproductive. The evaluation methodology and persons contacted; the project budget, design, and chronology; water system diagrams and statistics; and recommendations for the Government of Peru are appended.

AID-527-0177-G-T 527017700

Paper copy $ 6.76 Microfiche $ 1.08

094 PN-AAJ-288

A REVIEW OF HEALTH, POPULATION, AND NUTRITION ACTIVITIES IN THAILAND.

Stewart, M.M.; Dworkin, D.; Rogers, B.L.
American Public Health Association.
1980, 63 p.

To assist USAID/Thailand and the Royal Thai Government (RTG) to achieve their common goals of reducing infant and child mortality, increasing life expectancy, and reducing population growth, a three-member consulting team was asked to evaluate and recommend ways to improve the primary health care delivery system, which currently serves only 15% of the population. This report details the team's major findings, recommending changes and activities in five general areas. (1) Primary Health Care: As rural coverage by health services is incomplete, existing services should be evaluated and targeted to persons of greatest need. The duties of all village health workers (VHW) should be clearly defined and prioritized. (2) Nutrition: With 57% of Thai preschoolers classified as malnourished, child nutrition continues to be a serious national problem. This report calls for decreasing reliance upon food supplements, with increasing early nutrition surveillance and intervention. Village-level education should focus on improved home food production and purchasing patterns. (3) Village Water Supply: Two-thirds of all Thais obtain their water from open shallow wells. It is recommended that small piped-water systems be established in selected rural villages that lack adequate year-round water. (4) Population: Past efforts to limit population growth have been very successful, but mere continuation of current programs will be insufficient to reach the goal of 1.5% population growth rate by 1986. The RTG should increasingly support the cost of contraceptive supplies, while authorizing and training more health workers who can provide contraceptive services. (5) Integrated Village Services: Two programs, village-level nutrition and piped-water supplies, should be integrated to ensure maximum impact. For example, experience has shown that villagers use piped water to raise home gardens. With nutrition education, families will know which foods to grow to best supplement their diets. Included are a 10-item bibliography (1977–80) and three appendices recommending changes in the RTG Ministry of Public Health data system and detailing the conduct, itinerary, and principal contacts of the consulting team.

AID/DSPE-C-0053 936590000

Paper copy $ 8.19 Microfiche $ 1.08

095 PN-AAJ-357

AN APPROACH TO PLANNING THE DELIVERY OF HEALTH CARE SERVICES

Kaiser Foundation International; Ghana, Ministry of Health, National Health Planning Unit.
1979, 88 p.

Health Care Services Manual No. 1

Faced with a scarcity of resources, how can developing countries deliver health care services that yield maximum results? The key is planning, the systematic and continuous process of allocating resources to achieve objectives. This "how-to" manual, the first in a series of six publications, is designed to teach the health planning process in a developing country setting, based on the experience of the Ministry of Health of Ghana (MOHG). The first phase in the two-phase planning process is to establish a six-step methodology for the plan: (1) Specify planning objectives, identifying the target group and the approach to be used, i.e., "To plan a rural health care delivery system to extend coverage to 90% of the population of Region X". (2) Define the planning framework, considering all factors that will affect the outcome of the plan, such as a shortage of supplies or lack of government support. (3) Determine the structure for planning, making sure to address the areas of marketing, production, human resources, and finance. (4) Identify those who will participate, trying to include individuals knowledgeable and powerful enough to deal with the problems and see that prescribed actions or decisions are carried out. (5) Identify the data or information needed, specifying how it will be obtained and used. (6) Set a work schedule, stating who will be involved, what is expected of them, and

when they should complete assigned tasks. Once the plan's methodology is established, the second phase begins. In this phase, a three-part process called the "Health Planning and Management Cycle" is used, as follows, to carry out the plan: (1) health assessment, or the collection and analysis of pertinent data followed by the systematic identification of needs and health priorities; (2) programming, which consists of setting objectives, examining various alternatives for achieving them, and establishing a workable plan and budget to carry out the chosen strategy; (3) implementation, or actually carrying out the programs that have been planned. Appended are MOHG exhibits giving examples of the planning process.

AID/afr-C-1116 641006800

Paper copy $11.44 Microfiche $ 1.08

096 PN-AAJ-358

PLANNING AND MANAGEMENT OF HEALTH SERVICES AT THE DISTRICT LEVEL

Kaiser Foundation International; Ghana, Ministry of Health, National Health Planning Unit.
1979, 96 p.

Health Care Services Manual No. 2

Faced with a scarcity of resources, how can developing countries deliver health care services that yield maximum results? The key is planning, the systematic and continuous process of allocating resources to achieve objectives. This "how-to" manual, the second in a series of six publications, is designed to teach health planning at the district level in a developing country setting, based on the experiences of the Ministry of Health of Ghana (MOHG). The three-part "Health Planning and Management Cycle" is described: (1) In the health assessment phase, health data are collected from all major sources such as community studies, birth/death/disease statistics, and population censuses. These data are then analyzed to determine the health status and needs of the people. Next, health/disease problems are identified and prioritized according to their frequency, severity, manageability, degree of community concern, and related political, social, economic, and demographic factors. (2) Health programs are identified for each priority using a six-step method: state program objectives; if program is ongoing, review and evaluate past performance; review changing conditions and new directions; examine alternative schemes; draft an annual work plan specifying what is to be done, when it is to be done, and who is to do it; and obtain commitment and support for implementing the plan. Especially important is the preparation of annual budgets employing all available financial and resource inputs to activate the work plan. For example, a health manager may collaborate with other sectors to use their personnel and equipment in his sewage treatment program. (3) Implementation consists of determining organization, staff, and material requirements for all work plan activities; and directing and supervising staff according to the work plan. "Ten commandments" are given to help supervisors effectively communicate, delegate, motivate, and enrich. Finally, a four-step continuous cycle of evaluation is set up (establish standards; observe performance; compare performance with standards; and take corrective action). Appended are MOHG exhibits, worksheets, and notes illustrating the planning and management process.

AID/afr-C-1116 641006800

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097 PN-AAJ-381

HEALTH IMPACT GUIDELINES FOR THE DESIGN OF DEVELOPMENT PROJECTS IN THE SAHEL; VOLUME I, SECTOR-SPECIFIC REVIEWS AND METHODOLOGY

Barbiero, V.
Family Health Care, Inc.
1979, 133 p.

A new rural road improves mobility, communication, and levels of living, but it can also increase traffic accidents, transmit disease, and damage nearby farms and pastures. Such is the dual nature of development—desirable outcomes may have undesirable side-effects. This report, the first of two volumes, outlines the environmental and health impacts that can occur in development in the Sahel and suggests measures to limit their effect. Rainfed and irrigated agriculture can increase population density and the concentration of toxic substances in soil, plants, and human tissue and can cause a dramatic rise in the incidence of waterborne diseases (e.g., schistosomiasis, malaria) and communicable diseases. Livestock development, aimed at preserving pastureland and establishing optimal herd size, can increase the spread of zoonotic diseases such as brucellosis and anthrax to the human population. Because cattle need continuous supplies of water, the incidence of waterborne diseases may also increase. Fisheries provide breeding habitats for mosquitoes, snails, and crustaceans and thus contribute to the spread of waterborne diseases. As people migrate to areas with fisheries, population density also rises. Construction of roads, railroads, and airstrips can damage agricultural and livestock production by altering the patterns of drainage and vegetation on surrounding land. Roadside towns become overpopulated, forcing people to compete for limited supplies of food, water, waste disposal, employment, etc. Any approach taken to combat the negative impacts of development must embody technology that is feasible, affordable, maintainable, understandable, effective, and suited to the needs and resources of its users. The report suggests a decisionmaking process of recognizing a need, identifying alternative solutions, foreseeing possible consequences, weighing the options, making an informed choice, implementing that choice, and making needed adjustments. A suggested checklist to use in assessing a project's impact and choosing appropriate interventions is given. Suggested readings on

agriculture, livestock, fisheries, transportation, disease, and special issues in development are included.

AID/afr-C-1138 625092900

Paper copy $17.29 Microfiche $ 2.16

098 PN-AAJ-382

HEALTH IMPACT GUIDELINES FOR THE DESIGN OF DEVELOPMENT PROJECTS IN THE SAHEL; VOL. II, REFERENCE MANUAL

Barbiero, V.
Family Health Care, Inc.
1979, 206 p.

In the Sahel, as elsewhere in the world, a basic assumption of development efforts is that the downward spiral between disease, poor nutrition, population growth, and economic stagnation can be reversed and the quality of life improved. However, in the Sahel, despite large-scale efforts to eradicate or control diseases and provide health services to the population, the incidence and pattern of disease have changed little over the past several decades. This report, a reference manual accompanying a volume of sector-specific analyses, profiles the major diseases afflicting the Sahel. The Sahelian ecosystem and the six major groups of disease-causing organisms—protozoa, helminths, bacteria, viruses, spirochetes, and rickettsia are briefly discussed. The report then outlines the four modes of disease transmission: (1) by water which is contaminated by urine or feces from an infected person; (2) by food contaminated by dirty hands, mouth or nasal discharges, or human waste products; (3) direct contact in which the organism enters the body directly from the soil or air, or penetrates the skin via wounds, insect/animal bites, or sexual intercourse; and (4) by vector, in which case the disease-causing organism develops or multiplies within a second organism which then infects humans. The following diseases are summarized: malaria, schistosomiasis, onchocerciasis, trypanosomiasis, dracontiasis, dysenteries, measles, tuberculosis, pneumonia, poliomyelitis, trachoma, cerebrospinal meningitis, syphilis, gonorrhea, yaws, hepatitis A, nutritional deficiencies (marasmus, kwashiorkor, xerophthalmia, goitre, scurvy, pellagra, etc.), anthrax, brucellosis, bovine tuberculosis, and leptospirosis. Each entry includes a review page detailing the disease name, causative agent, vector, mode of transmission, symptoms, time of onset, groups at risk, prevention, and treatment. A glossary of terms, a 273-item bibliography (1949–79), and the names and addresses of sources of information and assistance regarding the Sahel are appended.

AID/afr-C-1138 625092900

Paper copy $26.78 Microfiche $ 3.24

099 PN-AAJ-536

POSSIBLE DISINFECTION OF ORAL REHYDRATION SOLUTIONS

Cash, R.; Chen, L.
Camp Dresser and McKee, Inc.
1980, 16 p.

Prepared by the Water and Sanitation for Health (WASH) Project, Coordination and Information Center

Because people in developing countries are frequently forced to use contaminated water in preparing the oral rehydration solutions (ORS) used to combat the effects of diarrhea, the question has been raised whether and how ORS's can be disinfected. This report summarizes the results of a meeting held by A.I.D. health personnel with consultants to discuss this question. Studies have documented a significant presence of *Escherichia coli* in ORS's of varying water quality. It is not known, however, whether drinking contaminated ORS results in reinfection or in prolongation of the diarrheal episode or at what point the ORS usually becomes contaminated. If it is assumed that contamination comes from the water itself, several options for disinfection exist: adding a bactericidal agent to home water storage vessels, boiling the water, exposing the mixed ORS to the sun's ultraviolet rays, or adding a disinfectant to ORS packages. In reference to the latter, the consultants suggested that further research be undertaken to answer such questions as what disinfectants would: Have a high bactericidal/viricidal activity? Be relatively inert with regard to the ORS components? Not decrease the shelf-life of ORS packages? Be palatable? Be of low cost? Be chemically inert with metal ions often found in untreated water? Not adversely affect the inflamed gut? It was also asked whether adding a disinfectant to ORS packages might not spur a movement to add supplemental vitamins, minerals, and proteins and whether the costs of adding disinfectants might not be better used, e.g., in improving public knowledge of ORS or in helping countries produce their own ORS packages. After discussions on alternatives to water purification strategy, e.g., reducing the size of the ORS package, and on the basic relation between drinking water and health, the meeting ended with a general agreement that, pending the results of further research, disinfectants should not be included in ORS packages at this time. Lists of meeting participants and of further research questions are attached, along with a report on the effectiveness of disinfection of ORS by sunlight and a brief description on methods of disinfecting ORS's.

AID/DSPE-C-0080 931117600

Paper copy $ 2.08 Microfiche $ 1.08

HEALTH

100 PN-AAJ-638

GUATEMALA'S RURAL HEALTH PARAPROFESSIONALS

Colburn, F.D.
Cornell University, Center for International Studies, Rural Development Committee.
1981, 61 p.

Special Series on Paraprofessionals No. 2

To redress the frequent bias of developing country health care systems toward providing high-cost, professional, curative care in urban areas to the neglect of delivering basic health care services in isolated rural areas, paraprofessional health workers are being increasingly used to serve the rural poor. This field study, one of six conducted by Cornell University, reviews the effectiveness of paraprofessionals in rural Guatemala. The origin and development of Guatemala's health paraprofessional program and its implementation in eight villages are reviewed. Despite stiff (and continuing) opposition from the physician-dominated health care community, the Guatemalan Ministry of Public Health and Social Assistance (MOPHSA) created two new layers of auxiliary health personnel to serve the rural poor—village health promoters and Rural Health Technicians (RHT). Promoters are village volunteers who receive one month of non-technical training, mainly in preventive health care. RHT's are full-time MOPHSA outreach workers who receive 2 years of technical training. Obstacles faced by paraprofessionals in their work included rampant poverty, fatalistic attitudes, and disrespect by villagers. Promoters in particular suffered from scarce resources and a lack of supervision by RHT's. Political fears of promoting community organizations or of being called "communists", as happened to at least one health promoter, also hamper promoter effectiveness. Approximately half of the promoters no longer practice due to lack of compensation or encouragement. The evidence suggests, nevertheless, that the paraprofessional program has brought health care to previously deprived areas (although evidence of illness or death declines is lacking) and that health promoters in particular have promoted community organization and are now providing limited curative care. In conclusion, the author discusses three ways to improve program effectiveness: increasing the resources available to promoters and their supervision by RHT's and improving cooperation between employees—paid or not—of concerned Guatemalan ministries. A 10-item bibliography (1974–79) in English and Spanish and a health promoter's newsletter in Spanish are appended.

AID/ta-BMA-8 931113700

Paper copy $ 7.93 Microfiche $ 1.08

101 PN-AAJ-703

RELATIONSHIPS OF RURAL DEVELOPMENT STRATEGIES TO HEALTH AND NUTRITIONAL STATUS: CONSEQUENCES FOR FERTILITY; A STATE-OF-THE-ART PAPER

Isely, R.B.; Zivetz, L.; Norman, R.; Banatte, H.
Research Triangle Institute; South East Consortium for International Development.
1979, 93 p.

Knowledge of the health and nutrition effects of different rural development strategies on maternal health and fertility is critical to sound development planning. This report, one in a series of seven state-of-the-art papers prepared for A.I.D.'s Rural Development and Fertility Project, analyzes the link between rural development strategies and fertility indicators. Health status, particularly that of mothers and children, is treated as an intermediate variable. The relation of maternal health and child survival to fertility is detailed, with specific reference to the three aspects of reproduction—intercourse, conception, and outcome of gestation. While maternal health influences the possibility of conception and the outcome of pregnancy, child survival affects frequency of intercourse and, therefore, likelihood of conception. Further analysis is made of the three determinants of maternal health: nutrition (as influenced by food availability, health practices, and income); the incidence of infectious disease (as affected by environmental quality and health attitudes/practices); and use of health services (as influenced by health service management and personnel, health attitudes and practices, income, and community social structure). Three development strategies—those focusing, respectively, on participatory development, agricultural production, and increased income—are then studied and compared for their impact on the above-mentioned determinants. The report concludes that: (1) In programs geared to promoting community participation, success depends on the distribution of benefits, attention to food production, and incorporation of health, nutrition, and family planning components. (2) Programs aiming to raise agricultural production and productivity are more successful in improving maternal health when taking into account the entire spectrum of agricultural production rather than a single subsector. (3) Unless food and services are equitably distributed, programs to increase income are of only limited value in improving health status. A 28-item annotated bibliography (1962–79) and a 130-item general bibliography (1945–79) are appended.

AID/ta-CA-1 931117000

Paper copy $12.09 Microfiche $ 1.08

102 PN-AAH-737

LESOTHO SHELTER SECTOR ASSESSMENT

DeVoy, R.S.
DeVoy Collaborative.
1978, 133 p.

Under its Second Five-Year Development Plan (1975–80), the Government of Lesotho (GOL) will seek to redress the country's severe housing shortage by constructing 9,000 housing units. This shelter sector assessment was prepared in response to a GOL request for A.I.D. assistance in developing a national housing policy to guide this effort. The greatest constraints to past housing projects in Lesotho have been their high cost in relation to income, lack of a centralized GOL housing agency, an undeveloped private housing market, and lack of donors. Construction costs have been high due to a shortage of building materials in urban areas and the migration of management personnel and skilled workers to South Africa. Construction has been largely carried out informally (formal construction being contracted exclusively by the GOL and parastatals), using self-help, hired skilled labor, and traditional building materials. Under its current 5-year plan, the GOL will invest Rand 5.93 million in housing, much of it from external sources, create a national housing policy, establish a housing finance institution serving all income groups (the Lesotho Building Finance Corporation—BFC), and increase low-income housing. This is the GOL's first commitment to housing (aside from civil servant and expatriate housing), although the program's financial disbursement still favors higher income groups. Households earning over R100 per month are likely to pay 25% of their income to become homeowners while low-income groups should be able to make a 10% down payment. The passage of the 1973 Land Act, the authorization of BFC, and two bills currently being considered are increasing the GOL's powers for development regulation, financing, and urban planning. Recommendations for a new national housing policy include: (1) use available resources; (2) ensure housing investments are efficient and equitable; (3) increase and not simply replace the housing stock; (4) increase options rather than provide standard housing solutions; (5) be explicitly concerned with all income groups; (6) maximize use of private capital; and (7) minimize subsidies. Annexes include the study's information sources and a list of those interviewed.

AID/otr-C-1634 912158900

Paper copy $17.29 Microfiche $ 2.16

103 PN-AAH-739

BOTSWANA SHELTER SECTOR ASSESSMENT

Devoy, R.S.
Devoy Collaborative.
1979, 157 p.

In view of the estimated 45,000 new housing plots needed by 1985 in the four towns—Gaborone, Selebi-Pikwe, Francistown, and Lobatse—where Botswana's high urban growth rate, perhaps the highest in Africa, is concentrated, the Government of Botswana (GOB) requested this AID-financed housing sector assessment. The report covers Botswana's housing needs and GOB housing plans, urban housing patterns, land tenure and planning, housing institutions, the construction sector, and related topics such as refugee settlements. To meet increasing housing needs, the GOB will introduce integrated urban and rural development and place greater stress on sites-and-services self-help housing (and provide loans to plotholders to build the permanent houses now required of them); and increase substantially its already notable (unofficial) subsidies to finance services for the expensive housing pattern (single-family detached housing) most prevalent in the four key towns. Botswana's current lack of the management and supervisory skills needed for an expanded and sophisticated housing program should not retard the growth of self-help construction which requires less skilled craftsmen. One of the most difficult issues with regard to low-cost housing is the development of suitable sanitation systems; waterborne sewerage is too expensive and uses too much water. Despite these problems, the GOB and the Town Councils are making headway in meeting the nation's housing needs. The report's main recommendation is that the GOB should aggressively pursue its present policies. Recommendations to strengthen various GOB agencies are also made, with emphasis on improving the pace and effectiveness of the Department of Town and Regional Planning development plans to avoid further delays and cost overruns; upgrading the revenue-generating and other capacities of Town Council Self-Help Housing Agencies; and, more generally, increased training of indigenous personnel. Other recommendations include continuing research and demonstration programs regarding indigenous building materials and low-cost sanitation and fostering private construction by such methods as encouraging financial institutions to make construction and mortgage loans.

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104 PN-AAH-786

MANAGEMENT AND TARIFF STUDIES RELATIVE TO WATER/SEWERAGE SYSTEMS; FINAL REPORT: OVERVIEW

Black and Veatch International; A.T. Kearney, Inc.; Sabbour Associates.
1979, 109 p.

Final report consists of Overview, PN-AAH-786; Management Systems, PN-AAH-787 to PN-AAH-793; Tariffs, PN-AAH-802 and PN-AAH-803; Inventory and Valuation, PN-AAH-794 to PN-AAH-801

To improve services to their respective communities, the Egyptian water/sewerage utilities must improve their operations and management. To this end, two U.S. firms were contracted to carry out a series of nine management systems studies. This

overview summarizes the major conclusions and recommendations of these studies. The Egyptian agencies under study included the Alexandria Water General Authority (AWGA), the General Organization for Greater Cairo Water Supply, the General Organization for Sewerage and Sanitary Drainage, and the Suez Canal Authority. A report on management procedures of the AWGA (equally applicable to the other utilities) identified significant external constraints to effective management, particularly compliance with the labor law; as well as deficiencies in key management practices such as failure to plan and to delegate authority effectively. A report on the organization and structure of the agencies as a whole pointed to a number of problems: an inabiltiy to retain key personnel because of non-competitive wages and benefits; a lack of operational autonomy; inadequate policy guidance on key issues such as conservation, coordination of water and sewerage projects, balances between personnel, operations and maintenance, and projects; and severe management shortcomings. A report on the utilities' physical assets found them to be only marginally acceptable. A report on management information systems recommended the following actions: periodic reporting from responsibility centers; revisions in the budgeting, accounting and data collection systems; and development of an information system for top management. The report on data processing suggests a single computer be obtained to serve all the utilities. In another report, procedures and methods in relation to project planning, operation and maintenance, billing and collection, procurement and inventory control, and mapping and record-keeping were reviewed. It was concluded that there is almost no control over those areas. In addition, a report was prepared on human resources management, and an organization manual was issued outlining organization charts for each utility. Executive summaries from each report are appended.

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105 PN-AAH-788

MANAGEMENT AND TARIFF STUDIES RELATIVE TO WATER/SEWERAGE SYSTEMS; FINAL REPORT: MANAGEMENT SYSTEMS—MANAGEMENT INFORMATION SYSTEMS

Black and Veatch International; A.T. Kearney, Inc.; Sabbour Associates.
1979, 114 p.

Final report consists of Overview, PN-AAH-786; Management Systems, PN-AAH-787 to PN-AAH-793; Tariffs, PN-AAH-802 and PN-AAH-803; Inventory and Valuation, PN-AAH-794 to PN-AAH-801

To assist the Government of Egypt improve its water/sewerage services, this report reviews the management information systems of Egyptian utility agencies. The report, one of a series on the management practices and tariff structures employed by these agencies, focuses on budgeting, capital programming, accounting systems, and information for planning and financial control. The agencies studied are the Alexandria Water General Authority, the General Sewerage and Sanitary Drainage, and the Suez Canal Authority. The budgeting system currently used to obtain funds from the central government cannot provide adequate control, since the allocation of expenses is not decided, nor the timing of expenses estimated, nor the need for expenses presented. Moreover, due to the lack of a well-defined process for planning capital programs, the agencies have failed to meet customer needs. Furthermore, the accounting systems currently used by these agencies do not provide useful internal cost and productivity information, while existing information systems neither provide sufficient and timely information needed for efficient planning, nor communicate the goals and plans of the respective organizations, nor focus attention on important decisions managers must make. Recommendations are made to improve each of the above areas. These include: (1) establish budgeting responsibility centers with separate budgets and insist that budget requests be made on the basis of need; (2) develop long-range capital programming plans and an annual capital budget (in addition to a project budget), prepare detailed analyses of the tasks for each major project, and have all major operating and staff departments submit regular progress reports; (3) develop new, streamlined accounting systems which give operations managers and supervisors greater responsibility for controlling costs, provide data to evaluate departmental performance, and permit the gradual introduction of electronic data processing; and (4) prepare a comprehensive set of management reports, containing both financial and operating information, for each major operating and staff department. Numerous exhibits and appendices relating to budget and accounting reports are included.

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106 PN-AAH-793

MANAGEMENT AND TARIFF STUDIES RELATIVE TO WATER/SEWERAGE SYSTEMS; FINAL REPORT: MANAGEMENT SYSTEMS—PHYSICAL ASSETS

Black and Veatch International; A.T. Kearney, Inc.; Sabbour Associates.
1979, 130 p.

Final report consists of Overview, PN-AAH-786; Management Systems, PN-AAH-787 to PN-AAH-793; Tariffs, PN-AAH-802 and PN-AAH-803; Inventory and Valuation, PN-AAH-794 to PN-AAH-801

To improve services to their communities, the Egyptian agencies responsible for water/sewerage services must improve their operations and management. To assist these agencies, two U.S. consulting firms were contracted to carry out a series of management studies. This report documents findings and recommendations regarding the agencies' management of physical assets (buildings and offices, warehouses and storage yards, office supplies and equipment, supplies and equipment

for operations and maintenance, and communications and transportation equipment). The agencies studied were the Alexandria Water General Authority, the General Organization for Greater Cairo Water Supply, the General Organization for Sewerage and Sanitary Drainage, and the Suez Canal Authority. The review covered recordkeeping, preventive maintenance, decisionmaking regarding repair versus replacement, and acquisition and disposal practices. Except for communications equipment, which is inadequate, the assets of the utilities permit marginally acceptable service. However, many improvements can and should be made. Major recommendations include: (1) install a real property inventory system; (2) increase emphasis on preventive maintenance of physical plants and other assets; (3) upgrade plant and local work conditions; (4) increase accountability of managers for property under their control; (5) conduct surveys to determine equipment needs and identify excess and salvage property; (6) create a mechanism for decisionmaking based on the costs of equipment repair versus replacement; (7) gradually replace outmoded office supplies and equipment; (8) install two-way radio systems in the operating departments to enable the agencies to provide more efficient service; (9) establish technical libraries at operating plants and laboratories; and (10) provide tools and shop facilities to improve operations and maintenance, and obtain tools and equipment recommended in engineering consultant studies. Outline descriptions of numbers 1, 2, 3, 6, and 7 are included in the report. The cost of additional physical assets required by the utilities during the next 10 years is estimated at LE 103 million. These costs are detailed in an appendix to the report.

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107 PN-AAJ-277

ZIMBABWE SHELTER SECTOR ASSESSMENT

Wright, J.; Oakley, D.; Baker, L.
Planning and Development Collaborative (PADCO), Inc.
1981, 104 p.

Technical Appendices: PN-AAJ-278, 179 p.

Zimbabwe's black urban population is growing at an annual rate of 5.7% and will require 17,800–51,700 new housing units per year, well above the 11,600 units constructed by the Government of Zimbabwe (GOZ) in 1978. It is the GOZ's predicament and the overall urban shelter sector which are the subjects of this report. Zimbabwe's urban houses are mainly semi-detached block units costing U.S. $1,200–1,900. Most are concentrated in Salisbury and Bulawayo and are owned by local governments. The Ministry of Local Government and Housing (MLGH) and its Housing Development Services Bureau (HDSB) oversee urban shelter development. Projects are initiated by local authorities; the MLGH approves plans and empowers localities to borrow. Because of the civil war, the GOZ has undergone structural and functional changes that have constrained its ability to plan, research, and evaluate housing projects. The MLGH 5-Year Program has been a step in the right direction, but housing standards are not designed to yield a range of units for different income groups; labor-intensive technology is not promoted; public land acquisition is time-consuming; infrastructure standards are unrealistic; engineers, planners, architects, craftsmen, and developers are in short supply; and formal mechanisms to accumulate savings and channel credit to borrowers do not exist. The report recommends that: (1) a series of interrelated projects be created to meet emerging housing demands; (2) higher-density housing be built in Salisbury; (3) the HDSB act as a shelter developer with localities being responsible for follow-on projects; (4) the HDSB's role as advisor to local authorities be expanded and comprehensive project planning be linked to local interests and resources; (5) the HDSB initiate an aided self-help program and test it with the assistance of Salisbury Municipality; (6) a comprehensive manpower training program be established for architects, planners, engineers, and surveyors; (7) a project evaluation capability be developed within the HDSB and the Salisbury City Council; and (8) a household savings mobilization and loan study be initiated. Technical Appendices (PN-AAJ-278) accompany the report.

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108 PN-AAJ-372

HOUSING SURVEY FOR DISASTER RELIEF AND PREPAREDNESS: LATIN AMERICA

Evaluation Technologies, Inc.
1981, 152 p.

When natural disaster strikes, it is the poor who are most likely affected and least able to recover without assistance. This disheartening fact provides the focus of this concise yet comprehensive profile of the Latin American housing sector aimed at assisting U.S. development organizations in planning relief operations and permanent housing assistance programs. The report's first section characterizes current housing and settlement patterns, construction techniques and materials, funding for low-cost housing, and the kinds of emergency shelter provided in the past for l0 Latin American countries which are prone to natural disasters and frequent recipients of U.S. relief: Bolivia, Chile, the Dominican Republic, Ecuador, El Salvador, Guatamala, Haiti, Honduras, Nicaragua, and Peru. The second part discusses disaster mitigation techniques in earthquake and wind-resistant housing. A characteristic found in all countries is the inadequacy of both urban and rural housing, due mainly to high rates of urbanization and insufficient provision of public services, such as water, electricity, and sewage. Included are figures on the widespread damage to existing housing and infrastructure facilities by tropical storms, earthquakes, and tornados over the past 20 years, e.g., the 1972 earthquake that destroyed 45% of Nicaragua's housing stock. Despite the existence of low-income housing policies

and local credit institutions in most countries, frequent government turnover and the lack of sufficient funds have rendered ineffective most nascent efforts at increasing availability of low-income housing. The housing situation for the poor as presented by such characterizations is grim, and the challenges faced by relief agencies in time of disaster are monumental. The authors do express hope, however, that natural disasters can by mitigated by recommending use of low-cost construction techniques—strong foundations, reinforced load-bearing walls, light-weight roofing materials—which are resistant to earthquakes and hurricanes. Foresight in choosing building sites, configurations of roofs and placement of doors, windows, and air vents to combat wind damage is also urged. A 13-item bibliography (1974–80) is appended.

AID/SOD-PDC-C-0283

Paper copy $19.76 Microfiche $ 2.16

109 PN-AAJ-389

HAITI SHELTER SECTOR ASSESSMENT

Robbins, E; Hamman, S.
A.I.D., Bureau for Development Support, Office of Housing.
1980, 59 p.

Most Haitians live in substandard shelter unconnected to water and sewer services, a situation which is particularly acute in burgeoning urban areas such as Port-au-Prince. Such are the country's basic shelter conditions according to this 1980 AID-supported sector study. After assessing socioeconomic factors such as migration, income, employment, and expenditure and savings patterns which impact on a national shelter policy and describing shelter conditions among the poor, the shelter delivery system is analyzed technically (land controls/prices, water and sewerage infrastructure, environmental conditions, and available housing stock) and institutionally (shelter policy, Government of Haiti and financial agencies, and A.I.D. strategy). The study concludes that five main constraints exist to upgrading the conditions of the shelter sector: (1) lack of a definitive Government of Haiti (GOH) shelter policy; (2) GOH inability to develop and maintain qualified middle management at its shelter sector agencies; (3) the difficulty of working in low-income areas which generally have a high population density and are located on hilly or swampy terrain; (4) absence of experienced private shelter institutions; and (5) insufficient mortgage financing. Strategies to improve shelter sector conditions should build upon current initiatives by GOH and foreign agencies to initiate land title registration and land planning procedures, e.g., by extending them to urban areas, and will require a joint GOH/private sector initiative to develop a national capital base for shelter programs. Improvement of the atmosphere for long-term lending will require a revised tax policy to encourage land sales and home improvements, along with GOH policies to secure lenders' collateral, lower the Central Bank's reserve requirement, and—of key importance—to mobilize savings. Another critical need is for public utilities to recover as high a percentage of their investment as possible in order for infrastructure investment to keep pace with the demand for service. In sum, unless internal resources for increased shelter activity are mobilized, the progress already made in designing and constructing minimal shelter solutions will have less impact.

Paper copy $ 7.67 Microfiche $ 1.08

110 PN-AAJ-486

A MARKET SURVEY OF PROTOTYPE CORE HOUSING UNITS IN MAURITIUS

Planning and Development Collaborative International.
1980, 87 p.

Following an AID-sponsored sheltor sector assessment in 1977, the Government of Mauritius decided to replace the subsidized high-standard dwellings used in previous post-cyclone housing reconstruction programs with smaller and more cost-efficient shelter units. Before embarking on a large-scale program, however, a market survey was conducted to determine the acceptability and affordability of the core units among lower-income families. This report analyzes the survey data and presents the implications for a possible A.I.D. Housing Guaranty loan. Two prototype core housing units were built at six demonstration sites throughout the island and the survey was administered to potential occupants, the majority of whom met the below-median income requirements. Principal findings of the survey were that 79% of those wanting a core house need to have the land supplied by the government, 99% would be willing and able to pay for it, 70% were willing to move to occupy a core house (although there was a strong preference to stay in one of the five major urban areas), and Mauritius suffers a shortage of permanent housing given the high percentage of dwellings made from iron or tin. The principal implications of the survey for low-cost shelter projects are: (1) there is ample need and effective demand among the potential target group to justify a Housing Guaranty Program; (2) low-income shelter projects should concentrate on the five principal municipalities; (3) serviced sites should be offered with building loans to those who prefer this option to core houses; (4) the houses should have two small rooms rather than one large room and be sufficiently reinforced to allow for eventual vertical expansion; (5) due to a high percentage of employed respondents, the present system of collecting mortgage loans through salary deduction would be feasible for many low-income households; (6) because the potential beneficiaries include a significant proportion of households headed by women, the legal and social status of women should be taken into account in project design. Appended are designs of prototype core houses and the survey questionnaire.

AID/C-1627 912158900

Paper copy $11.31 Microfiche $ 1.08

111 PN-AAJ-344

ENRICHED FOODS FOR PARAGUAY

Crowley, P.R.
U.S. Department of Agriculture, Office of International Cooperation and Development, Nutrition and Agribusiness Group.
1980, 20 p.

To replace wheat imports with locally-produced cereal products and help the urban poor cope with rising food prices, the Government of Paraguay (GOP) has plans to develop, on a pilot basis, inexpensive, protein-enriched processed foods for distribution to low-income, urban populations. To help meet the Inter-American Development Bank's funding requirements for this project, the GOP asked USAID for advice on product and processing alternatives and preplanning of feasibility studies. This paper summarizes the results of USAID's assistance. In light of the GOP's ultimate aim of expanding the project nationally, USAID advised the GOP to incorporate into the project's design steps for a transition from the pilot plant to full-scale, commercial production and distribution activities. Additional project components suggested by USAID were that the foods produced at the pilot plant be evaluated for nutrition and economy; that the suitability of select foods for full-scale processing and distribution be determined; and that training be given to project staff and food technology students. As nutritious substitutes for meat, milk, eggs, and other protein foods in urban poor diets, USAID suggested the following: (1) soybean flour for use in cereal foods; (2) cereal flours derived from local sources of wheat, corn, and mandioca; (3) weaning foods made from blends of rice and soybean flours, vitamins and minerals; (4) fortified/extended bread flour and pasta products made from soybean, rice, and/or mandioca flour; (5) substitute or extended milk products; (6) textured vegetable protein; (7) snacks and breakfast cereals made from corn, rice, soy, and cassava; (8) precooked soup powders with protein supplements; and (9) vitamin and mineral additives. Two alternative project approaches—using existing pilot plants in other Latin American countries rather than developing a pilot plant in Paraguay and processing only one food product to speed up project implementation—were rejected by the GOP as inappropriate to overall project concerns. USAID also submitted to the GOP a list of organizations and individuals capable of assisting in the project's design. A 3-item reference list (1979–80) in English and Spanish is appended.

RS-01-74 931083100

Paper copy $ 2.60 Microfiche $ 1.08

112 PN-AAJ-346

DEVELOPMENT OF FOOD FORTIFICATION PROGRAMS

Crowley, P.R.
U.S. Department of Agriculture, Office of Cooperation and Development.
1980, 18 p.

The success of food fortification programs, long considered by international nutritionists to be an important tool in solving developing country nutrition problems, has been less than overwhelming. This paper focuses on steps to foster and accelerate the use of food fortificaton by citing previous programs and suggesting ways to develop new ones. The U.S. Food for Peace program is highlighted as one of the largest food fortification programs in the world and its history is traced from the 1950's to the present. During this period, the program has changed from a simple food distribution program to a nutrition-oriented one, consciously designed to provide maximum benefit to recipients by fortifying foods with protein, vitamins, and minerals. The amounts and kinds of fortificants have changed periodically as program officials have become increasingly aware of recipients' problems. Such was the case in 1965 when powdered milk was fortified with vitamin A for countries where severe blindness and xerophthalmia had been detected. India, Colombia, and other developing countries have food fortification programs of their own in which fortified cereal foods are manufactured locally to fulfill the nutritional needs of the poor. The existence of these programs shows that food fortification is feasible—a practical and applicable technology exists, the foods are acceptable to the recipients, and the programs are affordable. Given widespread acceptability of the food fortification concept and its practicality as shown in several case studies, the author concludes that the major barrier to more extensive application of food fortification is the lack of a practical and effective set of implementation guidelines. He suggests that, in designing fortification programs, clear and specific objectives be defined and disseminated among decisionmakers; an action plan listing required activities, responsibilities and time frames be created; cost estimates be generated early on and updated periodically; and that contributors to the program be allowed to participate in its planning so they will more likely support its implementation.

RS-01-74 931083100

Paper copy $ 2.34 Microfiche $ 1.08

113 PN-AAJ-348

REVIEW OF FEASIBILITY OF ALTERNATIVES FOR THE SCHOOL MILK AND SCHOOL LUNCH FEEDING PROGRAMS IN KENYA

Barrett, F.F.
U.S. Department of Agriculture, Office of International Cooperation and Development.
1980, 25 p.

The Ministry of Basic Education (MBE) of the Government of Kenya is searching for alternatives for two major feeding programs for primary school children—the school milk and lunch feeding programs—in order to minimize costs while maintaining good nutritional quality. This study explores several alternatives to determine which have sufficient potential to warrant further consideration. Regarding the school milk program, MBE officials wanted a suitable alternative form of milk or milk-containing food to supplement the current morning distri-

bution of liquid whole milk to some 3.2 million school children twice a week during the regular school term. One alternative was the use of a whole milk biscuit, a blend of dry whole milk, sucrose, and flavoring that provides the nutrient equivalent of 200 ml of liquid whole milk. Since the biscuit is currently produced in New Zealand, the Ministry requested a feasibility study on production and distribution possibilities in Kenya. It was found that while the overall cost of providing milk biscuits in Kenya was 35.5 cents per unit as opposed to 50–70 cents per unit of whole milk, production would be dependent on unreliable liquid milk supplies; that the costs of in-country production facilities would be high; and that the children's receptivity to eating instead of drinking milk was uncertain. One viable alternative to milk biscuits is that of producing a true biscuit, or cookie, made from wheat and/or maize flour which provides desired levels of whole milk and shortening, increases the children's caloric intake, and costs only 20.9 cents per unit. Regarding the school lunch feeding program, MBE wanted prepared foods which could be centrally processed, were suitable for midday meals in individual schools, and required no cooking at the school level. The major suggestion was the use of low-cost extrusion cookers (LEC) for the central processing of maize and beans. This technology eliminates or greatly reduces the need for real cooking at individual schools, saves fuel and water, and adds a variety of types and flavors to the current midday meal. A process for quick-cooking beans is also described as a way of reducing fuel requirements by reducing cooking time.

RS-01-74 931083100

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114 PN-AAJ-379

GUIDELINES FOR THE ERADICATION OF VITAMIN A DEFICIENCY AND XEROPHTHALMIA: VI. RECENT ADVANCES IN THE METABOLISM AND FUNCTION OF VITAMIN A AND THEIR RELATIONSHIP TO APPLIED NUTRITION

De Luca, L.M.; Glover, J.; Heller, J.; Olson, J.A.; Underwood, B.
International Vitamin A Consultative Group.
1978, 46 p.

Vitamin A deficiency, often in association with protein deficiency, is a major nutritional problem among preschool children in many areas of the world. The most notable result of acute vitamin A deficiency is xerophthalmia, in which the surface of the cornea becomes dry and rough, ultimately causing permanent scarring or irreversible loss of sight. This report summarizes the latest findings about the absorption, metabolism, and function of vitamin A and suggests applications of this knowledge to improve vitamin A nutriture. Vitamin A and its provitamins (organic substances, such as carotenoids, which convert to vitamin A when ingested) are provided only through foods; proteins and fats in the diet stimulate their absorption. Technical detail is provided as to how vitamin A and its analogues (retinols) are absorbed into the tissues—including the complex route by which they are absorbed by the eye's retinal and photoreceptor cells—as well as on their storage, transportation, metabolism, and excretion. Vitamin A is an effective promotor of eye mucus production and a preventive agent of various types of chemical carcinogenesis; it can function as an anti-infective, but overdoses have the opposite effect. Determining vitamin A deficiency in children is more difficult than in adults, because of the combination of factors and symptoms often at work in the malnourished child. Dose responses in administering vitamin A to vitamin A-deficient persons vary widely depending upon the degree of deficiency and other external factors; for instance, diseases which affect the pancreas, liver and kidney markedly alter vitamin A needs. Correlations between vitamin A absorption and protein and fat, and between vitamin A deficiency and zinc, iron, and vitamin E deficiencies are shown, with corrective suggestions (increased consumption of eggs and meat; increased consumption of fruit and vegetable preparations containing the appropriate minerals and vitamin A and E equivalents, such as red palm oil, tomato juice, carrot juice, and spinach puree). Since complicated biochemical analyses of vitamin A deficiency are not feasible in the field, simpler methods are suggested, involving tissue samples.

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Paper copy $ 5.98 Microfiche $ 1.08

115 PN-AAJ-482

OVERCOMING WORLD HUNGER: THE CHALLENGE AHEAD—REPORT OF THE PRESIDENTIAL COMMISSION ON WORLD HUNGER

Linowitz, S.M.; Mayer, J.; Muller, S.; et al.
Presidential Commission on World Hunger.
1980, 276 p.

A.I.D. response, "A Strategy for Focusing A.I.D.'s Anti-Hunger Efforts": PN-AAJ-375, 58 p.

Although starvation claims the lives of millions of people throughout the world, famines are localized tragedies; the most pressing global food problem is chronic undernutrition which affects the lives of between 450 million and one billion people every year. Citing these facts, the Presidential Commission on World Hunger urges the United States to reorient its relations with the developing world to make the elimination of world hunger its first priority. Among the Commission's recommendations are that the United States: (1) support price stabilizing and tariff reduction agreements on commodities of particular interest to the developing world; (2) expand the Generalized System of Preferences and put it on a fixed-term, multiyear basis; and (3) expand the President's authority to assist the least developed nations. Under corporate involvement, the Commission recommends that: (1) non-profit organizations and private corporations create a clearinghouse to encourage collaboration between developing nations and U.S. small firms in food

and agriculture; and (2) the United States support United Nations efforts to prescribe investment standards with balanced requirements for both investors and developing countries. For enhanced food security, the United States should press for the establishment of a global system of food and grain reserves and take steps to preserve U.S. farmer-owned reserves for use in international emergencies. Under development assistance the United States should: (1) strengthen the International Cooperation and Development Agency so that its objectives can be more easily integrated into U.S. foreign policy; (2) disburse 0.7% of U.S. GNP as concessional economic assistance; (3) strengthen A.I.D.'s agricultural and managerial competence and use nutrition as an integrating theme in agricultural, health, and family planning programs. Domestically, the United States should: (1) establish a National Nutrition Surveillance Program as a systematic way to assess the nutritional standards of Americans; (2) remove the expenditure limit on federal funding for food stamps and other successful feeding programs; and (3) establish an organization to educate the American public about world hunger.

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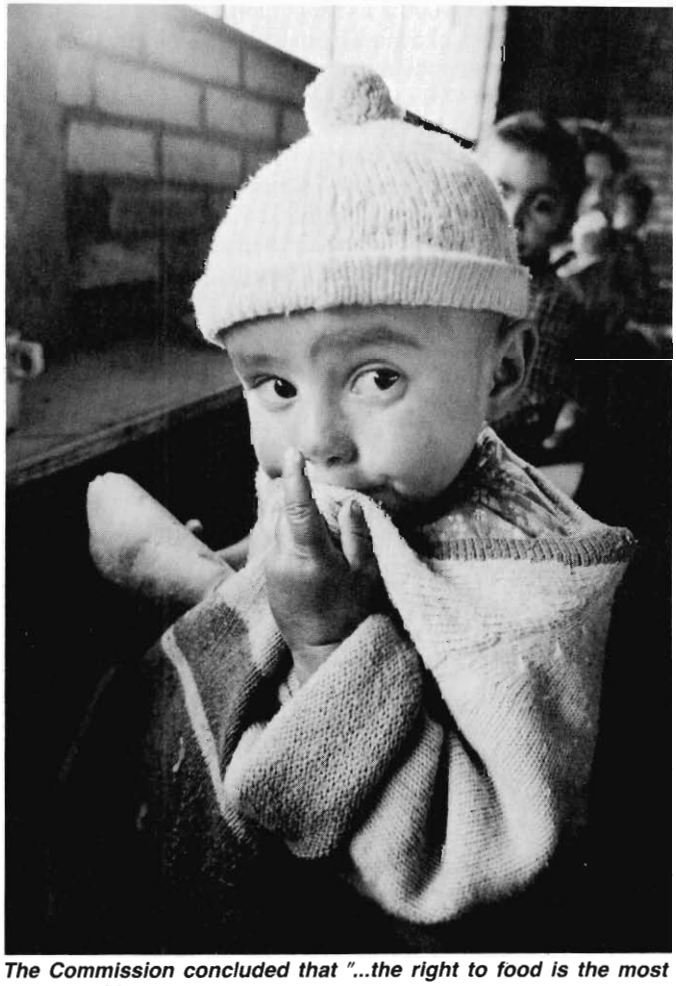


The Commission concluded that "...the right to food is the most basic..." of human rights.

116 **PN-AAJ-736**

NUTRITION-FERTILITY INTERACTIONS IN DEVELOPING COUNTRIES: IMPLICATIONS FOR PROGRAM DESIGN

Zeitlin, M.F.; Schlossman, N.P.; Meurer, M.J.; Wray, J.D.; Stanbury, J.B.
Massachusetts Institute of Technology, International Nutrition and International Population Initiatives Programs; Abt Associates, Inc.
1980, 179 p.

While lowering infant mortality decreases fertility, improvements in nutrition increase fertility. It is this apparent conflict, its policy implications, and the physiological and psychological elements of the nutrition-fertility interaction which are the subject of this report. The report examines the contraceptive effects of breastfeeding; good nutrition's impact on breastfeeding (when infants receive food supplements, breastfeeding diminishes, ovulation returns, and fertility increases earleir in well-nourished women); and the effects of uncontrolled fertility on nutritional status and mortality. The report also outlines various psychosocial determinants of family size—replacement, insurance, and investment births—which must be considered in programs to reduce mortality and fertility. Any attempt to maintain a low net reproduction rate through low nutritional status will necessitate high mortality and severe deprivation and will be incompatible with those changes in personal motivation needed for voluntary adoption of the two-child family norm. Modernization entails economic constraints and changing values which combine to encourage fewer children with greater investment per child. The following actions will encourage this process: (1) conveying the message that reducing infant mortality means a couple can achieve desired family size with fewer pregnancies; (2) providing integrated, community-based family planning, health, and nutrition services to complement those existing family planning, nutrition, or primary health care programs which are the most popular, powerful, and rapidly growing; (3) introducing modern methods of birth control soon after each birth, to take advantage of the contraceptive effect of breastfeeding as a back-up while mothers gain familiarity with the new methods; (4) reinforcing modern sector aspirations; (5) encouraging investments in child health, nutrition, and education; (6) promoting parent-child bonding and nucleation of the family, particularly in extended polygynous kinship groups; (7) reducing the social security function of children by establishing programs for the elderly; and (8) expanding women's educational opportunities and participation in the labor force. A 242-item bibliography (1940–80) is appended.

AID-otr-147-79-32

Paper copy $23.27 Microfiche $ 2.16

117 PN-AAJ-458

RURAL DEVELOPMENT, HEALTH, MORTALITY, AND FERTILITY IN RURAL NORTHEASTERN TANZANIA

Kocher, J.E.
Harvard Institute for International Development.
1980, 123 p.

To help determine the causes of, and possible relation between, high fertility and high mortality rates in tropical Africa, four rural areas in northeastern Tanzania were surveyed to determine the impact upon fertility and mortality rates of socioeconomic variables such as level of education, economic status, occupation, age at marriage, forms of marriage, place of delivery, breastfeeding practices, and health-related behavior. The survey, the findings of which are analyzed in this report, found that infant and child mortality rates in this area of Tanzania have declined substantially over the past two decades resulting in mortality rates uncommonly low for tropical Africa. Perception of this decline by parents differed widely with level of parent education. Major influences on desired levels of fertility were found to be the mother's age at first and last childbearing and the intervals between births. Women who marry later, generally the more educated, "catch-up" with or surpass women of the same age in fertility due to increased child survival and shorter birth intervals. Once women marry, fertility is determined by breastfeeding practices, sexual abstinence, and to some extent by infant mortality which shortens the interval between births. Of the socioeconomic variables analyzed, only one, "place of delivery" (hospital versus home) was consistently linked positively with lower infant mortality. This variable can be indirectly linked to education, economic status, pregnancy-related medical care, and occupation, although surprisingly, no direct correlations were found between these variables and infant survival. The study also found that a substantial proportion of parents desired to terminate childbearing after rearing five or more surviving children, but this desire could not be linked to educational or economic variables. The study suggests that the key factors promoting low fertility and mortality levels are basic education, especially for girls, and access to basic health care. It is recommended that promotion of family planning practices and immediate and prolonged breastfeeding be incorporated into the latter. A 60-item bibliography (1968–80) is appended.

AID/otr-G-1671 930004900

Paper copy $15.99 Microfiche $ 2.16

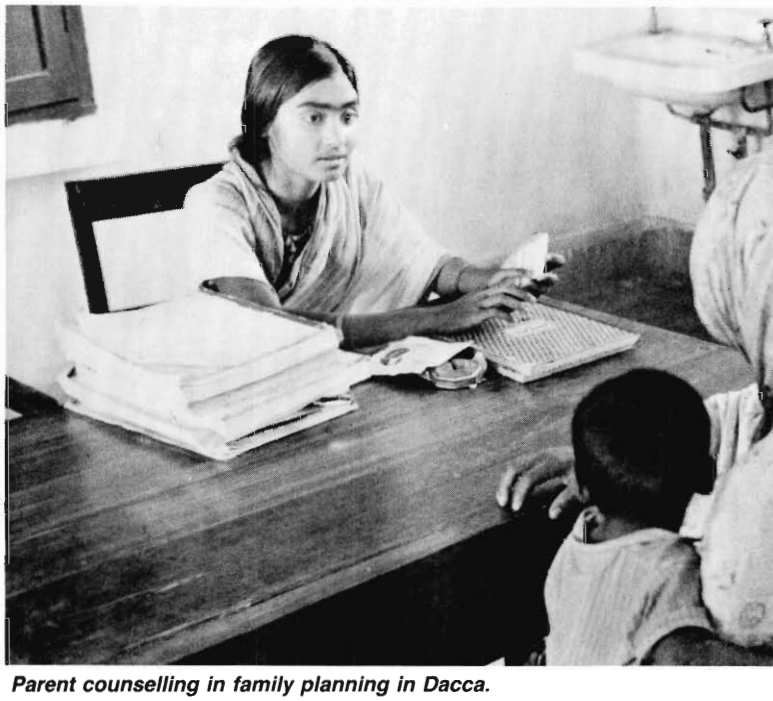
118 PN-AAJ-513

ESTIMATION OF RECENT TRENDS IN FERTILITY AND MORTALITY IN BANGLADESH

National Research Council, Committee on Population and Demography.
1981, 133 p.

Committee on Population and Demography Report No. 5

Although Bangladesh—with 88 million people living on 144,000 sq. km. in 1979—is one of the world's most densely populated countries, reliable population statistics needed to accurately predict demographic trends are lacking. This report estimates data and trends in (1) fertility; (2) mortality; (3) marital status; (4) regional variations; and (5) natural increase from 1960 to 1975. Estimation is difficult because vital events are not routinely registered; censuses are unreliable, and population shocks (e.g., natural disasters, Hindu migration) have occurred. Estimates of fertility vary widely depending on which technique is used, but a figure in the range of 6.8–7.3 births per 1,000 is likely. Aside from a slight decrease in fertility brought on by late marriages, no general trend in fertility is evident for the period. The incidence of widowhood has declined at a fairly rapid rate and probably caused a small increase in fertility. The age of first marriage rose 1.5 years for both men and women. Mortality information for Bangladesh consists of indicators which reflect but do not measure mortality and data derived from sample surveys. Infant mortality fluctuated between 130 and 160 per 1,000 from the late 1950's to 1975, with child mortality (ages 1–4 years) somewhat higher than infant mortality; despite year-to-year variations, no underlying trend was evidenced. Adult mortality was 18 per 1,000 in the mid-1960's; 17 per 1,000 in the mid-1970's. In terms of overall mortality, between 1964–65 and 1973–74, life expectancy at birth rose from 48.6 to 51.6 years for men and from 47.6 to 49.6 years for women. In terms of regional differences, fertility was highest in Rajshahi, followed by Khulna and Dacca, and lowest in Chittagong. Child mortality did not appear to vary by region. Although definitive estimates are not possible, it is likely that population growth increased between 1964 and 1974, primarily due to the drop in adult mortality. It is also probable that the female population grew



Parent counselling in family planning in Dacca.

faster (2.9–3.2%) than the male population (2.8–3.0%). A glossary of terms and a 51-item bibliography (1949–81) are appended.

AID/DSPE-G-0061 932064300

Paper copy $17.29 Microfiche $ 2.16

119 PN-AAJ-514

AGE MISREPORTING AND AGE-SELECTIVE UNDERENUMERATION: SOURCES, PATTERNS, AND CONSEQUENCES FOR DEMOGRAPHIC ANALYSIS

Ewbank, D.C.
National Research Council, Committee on Population and Demography.
1981, 125 p.

Committee on Population and Demography Report No. 4

Although demographers are resigned to age distributions being distorted by respondent ignorance, proxy reporting, poor questionnaires, faulty age estimation techniques, interviewer bias, and data processing errors, they must still account for these distortions in their work. This report reviews several studies on age misreporting (AM) and underenumeration (UE) conducted in Paraguay, Nigeria, South Korea, and other developing countries during 1966–80. Distortions due to AM or to UE can be detected by reinterviewing, checking data against other sources, examining distributions for unexpected differences, or comparing age distribution in different censuses. These techniques, of which historical event calendars, post-enumeration surveys, and stable population and census survival techniques are representative, are analyzed in terms of their underlying assumptions and ability to detect errors. Studies have shown distortions to fall into two broad patterns, the African/South Asian pattern, characterized by unidirectional AM over a broad range, and the Latin American pattern, marked by pronounced age heaping by single years with 5-year distributions tending to alternate excesses and deficits. The report concludes that: (1) questionnaires should reflect awareness of cultural factors and not require interviewers to perform arithmetic in the field; (2) the quality of age reporting depends strongly on the interviewer's education and experience; (3) local calendars of historical events are a waste of time and money; (4) more attention should be given to ensure or estimate the completeness of census counts; (5) published AM and UE studies rarely provide information needed to understand sources of errors or their importance; (6) stable population analysis and census survival approaches should receive greater use and study; (7) studies with moderate sample size which match age reports to other documents can produce valuable results; and (8) future simulation studies should compare alternative patterns of age reporting and use alternative age groupings from single year distributions. Numerous statistical tables, a glossary of terms, and an 89-item bibliography (1953–81) are included.

AID/DSPE-G-0061 932064300

Paper copy $16.25 Microfiche $ 2.16

120 PN-AAH-916

ECONOMIC AND SOCIAL BENEFITS OF FAMILY PLANNING IN GUATEMALA

Horlacher, David E.
American Public Health Association, International Health Programs.
1979, 100 p.

Guatemala's national family planning (FP) program is aimed at reducing the country's fertility rate to avoid a doubling of the population from seven million to 14 million by the year 2000 and a consequent shackling of the country's ambitious development plan. This report assesses, for development planners, the favorable social and economic benefits of a successful FP program. After comparing Guatemalan demographics with other countries in the region, the report identifies development planning goals which can be served by increased FP activity along with the differential impact on the attainment of economic and social goals of four alternative projections of reductions in the total fertility rate (TFR). A final section calculates the costs of achieving alternative fertility levels and develops cost/benefit comparisons of the population projections considered in the preceding sections. The study concludes that a reduction in TFR from 5.9 to 3.2 by the year 2000 will have the following predictable consequences: (1) income and arable land per capita will increase 28%; (2) the demographic and economic dependency ratios will be reduced, respectively, from 98/100 to 63/100 and from 272/1000 to 203/1000; (3) the government will save 32 million quetzals (Q) on health care programs and 104 million Q on social services as a whole; (4) capital per worker will increase 6%; (5) only l60,000 new jobs will be required to maintain current levels of unemployment, the capital

cost of which to maintain will require 1.7 million fewer Q than at present, 2.4 million fewer Q if female labor force participation rates increase 50%; (6) 353,000 fewer new housing units will be needed, at a saving of 1.76 million Q; (7) the number of primary school age children will be reduced to 712,000, requiring 16,400 fewer new primary grade teachers, while the number of children not receiving primary education will be reduced from 1.2 million to 730,000; (8) 3,642 fewer new doctors and 769 fewer new nurses will be needed to maintain current ratios of doctors and nurses per person; and (9) medical care at birth will be reduced 31%. These findings clearly support the decision to provide integrated FP services in Guatemala.

AID/DSPE-C-0053

Paper copy $13.00 Microfiche $ 2.16

121 PN-AAJ-557

FAMILY PLANNING: ITS IMPACT ON THE HEALTH OF WOMEN AND CHILDREN

Maine, D.
Columbia University, College of Physicians and Surgeons, The Center For Population and Family Health.
1981, 56 p.

The enormity of the maternal/child health problems facing developing countries is evident from the fact that two-thirds of their people are either children under 15 or women of childbearing age. This report explores how family planning (FP) can help avoid or reduce some of these problems. Using research data from 37 developing and developed countries, the author shows that a child's chances of surviving the first few years of life are reduced if children are born close together in time; the family already has three or more children; and the mother is under 20 or over 35. For example, in India, Lebanon, the Philippines, and Turkey, child mortality rates are highest for those born less than a year since their mother's last birth. Under the same conditions, the mother is also at significantly higher risk of incurring complications such as hemorrhage, pulmonary embolism, toxemia, or even death. Moreover, many of the estimated 15–25 million annual illegal abortions end in complications or death because dangerous traditional methods such as "massaging" the abdomen or inserting toxic herbs or sharp sticks into the uterus are used. When women have access to FP information and methods, a great number choose not to have large families, closely-spaced births, and births at unfavorable ages. For example, in Chile between 1962 and 1978, the proportion of third or later births declined sharply, with the largest drops among females under 15 or over 30—with a consequent drop in the number of fatal illegal abortions. In the United States, abortion now causes less than one death per million in women aged 15–44 as compared to 10–85 deaths per million in developing countries. Since the mid–1960's, when organized FP programs began in many developing countries, over 34% of women of childbearing age are using some form of contraception. However, because they lack easy access to contraceptive supplies and/or information, nearly half use inefficient methods (such as withdrawal, rhythm, or douching) or fear using modern methods such as the pill or IUD. The author recommends continuing and expanding FP programs in developing countries. An 87-item bibliography (1938–81) in English and Spanish is appended.

AID/DSPE-CA-0043 932063200

Paper copy $ 7.28 Microfiche $ 1.08

122 PN-AAJ-630

RURAL DEVELOPMENT INTERVENTIONS AND THEIR IMPACTS ON FERTILITY: STATE-OF-THE-ART PAPERS

David, A.S.; Levine, W.T.; Vickery, E.; Zivetz, L.
Research Triangle Institution; South-East Consortium for International Development.
1979, 105 p.

Rural Development and Fertility Project

To increase its ability to build antifertility strategies into rural development programs (RDP's), A.I.D. sponsored a series of state-of-the-art papers on the impact of RDP's on fertility decisions. This report presents executive summaries of these papers, along with a framework for synthesizing their key findings. The papers treat, in order, the fertility impact of RDP's that focus on women's roles; education; urban-rural migration; the cost/value of children; land tenure; income; and health/nutrition. Each paper includes an annotated bibliography of pertinent literature, an inventory and fertility-related analysis of hypotheses found in the literature, and an executive summary. Based on the fact that all the studies agree that fertility decisions and other decisions to allocate time and money are interdependent and that rural development programs rarely affect fertility decisions directly, a general model identifying linkages between household decisions and external influences on fertility is presented. Two sets of decisions directly affecting fertility are desired family size and the spacing of births (D1) and contraceptive use and age at first marriage (D2). Both sets are affected by income, the price of goods and services, household variables (e.g., age, religion), and local and national environments; and by household decisions regarding resource allocation in the areas treated in the seven studies. Externally, D1 and D2 decisions are mainly affected, respectively, by economic and social/environmental factors. Decisions for fertility imply decisions for child education and for maternal/child health and nutrition. Decisions for adult quality of life and thus against fertility are most often decisions for durables and savings, additional woman's education, off-farm employment of women, and migration to cities. All of these factors can be indirectly influenced by RDP's. Six RDP categories, i.e., self-help, social service extension, marketing systems, area development, financial markets, and off-farm employment, are discussed in this context. For example, building a school through self-help efforts will increase a local child's education, in turn reducing the child's future desire for a large family.

AID/ta-CA-1 931117000

Paper copy $13.65 Microfiche $ 2.16

123 PN-AAJ-292

SOLAR COOKERS: TEST RESULTS AND NEW DESIGNS

Bowman, T.E.
Florida Institute of Technology, Center for Research on Energy Alternatives.
1978, 30 p.

Prepared for presentation at the Second International Symposium of Engineering, "Technology Appropriate to Underdeveloped Countries," San Salvador, 1979

The availability of fuel for cooking has become a major problem in many developing countries. Increased use of charcoal made from native wood can cause deforestation and loss of agricultural land, and most developing countries lack the fuel distribution system necessary for the use of kerosene, gasoline, or liquified petroleum gas. Solar energy, by contrast, is abundant and available. This paper reports on a program to design, fabricate, test, and evaluate solar cookers for possible use as the primary means of cooking by rural families in developing areas. Four Telkes ovens, two Adams cookers, three direct-focusing cookers, two steam cookers, and three combined focusing/oven cookers were tested. These included cookers which were designed by the authors, purchased, or modified/copied from earlier designs. The cookers were evaluated in terms of time to boil three liters of water, maximum temperature of vegetable oil, energy storage, capacity, versatility, ease of use, ease of maintenance, durability, wind stability, portability, materials cost, and ease of manufacture. It is concluded that the Telkes, Adams, and combined focusing/oven cookers, if well designed, are easy to use, versatile, maintenance-free, and effective, and have high potential for widespread use. Although direct-focusing cookers cook well and have a much lower initial cost, they utilize relatively delicate, perishable reflective surfaces that must be replaced periodically. The expense and distribution problems associated with supplying replacement reflectors are comparable to those of supplying kerosene for fuel-burning stoves, which are easier to use. The steam cookers tested did not provide adequate heat for most cooking applications. Test results and some design criteria for Telkes ovens are presented, as well as three new designs for focusing/oven cookers, two of which have been built and tested. The highest performance example yields 700° F oven temperatures, and can heat 1.1 kg of eutectic lead/tin alloy from ambient to the melting point in 20 minutes and from the melting point to 600° F in 27–32 minutes. A 13-item bibliography (1959–78) is appended.

AID/ta-C-1333 931023400

Paper copy $ 3.90 Microfiche $ 1.08

124 PN-AAJ-326

LOW-COST EXTRUSION COOKERS, SECOND INTERNATIONAL WORKSHOP PROCEEDINGS, 1979, DAR ES SALAAM, TANZANIA

Colorado State University, Department of Agriculture and Chemical Engineering, Department of Food Science and Nutrition.
1979, 294 p.

Low-Cost Extrusion Cooker (LEC) Report No. 7

Thanks to the recent development of the Brady low-cost extrusion cooker (LEC) and its accompanying technology, consumers in developing countries are beginning to have access to nutritious foods, particularly vitamin-rich foods for infants and young children, which can be processed locally at low cost from locally produced raw foods. These LEC-processed foods have included vitamin-enriched corn-soy-milk (CSM) baby food products marketed under the name of "Lisha" (Tanzania); CSM baby foods marketed under the name of "Thriposha" (Sri Lanka); CSM products, full-fat soy flour, and pea soup (Costa Rica); CSM baby food, breakfast cereals and beverages marketed under the name of "Maisoy" (Bolivia); CSM baby food marketed under the name of "Cerex," and pea soup (Guyana); and full-fat soy flour and other CSM products (Mexico). Other soy products are also being tested, such as textured vegetable protein and soy milk extenders. Other raw food materials currently being tried in pilot programs include coconut, cowpeas, rice, mung beans, winged beans, and pigeon peas. Pilot programs in preparation for the marketing of products processed through LEC's are presently under way in Colombia, Guatemala, Honduras, India, Indonesia, Korea, Pakistan, the Philippines, and Thailand. This report comprises the proceedings of the Second International Conference on LEC's, held January 15–18 in Dar es Salaam, Tanzania, at which representatives from the United States and each of the above countries reported on LEC processing methods and marketing techniques. Policy descriptions are provided of USAID- and U.S. Department of Agriculture-sponsored nutrition programs promoting LEC development. Numerous recipes are included for producing good-tasting meals by combining LEC foods with other ingredients, such as fresh fruit and eggs. Appended are bibliographies (1965–78) totalling 47 items in English, Spanish, and Swahili and the names and addresses of the 43 conference participants (from 17 countries).

RS/USDA-01-74 931083100

Paper copy $38.22 Microfiche $ 3.24

125 PN-AAJ-347

STABILIZATION OF RICE BRAN WITH EXTRUSION COOKERS, AND RECOVERY OF EDIBLE OIL: A PRELIMINARY ANALYSIS OF OPERATIONAL AND FINANCIAL FEASIBILITY

Enochian, R.V.; Saunders, R.M.; Schultz, W.G.; Beagle, E.C.; Crowley, P.R.
U.S. Department of Agriculture, Office of International Cooperation and Development.
1980, 52 p.

Rice bran, a by-product of white rice, could become a large source of edible oil if feasible methods can be developed to

stabilize the bran and extract its untapped oil. This study examines the operational and financial feasibility of using extrusion cookers (EC) for this purpose in developing countries. Citing India and Eygpt as trial cases, the report focuses on rice milling operations, rice bran oil extraction, marketing of raw and extracted bran and rice bran oil, and the major rice system components which could impinge technically and economically on EC operations. Analysis shows that EC's apply the heat needed to stabilize the rice bran so as to extract its oil and that installation of EC systems in individual small rice mills would require capital costs of about $6,200, yield 50% on this investment, and produce the equivalent of some 30 metric tons (MT) of edible oil per year. Installation at large mills or centralized locations serving a number of small mills would require $28,000 in capital costs, yield an annual return on investment of 23% in Egypt and 35% in India, and produce approximately 600 MT of edible oil per year. In total, these systems could produce as much as 700,000 MT of additonal edible oil per year in developing countries. Based on previous USAID research showing the feasibility of installing and operating EC systems in developing countries, the authors conclude that EC is operationally and financially feasible for stabilizing rice bran and recovering its edible oil. However, since the present study is based on hypothetical field conditions, field testing should be conducted to verify that: (1) extruder equipment is appropriate for rice bran stabilization; (2) extruder-stabilized bran remains stable for a sufficient time to extract oil; (3) refined oil from varying rice strands and environments is of edible quality; and (4) local operating conditions, repairs, and maintenance permit satisfactory financial returns. The report concludes by suggesting areas for further research. Appended are a 5-item reference list (l971–79), statistics for rice milling and oil extraction plants in India and Egypt, and a description of rice bran stabilization in Burma.

RS-01-74 931083100

Paper copy $ 6.76 Microfiche $ 1.08

126 PN-AAJ-561

THE A.I.D. HAND-OPERATED WATER PUMP: A CLASSIC EXAMPLE OF TECHNOLOGY TRANSFER

Potts, P.W.
Georgia Institute of Technology.
1981, 58 p.

A.I.D.'s technology transfer efforts have enabled various developing nations to produce their own hand-operated water pumps, thereby providing them with improved rural health, a source of pride and employment, and an alternative to costlier imported pumps. This report describes A.I.D.'s project to assess the applicability, initiate the manufacture and installation, and evaluate the performance of locally-produced water pumps in Nicaragua, Costa Rica, the Dominican Republic, Indonesia, Sri Lanka, Tunisia, and Ecuador. A.I.D. and the Georgia Institute of Technology (GIT), the project implementing agent, surveyed various nations' ability to manufacture the pump, their enthusiasm for the endeavor, the pumps' applicability to rural water supply programs (particularly those already involving A.I.D.), and local pump manufacturing costs versus import costs. An initial production run gauged local manufacturers' capabilities, with GIT supplying appropriate technical assistance. After inspection, the pumps were installed in rural areas for field tests, with recipients also receiving on-the-job training in water hygiene and pump maintenance. Under this project, A.I.D.'s U.S.-manufactured Dempster deep and shallow pumps were compared on the basis of local applicability with the Brazilian Marumby pump, the U.S. Moyno pump, the Japanese Lucky pump, and the Canadian International Development Research Centre pump. Robo devices (valves, screens, and meters) were used successfully with the Dempster pump in Sri Lanka, Tunisia, and Ecuador. After initial tests in Nicaragua and Costa Rica, there were several modifications to improve the Dempster pump; the then government of Nicaragua elected to use the pump in a national program, but Costa Rica did not. Manufacture problems included the unavailability of key spare parts, product quality control, and a consistent early underestimation of production costs. Bolivia, Togo, Benin, Liberia, and the Philippines were surveyed but judged ineligible for project inclusion. The report includes a description of the involved host country institutions, diagrams of the Dempster pump, and per-country costs of pump manufacture. A 16-item (1975–80) bibliography is appended to the report.

Clean rural water supply is only one benefit of technology transfer.

AID/ta-C-1354

Paper copy $ 7.54 Microfiche $ 1.08

127 PN-AAH-745

SOLAR ENERGY DOMESTIC POLICY REVIEW INTERNATIONAL PANEL POLICY OPTIONS

A.I.D., Bureau for Development Support, Office of Energy.
1978, 87 p.

To a world faced with depleting supplies of traditional energy sources such as fossil fuels, solar energy (SE), which is both clean and renewable, presents itself as a necessary energy alternative. This report presents options for U.S. SE promotion in the three areas of commercialization, technology development, and cooperation with developing countries. After analyzing these options in terms of their consistency with other federal programs, legislative and budgetary requirements, and foreign policy implications, recommendations are made for each of the three above-mentioned areas, as follows: Domestic SE firms should be encouraged to help meet international demand for SE technology by conducting global marketing surveys, advising government agencies on the viability of planned SE projects, and helping to implement the latter. For its part, the U.S. Government should assist in developing SE technology. The Department of Energy, for example, should fund research and development (R&D) projects in SE for specific developing country needs while ensuring that the technology is appropriate to developing country conditions and not to the U.S. market. The United States should also initiate technical cooperation with countries which have significantly developed SE in their own economies. Current U.S. participation in both multilateral (International Energy Agency) and bilateral (France, Saudia Arabia, Spain, U.S.S.R.) SE agreements will soon be extended to include Japan, India, Italy, and Brazil. Given these successes, the U.S. should initiate new bi- and multilateral agreements in SE-powered desalinization, water management, heating and cooling, and agricultural projects. Lastly, the United States should cooperate with developing nations to meet U.S. commitments made at the recent Bonn Economic Summit. The cooperative program will consist of: (1) enhanced R&D on solar technologies; (2) an analysis of the special energy needs and resources of each developing country; (3) support for indigenous SE training; (4) testing and adaptation of solar technologies in developing countries; and (5) a separate international program to exchange SE information and increase awareness of solar technology and its applications.

Paper copy $11.31 Microfiche $ 1.08

128 PN-AAJ-274

SENEGAL FOOD AND ENERGY STUDY: ENERGY USE AND OPPORTUNITIES FOR ENERGY-RELATED IMPROVEMENTS IN THE FOOD SYSTEM

Brookhaven National Laboratory; Checchi and Company.
1980, 270 p.

The growth of agriculture, the mainstay of Senegal's economy, is contingent upon the acquisition of imported energy. This study examines the key constituents of the Senegalese food system in relation to energy supply and demand. The study first analyzes the food system (crop characteristics, and physical and institutional components) and the energy system (sources, costs, supply/conversion technologies, and consumption patterns). Next, energy-use profiles are provided on the production and distribution processes of millet/sorghum, rice, groundnuts, and fish. Household cooking practices are also discussed. Relative to other sectors, the food system's commercial energy requirements are small, with over half the energy used expended by motorized fishing crafts. Energy costs are compounded because infestation and decomposition eliminate 25% of the nation's catch. Losses can be reduced by improving solar drying equipment, installing appropriate cold storage facilities, and studying the potential of chemically preserving fish. Since fertilizer is the key to achieving national food self-sufficiency, research on nitrogen fixation through nonchemical means and on increasing the assimilation rate of phosphate rocks by soils is advocated, along with promotion of green manuring and composting practices and development of less energy-intensive fertilizer manufacturing and distribution methods. Recommendations to improve irrigation, the second key to increasing food supplies, include funding for low-capacity photovoltaic and solar-thermal systems, setting up windmills in coastal areas, and designing large-capacity solar plants similar to those at Bakel. To save energy at the household level, wood or charcoal cooking stoves must be made more efficient and the use of biogas plants should be studied. To counter the serious depletion of fuelwood, Senegal's main indigenous energy resource, energy-efficient charcoal production should be developed, the charcoal industry reorganized, and afforestation and forest management programs expanded. A national energy assessment is also recommended. A glossary of study-related Senegalese institutions and a 75-item French and English bibliography (1954–79) are appended.

PA/ERDA/TAB-995-18-76

Paper copy $35.10 Microfiche $ 3.24

129 PN-AAJ-422

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME I, EXECUTIVE SUMMARY

Energy Systems International.
1980, 149 p.

ESI Report No. EA-80-0101-1

Because heavy dependence on costly imported fuel has greatly inhibited Jamaica's economic development, USAID/Jamaica and the Government of Jamaica (GOJ) sponsored a preliminary energy assessment to identify and develop viable alternative energy options. Specialized studies included solar energy (commercial/industrial and agricultural), biogas applications, energy conversion from waste, a coal prefeasibility study, and an electric utility rate analysis. Individual studies were published in three volumes (with volume three on renewable energy being in four parts, for a total of six volumes). This first introductory volume provides a lengthy executive summary of

the entire assessment. (A second introductory volume provides an economic assessment of each specialized study area.) After summarizing the findings of the specialized studies, a lengthy series of recommendations is presented. General recommendations include assessing the potential of other promising energy areas; establishing a GOJ office to develop an overall energy conservation plan; identifying the specialized personnel requirements of the GOJ Ministry of Mining and Natural Resources Energy Division; developing the required infrastructure among the various Jamaican groups involved in energy programs; and developing and implementing training and technical assistance plans for GOJ energy program personnel. Specific recommendations include implementing solar water heating, solar agricultural drying, and biogas applications programs; studying waste collection problems in Kingston; establishing an Alternative Energy Laboratory at the University of the West Indies' Mona Campus; upgrading existing oil-fired electric power plants; investigating a possible coal-fired plant and coal supply and shipping; monitoring coal-oil mixture development and coal gasification technology progress; and having the Jamaican Public Service Company assess various options for electric utility rates. A Combined Energy Program based on these recommendations would be economically beneficial and should be implemented. Appendices include a five-item bibliography (1978–79), profiles of the U.S. energy assessment team members, and a summary of a splinter group discussion.

AID-532-79-11

Paper copy $19.37 Microfiche $ 2.16

130 PN-AAJ-423

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME II, ECONOMIC ASSESSMENT

Energy Systems International.
1980, 111 p.

ESI Report No. EA-80-0101-2

Because heavy dependence on costly imported fuel has greatly inhibited Jamaica's economic development, USAID/Jamaica and the Government of Jamaica (GOJ) sponsored a preliminary energy assessment to identify and develop viable alternative energy options. Specialized studies included solar energy (commercial/industrial and agricultural), biogas applications, energy conversion from waste, coal prefeasibility study, and electric utility rate analysis. These studies were published in three volumes (with volume three on renewable energy being in four parts, for a total of six volumes). A first introductory volume provides an executive summary for the assessment as a whole. This second introductory volume presents an economic assessment of the specialized study areas, reviewing recommendations from the specialized studies in relation to each other and to the GOJ's 5-year Development and Energy Sector Plans. After analyzing the effects of these recommendations on Jamaica's energy situation and economy, the recommendations are integrated and prioritized in a proposed Combined Energy Program (CEP) which is recommended for immediate GOJ implementation. Highest priority items include research, testing, training, and tax structures to encourage solar hot water and agricultural drying systems; installation of small- and medium-size biogas plants; and negotiating joint port usage for a possible coal-fired electricity plant. Costs of the proposed program are modest (a maximum of $6.25 million), while the resulting reduction in net energy imports is estimated to be 4.4% by 1985 and 8.3% when fully implemented. Most of the projects can be initiated in the CEP's first year and can begin producing benefits in the first or second year. Reliance on imported technology or commodities is relatively low. Because of the many GOJ agencies involved, it is suggested that an Interagency Energy Coordinating Committee be formed to resolve conflicts and facilitate exchange of information. Appendices include a 13-item bibliography (1976–79), contract statement of work, a list of discussions held (and with whom) in preparing the study, and modifications required in the GOJ's Energy Sector Plan to accommodate the CEP.

AID-532-79-11

Paper copy $14.43 Microfiche $ 2.16

131 PN-AAJ-424

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME III, RENEWABLE ENERGY: SOLAR ENERGY—COMMERCIAL AND INDUSTRIAL

Energy Systems International.
1980, 100 p.

ESI Report No. EA-80-0101-3a

Because dependence on costly imported fuel is greatly retarding Jamaica's economic development, USAID/Jamaica and the Government of Jamaica sponsored a preliminary energy assessment to identify and develop viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, the first part of volume three, concerns commercial and industrial solar applications, specifically solar water heating and solar air cooling. The study finds that solar domestic water heating and boiler make-up water preheating are technically feasible and, depending on the displaced energy source (electrical or various fuel types), economically justified; and that solar hot water installations could displace the equivalent of 189,842 barrels of fuel oil per year. However, solar cooling requires high performance collectors not currently manufactured in Jamaica, and feasibility studies indicate that solar cooling in the near term is not economically justified. Specific recommendations for a 3-year program are: establish a solar collector performance testing and certification program and 10 climatic stations to record solar radiation and ambient temperatures; eliminate the 37.5% tax on water heater tanks in solar

systems; establish a consumer energy information office, training courses for solar system installers, and college-level energy conservation and solar application programs for architects and engineers; investigate the possible export of Jamaican solar products; provide technical support to the Residential Solar Demonstration Program; start indepth feasibility studies of industrial, commercial, and hospital solar hot water applications; establish tax incentives for solar applications; and start an institutional solar hot water demonstration program. Appendices include, inter alia, a five-item bibliography (1977–79), some interim guidelines for solar water heaters in Jamaica, various technical reports, and the summary of a splinter group discussion.

AID-532-79-11

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132 PN-AAJ-425

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME III, RENEWABLE ENERGY: SOLAR ENERGY—AGRICULTURAL

Energy Systems International.
1980, 70 p.

ESI Report No. EA-80-0101-3b

Because heavy dependence on costly imported fuel is greatly hindering Jamaica's economic development, USAID/Jamaica and the Government of Jamaica sponsored a preliminary assessment study to identify viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, part two of volume three, is concerned with the use of solar heat for drying agricultural products (crops, timber, and fish). The study finds that Jamaica has an ideal climate for solar agricultural product drying with the following methods offering the greatest promise: sun drying using open barbeques; drying in transparent buildings (with or without attached collectors) for small operations; new drying systems using solar air heaters with forced air drying; preheating air for existing commercial fossil-fueled dryers; and fish drying via chemical dehydration with solar regeneration of the chemical. The primary needs are to develop and construct environmentally suitable solar dryers and to train engineers in solar system design and installation. Specific recommendations include establishment of 10 climatic stations to record solar radiation and ambient temperatures; development of air-type solar collectors; research and development on agricultural product drying and on cost-effective drying methods; encouragement of sun drying; construction of solar-heated, forced-air dryers (and providing the training necessary for design, construction, and operation); and construction of supplemental solar heaters for preheating at commercial drying facilities. Increased use of agricultural solar drying would provide a better supply of food products throughout the year and would also improve Jamaica's balance of payments. Appendices include a 15-item (1970–79) bibliography; a list of interviewees; data on various solar applications including computed solar radiation, solar preheating of air for rotary drum drying and agricultural product drying; and a summary of a splinter group discussion.

AID-532-79-11

Paper copy $ 9.10 Microfiche $ 1.08

133 PN-AAJ-426

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME III, RENEWABLE ENERGY: BIOGAS APPLICATIONS

Energy Systems International.
1980, 84 p.

ESI Report No. EA-80-0101-3c

Because heavy dependence on costly imported fuel is greatly hindering Jamaica's economic growth, USAID/Jamaica and the Government of Jamaica sponsored a preliminary assessment to identify viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, the third part of the first technical volume, considers the feasibility of biogas generation and applications. Biogas is a high grade fuel produced by anaerobic digestion of organic matter such as farm crops or animal manure and is useful for cooking and other purposes. The Jamaican Scientific and Research Council (SRC) has developed and tested a family-size biogas plant and is currently designing a medium-size plant. A climate eliminating the need for costly digester equipment, the lower cost of biogas relative to imported oil, and widespread enthusiasm for biogas lead to the conclusion that a national biogas program would be successful. Recommendations for implementing this program are: select one of SRC's family- and medium-size biogas plant designs for large-scale implementation; implement a 5-year plan to deploy 2,700 family-size and 41 medium-size biogas plants; determine the feasibility of a large-scale biogas unit to generate electricity and the possibility of constructing more family- or medium-size biogas plants; assess the commercial potential of the biogas plant design in Jamaica and other countries and decide on the basis of this assessment whether to implement an accelerated biogas program; establish a national biogas program organization; and begin a comprehensive training and public awareness program. Installation of a biogas collector at the University of the West Indies' Mona Campus sewage treatment plant was rejected as uneconomical due to the plant's small size. Appendices include a five-item bibliography (1975–79), data on other biogas pro-

grams, lists of the study's information sources, a biogas survey questionnaire, and a summary of a splinter group discussion.

AID-532-79-11

Paper copy $10.92 Microfiche $ 1.08

134 PN-AAJ-427

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME III, RENEWABLE ENERGY: ENERGY CONVERSION FROM WASTE

Energy Systems International.
1980, 60 p.

ESI Report No. EA-80-0101-3d

Because heavy dependence on costly imported fuel is greatly hindering Jamaica's economic growth, USAID/Jamaica and the Government of Jamaica sponsored a preliminary assessment to identify viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, the fourth part of the first technical volume, considers the feasibility of energy conversion from wastes. Specifically, the study analyzes the potential for energy recovery from urban wastes in Jamaica, with the Kingston area serving as a case study, and assesses the feasibility of building a prototype demonstration unit for energy recovery from solid wastes at the University of the West Indies (UWI)-Mona Campus. Steam-generating waterwall combustion, refuse-derived fuel systems, pyrolysis, anaerobic biological conversion (biogas), and gas recovery from landfills are discussed as alternative systems for energy recovery from urban wastes. It is concluded that the only practical alternative for use in Kingston is waterwall combustion. This program could be cost-effective, but cannot currently be applied because of inefficient and unreliable refuse collection. It is therefore recommended that a detailed study be made of the physical, management, and sociological aspects of the refuse collection problem. With respect to a demonstration program at UWI-Mona Campus, it is concluded that biogas generation would be the only suitable process given the size of the program's waste treatment plant. However, because of the heterogeneous nature of urban wastes and the low efficiency of the recovery process, this method will probably not have widespread urban usage. It is therefore recommended that UWI's Mona Campus not proceed with a field-scale biogas generation demonstration unit, but rather that it be financially assisted in developing a laboratory to study various energy alternatives. Appendices include a 9-item bibliography (1968–79) and a summary of a splinter group discussion.

AID-532-79-11

Paper copy $ 7.80 Microfiche $ 1.08

135 PN-AAJ-428

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME IV, COAL PREFEASIBILITY STUDY

Energy Systems International.
1980, 118 p.

ESI Report No. EA-80-0101-4

Because dependence on costly imported fuel is hindering Jamaica's economic growth, USAID/Jamaica and the Government of Jamaica (GOJ) sponsored a preliminary assessment to identify viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, the second technical volume, assesses the technical, economic, and environmental feasibility of diversification from oil to coal for generating electric power for the Jamaican Public Service Company (JPS) and the bauxite/alumina industry. The study found that the JPS system has sufficient capacity for current demand, but better maintenance, especially of the newer, more efficient units, is needed to avoid blackouts. Current JPS and alumina company boilers cannot be retrofitted to burn coal directly, but may be able to burn a coal/oil mixture or coal gasification product. Developments in these areas should be monitored. Evaluation of four alternative electricity generating schemes (coal-fired, combined-cycle gas turbine, low-speed diesel, and oil-fired) indicates that coal-fired units will provide economic benefits only if port and coal unloading facility costs are kept low or if the coal-oil cost differential widens rapidly. Old Harbour Station, Montego Bay, Port Esquivel, and Cuckold Point in New South Manchester are possible sites for a coal-fired plant. Negotiations should be begun for joint use of the harbor facilities and site at Port Esquivel and Cuckold Point. If these negotiations succeed, a more detailed cost and cost-benefit estimate should be prepared. Although coal supply and shipping conditions seem favorable, a study is recommended to confirm the delivered price of coal. While a preinvestment feasibility study is not recommended at this time, a full feasibility study is recommended in 2–3 years if all other factors prove positive. Appendices include a list of four references (1978), data on various energy programs/sectors, and a summary of a splinter group discussion.

AID-532-79-11

Paper copy $15.34 Microfiche $ 2.16

136 PN-AAJ-429

PRELIMINARY ENERGY SECTOR ASSESSMENTS OF JAMAICA, VOLUME V, ELECTRIC UTILITY RATE ANALYSIS

Energy Systems International.
1980, 134 p.

ESI Report No. EA-80-0101-5

Because heavy dependence on costly imported fuel is greatly hindering Jamaica's economic development, USAID/Jamaica and the Government of Jamaica sponsored a preliminary assessment to identify viable alternative energy options. Technological studies were published in three volumes (with volume three being in four parts, for a total of six volumes), to which two introductory volumes were added, providing, respectively, an executive summary of the entire assessment and an economic assessment of the individual areas. This study, the last of the three technical volumes, analyzes the electric utility rate structure of the Jamaica Public Service Company (JPS) in order to determine whether it promotes economically efficient use of electricity, is based on principles of equity and fairness, and provides JPS with sufficient resources to maintain acceptable service quality. Current tariffs are described, and features such as declining block tariffs (decreasing unit price with increasing volume used), expander clauses (decreasing rate if total energy use increases without increasing maximum power demand), and ratchet clauses (little or no reduction in charges if use falls below a previously set high), which may not encourage conservation or efficient system usage, are noted. Various tariff options, based on marginal cost pricing principles (tying prices to the additional cost of supplying the electricity), are presented for each rate category in the JPS system (residential, small commercial, industrial, and large commercial). Flat rate (with and without demand charges), time of use pricing, fuel adjustment, and cost of service adjustment are considered. These options demonstrate immediate or interim steps that can be taken to gradually approach marginal cost pricing. The effects of each step in tariff development and the associated customer bill impacts are indicated. As requested by JPS, specific recommendations for the type of tariff system to be adopted are not presented. It is recommended that JPS review and analyze these options and present its own suggestions to the Ministry of Public Utilities. Appended are a 10-item bibliography (1958–77) and a summary of a splinter group discussion.

AID-532-79-1

Paper copy $17.42 Microfiche $ 2.16

137 PN-AAJ-432

ENERGY FOR AFRICA; SELECTED READINGS

French, D.; Larson, P.
A.I.D., Bureau for Africa, Office of Development Resources, Special Development Problems Division.
1980, 201 p.

The scarcity of Africa's energy supplies threatens the continuation of development programs vital to its poor. This report presents seven studies relevant to meeting this challenge. The first study, questioning whether tree planting and developing renewable energy will be able to replace the rapidly diminishing oil and fuelwood oil which now satisfy 90–100% of Africa's energy needs, contends that scarce/expensive energy will become a permanent condition and therefore urges governments at once to recalibrate their development strategies accordingly. The next study, which examines how fuelwood-policy decisions are made and executed, recommends further study on two possible ways to provide incentives for local fuelwood management: privatizing land and trees and strengthening local ability to manage common resources. The third study asserts that promotion of energy technologies should proceed by taking a preliminary socioeconomic survey of the target group, discussing the proposed technology with the group, and then collecting data to determine the technical, social, and economic feasibility of the proposed system. A key to this approach is the use of appropriate analytical filters, e.g., cost/benefit analysis for judging economic feasibility. The next study analyzes energy system return rates by using the dissemination cost/ratio method, i.e., comparing the incremental budgetary cost of new energy units with their incremental value to society. The incentive to buy, the availability of resources, and the ease of dissemination are constituents of this process. A fifth study holds that villagers are more likely to adopt technology the more the choice is spontaneous and not forced, and if the technology coincides with their self-interest and is controllable. A study on community participation in fuelwood projects reveals that project success requires the participation of all parties—specifically, of villagers—and recommends joint agreement on issues such as goals and procedures prior to the project. The final study, on the role of evaluations in energy projects, poses questions to be asked during project implementation and recommends continual project monitoring. Individual bibliographies are appended.

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138 PN-AAJ-471

AN OVERVIEW OF ENERGY STRATEGIES FOR JAMAICA

Palmedo, P.F.; Ashby, W.R.; Doernberg, A.; Tunnah, B.; et al.
Energy/Development International; Energy Systems International.
1981, 78 p.

Jamaica, with a virtual total dependence on imported oil, must develop alternative energy sources if expected GNP growth rates are to be achieved. This study selectively assesses alternative energy techniques and places Jamaica's various energy options in perspective according to anticipated levels of energy demand. The major energy options considered include use of coal and peat in industry and electric generation; promotion of energy conservation in industry, transportation, and utilities; hydropower; solar power; and biomass generation. Each option is evaluated in terms of its commercial availability, capital and production costs, oil savings, and foreign exchange impact. Although the demand for oil is expected to rise 60% in the next 10 years, the report predicts that a strategy combining various alternative energy sources could reduce oil as a

fraction of Jamaica's total energy consumption from the present level of 97% to 64% by 1990. In the short run—the next five years, the most effective measures to reduce oil imports include implementation of a slow-speed diesel generator in public utilities; conservation in the industrial and transportation sectors; use of coal in major electric power industries; more efficient use of bagasse in the sugar industry; domestic and commercial use of solar water heaters; and medium-scale hydropower. Because few options exist for direct fuel use in the household and transport sectors, increased energy efficiency, liquid fuels from biomass, and household fuels such as charcoal should receive added attention. In the intermedite term, ocean thermal energy conversion systems, large-scale hydropower, use of urban waste for power generation, and use of wood or charcoal could be viable. Depending on technical performance, environmental implications, and social acceptability, solar ponds, high temperature solar collectors, wood-based electricity generation, and liquid fuels derived from sugar, tropical grasses, or fast-growing trees could prove important over the long run—up to the year 2000. Option work sheets based on varying assumptions in each energy sector are appended.

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Paper Copy $10.14 Microfiche $ 1.08

139 PN-AAJ-490

ENERGY AND DEVELOPMENT IN CENTRAL AMERICA, VOLUME ONE: REGIONAL ASSESSMENT

Park, W.; Neves, C.; Trehan, R.; Ackerman, E.; Gallagher, W.; Palmedo, P.; Doernberg, A.; Oberg, K.; Kyle, S.
Mitre Corporation.
1980, 127 p.

Volume II., Country Assessments: PN-AAJ-491, 348 p.

A survey of Central American (CA) energy needs and resources was conducted to help CA countries and USAID and other donor organizations define, plan, and meet CA energy needs. Results of that survey have been published in two volumes, of which this first assesses energy concerns and strategies on a regional basis. Volume two provides country energy assessments. Petroleum and noncommercial biomass are currently the region's most commonly used energy sources, but there is significant energy potential in water, geothermal, solar, and wind resources as well. The region's petroleum consumption (excluding Panama) grew 7% from 1968–76, while the yearly growth of electric generation between 1965–77 was 10.6%. Energy demand projections show petroleum demand increasing 3.6–5.4% and that of noncommercial fuel 2.9% annually to the year 2000. Given the problems created by high-priced oil and wood depletion, three alternative energy strategies—imported oil substitution, conservation, and rural energy development—are outlined to exploit the region's projected resource potential. Possible substitutes for imported oil include developing indigenous oil reserves, using electric power generated by hydro, geothermal or solar means, and employing methanol from trees or ethanol from sugar cane or other crops to fuel transit systems. Prospects are good for conserving 10–20% of energy demanded through better energy management, minor capital investments, and promotion of mass transit systems. Alternative forms of rural energy include replacing diesel generators with solar, hydro, or wind generators; developing reforestation policies; and promoting rural electrification. It is recommended that USAID support: (1) development of country energy policies and institutions, biomass-based liquid fuels, and country conservation and rural energy programs; (2) renewable energy resource assessments; (3) innovative energy research; (4) dissemination of energy development information; and (5) regional energy institutions such as the CA Institute for Industrial Research and Technology (ICAITI). Appended are conversion tables, a list of CA contributors to the study, and a 15-item bibliography (1976–80) in English and Spanish.

AID/SOD/PDC-C-0146 598060100

Paper copy $16.51 Microfiche $ 2.16

140 PN-AAJ-491

ENERGY AND DEVELOPMENT IN CENTRAL AMERICA, VOLUME TWO: COUNTRY ASSESSMENTS

Ackerman, E.; Doernberg, A.; Gallagher, W.; Kyle, S., et al.
Mitre Corporation.
1980, 348 p.

Volume One: Regional Assessment, PN-AAJ-490, 127 p.

Energy development is critical to Central America's (CA) future. This second of two volumes on energy and development in CA provides energy assessments for six CA countries to supplement the regional energy assessment given in Volume I. Each profile outlines in-country geographic, social, and economic factors affecting energy consumption; assesses energy resources and institutions; describes current energy-use patterns and applies Volume I methods to forecast energy needs to the year 2000; and develops basic energy strategies. Besides specifying the regional recommendations given in Volume I, the report recommends the following for USAID support: (1) in Guatemala—a conservation office/program, rural energy development (e.g., technology centers and education programs), extension of rural electrification, reforestation, and institution-building for technology transfer; (2) in Honduras—institution-building in energy research and development in minihydro, coal, and solar energy, and determining the feasibility of proposals regarding charcoal, cement, and agricultural residues; (3) in Nicaragua—geothermal development (financial support), assessing minihydro potential, and controlling brine-related air and water emissions; (4) in Costa Rica—integrating energy/transportation planning, reducing/displacing petroleum use in irrigation, food processing, packaging, transportation, and fertilizer operations, hydrocarbon research, and wind and solar assessments; and (5) in Panama—a national energy

organization (as a prerequisite to further USAID support), energy-conservation skills (in all USAID assistance), energy-related curriculum development at the University of Panama, resource assessments, and Panamanian participation in regional energy initiatives. Also recommended are efforts to derive ethanol from sugarcane in Nicaragua, Guatemala, and Honduras; use of Peace Corps Volunteers in rural energy programs in the latter two countries; and training for government officials in natural resource assessment and energy/environmental planning in Honduras and in fossil fuels and energy planning in Nicaragua. El Salvador requires further study before recommendations can be made. Bibliographies follow each section.

AID/SOD/PDC-C-0146 598060100

Paper copy $45.24 Microfiche $ 4.32

141 PN-AAJ-628

ENERGY IN IRRIGATION IN DEVELOPING COUNTRIES; AN ANALYSIS OF ENERGY FACTORS TO BE INCLUDED IN A NATIONAL FOOD POLICY

Smerdon, E.T.; Hiler, E.A.
1980, 82 p.

In response to the challenge posed by escalating increases in the amount of energy needed for irrigation in developing countries, this report analyzes current energy consumption in irrigation, renewable energy technologies, and relevant food policy issues facing developing country governments. The authors find that developing groundwater supplies entails twice the energy costs of developing surface water supplies, and that the latter can be more efficiently manufactured, installed, and operated in developing countries. In determining the amount of energy needed to manufacture, install, and operate various irrigation systems, it is found that sprinkler and trickler systems are competitive only when pumping lifts are very high (100 meters). Discussion of renewable energy sources covers biomass systems such as direct combustion and gasification, as well as solar and wind sources. Currently, agricultural production of biomass fuel is a problem due to the fuel/food conflict in developing countries. The potential of solar power, e.g., photovoltaic cells, is also discussed. Unfortunately, solar costs remain high. Finally, wind energy was found to be technically more suitable for developing countries than biomass and solar sources. The impact of energy alternatives on the food production effectiveness of irrigation systems is also assessed, with stress laid on the importance of providing water at crop-critical times—a point of essential importance for systems such as windmills. Energy is best saved by eliminating water losses, although upgrading poorly designed irrigation systems can also save water and energy supplies. Recommendations, in their order of priority, are: reduce water losses in watercourses and water distribution systems; improve on-farm irrigation practices; maintain irrigation pumps; water crops only in accordance with their needs; and use surface water sources when available. It is also recommended that research concentrate on improving on-farm water management systems and that governments realistically assess their irrigation systems' energy needs in light of food needs. Tables, graphs, appendices, and a 83-item bibliography (1954–80) are provided.

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Paper copy $10.66 Microfiche $ 1.08

142 PN-AAJ-698

ENERGY RESOURCES IN SOUTHERN AFRICA: A SELECT BIBLIOGRAPHY

Cavan, A.
African Bibliographic Center.
1981, 72 p.

In Southern Africa Development Information/Documentation Exchange (SADEX)

The high cost of imported oil is forcing developing nations to examine their domestic resources for energy alternatives. Accordingly, many nations of Southern Africa are studying their possible use of the region's lakes and rivers to generate hydroelectric power; employing geological teams to explore for coal, gas, oil, and uranium; and examining their use of firewood and the resultant impact upon the environment. In addition, innovative energy sources such solar and wind power, are being tested and applied throughout the region. The aims, progress, and possibilities involved in Southern Africa's energy development are the subject of this 473-item bibliography. The primary items of information described in this document are relatively recent (1975–81), originate from both indigenous and international sources, and are mostly in English, although a few are in French and Portuguese. The presented information focuses on the African continent, the Southern African region, and the nations of Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, South Africa, Tanzania, Zambia, and Zimbabwe. The energy source topics include alcohol, coal, gas, oil, solar, uranium, water, wind, and wood; as well as a general energy-development category. The bibliographical listings for some nations include many categories—such as Zambia's development of its alcohol, coal, oil and gas, uranium, water, and wood energy sources. For other nations, however, the listed categories are few, e.g., Malawi's general and alcohol energy development.

AID/afr-C-1538 698013500

Paper copy $ 9.36 Microfiche $ 1.08

SOCIAL SCIENCE

143 PN-AAH-488

YAOUNDE HOUSEHOLD AND HOUSING CHARACTERISTICS

Government of Cameroon, Ministry of Equipment and Housing, Urban and Rural Lands Development Authority.
1978, 175 p.

In cooperation with USAID/Cameroon

To develop plans for appropriate low-income housing in Yaounde, Cameroon, Cameroonian and USAID specialists surveyed 97 households representing each of the city's seven urban housing types. Surveyors concentrated on lower income housing types, but included some middle- and upper-income households for comparative purposes. This three volume report presents the survey results, housing policy implications, and case studies for each housing type. In Part I of Volume I, the land use, location, population density, and levels of municipal service are compared for each housing type, and differences among the three broad socioeconomic groups inhabiting urban housing are examined. In Part II of Volume I, policies to best meet Yaounde's housing needs are described. A major recommendation is to orient policy and programs in favor of the poorest household group (Group I), which makes up 85% of the total urban population. The services most critically needed by this group are access roads, water supply, street lighting, and electricity. The authors recommend that Group I households participate in providing or upgrading these basic neighborhood services. In addition to infrastructure improvements, the development of a coherent land ownership policy, especially land title regularization, improved access to credit, and construction information are recommended as priorities over physical improvement of homes. The paper predicts the number of low-income dwelling units and related services which Group I will require as it increases. Newly developed areas should be located close to employment zones to avoid failures caused by lack of adequate, affordable transportation. Volume I contains annexes on data collection methods and infrastructure standards. Volume II presents details of the data collected, including household social and economic characteristics (family size, religion, income, rent, etc.), housing descriptions, existing levels of service and infrastructure, and needed improvements in health, education, and employment services. Volume III presents graphs and data on 50 case studies and two annexes—a functional analysis of a typical low-income dwelling unit and a table of average room size per housing type.

Paper copy $22.75 Microfiche $ 2.16

144 PN-AAH-597

THE HILL PEOPLE OF NORTHERN THAILAND; SOCIAL AND ECONOMIC DEVELOPMENT

Hickey, G.C.; Wright, J.
1978, 285 p.

Until recently, Thailand's hill people were largely neglected by the central government. Although numerous development programs, many attempting to introduce new cash crops as substitutes for opium poppies, have been introduced since 1970, the basic circumstances of the hill people remain unchanged. A nutrition survey in Chiang Mai showed that highland children are almost 50% deficient in protein. The average percent of hill people with no education is 76%, compared to the national average of 26%. Furthermore, 41% of the hill people have no ability in the Thai language. The purpose of this study, which was based on a study of documentary materials, interviews with various Thai government officials, and field studies, is to provide background information to be used in designing development projects for the hill people, especially a proposed Hilltribe Integrated Rural Development (HIRD) Project. This report consists of four parts: (1) a summary of findings and recommendations; (2) a brief characterization of the various hill people and a discussion of Thai government policy toward them; (3) an analysis of the dynamics of change in Northern Thailand; and (4) a survey of current socioeconomic conditions among the hill people. The authors conclude that the potential for successful socieconomic development programs does exist. Considerable social and economic change has already occurred—e.g., village isolation is breaking down, more hill people have begun to participate in the market economy, and some new career opportunities are opening up. The authors recommend that USAID/Thailand formulate programs to improve the hill peoples' standard of living and to provide them with greater occupational opportunities. They also recommend that USAID support existing Thai education and health programs directed at the hill people and implement the proposed HIRD Project as a model socioeconomic development scheme. Included are appendices on Northern Thailand's physical environment and on its social, economic, political, and religious systems; the population and nutritional status of hill people; a case study of a special education school established for them; and a bibliography (70 entries, 1876–1978).

AID/ASIA-C-1310 498024900

Paper copy $37.05 Microfiche $ 3.24

145 PN-AAH-943

SAHELIAN SOCIAL DEVELOPMENT

Reyna, S.P.
A.I.D., Regional Economic Development Services Office, West Africa.
1980, 716 p.

Today in the Sahel one can raise animals or plants and be very poor; or one can leave. Such is the dilemma examined by the five authors whose studies of Sahelian social development comprise this book. "A Brief History of the Sahel" concentrates on the pre-colonial, colonial, and post-colonial eras of development and their effect on the ecosystem and people of the Sahel. "The Fulani in a Development Context" refutes the stereotype of Sahelian pastoralists as a people so infatuated with their animals that they wander about the bush singing songs and dedicating poetry to their beasts, when they should be selling

them at the local abattoir. The Fulani (who instead sell milk and butter) see their herds as a trust and are unwilling to part with any of their dividend-producing stock. Furthermore, the Fulani are nomads, not because they love wandering, but because it enables them to feed their cattle. Thus, what is often perceived as backwardness is in reality a rational adaptation to a limited, harsh environment. "The Conditions of Agricultural Intensification in the West African Savannah" examines climate, soils, and farming practices in the Sahel region. Following a general discussion, three case studies are outlined involving the Kasasi of Ghana, the Hausa of Nigeria, and ethnic peoples of the Niger Delta of Mali. Although the authors fail to see any simple relationship between environment and farming systems, they note that existing food-production strategies do seem designed to minimize environmental risks. In "Development for Whom", the author addresses the distribution of benefits from large-scale agricultural intensification projects (especially irrigation projects) and concludes that the rural poor are not among the beneficiaries. In most instances, these projects are actually resettlement schemes, forced on and inhospitable to local culture and traditions. In "Cooperatives, Initiative, Participation and Socio-Economic Change", the author reaches similar conclusions with regard to the impact of government-run cooperatives and parastatals. Footnotes or bibliographies follow each article. Most of the publications listed are in English, with a significant number of French titles appearing as well.

Paper copy $93.08 Microfiche $ 8.64

146 PN-AAJ-633

RURAL ORGANIZATIONS IN SOUTH INDIA: THE DYNAMICS OF LABORER AND TENANT UNIONS AND FARMER ASSOCIATIONS IN KERALA AND TAMIL NADU

Alexander, K.C.
Cornell University, Center for International Studies, Rural Development Committee; National Institute of Rural Development.
1980, 105 p.

Special Series on Rural Local Organization No. 2

Rural organizations, prominent features in agrarian development, are capable of transforming political and socioeconomic relationships. This study examines the emergence of peasant organizations in the Indian districts of Kerala and Tamil Nadu. The report describes the various agricultural laborer and tenant organizations and tiller and farmer associations and the factors affecting membership and participation. These organizations are also analyzed in light of several theories of peasant mobilization which claim peasant movements result from deteriorating economic conditions, depend upon a geographically or organizationally concentrated rural proletariat, and require a perception of traditional institutions and relations as illegitimate. Investigation is made of various changes in agrarian relations, such as the radical tenure reforms in Kerala and the improvement of patron-client relations in Alleppy, Tamil Nadu, which have yielded substantial economic and social improvement. The report addresses the political polarization which peasant movements have brought about. Whereas unorganized peasants are deprived of almost all political power in the village, organized peasants increasingly defend their interests in the political arena, often with the aid of the Indian Communist Party (CP). On the other hand, caste, except in the case of the Harijan caste which is dominant among rural laborers, has impeded peasant unity. The division of the peasantry between landless laborers and those employed on their own small holdings is an additional and powerful barrier to solidarity. Many small farmers with marginal holdings have joined larger farmers in forming groups such as the All-Kuttanad Farmers Association which are antagonistic to the CP and its efforts on behalf of the landless. Also, neither the inability of cropping systems to satisfy demand, the deplorable level of living, nor the infusion of capitalism have been sufficient to mobilize peasants. Thus, the report concludes that India's poor are divided into hostile groups which for the time being will prevent development of organizations embracing all sections of the rural poor.

AID/ta-BMA-8 931113700

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147 PN-AAJ-644

LOCAL ORGANIZATION DIMENSIONS OF RURAL DEVELOPMENT IN TURKEY: SOCIO-ECONOMIC STRATIFICATION ORIENTATIONS TOWARD PARTICIPATION, AND ATTITUDINAL MODERNITY

Copur, H.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 82 p.

Special Series on Rural Local Organization, No. 5

Although Turkey's agricultural sector employs 75% of its people and accounts for nearly all its exports, the country's overall economic development requires strenuous efforts to raise rural productivity, boost agriculture's contribution to GNP, and achieve more equitable distribution of rural incomes. Such are the conclusions of this study, performed under the auspices of Cornell University's Rural Development Committee, aimed at finding correlations between the socioeconomic and attitudinal composition of rural organizations and the development of the agricultural sector. Seven thousand villagers in 458 villages were surveyed in terms of the variables noted below. The following correlations were made: (1) Advanced village development strengthens the tendency to initiate and participate in organizations. (2) Equal distribution of wealth is directly proportional to village development, especially in villages with high levels of organizational intiative, technological development, and equal land distribution. There is little or no direct proportionality between equal land distribution and level of village development alone. Equal land distribution and village development are directly proportional, however, when village organizational initiative is high or wealth distribution is equitable or when these two conditions are found together. (3) Variations in village development are not directly proportional to improve-

ments in agricultural technology except when organizational initiative is high; equity in wealth is high; equity in land distribution is high; and organizational initiative is high and wealth distribution is equitable. (4) In general there is no relationship between the degree of fatalism in a village's attitude and the degree of village development. However, where feelings of personal efficacy are expressed, village development is usually high if organizational initiative is high and land and wealth distribution is equitable. (5) Level of education is directly proportional to village development when organizational initiative is high and land distribution is equitable. Illustrative tables are included.

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148 PN-AAJ-645

LANDLESSNESS AND RURAL POVERTY IN LATIN AMERICA: CONDITIONS, TRENDS, AND POLICIES AFFECTING INCOME AND EMPLOYMENT

Lassen, C.A.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 192 p.

Special Series on Landlessness and Near-Landlessness No. 4

A major fallacy in discussing the Third World's rural poor is to depict them as an undifferentiated mass of small farmers. This report argues that while small farmers in Latin America are generally poor, the 65% of Latin America's rural population who are landless and near-landless (LNL) are destitute. To support this premise, the report outlines the dimensions, sources, and trends in Latin American rural poverty, who the LNL are, and what can be done to mitigate their hardship. The LNL—agricultural and non-agricultural rural workers, marginal and tenant farmers, and the non-sedentary poor—earn low pay, have few job opportunities, and lack assets as well as access to public goods and services. Their plight has two root causes. The first is institutional rigidities which concentrate resources in the hands of large producers, even in countries such as Argentina, Uruguay, and Paraguay where arable land is abundant; or which ban the formation of migrant and tenant interest groups as occurs in Brazil, Chile, Paraguay, and Uruguay. The second main cause is the increasing commercialization of agriculture promoted by governments to provide cheap domestic food and exports as in Brazil, Guatemala, and Bolivia; or, again as in Brazil, by the emergence of large concerns and foreign agribusinesses which eliminate the small trader and producer. The increasing displacement of labor due to farm mechanization also contributes to the plight of the LNL. All of these factors have led to an accelerating proletarianization of the rural worker. In this process, traditional patron-client relationships have broken down, weakening the old forms of vertical and horizontal solidarity among the poor and opening the door to their exploitation by political and economic middlemen. To reverse this situation, policies are needed to raise the price of LNL-produced goods and services and preserve more of their real income and to develop income-generating employment programs on their behalf. The report concludes by recommending further research in areas such as employment, seasonal migration, commercial farming, and labor laws. Country profiles are appended.

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Paper copy $24.96 Microfiche $ 2.16

149 PN-AAJ-646

LANDLESS PEASANTS AND RURAL POVERTY IN INDONESIA AND THE PHILIPPINES

Rosenberg, J.G.; Rosenberg, D.A.
Cornell University, Center for International Studies, Rural Development Committee.
1980, 136 p.

Special Series on Landlessness and Near-Landlessness, No. 3

The dramatic rise in the number of poor, landless peasants to 84.7% of all rural households in Indonesia and to 77.4% in the Philippines is a seemingly contradictory but direct result of economic growth and rising GNP. This paper examines how rising rates of economic output and expanding incomes are linked to pervasive unemployment and growing income disparities in these two countries. A growing national and international market for agricultural products, coupled with increased land productivity and the introduction of new technologies such as high-yielding seeds and fertilizers, has promoted high economic growth rates in the rural sectors. Simultaneously, high population growth rates, finite rural resources, the use of capital-intensive technology, and free market play in sales of productive resources discriminate against the rural poor. As land values spiral, credit tightens, and increased expenditures are required on technological inputs, poor rural households find it impossible to remain competitive and quickly lose their assets. Ownership of land and productive assets thus becomes concentrated in fewer hands while more small farmers and weak tenants join the ranks of the landless. Economic discrepancies are heightened as wealthy landholders enjoy easy access to credit, government programs, crop price supports, and heightened political influence. Meanwhile, the landless are locked in fierce competition with each other for the few available, but low-paying odd jobs. With displacement and pauperization, nutritional levels decline, jobs become scarcer, population growth rates remain high, and inequitable economic growth is exacerbated. These economic discrepancies are not, however, inevitable. Government policies can reverse inequitable ownership by promoting formation of cooperatives and by shifting credit accessibility to small borrowers. The promotion of low-cost and labor-intensive technology in addition to training opportunities in new skills can significantly reduce the plight of the landless and the effects of rural poverty. Urgent action is needed, for as the range of options diminishes, the current inequitable growth process threatens political and social stability.

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Community cooperation can often mean the difference between project success or failure.

150 **PN-AAJ-652**

SOCIAL ANALYSIS OF A.I.D. PROJECTS: A REVIEW OF THE EXPERIENCE

Ingersoll, J.; Sullivan, M.; Lenkerd, B.
1981, 110 p.

Because the success of A.I.D. development assistance projects depends essentially on their social acceptability and appropriateness, A.I.D. has made social soundness analysis (SSA) a regular part of its project process. This comprehensive study of SSA was designed to identify the most useful features of SSA; determine ways in which A.I.D. procedures encourage or discourage the use of social analysis during the project design process; and recommend new guidelines for SSA for inclusion in the revised Project Assistance Handbook. Among the study's findings were: (1) at least 25% of the SSA's studied significantly influenced the design of proposed projects; (2) substantial differences exist in the quality and usefulness of first generation SSA; (3) A.I.D.'s new emphasis on careful design, implementation, and evaluation of projects produced a better working environment for SSA; and (4) although SSA incurs significant costs, costs may be greater for a project that failed due to a lack of SSA. Among the study's recommendations are: (1) SSA should remain an essential element in designing A.I.D. projects; (2) A.I.D. should disseminate SSA's shown to be exceptionally useful; (3) efforts should continue to integrate SSA into the entire project process, e.g., send SSA personnel to the field earlier and expand their tours of duty when confronted with complex social factors; and (4) A.I.D. should compare the costs of preparing different kinds of project analyses with the costs incurred when projects fail. Appended to the study is a list of revised guidelines to improve SSA. The guidelines require analysis of: (1) the primary problems of poverty and development addressed by a proposed project; (2) the project's basic goals, purposes, and assumptions; (3) the social environment that will affect and be affected by the project with emphasis on the difficulties to be expected; (4) an evaluation of local participation throughout the planning and implementation phases; (5) the distribution of costs and benefits among the target groups; and (6) the sustainability, replicability, and diffusion of project benefits.

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Wildlife is a precious resource. A.I.D. is helping to preserve these rhino—suspiciously eyeing the photographer's Land Rover—and other species in Kenya, Tanzania, and Uganda through road construction programs and training of national park wardens and game managers.

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Agency for International Development
Washington, D.C. 20523
United States of America