

A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS

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INTRODUCTORY NOTE

With this issue of A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS we enter our fifth year of publication. You will note several changes in format in the present number, but the overall purpose of this abstract journal remains essentially the same.

A.I.D. RESEARCH AND DEVELOPMENT ABSTRACTS will continue to announce R&D titles produced under sponsorship of the Agency for International Development. It will also guide its users to sources where copies of materials may be obtained on request.

In this issue an *Author Index* and an *Index of Issuing Offices* have been included for the first time. These aids in using the journal come after the main subject section which contains both citations and their accompanying abstracts. The *Table of Contents*, immediately following this note, offers a thumbnail summary of subject areas covered and their positions in this issue.

Research and development titles in plant and animal protection have been highlighted in this issue. Please note the subject sections: plant protection, weeds, and pests of animals, identified in the *Table of Contents*. Grouped here you will find titles recently produced in these fields, together with a few significant titles issued within the recent past.

A selection of titles dealing with institution building and technical assistance methodology is also contained in this issue. A major portion of these titles has been issued by the Midwest Universities Consortium for International Development, Inc. (MUCIA). Please check under MUCIA in the *Index of Issuing Offices* at the rear for a combined listing of references to titles in this field produced by this grantee.

Documentation Coordinator
Bureau for Technical Assistance
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Washington, D.C. 20523

July, 1977

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INSTITUTIONS IN DEVELOPING COUNTRIES—COPIES FROM AUTHORS

Researchers who desire copies of papers described in this quarterly are encouraged, in accordance with the usual tradition in the scientific community, to send requests directly to authors. Within the title of each publication abstracted the issuing office is shown in abbreviated form. The name and address of these units are then given in full in the Index of Issuing Offices at the rear. Requests for copies of publications from the author should be mailed to the appropriate institutions' addresses.

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A.I.D. personnel may desire to submit additional addresses of institutions or individuals in developing countries to be added to our mailing list for distribution of this quarterly of abstracts. We do not include individual names in the mailing list. Therefore, if you prefer that an individual receive the quarterly please give us his title and complete address of his institution.

AGRICULTURE AND NUTRITION

AGRICULTURAL RESEARCH

(001) GUIDELINES ON A METHODOLOGY FOR PREPARING STATE-OF-THE-ART ANALYSES, DOCUMENTS, AND HANDBOOKS FOR WORLD FOOD PROBLEMS

Plucknett, D. L.; Viets, Frank; Kitchell, R. E. 1976, 13p.

AID/TA/AGR

A description of the purpose of AID state-of-the art analyses, how they should be conducted, and the elements they should contain. The state-of-the art analysis (SOTA) guidelines developed by AID for use by AID grantees and contractors employ a new programming and analytical approach that seeks: (1) to develop guides as to what should *and* what should not be "delivered" to the targeted farmer in developing countries; (2) provides guidance for testing the application of known principles and practices; and (3) identifies critical knowledge gaps requiring investigation. Obviously, there is more than one way to perform a SOTA review and/or prepare a SOTA statement. The approach will vary with (a) the complexity and nature of the problem or subject; (b) the intended use of the results; (c) the money, time, and expertise available; (d) the availability of appropriate data; and (3) most important, the comprehension, ingenuity, and innovativeness of the people involved. The intent here is to explain the concept and suggest a general approach which is subject to adaptation and modification. In brief, the logic which should be applied to assure a useful SOTA paper involves six steps: (1) Define the problem and its components; (2) For each component, determine state-of-the-science, useful principles, and critical variables; (3) Develop statement of knowledge gap; (4) Specify steps to complete inventory; (5) Evaluate critical variables and recommend practices, training needs, and research priorities; (6) Prepare outputs; publications, seminars, new proposals for R&D. The guidelines include specific steps or details for those six parts of the process.

PN-AAC-859

Paper copy \$2.00

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EDUCATION, EXTENSION, AND ADVISORY WORK

(002) REGIONAL AGRICULTURAL PRODUCTION PROGRAM, TRAINING AND DESIGN STRATEGIES

Swanson, B. E. 1976, 30p.

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution building and technical assistance methodology. Publication)

A description of certain real-world problems of institution building as an instrument of social and economic development, and of some practical responses to them. Case material is presented concerning the training of research and extension workers in an international agricultural research center. The relations between training and results are then examined. The two successful pilot projects analyzed in this paper provide certain lessons regarding how to design and implement regional production programs. First, both cases demonstrate that well-designed pilot projects can be used as an important tool in pressing for institutional change within established research and extension agencies. Second, technology development and dissemination functions in project design must be closely integrated. Third, pilot projects must go beyond the traditional roles of research and extension organizations; regional production teams must become active advocates and proponents for small farmers and peasants. Fourth, interdisciplinary teams of research and technical assis-

tance specialists must be trained so that they can move into new regions and establish new production programs. National programs attempting to adopt this approach must recognize that the technical, as well as social, economic, and political factors in each country are different, and that regional agricultural production programs must be carefully designed to accommodate these differences. After a workable strategy has been developed on a pilot scale, the project can then be used as a training mechanism to prepare regional agricultural production teams and village-level extension agents for programs in other parts of the country.

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Paper copy \$2.50

Microfiche \$1.00

(003) ORGANIZING AGRICULTURAL TECHNOLOGY TRANSFER, THE EFFECTS OF ALTERNATIVE ARRANGEMENTS, TWO PAPERS

Swanson, B. E. 1975, 85p.

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution building and technical assistance methodology. Publication)

One of a series of PASITAM "Design Studies." This publication examines a problem of organization, a practical problem of great importance with the field of technical assistance. In a narrow sense, it is a case study of the different effects of alternative patterns of organization, where one pattern seems to be significantly more effective than the other in serving a given set of technical assistance aims. Cases such as this offer lessons. The lesson of this study is pertinent to certain other arrangements for providing technical assistance. The expertise developed in producing this study is currently available within MUCIA. The study itself, along with other PASITAM materials concerning the design and implementation of effective action systems, can be used in training activities aimed at improving the quality of developmental efforts.

PN-AAC-933

Paper copy \$7.05

Microfiche \$1.00

(004) INSTITUTION BUILDING, IMPACT OF THE INTERNATIONAL SYSTEM ON NATIONAL RESEARCH CAPACITY: THE IRRI AND CIMMYT TRAINING PROGRAMS

Swanson, B. E. 1975, 44p.

MUCIA (CSD-2958 211d)

(In his Organizing agr. technology transfer, the effects of alternative arrangements, p. 33-76.)

This design study examines the impact of the different training strategies of the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT) on helping LDCs to build a national research capacity. In CIMMYT's case, it was expected that once a "critical mass" of trained research workers was present in a wheat improvement program, that program would function effectively and that it would 1) work out its own research structure to fit local needs and requirements and 2) take over the necessary informal on-the-job training of new personnel. To achieve this, CIMMYT concentrated on one specific production problem, the need for improved genetic technology through its training strategy, built carefully and systematically this relatively simple research function into each national program. Thus organizational change was a specific, but implicit, training objective and it appears that this strategy is working. IRRI uses the research project approach and trains research workers in separate disciplines. While trainees study production problems relevant to home country conditions, it appears that in most cases their research effort —

AGRICULTURE AND NUTRITION

as it contributes to the overall national research capacity — lacks sufficient emphasis on and attention to the problem of producing biological technology.

PN-AAD-003

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Microfiche \$1.00

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

Van Veen, M. S.; Close, A. K.
1976, 44p.

HEW/MCHS (RSSA 12-74 GTS)

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

PN-AAC-747

Paper copy \$3.65
Microfiche \$1.00

LEGISLATION

(006) INTERNATIONAL CONFERENCE ON GLOBAL WATER LAW SYSTEMS; SUMMARY REPORT

Radosevich, G. E.; Boira, V. G.; Daines, D. R.; Skogerboe, G. V.; Vlachos, E. C.
1976, 52p.

Colo. State (AID/ta-G-1197 GTS)

Proceedings of a conference convened in Spain in September, 1975. The purpose of the conference was to focus on some issues basic to analyzing and improving water laws, considering the function of law and its relationship to other disciplines and sectors of socioeconomic activity. The conference objectives were (1) build upon materials assembled in past meetings and publications, and establish a systematic foundation of knowledge of water law and administration systems around the globe; and (2) develop an analytic methodology for interfacing interdisciplinary, intersectoral, and intergovernmental inputs to new or improved laws and codes. Among the water law systems reviewed were the Spanish, French, British, Italian, Soviet, Hindu-Bali, Moslem, Latin American, Israeli, those in selected Asian countries, and variations found in the United States. The relationship of water law to the human and physical environment was discussed from the social, economic, and technical perspectives. Concluding presentations covered national water planning, drafting water codes, and multi- and bilateral assistance available to developing countries in preparing or revising water codes and administrative arrangements. Three key issues identified as impediments to optimal use of water resources were discussed: allocation and reallocation of water supplies; integration of water

quantity and water quality control, and management and conjunctive use of ground and surface waters. A basic problem discussed was that water laws and organization structures that at one time were designed to solve particular problems often became the major problem—the inflexibility of the status quo.

PN-AAC-592

Paper copy \$4.30
Microfiche \$1.00

AGRICULTURAL ECONOMICS

(007) FOODGRAIN PRICES AND ECONOMIC GROWTH

Parthasarathy, G.; Mudahar, M. S.
1976, 21p.

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

(In Indian J. of Agr. Economics, v. 31, no. 2)
(In Occasional paper no. 89)

An examination of the dual effects of shifting terms-of-trade on 1) foodgrain production and 2) overall growth as judged by the aggregate level of savings, with an assessment of the combined effects on growth. Terms-of-trade were found to have a positive effect on foodgrain production but a negative effect on aggregate savings. By way of the positive effects on foodgrain production, they also had a positive effect on national income and thereby on saving. The net effect on savings of favorable terms-of-trade for foodgrain production was negative. Shifting the terms-of-trade in favor of foodgrain production is only one instrument available to policymakers and its efficacy in relation to other instruments, such as direct public investments in agriculture, continues to be debated. Policymakers in developing countries should not be blamed if they do not accept eagerly the policy advice of "positive pricing" enthusiasts. Though the conclusions of this paper are based on Indian experience, they may have a wider relevance to the policy options available to other developing countries.

PN-AAC-794

Paper copy \$2.00
Microfiche \$1.00

(008) THE ECONOMICS OF RURAL AND URBAN SMALL-SCALE INDUSTRIES IN SIERRA LEONE

Liedholm, Carl; Chuta, E. J.
1976, 139p.

Mich. State (CSD-3625 Res.)

(In African Rural Economy Paper no. 14)

A study revealing that small-scale industries are a significant component of Sierra Leone's industrial sector. Small-scale industries account for 95% of the employment and approximately 43% of the value added of the entire industrial sector, and mostly are found in rural areas. In all locations, however, tailoring is the single most important activity; blacksmithing, carpentry, baking, and gara dyeing follow, but by quite a wide margin. In view of the strong economic justification for small-scale industries, the major policies either directly or indirectly influencing them are examined in detail. It was found that capital or credit may not necessarily be the overriding constraint on small-scale industry in Sierra Leone, but that improved institutional mechanisms to increase the access to and availability of credit at interest rates somewhat higher than those at commercial banks, would be of value. Fiscal policies — particularly tax incentive ordinances and the import duty structure — often were seen as discriminating against small-scale industries. Other policies, those designed to expand the infrastructure, to benefit large-scale industries, and to increase agricultural output and incomes, are discussed in terms of their positive or negative effects on small-scale industries.

PN-AAC-756

Paper copy \$11.55
Microfiche \$ 2.00

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(009) SOME ASPECTS OF LABOUR USE IN INDIAN AGRICULTURE

Mehra, Shakuntla
1976, 32p.

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

(In Occasional paper no. 88)

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

PN-AAC-793

Paper copy \$2.65
Microfiche \$1.00

AGRICULTURAL DEVELOPMENT

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

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

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution building and technical assistance methodology. Publication)

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

PN-AAC-931

Paper copy \$6.25
Microfiche \$1.00

(011) APPROACHES TO THE DESIGN OF AGRICULTURAL DEVELOPMENT PROJECTS

Schaefer-Kehnert, Walter
1977, 16p.

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution building and technical assistance methodology. Design study)

A brief and trenchant paper that addresses the question of the best way to organize agricultural development projects. Discussed are the three possible approaches to the design of such projects—by sector, by function, and by area. Those are discussed in terms of which is more likely to work under a given set of circumstances. Six factors that have important effects of a project's success are then presented. The three prospective ways of designing projects are then examined in terms of their compatibility with the factors influencing success. The result is a cogent set of statements to guide those who would design projects, and do so with the opportunity to choose from among alternative approaches. The six project features determining success are stated as (1) Simplicity and clarity of the objectives; (2) Availability of an economically attractive technology to promote the product; (3) Integration of the basic production services, especially those of extension, input supply, credit, and marketing; (4) Access to the necessary specialists and provision for the training of needed personnel; (5) The ability to recognize potential constraints and to design contingency plans to overcome them; and (6) Compatibility of the project with existing administrative structures. Compliance with these criteria does not guarantee project success, since even a well-designed project can fail because of bad management. But it is unlikely that a badly designed project can be made successful only through good management.

PN-AAC-932

Paper copy \$2.00
Microfiche \$1.00

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

Green, H. A.
1976-1977, 151p.

Census (COM/CEN 3-75 GTS)

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

PN-AAC-951

Paper copy \$12.55
Microfiche \$ 2.00

(013) DESIGNING AND MANAGING BASIC AGRICULTURAL PROGRAMS

Kulp, E. M.
1977, 269p.

MUCIA (CSD-2958 211d)

A systematic and highly readable workbook of techniques for designing and managing basic agricultural programs. It is dedicated to the 700 members of the Izaula-Igogero Growers Cooperative Society, Busoga District, Uganda, who demonstrated vigorously how very rapidly a two-hectare farmer can acquire a taste for innovation and development. The book has four major parts: Fundamental Concepts (basic systems con-

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AGRICULTURE AND NUTRITION

cepts, agricultural development systems dynamics, policy essentials); Farm-Level Analysis (the farm model, selection of innovations, programming technique); Project Formulation (project policy options, project pacing and outputs, project inputs, project financing); and Implementation Planning and Control (management of field agents, scheduling, the organizational dimension). The book is designed for practitioners and prospective practitioners—for agricultural planning specialists, project designers and managers, district and provincial agricultural officers, rural development officers, and students preparing for practical work in agricultural development. The book stresses *techniques*. A serious engagement with it will give the user considerable competence in certain concrete methods of analysis. But techniques have a way of capturing the game, of defining the situation, of diverting the mind from important matters the techniques themselves do not address. Therefore, they have to be applied carefully, with due regard for the way things work in a particular society and community. With careful application, the techniques can be used to design and implement practical arrangements for improving the conditions of peasant agriculture and its practitioners.

PN-AAC-868

Paper copy \$24.55
Microfiche \$ 4.00

(014) ADMINISTRATIVE PROBLEMS AND INTEGRATED RURAL DEVELOPMENT

Siffin, W. J.
1976, 28p.

MUCIA (CSD-2958 211d)

An analysis of administrative problems associated with integrated rural development. The study of the Oakland, California, project designed to reduce racial tensions concluded that a major problem involved the common assumption that implementation of urban projects is easy. The crucial problems of implementation are institutional, strategic, and operational—of moving from visions and concerns toward action. Those problems are difficult. They are only partly responsive to applications of technology, only partly subject to formal authority, only partly amenable to anticipation. Does hard and unconventional scrutiny of the dimensions of these problems do disservice by dampening enthusiasm and eroding hope? Or may enhanced insight lead to more auspicious action? Such questions may help stimulate the development of practical knowledge about the ways and means of better implementation. In the final analysis, none of these problems can be solved on paper or through reflection. We can—and should—address the administrative problems of integrated rural development by laying out the issues and tendering possible answers. But the palpable problems can only be truly confronted, and sometimes resolved, in action.

PN-AAC-929

Paper copy \$2.30
Microfiche \$1.00

(015) GRASS ROOTS INSTITUTION BUILDING: A REALISTIC FOCUS FOR AGRICULTURAL DEVELOPMENT

Kirkwood, J. I.; Brams, E. A.; Brams, P. C.
1974, 32p.

Prairie View (CSD-2836 211d)

A description of the Grass Roots Institution Building (GRIB) model of agricultural development in LDCs. The GRIB approach adopts elements from two other current models: (1) Esman's Institution Building (IB) model, and (2) Loomis's Processually Articulated Structural (PAS) model. Three previous models applied to Latin America are discussed. The "pure extension" model—an application of the American experience—was unsuccessful in Latin America in the 1940s. The agents were isolated from institutional supports, and reached relatively few farmers. The second approach, the "servicio," sought to in-

stitutionalize extension activities but failed because lack of funding and inter-ministry rivalries. A third approach, "formento," regarded extension personnel as change agents. It failed because of lack of organization among extension personnel and lack of techniques for fostering change. The current IB model emphasizes forming a stable institutional infrastructure for planning and implementing programs. However, its "from the top down" assumption does not fit countries where need is immediate but institutions and leadership are undeveloped. The current PAS model allows for building from the bottom upward. It views the change process as a personal growth process for the farmer, and not primarily as institutional growth. The GRIB model adopts this, along with elements of the IB model. It emphasizes locating change agents—interdisciplinary teams—at the village level, where they can change the farmer through personal contacts.

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Paper copy \$2.65
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RURAL SOCIOLOGY

(016) RURAL-URBAN MIGRATIONS IN SIERRA LEONE, DETERMINANTS AND POLICY IMPLICATIONS

Byerlee, Derek; Tommy, J. L.; Fatoo, Habib
1976, 126p.

Mich. State (CSD-3625 Res.)

(In African Rural Economy Paper no. 13)

The three objectives of this survey were: 1) to increase the understanding of rural-urban migration processes in Africa and particularly in Sierra Leone; 2) to develop and test a theoretical schema and survey methodology for migration research, and 3) to evaluate the effects of policies of migration. It was found that the young and educated were dominant in rural-urban migration. Education played a major role in migration behavior. Rural household heads and parents of migrants were important to the decision to migrate, mostly because of the young age of migrants. The analysis of rural-urban migration was based on a modified cost/returns model of the decision to migrate. The results confirmed that economic variables—particularly rural and urban wages were important in determining migration, although effects of these variables depended importantly on the level of urban unemployment does *not* appear to have much influence on migration. The eight most important policy variables and the elements of the migration decision they influence are discussed each in relation to the rate, the concentration, and the composition of rural-urban migration. The eight are: 1) policies to raise rural incomes, 2) policies affecting urban incomes, 3) food pricing policies, 4) educational policies, 5) distribution of social amenities, 6) policies affecting urban living costs, 7) policies affecting information flows, and 8) policies directly controlling migration.

PN-AAC-755

Paper copy \$10.45
Microfiche \$ 2.00

(017) CORRELATES OF FISHERMEN'S COOPERATIVE MEMBERSHIP IN THE REPUBLIC OF PANAMA

Pollnac, R. B.; Ruiz-Stout, Roberto
1976, 26p.

R. I. (CSD-2455 211d)

(In Anthropology working paper no. 8)

For this examination, a causal model was developed and tested relating cooperative/pre-cooperative membership to formal edu-

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cation as mediated by exposure to mass media and knowledge about cooperative organizations. Exposure to mass media, especially newspapers, was found to be an essential factor in the causal chain. The relationship between cooperative/precooperative membership and individual fishing technology was ambiguous. Nevertheless, it was noted that these organizations do provide some essential marketing services as well as equipment. There also was some indication that cooperative/precooperative members manifest a slightly better material style of life. Further, the proposition that a cooperative functions to deal with the uncertainties of the fishermen's occupational life was supported in several instances. Cooperative/precooperative members were found to be more positive toward the occupation of fishing than non-members. Additionally, they appeared to be less uncertain about their future status. Overall, findings suggest that the cooperative/precooperative fishermen's organizations in Panama have no negative effect on the small-scale fishermen; in general, the effects of these organizations seem to be positive.

PN-AAC-710 Paper copy \$2.15
Microfiche \$1.00

(018) ARTISANAL FISHERMEN'S ATTITUDES TOWARD THE OCCUPATION OF FISHING IN PANAMA

Pollnac, R. B.; Ruiz-Stout, Roberto
1975, 10p.

R. I. (CSD-1455 211d)

(In Anthropology working paper no. 6)

In general, the Panamanian artisanal fisherman has a rather positive attitude toward his occupation — so positive that roughly one-half would like their sons to be fishermen. However, patterns of association between attitudes toward the occupation of fishing and other variables lead to the prediction that this relatively positive image of the occupation may become more negative in the future. This is based on findings suggesting a tendency among younger fishermen to be more critical of their occupation than older fishermen, and that the more education a fisherman has, the less likely he will be to perceive fishing as a desirable occupation for his son. Today, though, it probably would be difficult to convince many fishermen that an alternative occupation could be as rewarding, unless the alternative rewards are presented in such a manner that they contrast favorably with the fisherman's perception of his present occupation.

PN-AAC-706 Paper copy \$2.00
Microfiche \$1.00

(019) PSYCHOCULTURAL CORRELATES OF SUCCESS AMONG SMALL-SCALE FISHERMEN IN WESTERN PUERTO RICO

Poggie, J. J.; Barteo, J. G.; Pollnac, R. B.
1976, 17p.

R. I. (CSD-2455 211d)

(Presented at the annual meeting of the North Eastern Anthropological Assoc., Middletown, Conn., 1976)

An exploration of the concept of success as it applies to small-scale fishermen in Western Puerto Rico. The paradigm followed is an ecological-adaptational one positing that there are psychological, ideational, and social characteristics which are adaptive to the total environment of fishing, and that on the individual level these characteristics are related to relative success of individuals involved in this form of hunting activity. The paper's findings point to the importance of the psychological variable of deferred gratification in understanding why some fishermen are more successful in their occupation than others. The paper also demonstrates the utility of emic measures of

success. Further analysis will be necessary to determine the causal links suggested here.

PN-AAC-705 Paper copy \$2.00
Microfiche \$1.00

(020) ECONOMIC GRATIFICATION ORIENTATIONS AMONG SMALL-SCALE FISHERMEN IN PANAMA AND PUERTO RICO

Pollnac, R. B.; Poggie, J. J.
1976, 38p.

R. I. (CSD-2455 211d)

(Presented at the 36th annual meeting of the Soc. for Applied Anthropology, St. Louis, Mo., 1976)

This paper examines the interrelationships of economic gratification patterns with age, occupation, income, self-evaluation of socioeconomic position, material culture, ownership of means of production, education, exposure to mass media, urbanization, acculturation, and cosmopolitanism among small-scale fishermen in Panama and Puerto Rico. The research data were obtained through interviews with 123 fishermen in Panama and 111 fishermen or cane workers in Puerto Rico. The attitudes of the fishermen toward spending or investing money received as a gift were investigated through two standard questions. The answers were then assessed in terms of the above-mentioned independent variables, which were investigated through other questions in the interviews. The results showed that older fishermen are more likely to defer their economic gratifications—that is, to save or invest unexpected income, rather than spend it on luxury items. In general, the findings indicate, as the authors state in their Conclusions section, "a strong situational component influencing differential patterning of determinants of gratification patterns. Periodicity, relative security, optimism, and opportunity structure are proposed as general factors influencing gratification orientations." The "strong situational component" is taken to mean that the preference of the fishermen for spending the money or saving it was influenced more by the immediate, personal details of their situation than by any generalizable, analyzable theoretical construct the researchers set up as independent variables.

PN-AAC-709 Paper copy \$3.15
Microfiche \$1.00

AGRICULTURAL DISTRIBUTION AND MARKETING

(021) ASSESSMENT OF GRAIN STORAGE AND MARKETING FACILITIES IN THE DOMINICAN REPUBLIC

Pfost, H. B.; Jack, D. S.; Hugo, Cornelius
1976, 64p.

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

(In Grain storage, processing, and marketing rpt. no. 57)

A report on three different consulting projects conducted in the Dominican Republic in March and April, 1976. The first concerned a review of new grain storage and handling facilities in Santiago. The silos were found generally well constructed, but exhibit certain design weaknesses and failure to meet specifications. Fifteen specific problems are listed. The second project concerned evaluating a plan for development of a network of Rural Marketing Service Centers. Detailed recommendations are made concerning the need for a feasibility study to establish the number, type, locations, and sizes of the warehouse/purchase/sales facilities, as well as a financial accounting system for effective administration of the centers. The third project concerned inspecting a grain storage and handling facility constructed in Santiago in 1969. Since 1973 the facility has settled unevenly several inches, setting askew interior conveyors and

AGRICULTURE AND NUTRITION

man lifts. The loading history of the facility is reviewed, and details of the facility distress discussed. It was concluded that further uneven settlement is extremely unlikely; that the internal machinery can be buttressed independently; and the facility can be reloaded and used normally, provided that monthly measurements for possible differential settlement be made under the supervision of a competent structural engineer.

PN-AAC-834

Paper copy \$5.30
Microfiche \$1.00

(022) MARKETING STRUCTURE OF SELECTED AGRICULTURAL PRODUCTS AND SERVICE INDUSTRIES IN SOUTH CENTRAL VIRGINIA

Moak, S. K.; Whyte, C. D.
1976, 45p.

Va. State (CSD-3415 211d)

(In BERD pub., v. 4, no. 2)

The first two sections of this paper deal with the marketing of the area's two most important agricultural products, tobacco and peanuts. The next two sections examine cattle marketing, because of its growth potential, and swine marketing, because of its traditional importance. Sections five and six discuss the area's wholesale and retail marketing activities. Rather than an analysis, this monograph is intended to describe the area's economic as well as social conditions so that the problems of rural development can be solved more readily. Outlooks show the demands for tobacco and peanuts increasing, despite the uncertainties in the outlook for tobacco related to health hazards, trade arrangements and foreign competition. The high nutrition and relatively low price of peanut products assure it of a bright future. The long-run outlooks for cattle and swine are encouraging, despite some uncertainties in the short-range views. Due to increasing trends in industrialization and population growth, as well as geography, wholesale establishments show promise. The future of the retail market is fixed and depends on population growth, purchasing power, consumer mobility, and inflation.

PN-AAC-959

Paper copy \$3.75
Microfiche \$1.00

(023) AN ASSESSMENT OF AGRICULTURAL MARKETING NEEDS OF THE SOYBEAN AND GRAINS SECTOR IN ECUADOR

Borsdorf, Roe; Heid, W. G.
1976, 44p.

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

(In Grain storage, processing, and marketing rpt. no. 58)

This study assesses Ecuador's marketing structure for soybeans and other grains and makes recommendations in regard to production, processing, and marketing. The major strength of Ecuador's marketing system is its private enterprise sector which is strong and viable; major weaknesses are the lack of a comprehensive market development plan, lack of adequate storage facilities and/or associated quality control equipment and technology, and lack of human resources development. It was recommended that marketing goals should be: 1) to produce and market a larger volume of soybeans, with the idea of eventually becoming self-sufficient; 2) to strive for a higher-quality product;

3) to maintain stable prices at or near the world price level; and 4) to establish an efficient marketing system.

PN-AAC-915

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PLANT PRODUCTION (GENERAL)

(024) FOURTH INTERNATIONAL SEED TECHNOLOGY TRAINING COURSE FOR CENTRAL AMERICA, PANAMA, AND THE CARIBBEAN

Andrews, C. H.; Boyd, A. H.; Welch, G. B.
1976, 21p.

Miss. State (AID/ta-C-1219 GTS)

(In TA 76-19)

A report on a three-week training course conducted by Mississippi State University at the Pan American School of Agriculture, Zamorano, Honduras, in October and November, 1976. Mississippi State provided three instructors; the Pan American School provided facilities and training equipment. Students included 28 participants from seven countries, plus 17 third-year students at the Pan American School. The course included five and one-half days of instruction and two weeks of related practical work training. Topics included program development, seed production, harvesting, processing, analysis, drying, storage, marketing, and management. A comprehensive final examination was used to evaluate the success of the course. The results indicated that most of the participants had grasped and retained the more important concepts presented in the course. All participants expressed sincere interest in the course, and many useful discussions pertaining to specific country situations and problems were held.

PN-AAC-790

Paper copy \$2.00
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(025) SOIL-PLANT-WATER RELATIONSHIPS AS INFLUENCED BY VARIOUS SOIL AND PLANT MANAGEMENT PRACTICES ON CAMPO CERRADO SOILS IN THE CENTRAL PLATEAU OF BRAZIL

Bandy, D. E.
1976, 261p.

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

(Diss.—Cornell)

Discussion and results of a two-year experiment in Brazil to study the effect of a *veranico* (drought) on corn (*Zea mays* L.) growth and yield. The experiments were designed to provide a drought avoidance mechanism for the corn plant. In one experiment, soil management techniques were used to allow a crop to tap a greater quantity of the soil water stored in the soil. A second experiment used crop management techniques to increase water use efficiency by decreasing water loss from the soil surface and from the corn leaf. The soil management experiment consisted basically of lime rates and depths of lime incorporation, i.e., 0-lime, 8 T/ha lime incorporated to a 15 cm depth and 8 T/ha lime incorporated to a 30 cm depth, and a broadcast versus banding application of phosphorus. Without plant water stress, no depth of lime effect was noted on plant growth before the tasseling stage. From silking to grain maturity, the deep limed plants maintained a longer period of active plant growth by delaying leaf senescence. The unlimed corn plants were always inferior to the limed plants with the dry-cool season crop showing a more pronounced decrease in plant growth. The second experiment used two types of mulches, two antitranspirants, two corn varieties, and two lime depth incorporations. Mulching was shown to influence corn growth and development. Grass mulch decreased plant growth and development due to cooler soil temper-

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atures (2-3°C) while black plastic mulch increased plant growth and development due to warmer soil temperatures (3-4°C) in relation to the non-mulched plots. An upland rice (*Oriza sativa* L.) experiment was conducted to study depth of lime incorporation and row spacing on the rice plant's internal water balance and final grain yield with two rice varieties. An analysis of growth and yield parameters showed that Pratao Precoce was more influenced by row spacing than by lime depth incorporation. The 15 cm row spacing showed more grain sterility and lighter grain weights which influenced a lower grain: straw ratio and lower grain yield/plant. Final yield results showed that narrow row spacing (15 cm) produced 400 kg/ha less than the 45 cm row spacing. Shallow lime treatments outyielded deep lime treatments by 400 kg/ha because they produced greater panicle weights which in turn produced more grain/plant.

PN-AAC-887

Paper copy \$21.65
Microfiche \$3.00

PLANT PRODUCTION (SPECIFIC CROPS)

(026) IMPROVING THE NUTRIENT QUALITY OF CEREALS, REPORT

Wilcke, H. L.; AID/TA/AGR; AID/TA/N; Workshop on Breeding and Fortification. 2d, Boulder, Colo, 1976, 335p.

LIFE (AID/ta-C-1071 GTS)

(Proc. of the 1st Workshop, 1970 available as follows: English: PN-AAC-685; Spanish: PN-AAC-686)

This report includes analyses of the corn fortification project in Guatemala, the wheat fortification project in Tunisia, and the rice fortification project in Thailand. In the area of plant breeding, there are examinations of high lysine corn, wheat, high lysine sorghum, millets, barley, rice, and food legumes. Other discussions include the relative importance of protein and calories, the possibility of developing an adequate diet by modification of existing food patterns, and the question of whether yield can be maintained when protein levels in grains are increased through genetic manipulation. General recommendations were: 1) Qualitative or quantitative improvements in cereal grains should be directed toward specific population groups. 2) Adequacy or availability of proteins should be evaluated only in the presence of adequate calories. 3) Communication and cooperation on all improvements are essential. 4) Acceptance of a decrease in yield must be considered on a cost-benefit basis. 5) The question of bulk of foods must be considered and evaluated. 6) The possibility of providing special foods for special purposes must be considered. 7) Attempts to increase vitamin or mineral content of cereals by genetic means generally offer only limited success. 8) Food nutrients should be evaluated with consideration of nutrient losses in processing and cooking. 9) The U.S. Government should consider using grains with greater amounts of utilizable protein where they could help to reduce malnutrition. 10) Preliminary research should be conducted, as it may obviate the necessity for field trials.

PN-AAC-949

Paper copy \$27.80
Microfiche \$ 4.00

(027) MANUAL ON GENETIC CONSERVATION OF RICE GERM PLASM FOR EVALUATION UTILIZATION

Chang, T. T.
1976, 81p.

IRRI (AID/ta-G-1074 GTS)

A discussion of utilizing genetic diversity on a broad base in rice-plant breeding programs, with the objective of deterring rapid and widespread epidemics of plant diseases and outbreaks of insect pests, thus sustaining a high level of crop yield. At

IRRI, 35,000 genetic accessions of rice were assembled, characterized, evaluated, utilized, and preserved. It was desirable to plan for conservation at the initial stage of seed increase. During preliminary evaluation a judicious roguing of obvious off-types in the original population was all that was needed so that the general composition of the sample remains unaltered. When a larger seed stock was obtained from the initial seed increase, a representative sample was sent to a seed bank for long-term storage. The national center than began evaluation and utilization that involved selection and purification. Conservation here was seen as providing the inputs, while evaluation and utilization made the conservation efforts worthwhile.

PN-AAC-914

Paper copy \$6.70
Microfiche \$1.00

(028) RESULTS OF THE SIXTH INTERNATIONAL WINTER WHEAT PERFORMANCE NURSERY GROWN IN 1974

Wilhelmi, K. D.; Kuhr, Steven; Johnson, V. A.; Mattern, P. J.; Schmidt, J. W.
1976, 187p.

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

(In Research bul. 279)

The Sixth International Winter Wheat Performance Nursery (IWWPN) was grown at 48 locations in 30 countries in 1974. Fifty-five locations were mailed seed and 87% of the cooperators returned data for analysis. The nursery consisted of 29 winter wheat cultivars and one spring wheat variety. Thirteen new cultivars were added to the 1974 IWWPN. Seventeen varieties, which include four long-term checks, have been grown over a three-year period. Data are reported on grain yield, test weight, plant maturity, plant height, lodging, shattering, winter survival, 1000-kernel weight, frost damage, plant diseases, grain protein, and other traits reportedly cooperators. Supplemental nursery management information is reported for each nursery site adjacent to the agronomic, grain quality, and disease data tables. Summary tables by trait over locations for each variety and across varieties for 1974 are presented. In addition, means based on regionalization of the data into six rather broad geographic areas of the world with appropriate statistical analyses are reported. Means and statistics for 16 cultivars that were grown concomitantly in three IWWPNs from 1972 to 1974 also were reported.

PN-AAC-797

Paper copy \$15.50
Microfiche \$ 2.00

(029) INTERNATIONAL SOYBEAN VARIETY EXPERIMENT, SECOND REPORT OF RESULTS

Whigham, D. K.
1976, 228p.

111. (AID/CM/ta-C-73-19 Res.)

(In INTSOY ser. no. 11)

The yield potential of commercial U.S. soybean cultivars grown in tropical environments was encouraging. This report concentrates on those sites less than 30° from the equator and less than 500 m in altitude, where the majority of the trials were located. Within these parameters, yield was less when latitude increased. The number of days before flowering and maturity became greater as latitude increased. Plant height also increased as latitude increased and was highly correlated with lodging. However lodging and shattering were not serious problems at most sites. In general, stand establishment was best at sites nearest the

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equator. Pod number increased, but seed weight decreased as latitude increased. Oil percentage decreased with increased latitude, but protein percentage was inconsistent.

PN-AAC-923

Paper copy \$18.90

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(030) DEVELOPMENT OF IMPROVED VARIETIES OF SOYBEANS, FINAL REPORT

III. Univ. Int. Soybean Program
1976, 145p.

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

(Summary of research contract findings, 1973-1976)

An extensive evaluation of various varieties of soybeans was conducted to identify the varieties with the best potential for home and commercial production in the less developed countries of the tropics and subtropics. Some 90 countries volunteered to participate in the program. Seed from promising varieties was increased in Puerto Rico and then distributed for use in preliminary observation trials at selected locations in six countries. In plant protection work, a pest management program developed for use in Illinois was tested in Brazil with encouraging results. Studies of economic injury levels and host plant resistance were conducted, as were virus vector studies on soybean mosaic virus and tobacco ring-spot virus. Various seedborne microorganisms and pathogens associated with soybeans in selected countries were identified. Research in soybean food use led to development of concepts for rapid preparation of weaning foods and soybean-cereal patties, a procedure for preparing a soybean beverage for village use, and appropriate methods for home and village-level preparation of the foods and beverage. A study was made of the effects of using corn, rice, or wheat flour as ingredients in drum-dried soy-cereal weaning foods. Also studied were water uptake and use of sodium and ammonium bicarbonate for their effects on tenderness of cooked soybeans. Protein efficiency ratios were determined on many prototype foods made wholly or partly from field varieties of soybeans. The research results were disseminated through an active publication series, a newsletter, regional workshops, training courses, and country programs. The soybean development network was expanded through formal linkages between INTSOY and national and international organizations.

PN-AAC-665

Paper copy \$12.05

Microfiche \$ 2.00

(031) PERFORMANCE OF THE FOURTH INTERNATIONAL MUNGBEAN NURSERY

Poehlman, J. M.; Sechler, D. T.; Swindell, R. E.; Sittiyos, Prathes
1976, 38p.

Mo. (AID/CM/ta-C-73-36 Res.)

(In. Univ. of Mo., Colombia, Agr. Exp. Station. Special rpt., 191)

The International Mungbean Nursery was started in 1972 to obtain information on (a) the range of adaptation of the mungbean species; (b) the range of adaptation of specific mungbean cultivars; and (c) characteristics of the mungbean plant that influence adaptation. The nursery has also served as a means of distributing superior cultivars to mungbean research workers in many countries. Its value in this respect grows as cooperators make seed available of superior local cultivars so that they may become entries in the nursery. Perhaps the greatest utility of the nursery is that it has identified a network of mungbean research workers around the world and has provided, for the first time, some communication among them. This report presents data from the Fourth IMN, received from 22 test locations in 13

countries. Summaries are also included over all test locations for the four nurseries conducted thus far. Thirty strains of mungbeans were grown in the Fourth IMN. The entries included eight strains previously grown in the First, Second, and Third IMNs, four strains previously grown in the Second and Third IMNs, and nine strains previously grown in the Third IMN. The new entries in the Fourth IMN were M304 and M358 from Korea, M394 and M1956 from the Philippines, M467 from India, M530 from Iran, M1645 and M2069 from Taiwan, and M2070 from the U.S.A. Mungbean strains M1134 (from Oklahoma) and M409 (from Peru) ranked highest in yield over all locations, with average yields of 1,009 and 953 kg/ha, respectively. Both produced spectacular yields in the irrigated test of Melka Werer: 6,907 kg/ha for M409 and 5,800 kg/ha for M1134.

PN-AAC-698

Paper copy \$3.15

Microfiche \$1.00

(032) EDIBLE LEAVES OF THE TROPICS

Martin, F. W.; Ruberte, R. M.
1975, 238p.

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

An extensive description of edible green leaf plants of the tropics. Green leaves in the tropics serve as direct food sources to man. The important species are grown and preserved on both home and commercial scales. Yet these usages hardly touch on the potentials that exist in most environments. Green leaves are underutilized and neglected, or depreciated and destroyed. Reasons for such neglect are ignorance and prejudice. Both conditions are hard to cure. One of the purposes of this book is to reduce the levels of ignorance and prejudice. The introductory chapter includes tables that list the protein, fat, carbohydrate, and amino acid percentages contained in many different edible green leaves of plants in the tropical and temperate zones. Successive chapters discuss the principal edible green leaf herbs of the tropics; some fruits, vegetables, and ornamental plants that also bear edible leaves; common weeds with edible green leaves; tropical trees with edible green leaves; tropical leaves as spices and teas; temperate-zone green leaves in the tropics; lettuce in the tropics; tropical leaves that are poisonous; and culture and care of green-leaved vegetables. The book contains 56 illustrations, selected references concerning edible and poisonous leaves, a list of tropical plants with edible leaves, and an index to species mentioned in the text.

PN-AAC-860

Paper copy \$19.75

Microfiche \$ 3.00

(033) GUAYULE, AN ALTERNATIVE SOURCE OF NATURAL RUBBER

National Research Council. Board on Science and Technology for Int. Development
1977, 89p.

NAS (CSD-2584 GTS)

This report examines the state of knowledge and the future promise of guayule *Parthenium argentatum* Gray, a little-known shrub native to deserts of southwest Texas and northern Mexico that was a commercial source of natural rubber during the first half of this century. The report is the product of the Panel on Guayule, an international panel of botanists, agronomists, engineers, chemists, rubber technologists, and a rubber economist. Specific objectives were to analyze guayule's strengths and limitations as a modern, commercial crop, to identify areas of uncer-

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tainty, to judge the wisdom of renewed development and research, and to consider the potential of guayule for providing employment and enabling better use of land on Indian reservations in Texas, New Mexico, Arizona and California. Conclusions were: 1) Guayule rubber and hevea rubber have virtually identical chemical and physical properties. 2) The demand for all rubbers is expected to increase worldwide, and a market for guayule rubber is assured if it can be sold at a competitive price. 3) Using agricultural techniques and rubber extraction methods in use when guayule rubber was last produced 30 years ago, it is doubtful if the plant would be a commercially viable crop today. 4) Guayule has potential to become important to the nation's economy and security. 5) Guayule cultivation eventually might help Indians in the Southwest to develop an economic base for their reservations. 6) Guayule has potential to become an important crop in several regions of the world outside of its indigenous areas in Mexico and the U.S.. Recommendations were: 1) The U.S. Government should initiate a program of research and development leading to commercialization of the guayule plant. 2) The U.S. and Mexican Governments should collaborate in guayule research and development. 3) Guayule should be established in appropriate areas of California, Arizona, New Mexico, and Texas. 5) The U.S. Government should centralize its guayule records at a location in the Southwest accessible to researchers.

PN-AAC-956

Paper copy \$7.40
Microfiche \$1.00

SOIL RESOURCES AND MANAGEMENT

(034) RECLAMATION AND WATER MANAGEMENT STUDIES ON COARSE-TEXTURED SALINE-SODIC SOILS IN THE SAN LUIS VALLEY OF COLORADO

Franklin, W. T.; Whitney, R. S.
1976, 76p.

Colo. State (CSD-2460 211d)

A field experiment was conducted to study methods of reclaiming and managing the coarse-textured saline-sodic soils in the Mosca-Hooper area of the San Luis Valley. The objectives of the experiment were to determine the effects of pre-leaching, amendments, and irrigation on soluble salt and exchangeable sodium removal and on subsequent crop growth at various water table levels. The experimental variables on the 96 plots in the investigation included: two water table levels; the application of 0.1% krillium, 1 and 4 tons per acre of gypsum, and 0.8 and 3.2 tons per acre of calcium chloride; two rates of leaching; various rates of surface irrigation; nitrogen fertilizer rates with and without phosphorus fertilizer; and subsoil tillage. Water table differences were achieved by pumping water from one area to lower the water table level and using the pumped water to raise the water table level in the second area. A water table difference was maintained but the levels in both areas fluctuated considerably from year to year. Crops grown on the plots to test the effects of the various treatments were: barley (1952, 1955, 1961-2); sweetclover (1953); potatoes (1954); alfalfa (1956-60); and oats (1963-4). Salts and sodium reaccumulated rapidly in the soil surface whenever the water table was raised to three feet or higher in the high water table area. These were reduced again by irrigation when the water table level lowered. Raising the water table level to three feet or higher during the cropping season resulted in increased crop yields and a greater response to amendment treatments. Incorporation of alfalfa into the crop rotation is recommended; it will contribute to an increased organic matter build-up and bring about an improvement in the physical condition of the soil.

PN-AAC-779

Paper copy \$6.30
Microfiche \$1.00

PLANT PROTECTION

(035) PROGRESS REPORTS OF THE UC/AID PEST MANAGEMENT AND RELATED ENVIRONMENTAL MATTERS PROJECT, 1971/1973 thru 1975/1976

Calif. University Berkeley. Dept. of Entomological Sciences
1974-1976

Calif.—Berkeley (CSD-3296 GTS and AID/ta-C-1195 GTS)

The main purpose and short-term goals of this project were to provide developing countries with assistance in devising and implementing ecologically sound and economically valid integrated pest management systems for the control of agricultural pests and diseases so that the long-term, or ultimate goal, of increasing their agricultural productivity can be achieved. These goals are to be attained by developing their scientific and institutional capacity to handle diverse pest problems through: 1) training and re-training of crop protection personnel from participating countries; 2) establishing technical assistance and extension projects aimed at specific crop protection problems; and 3) assisting local personnel and their institutions to establish or improve programs of research, training, and extension related to crop protection. Multi-disciplinary survey teams identified the most serious pest and disease problems (including environment deterioration) of the most important crops in the countries they visited. Each team consisted of four or five men in the fields of entomology, plant pathology, nematology, and weed science. The study team reports include 1) an analysis of the problems encountered; 2) recommendations for problem priorities; 3) recommendations for research, training and control programs based on the importance of the problems identified and the probability of successful control; 4) evaluation of the technical capacity or potential of local scientists and facilities; 5) where possible, an identification of capable people who would fit into project training programs, or as degree students in the university; 6) identification of needed "institution building" and scope of the need; 7) an analysis of the way and extent that the UC/AID/PM Project can contribute to strengthening local capacity to manage these problems; and 8) an evaluation of social and cultural problems that might arise as a result of problem solutions and their effects on local agriculture, marketing, and economics. In the first year of the project, pest management workshop/seminars were held in El Salvador, Indonesia, and the Philippines and in the second year, in Guatemala. In 1974/1975 special study teams for USAID missions were sent to Pakistan for an analysis of pesticide use, and to South Vietnam for an analysis of pesticide handling and use. The following year special reports were presented on pest management in Egypt, information systems for alternative methods of pest control, and potential pesticide contamination at a research station in Colombia. That year special project activities included the periodical newsletter, *Pest Management News*; a quality control program for pesticide analytical laboratories; a UC/AID/PM international plant protection library; an international workshop on ecology and control of bacterial wilt diseases; and a special training workshop in pest management for entomologists.

PN-RAB-312 1971/1973 (49p.)

-Paper copy \$4.05
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PN-RAB-485 1974/1975 (66p.)

-Paper copy \$5.50
-Microfiche \$1.00

PN-AAC-602 1975/1976 (38p.)

-Paper copy \$3.15
-Microfiche \$1.00

(036) PESTICIDE MANUAL (issued in 3 pts., individually abstracted below)

Von Ruemker, Rosemarie; Horay, Freda
1972

Calif.—Berkeley (CSD-3296 GTS)

AGRICULTURE AND NUTRITION

Part I, 273p. discusses thoroughly such topics as: 1) pesticide development, regulation, formulations, and containers; 2) handling, transportation, and storage, including hazards in movement and pesticide stability; 3) disposal of used pesticide containers and surplus pesticides; 4) pesticide application equipment; 5) human safety; 6) judicious use of pesticides; 7) monitoring pesticide residues in food and in the environment; and 8) important pest problems and pesticides in tropical and subtropical countries, including land use, crops, livestock, insects and diseases, pesticides used for their control, nematodes, weeds and the use of herbicides on tropical and subtropical crops, livestock insects, and pest resistance to pesticides. This manual was written as an aid to evaluating contemplated pesticide uses in programs for developing countries and ensuring the safe and efficient use of pesticides. Because the knowledge of pesticide handling and use is limited, only existing information, naturally, can be offered. The manual, however, is not to be regarded as a "how-to-do" instruction book, but rather as an overview of all the known aspects of pesticides, with emphasis on hazards and unknowns.

(Contains rev. chapt. on Handling, Transportation, and Storage of Pesticides, issued 1976)

PN-AAB-811

Paper copy \$22.65
Microfiche \$ 3.00

Part II, 205p., of the *Pesticide Manual* treats thirty-five pesticide chemicals. Outlined, with pertinent charts and tables, are their identity, physical and chemical properties, analytical methods, hazards to humans, hazards to the environment, and pesticidal effectiveness. The chemicals covered are: 1) Herbicides - Alachlor; Propanil; Trifluralin; Dalapon-NA; MGPA; 2,4-D; 2,4,5-T; 2) Insecticides-(organic phosphates and carbamates)-Garbaryl; Malathion; Naled; Dimethoate; Fenthion; Diazinon; Ethion; Oxydemeton-methyl; Azinphos-methyl; Phosphamidon; Mevinphos; Methyl-parathion; Parathion (chlorinated hydrocarbons) - DDTG; BHC; Chlordane; Heptachlor; Toxaphene; Aldrin; Dieldrin; Endrin; 3) Fungicides-Captan; Benomyl; Zineb; Maneb; Mancozeb 4) Fumigant; Methyl bromide; and 5) Rhodenticide-Zinc phosphide. A pesticides cross-reference index and an index of trade names and common names are included.

PN-AAB-812

Paper copy \$17.00
Microfiche \$ 3.00

Part III, 261p., provides three types of specifications for the thirty-five pesticide chemicals detailed in Part II. They are: 1) FAO (Food and Agriculture Organization of the United Nations) Specification; 2) Provisional Specification (developed and to be published by FAO) with an FAO code number in the title; and 3) Provisional Specification (developed by AID and in the FAO format) without a code number. The specifications include the following physical and chemical properties: description, active ingredient, impurities, physical properties, storage stability, and containers. Each pesticide is discussed in outline form.

PN-AAB-813

Paper copy \$21.65
Microfiche \$ 3.00

(037) MANUFACTURERS OF PESTICIDE APPLICATION EQUIPMENT, A WORLDWIDE CATEGORIZED PARTIAL LISTING

Deutsch, A. E.
1976, 60p.

Or. State (AID/CM/ta-C-73-23 Res.)

(English and Spanish)
(In Pub. 19-A-76)

The directory of manufacturers of pesticide application equipment is a successor to the *Manual of Pesticide Application Equipment*, published in 1972 by the International Plant Protec-

tion Center at Oregon State University. Its purpose is the same; to present pertinent information for the use of agriculturalists, researchers, and crop production specialists worldwide. The directory is organized in three sections. Section I presents a graphic chart of all the categories and subcategories of equipment. Section 2 lists the names and countries of firms manufacturing equipment in those categories. Section 3 contains a complete listing of all manufacturers, grouped alphabetically and within country, including full names and international postal addresses. While the directory lists more than 400 manufacturers, it makes no pretense of listing all manufacturers of pesticide application equipment worldwide, though most major firms are represented. Nor is the quality of effectiveness of the listed firms' products evaluated. The directory is printed in side-by-side English and Spanish.

PN-AAC-549

Paper copy \$5.00
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(038) INFORMATION SYSTEMS FOR ALTERNATIVE METHODS OF PEST CONTROL WITH EMPHASIS ON PROBLEMS AND NEEDS OF CROP PROTECTION SPECIALISTS IN DEVELOPING COUNTRIES

Bottrell, D. G.; Huffaker, C. B.; Smith, R. F.
1976, 45p.

Calif.—Berkeley (AID/ta-C-1195 GTS)

(Presented at FAO/UNEP Consultation on Pest Management Systems for the Control of Cotton Pests, Karachi, Pakistan, 1975)

This document addresses the problems and progress of information systems as related mainly to non-chemical methods of pest control, and discusses some of the major problems and needs confronting pest control specialists in developing countries. It was found that information about various methods of pest control must be coordinated and consolidated in order to aid pest management programs in developing countries; computer-based data bases and their services offer tremendous potential for this. Scientific societies, information centers, and organizations assisting these developing countries must provide immediate solutions to the most pressing needs in information gathering and dissemination. To begin solving these needs, it is recommended that an international information project center for alternative methods of pest control be formed. It is mandatory that the institution selected to coordinate the project has a wide range of inter-disciplinary programs in pest management, and a staff of highly knowledgeable pest management scientists in these disciplines to utilize the various pest control methods in the developing countries.

PN-AAC-145

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(039) CROP LOSSES: RICE; FIELD LOSSES TO INSECTS, DISEASES, WEEDS, AND OTHER PESTS

Barr, B. A.; Koehler, C. S.; and Smith, R. F.
1975, 64p.

Calif.—Berkeley (AID/ta-C-1195 GTS)

Increasingly, attention is being focused on the challenge of producing enough food in developing nations to meet the needs of their rapidly growing populations. On a worldwide basis, rice is the most important of the food crops, constituting the staple food of over half of the people in the world. Pests of rice—insects, organisms causing diseases, rodents, birds, etc.—compete di-

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rectly with humans for rice crops and exact a staggering toll. Weeds compete with the rice plant itself for factors essential to plant growth and in this way take their toll. If all the land presently planted to rice in the developing countries of the world suffered an average of only one percent loss in yield as a consequence of the damage caused by pests, it would be tantamount to acknowledging that about 900,000 hectares (approx. 2.2 million acres) had been planted for no other purpose than to feed pests. Unfortunately, the yield losses caused by the complex of rice pests, although not known precisely, are much greater than ten times one percent. The purpose of this report is to present some representative loss data from some of the more important rice-growing regions and for some of the more significant pests in the field in order to call attention to the extent to which pests are affecting rice yields in developing countries and thereby to the great need of these countries for effective crop protection schemes.

PN-AAB-347

Paper copy \$5.30
Microfiche \$1.00

(040) THE AGROMEDICAL APPROACH TO PESTICIDE MANAGEMENT

Calif. Univ./USAID Pest Management and Related Environmental Protection Project
1976, 120p.

Calif.—Berkeley (AID/ta-C-1195 GTS)

Proceedings of a seminar/workshop on Pesticide Management held in Manila on February 10, 1975. Contains 12 papers presented by participants. The objective of this volume is to provide a background in pesticide management. The papers deal with such subjects as the use of pesticides in increasing food production, better protection of human health from vector-borne disease, prevention of human poisoning, prevention of environmental pollution, and avoidance of pest resistance. The papers are of interest to professional workers in agriculture and health, to administrators in those fields, and administrators in the chemical pesticide industry. Others who should find the papers of use are persons responsible for planning programs in developing countries. The purpose of the workshop sessions is to develop interdisciplinary teams to address the problem of developing pesticide management teams, a clearinghouse to deal with problems of persistence, resistance, and poisoning, and a capability for monitoring and analyzing pesticide residues. These teams will also make recommendations for implementing these pesticide management problems.

PN-AAC-937 (120p., English)

Paper copy \$ 9.95
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PN-AAC-938 (131p., Spanish)

Paper copy \$10.85
Microfiche \$ 2.00

(041) REPORT OF THE SAHEL CROP PEST MANAGEMENT CONFERENCE

Smith, R. F.; Schlegel, D. E.
1974, 86p.

Calif.—Berkeley (CSD-3296-GTS)

Conf. conducted in Washington, D.C., December 11-12, 1974

In recent months, the increased demand for emergency assistance in the Sahel states has suggested certain conclusions which bear on the medium and long-term recovery and development of the Sudano-Sahelian zone. The present capability of the Sahel states to manage common, annual crop pests is extremely limited. This condition, where it exists, will tend to neutralize attempts at increasing crop production. The Sahel Governments are aware of the crop pest problem, and many are ready to seek a long-range solution to it. The members of the donor community

are also aware of the problem. The objectives of the Conference were:

- (1) To establish a technical understanding of the problem. While any one concerned organization possessed valuable information, there had not been a comprehensive compilation and exchange of such information.
- (2) To develop a technical consensus from the standpoint of professional pest control management on the most appropriate approaches to the solution to the problem.
- (3) To help create a forum or network for continued exchange of information bearing on the problem.
- (4) To gain some indication of the kind of assistance donors might provide.

PN-AAB-094

Paper copy \$7.15
Microfiche \$1.00

(042) ANALYSIS OF PESTICIDE USE IN PAKISTAN, A MULTI-DISCIPLINARY STUDY TEAM REPORT.

Yates, W. E.; Maxwell, R. C.; Davis, J. H.
1974, 44p.

Calif.—Berkeley (CSD-3296 GTS)

The mission of this study team was to provide technical assistance on the efficiency and safe use of agricultural pesticides. Local conditions of pesticide manufacture, formulation, distribution, storage, and application were observed, and potential pollution of the local environment and possible effects on public health were considered. Specific suggestions are given on pesticide registration, establishment of toxicity and restricted use categories. Suggestions also are made on methods of increasing sales and distribution with emphasis on education and quality control standards. Ways of reducing losses and hazards during distribution are discussed, including containers, storage, proper labeling, and directions for use. A professional agriculture engineering research section should be established to design and develop pesticide application equipment, to train staff in application techniques, and to determine effectiveness and possible losses. A program also should be developed to monitor pollution of crops and environment. Finally, there should be coordination among agriculture, health, and the military in matters of pesticide usage.

PN-RAA-577

Paper copy \$3.65
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(043) PLANT PROTECTION IN BANGLADESH, A MULTI-DISCIPLINARY STUDY TEAM REPORT

Wilcoxson, R. D.; AliNiasee, M. T.; Dresner, Edgar; Hedlund, G. W.; Maxwell, R. C.
1975, 76p.

Calif.—Berkeley (AID/ta-C-1195 GTS)

Report of an evaluation of the Bangladesh plant protection program by a five-man team of U.S. experts during the period October-December, 1975. The evaluation included an assessment of the capabilities of the Plant Protection Directorate, and the government's capacity to undertake training, conduct research, plan, implement plant protection projects, and market pesticides. Excerpts from the recommendations section of this report: The Plant Protection Directorate (several agencies) should be organized to accomplish its functions of training, regulation, and applied research. The basis for plant protection programs should be established in law. Effective surveillance pro-

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AGRICULTURE AND NUTRITION

grams on all types of plant pests need to be developed. Pesticide application equipment should be evaluated. A lack of trained personnel is perhaps the greatest program in plant protection in Bangladesh; training programs deserve high priority. The plant quarantine service should be strengthened. The aerial spraying capability should be maintained for pest control only in emergencies. The pesticide standardization system should be retained and strengthened. The distribution of power sprayers should be discontinued until the two-cycle engine oil they require is available. A deputy director within the Agricultural Research Council should be appointed to coordinate and stimulate research in plant protection. The universities should be more fully supported in their plant protection efforts. A Plant Protection Society for Bangladesh should be organized to give scientists an opportunity to communicate with each other. Specialists in the PPD and other agencies and equipment should be limited to realistic estimates of needs.

PN-AAC-939

Paper copy \$6.30
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WEEDS

(044) WEED CONTROL SYSTEMS FOR REPRESENTATIVE FARMS IN DEVELOPING COUNTRIES, TERMINAL RESEARCH REPORT

Or. State Univ. Int. Plant Protection Center
1976, 120p.

Or. State (AID/CM/ta-C-73-23 Res.)

An investigation of weed control systems and policies in three ecologic and cultural zones—one in central El Salvador, and two in Northeast Brazil. The weed control systems were investigated to determine their effect on economic efficiency, employment, and income distribution. Manual methods were found to be most efficient for small farms producing beans, corn, and sorghum. Chemical and mechanical control methods appeared to be more economical for cassava, sugarcane, and rice grown on larger farms. Evidence from El Salvador demonstrates that, under some conditions, efficient weed control methods can substitute for fertilizer. In areas of labor abundance, manual weed control methods are most economical and efficient in growing food crops on small farms operated by farmers with limited capital and low levels of training. More advanced weed control methods are economical on plantations and large commercial farms where labor costs are higher, capital and credit are more abundant, and generally government subsidies and support prices are more favorable. Manual weed control methods are generally impractical for wheat and rice. In situations where land itself is not limiting, the major factor determining how many hectares a farmer will plant is his ability to clear the land before planting and to keep the crop weeded. Adverse weather often delays manual weeding, resulting in yield losses. For the sugar plantations of Northeast Brazil and the large rice farms of central El Salvador, the least cost weed control method is consistently chemical when private prices are used, and manual when social prices are used. The welfare of small farmers cannot be improved significantly by only focusing on a single problem, such as weed control. Government policies affecting inputs and outputs must be considered.

PN-AAC-869

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(045) WEED CONTROL SYSTEMS FOR REPRESENTATIVE FARMS IN DEVELOPING COUNTRIES; ANNUAL RESEARCH REPORTS, 1966/1967 through 1975/1976

Or. State Univ. Int. Plant Protection Center
1967-1976

Or. State (CSD-1442 Res. and AID/CM/ta-C-73-23 Res.)

General objectives of this project included detailing weed problems by crop, production methods, and climate for each agricultural region; determining the losses caused by weeds in specific crops and relating these to the economic factors involved in control, and determining the interrelationship between weeds and response to fertilizer and improved varieties. In the Colombian highlands, research was conducted on corn, beans, wheat, barley, oats, potatoes, beets, onions, carrots, peas, pastures, kikuyo grass, ditch bank weed control, and aquatic weed control. In the subtropics and tropics, weed control research was conducted on corn, sorghum, rice (paddy and dryland), cotton, beans, soybeans, sugar cane, tomatoes, onions, sesame, peanuts, African oil palm, bananas, citrus, coffee, pineapple, nutsedge, pastures, non-crop land, yucca, and hotland wheat. In 1968 work was initiated in Ecuador on a cooperative basis with Colombia. Experiments in Ecuador were conducted on corn, cacao, wheat, potatoes, and fence rows. Expansion of project activity in Colombia included further assessment of weed control problems (particularly in the areas of pasture and aquatic weeds), cataloguing and identifying weeds in several key agricultural production areas, and increased emphasis on extension work in and the economics of weed control. The *Herbicide Index*, the *Crops-Herbicide Index*, and the *Weed Susceptibility Index* have been published. In 1969/70 two new regional programs were started, one in El Salvador serving Central America and the other in Ecuador serving the lowlands of Ecuador and Panama. Emphasis on weed control as part of integrated pest control and on the application of weed control technology was increased. Several fact sheets dealing with weed control in specific crops and a full-color manual of 50 economically important temperate zone weeds were published in 1970. Extensive herbicide testing in Hawaii on a variety of crops, especially rice provided information which has been revised and issued annually; these reports are available on request from the Contractor. The projects in Central America and El Salvador were directed toward identifying alternative weed control methods, not only herbicides but also the use of clean seed, clean fallow, and crop rotation. Experiments with various crops using specific herbicides produced the following conclusions: 1) In El Salvador, purple nutsedge can be controlled effectively in beans by the use of EPTC or butylate at the rates of 5 to 6.5 kilograms per hectare. 2) In Costa Rica, grasses and broadleaves in citrus can be controlled effectively by paraquat in a mixture with simazine (0.36 + 4.0 kg per h) or diuron (0.36 + 4.0 kg per h). Equally good control can be obtained through manual and chemical means. 3) Good weed control in corn was obtained through the use of atrazine and butylate or EPTC. 4) No effect was noted on the germination of potatoes when a selected group of herbicides was applied. In Northeast Brazil well-timed manual control continued to be the most economical technique. However, in specific weed conditions certain herbicide treatments resulted in higher levels of control. Seedbed preparation and its subsequent effect on weed growth provided increased yields over traditional seedbed preparation. Preliminary data indicate that, under traditional soil preparation, corn and bean yields were reduced 60-70% in the absence of weed control. Timing of manual weeding is critical; one correctly timed hoeing is as effective as the prevalent two manual weedings. The use of herbicides in El Salvador is more promising. A herbicide-manual weeding combination seems to be the most economical treatment for corn. Herbicide usage in rice was consistently the most efficient method; that for beans is not clear.

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AGRICULTURE AND NUTRITION

One-time manual weeding in beans seemed to substitute for the recommended rate of herbicides.

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PN-RAB-262 1967/1968 (58p.)	Paper copy \$4.80 Microfiche \$1.00
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PN-RAB-268 1974/1975 (39p.)	Paper copy \$3.25 Microfiche \$1.00
PN-AAC-024 1975/1976 (25p.)	Paper copy \$2.00 Microfiche \$1.00

(046) FIELD MANUAL FOR WEED CONTROL RESEARCH

Burrill, L. C.; Cardenas, Juan; Locatelli, Eduardo
1976, 64p.

Or. State (AID/CM/ta-C-73-23 Res.)

A heavily illustrated manual of procedures for conducting field research on weed control methods. For many developing nations, weed-caused economic losses are assuming increased importance, particularly in relation to the introduction of new, high-yielding varieties and the "production package" approach. Merely testing chemicals for weed control effectiveness and safety to crops is no longer sufficient. Extensive data must be collected on herbicides and their residues. This manual has been prepared to encourage improved weed control research, and to provide flexible guidelines for conducting the crucial field experiments in weed control. Research workers should be aware that, though this publication concerns control through use of chemicals, weed control programs require integrated techniques. Seldom will chemical weed control alone yield maximum benefits; cultural, manual, and mechanical methods also need to be considered and tested. Sections of this manual discuss such topics as reviewing and defining the problems; types of field trials, location of trials; agreements with owners; level of production technology; research procedures, including establishing trials, site selection, block and plot arrangement, plot size and borders, control plots, herbicide rates, cultural practices, seeding weeds, marking experimental area, numbering plots, and equipment; research evaluations, including time of evaluation, qualitative methods, and quantitative evaluations; data analysis; recording and reporting results; safety in handling herbicides; and equivalents and conversion rates for the metric system and U.S. measures.

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

National Research Council. Board on Science and Technology for Int. Development
1976, 183p.

NAS (CSD-2584 GTS)

The menace of water weeds is reaching alarming proportions, particularly in tropical nations. The weeds block canals and pumps, interfere with hydroelectricity production, waste water, hinder boat traffic, increase waterborne disease, interfere with fishing, and prevent adequate drainage of rivers and canals. Aquatic weeds spread water snails that cause schistosomiasis;

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

PN-AAC-821 Paper copy \$15.20
Microfiche \$ 2.00

(048) AQUATIC WEED CONTROL, REPORT OF TRAVEL TO EGYPT AND SUDAN, 1976

Yeo, R. R.; Bailey, Wm.
1976, 46p.

NAS (CSD-2484 GTS)

As a result of the Regional Workshop on Aquatic Weed Control and Management, held in Khartoum, Sudan, November 24-29, 1975, Dr. Richard R. Yeo and Mr. William Bailey were asked by the National Academy of Sciences to deliver Chinese grass carp and dwarf spikerush to Egypt and spikerush into Sudan. The Chinese grass carp is being used in many countries for removal of undesirable submersed aquatic vegetation in canals, ponds, lakes, and other water systems. The fish can eat its own weight in vegetation each day, and is a palatable source of protein. The spikerush is a short-growing aquatic plant that displaces rooted aquatic weeds. The dwarf spikerush, which thrives in low elevations and warm climates, has completely displaced dense growths of weeds in some canals in California. On May 20, 1976, Yeo and Bailey flew to Egypt with plastic, insulated bags and boxes containing 60,000 six-day-old fry of Chinese grass carp (bred in Arkansas) and four vials of dwarf spikerush seed. In Egypt the spikerush seed was delivered to the Farm Research Station of Cairo University for start-up of a spikerush nursery. The grass carp fry were delivered to Egyptian biologists for rearing at the Sirw Fisheries Research Station. Detailed in this report are the observations of the Egyptian facilities, meetings held, with whom, and types of aquatic weeds noted in various canals visited. On May 27 Yeo and Bailey flew to Sudan and delivered spikerush seeds to Sudanese scientists, who planned to construct a spikerush nursery at the Gezira Agricultural Research Station. Detailed are research sites visited, meetings held, lectures given, and aquatic weeds identified in various canal systems. Recommendations for further international exchange of research techniques, seeds, and fry are included.

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AGRICULTURE AND NUTRITION

(049) AQUATIC WEEDS IN THE SUDAN, WITH SPECIAL REFERENCE TO WATER HYACINTH

National Research Council. Board on Science and Technology for Int. Development; National Research Council, Sudan 1975, 165p.

NAS (CSD-2584 GTS)

Included in this report are twelve articles dealing with the water resources of the Upper Nile, agricultural and aquatic environments of the Sudan, and problems of controlling the spread of water hyacinth, which is interfering with navigation, irrigation, fishing, and supplies of drinking water. For the Sudan the Nile is the main source of irrigation water for agriculture, hydro-power potential, fish supply, riverain grazing, and water transport. Present irrigated areas of 4.6 million acres are supplied by a hierarchical system of supply canals. The estimated surface area of fresh water in the Sudan is about 10 million acres. This is equal to the area of irrigable land to be developed. New dams and water channels are increasing the surface area of water, and means must be found of preventing the spread of water hyacinth and other aquatic weeds in the present and new waterways. The water hyacinth now infests vast areas. It reproduces so rapidly that efforts to control it have been ineffective. Many means have been considered for utilizing the plant in order to recoup costs incurred in efforts to kill it. Much research must be conducted to establish the most effective new means of control, and cost-effective uses of the plant as animal protein. Some of those possibilities are discussed in the articles in this document.

PN-AAC-696

Paper copy \$13.70
Microfiche \$ 2.00

(050) SOME PROSPECTS FOR AQUATIC WEED MANAGEMENT IN THE SUDAN AND NILE BASIN

Workshop on Management and Utilization of Aquatic Weeds in the Sudan and Nile Basin, Khartoum, 1975
1975, 63p.

NAS (CSD-2584 GTS)

The growth of water hyacinth and other aquatic weeds in rivers and canals of the Sudan is a very serious environmental problem. The water hyacinth, a South American plant, was first reported in the Upper Nile region in 1958, and by the mid-1960s had infested much of the waterways. Control efforts have not been very effective, despite Sudanese expenditures of more than \$19 million since 1959. The water hyacinth infestation has several negative effects. It increases water loss by an estimated seven billion cubic meters per year. It blocks irrigation-pump inlets and hydroelectric power plants, clogs canals, spoils water supplies for drinking, damages river steamboats, and interferes with shallow-water fishing. It contributes to increased mosquito breeding and snail growth, and thus malaria and bilharzia. Mats of water hyacinth harbor snakes, and also force crocodiles to leave the river, causing unrest among the villagers. This study produced 16 recommendations: (1) Because the Nile Basin waterways of Egypt, Sudan, Ethiopia, Uganda, Kenya, and Zaire are interconnected, effective control efforts require close communication between control agencies in each of these countries. (2) A ban must be imposed on importing foreign aquatic plants to the region. (3) Current herbicide spraying programs need to be continued. (4) Insects that live on and destroy water hyacinths need to be imported. (5) Small biogas generators for producing methane gas from fermented water hyacinth should be built and tested. (6) Engineering companies should build simple presses for converting water hyacinth to animal feed. (7) Composting trials should be undertaken. (8) Grass carp that eat water hyacinth should be introduced. (9) Water buffalo that eat hyacinth should be introduced. (10) The potential effectiveness of introducing White Chinese Geese should be studied. (11) The use of aquatic weeds that control bilharzia should be studied. (12)

Nutrition labs should investigate the processing of water hyacinth for human food. (13) Spikerush plants that displace canal weeds should be introduced. (14) Water hyacinth should be used in sewage treatment lagoons in Egypt, but not in the Sudan. (15) The relevant Sudanese government agencies should work together to ensure that herbicides used to control water hyacinth and snails do not adversely affect the fish populations. (16) Appropriate researchers should study the basic biology, distribution, and taxonomy of aquatic plants throughout the region, and work with administrators to apply the knowledge to making the aquatic weed control programs maximally effective.

PN-AAC-647

Paper copy \$5.25
Microfiche \$1.00

WOOD TECHNOLOGY AND INDUSTRIES

(051) GHANAIAN HARDWOOD MIXTURES FOR PULP AND PAPER

Laundrie, J. F.
1977, 23p.

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

(In AID rpt. no. 7)

Kraft pulps, with quality equal to or better than those of North American hardwood kraft pulps, were made using 3 mixtures of 22 Ghanaian hardwood species. The concept of using air classification to obtain improved pulp quality from mixed tropical hardwoods was verified as being feasible. Also verified as being feasible was the idea of using a high-yield kraft process with 25 to 30 percent screenings being used in corrugating medium and the remaining screened pulp for linerboard. Handsheet tests indicate that acceptable quality corrugating medium also can be made from all three mixtures cooked by the neutral sulfite semichemical (NSSC) process. Acceptable quality newsprint can be made from a furnish containing as much as 90 percent Ghanaian hardwood pulps.

PN-AAC-886

Paper copy \$2.00
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(052) PROPERTIES OF PARTICLEBOARDS FROM MIXTURES OF PHILIPPINE HARDWOODS

Gertjeansen, R. O.; Haavik, D. W.; Carino, H. F.; Okoro, S.P.A.; Hall, H. J.
1976, 53p.

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

Particleboards were manufactured in a laboratory of the Department of Forest Products, University of Minnesota, from three different mixtures of hardwood chips imported from the Philippines, using 5% and 8% levels of urea formaldehyde resin. The three chip mixtures, A, B, and C, contained different proportions of 50 Philippine species. The average specific gravities of the mixtures were 0.50, 0.70, and 0.52, respectively. Boards were also manufactured from a planer shavings mixture with a species composition identical to chip mixture C, and from steamed and unsteamed ring-flaked chips of mixture A. All strength properties increased with an increase in either resin content or board density. Linear expansion and thickness swelling were reduced by an increase in resin content but were not significantly affected by density. There were no differences between boards from ring-flaked steamed and unsteamed chips. Of the three furnishes from hammermilled chips, mixture B had properties inferior to the other two mixes. The strength proper-

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ties of all the urea-bonded boards compared favorably with Commercial Standard CS 236-66 type 1B2 board. However, the maximum allowable linear expansion was, with one exception, met only by the boards from ring-flaked furnishes. Exterior type boards made with phenol formaldehyde resin from a furnish of mixture A hammermilled chips met the minimum property requirements of commercial standard type 2B2 boards at the 8% resin level but not at the 5% resin level.

PN-AAC-708

Paper copy \$4.40

Microfiche \$1.00

(053) ADDITIONAL NEWSPRINT FROM A MIXTURE OF 24 LOWER DENSITY PHILIPPINE HARDWOODS

Laundrie, J. F.; Fahey, D. J.
1977, 11p.

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

(Addendum to AID rpt. no. 2, Newsprint from mixtures of Philippine hardwoods, 10p. PN-AAC-002)

This addendum establishes the suitability of increasing the number of species and the range of specific gravity of these species for the production of thermomechanical pulp for use in the manufacture of newsprint paper. With the exception of brightness, which has lower than commercial standards, acceptable quality newspaper was produced from a furnish containing 70 per cent bleached thermomechanical and 20 per cent bleached kraft pulps, both made from the same Philippine hardwoods mixture, and 10 per cent long-fibered kraft pulp.

PN-AAC-885

Paper copy \$2.00

Microfiche \$1.00

ANIMAL NUTRITION

(054) METHODS OF MINERAL ANALYSIS FOR PLANT AND ANIMAL TISSUES

Fick, K. R.; Miller, S. M.; Funk, J. D.; McDowell, L. R.; Houser, R. H.
1976, 80p.

Fla. (AID/ta-C-1153 Res.)

A manual that describes in detail methods of analyzing cattle blood and tissue to determine its mineral contents. It is a work-product of a research contract entitled "Determination of Mineral Deficiencies and Toxicities for Cattle in Latin America." The research objectives are to determine the locations of mineral deficiencies in cattle in selected areas of Latin America, assess the economic benefits of mineral supplementation for grazing cattle, evaluate supplementation methods, and publish research information to stimulate the widespread use of mineral supplements. The vast majority of cattle in Latin America receive little or no mineral supplements. This contributes to low yields in cattle production. No single factor has as much potential for increasing livestock production at a relatively low-cost input as does adequate mineral nutrition. This publication describes standardized methods of analyzing mineral contents. Several different procedures and methods are suitable for analyzing mineral contents. The methods described in this publication are offered as guides; in some cases they will need to be modified to fit experimental conditions or particular laboratories. The first section deals with collection, identification, and storage of samples (blood, liver, bone, forage). Next discussed are procedures for preparing samples at the laboratory; preparation of standard samples; determination of phosphorus by a colorimetric procedure; and mineral analysis by flame atomic absorption spectrophotometer.

PN-AAC-873 (80p., English)

Paper copy \$6.65

Microfiche \$1.00

PN-AAC-768 (90p., Spanish)

Paper copy \$7.45

Microfiche \$1.00

PESTS OF ANIMALS (HEMOPROTOZOA)

(055) HEMATOLOGIC AND CLINICAL RESPONSE TO ANAPLASMOSIS VACCINES AND THE COMPARATIVE EFFICACY OF THESE VACCINES AS MEASURED BY FIELD AND EXPERIMENTAL CHALLENGE

Kuttler, K. L.; Zaraza, Herman; Roberts, E. D.
1968, 12p.

Tex. A&M (CSD-1947 Res.)

(In Proc., 5th National Anaplasmosis Conf., Stillwater, Okla.)

A report of experiments designed to assess the best means of immunizing calves against *Anaplasma marginale* infection. Twenty calves three months old were divided into four groups. Group I was inoculated with an attenuated *Anaplasma marginale*, Group II with an *A. marginale* adjuvant vaccine. Group III was infected with virulent *A. marginale* followed by treatment, and Group IV remained as unvaccinated controls. All animals were moved into an *Anaplasma* endemic zone three months later and allowed to undergo natural field challenge. Evidence of acute severe anaplasmosis was observed in all calves except those preimmunized by virulent *A. marginale*. In a second experiment, hematologic response to virulent, attenuated, and killed *A. marginale* vaccines was measured in 18 mature cattle divided into three groups. An experimental challenge was administered 8 weeks later to cattle that received that attenuated and adjuvant vaccines. An unvaccinated control group was also administered the challenge. All of the control animals developed acute anaplasmosis. Cattle that received the attenuated vaccine resisted the challenge. Cattle that received the adjuvant vaccine reacted to the challenge, but less severely than did the control animals.

PN-RAA-135

Paper copy \$2.00

Microfiche \$1.00

(056) SERIAL PASSAGE OF AN ATTENUATED ANAPLASMA MARGINALE IN SPLENECTOMIZED CALVES

Kuttler, K. L.
1969, 6p.

Tex. A&M (CSD-1947 Res.)

(In Proc., 73d annual meeting of U.S. Animal Health Assn.)

A report of an experiment on the merits of vaccinating calves against *A. marginale* through use of a vaccine containing an attenuated organism. Twelve serial passages of an attenuated *A. marginale* were made in splenectomized calves by blood inoculation. The severity of infection produced at the twelfth passage level in four calves was compared to the infection occurring in four similar calves at a second passage level. Significantly higher parasitemias and lower packed cell volumes occurred in the twelfth-passage group, suggesting an increased virulence. No deaths occurred among animals of the second-passage group, whereas one of four died in the twelfth-passage group. When faced with the decision of whether to depend on preimmunization with a virulent organism by natural means or to vaccinate all calves with an attenuated organism, the choice is clearly in favor of the latter. However, a potential for reversion exists, and in areas of low anaplasmosis incidence, the introduction of even an attenuated agent might be hazardous; this might produce serial transmission. Thus the indiscriminate use of such a vaccine in some areas could establish infection where it previously has not existed.

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AGRICULTURE AND NUTRITION

(057) IMMUNE RESPONSE OF CATTLE VACCINATED AGAINST BABESIOSIS IN COLOMBIA

Todorovic, R. A.; Gonzalez, E. F.; Adams, L. G.
1970, 8p.

Tex. A&M (CSD-1947 Res.)

(Presented at meeting of Am. Assn. of Veterinary Parasitologists, Las Vegas, Nev.)

A report of a controlled study of immunologic responses of Colombian cattle to babesiosis. Five groups of 20 cattle each were vaccinated with live or killed *Babesia* vaccines at Palmira, Colombia. Immune responses of the vaccinated animals were evaluated by several immuno-serologic methods. The degree of resistance to tick-borne challenge was determined by the percentage of recovery to normal parameters used in this study. Those included packed cell volumes, percentage of parasitemia, body temperatures, body weight, complement fixing antibody titers, general physical conditions, and percent recoveries after tick-borne challenge. The results in general indicate that resistance to babesiosis can be produced by co-infectious or sterile immunity. Experiments in prophylaxis, based on residual action of the babesiocidal drug, gave consistent and satisfactory results. In future it may be possible to develop control programs against bovine babesiosis, based on these observations.

PN-RAA-124

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(058) COMPARATIVE EFFICACY OF DIFFERENT IMMUNIZATION SYSTEMS AGAINST ANAPLASMOSIS

Zaraza, H.; Kuttler, K. L.
1971, 6p.

Tex. A&M (CSD-1947 Res.)

Published in Tropical animal health and production (1971) 3:77-82

Animal response to anaplasmosis vaccination was measured using an attenuated organism, a killed adjuvant vaccine, and a virulent *Anaplasma marginale*. A total of 7 calves (2-4 months of age) and 5 heifers (18 months of age) received the attenuated organism; 8 calves were given the adjuvant vaccine; 7 calves were preimmunized with virulent *A. marginale*; and 7 calves remained as non-vaccinated controls. The animals were vaccinated at Tibaitata on the Bogota Savannah and later moved to the north coast of Colombia, an anaplasmosis enzootic area. All vaccination methods produced positive CF results. The live agents resulted in low parasitemias in most instances, although the attenuated organism was particularly mild in the younger animals. Protection from field challenge was observed in all calves preimmunized with virulent organism, and in 2 of 5 heifers preimmunized with the attenuated organism. All other vaccinated animals developed anaplasmosis which was equally as severe as seen in the non-vaccinated controls.

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(059) EFFICACY OF OXYTETRACYCLINE AND A DITHIOSEMICARBAZONE IN THE TREATMENT OF BOVINE ANAPLASMOSIS

Kuttler, K. L.
1971, 4p.

Tex. A&M (CSD-1947 Res.)

(In Am. J. of Veterinary Research, v. 32, no. 9, pp. 1349-1352)

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A study to determine the effectiveness of oxytetracycline and a dithiosemicarbazone, separately and together, in treating *A. marginale* infections in Holstein-Friesian calves. Three groups of calves were treated. The groups given only oxytetracycline or dithiosemicarbazone (356C61) alone displayed evidence of relapsing infection. When both drugs were injected simultaneously, signs of relapse were not evident in any of 6 calves for 120 days of observation. The *A. marginale* carrier state in splenectomized calves was suppressed for that period, and possibly eliminated. The calves received three injections of 356C61 (5 mg/kg) and oxytetracycline (11 mg/kg) given simultaneously at 48-hour intervals.

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(060) A CLINICAL, SEROLOGICAL, AND PATHOLOGICAL STUDY OF CONCURRENT ANAPLASMOSIS AND BABESIOSIS IN EXPERIMENTALLY INFECTED CALVES

Corrier, D. E.
1972, 115p.

Tex. A&M (CSD-1947 Res.)

(Thesis M.S.—Tex. A&M)

A report of a controlled study of the individual and combined effects of the two infectious organisms in seven-month-old calves. Isolates of *Anaplasma marginale* and of *Babesia bigemina* were obtained from naturally infected calves. Twenty-two male, nonsplenectomized Holstein-Friesian calves were divided into four experimental groups. Group I was infected with anaplasmosis, Group II with babesiosis. Group III was infected with anaplasmosis and *B. bigemina* concurrently. Group IV was infected with babesiosis and *A. marginale* concurrently. The mild symptoms of disease consisted of slight fever, poor body condition, decreased weight gain, and inactivity. Associated with appearance of parasitized erythrocytes were decreases in packed cell volume, hemoglobin, albumin:globulin ration, and serum albumin, and slight increases in the levels of serum bilirubin, serum glutamic oxalacetic transaminase, and alpha and beta serum globulins. Gross lesions observed in the concurrently infected calves included an excessive quantity of yellow fluid in the peritoneal cavities, lymph node enlargement, moderate renal congestion, and occasional serous atrophy of depot fat. Hepatocellular degeneration and necrosis occurred in the centrolobular areas of the liver. Complement fixing antibodies for *Anaplasma* were first observed 17 to 26 days after inoculation. They were first observed for *Babesia* 12 days after inoculation. The biological relationship of *A. marginale* and *B. bigemina* appeared to be independency, not inhibitory or synergistic. The symptoms of infection were more severe, indicating that the concurrent infections were additive in their effects.

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(061) THE ISOLATION, SEPARATION AND PRESERVATION OF BABESIA BIGEMINA

Bishop, J. P.
1973, 5p.

Tex. A&M (CSD-1947 Res.)

(In Tropical animal health and production, v. 5, p. 141-145)

Experiments were performed to separate *Babesia bigemina* from contaminating organisms. *Babesia bigemina* was passaged serially through 5 splenectomized calves. The first calf was inoculated with blood carrying several different organisms, and subsequent subinoculations were done soon after blood smears from each calf were found to be positive for *B. bigemina*. Five blood passages were carried out in 6.5 days. *Babesia argentina* B.

major and *A. marginale* were eliminated as contaminants of the *B. bigemina* isolated after four passages. A frozen stablate of the isolated *B. bigemina* was established.

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(062) BOVINE BABESIASIS AND CONTROL

Todorovic, R. A.
1974, 8p.

Tex. A&M (CSD-1947 Res.)

(In Am. J. of Veterinary Research, v. 35, no. 8, p. 1045-1052)

The investigation was conducted to develop new systems and to evaluate existing ones for the diagnosis and control of bovine babesiosis in Colombia, South America. Antigens of *Babesia bigemina* and *Babesia argentina* were isolated and used in the complement fixation and rapid agglutination tests for the diagnosis of babesiosis in cattle. Three systems were evaluated for the control of bovine babesiosis: (1) vaccination of susceptible cattle with killed *Babesia* spp. vaccine to produce resistance based on sterile immunity; (2) premunition of cattle with virulent *Babesia* spp., followed by chemo-therapy to produce resistance based on co-infectious immunity; and (3) chemoprophylaxis based on the activity of babesiacidal compounds with prolonged residual action. All these systems were found effective in controlling bovine babesiosis under the conditions of these experiments. The epizootiological conditions of babesiosis enzootic areas will indicate which system is applicable. In zones with a high incidence of *Boophilus microplus*, the premunition is indicated; in areas where the tick population is controlled, or in areas at constant risk of tick exposure, the system of inducing resistance with killed *Babesia* spp. or chemoprophylaxis is indicated.

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(063) INFECTIVITY AND CROSS IMMUNITY STUDIES OF COLOMBIAN BOVINE BABESIA SPECIES

Craig, T. M.
1973, 86p.

Tex. A&M (CSD-1947 Res.)

(Thesis M. S.—Tex. A&M)

A thesis that reports two experiments on control of cattle disease. Babesiosis is an infectious cattle disease endemic to many areas of the globe. It is one of the most costly cattle afflictions in the world. The problem of how to immunize cattle against babesiosis has perplexed scientists for decades. When cattle are pre-immunized with blood containing controlled amounts of viable infectious *Babesia* organisms, they resist future exposure but become carriers of the infection. An experiment was conducted to ascertain the feasibility of using macerated ticks, infected with *Babesia argentina*, as a source of infectious material. A colony of *Boophilus microplus* ticks was infected with *Babesia* by permitting them to feed on infected cattle. The eggs, larvae, and nymphs from the infected ticks were macerated and injected subcutaneously into splenectomized calves. The experiment was not successful; none of the calves showed signs of infection, and they proved to be fully susceptible when challenged with *B. argentina*. In a second experiment, *Babesia bigemina* was isolated from other bovine hemotropic agents by rapid serial passage through splenectomized calves. A second group of eight calves was injected with a strain previously isolated from a different geographic region of Colombia. A third group of calves served as controls. After 28 days, four calves in each of the three groups were challenged with *B. bigemina* organisms of each isolate. The challenge groups were homologous, heterologous, and control. Both the homologous and heterologous groups

demonstrated immunity to challenge. No differences in the virulence of the two isolates were demonstrated.

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(064) THE CHEMOTHERAPEUTIC EFFICACY OF IMIDOCARB DIHYDROCHLORIDE ON CONCURRENT BOVINE ANAPLASMOSIS AND BABESIASIS

Adams, L. G.; Todorovic, R. A.
1974, 16p.

Tex. A&M (CSD-1947 Res.)

(In Tropical animal health and production, v. 6, pp. 71-84)

A report of an experiment to determine how effective this drug is against those two cattle parasites. Eighteen male Holstein-Friesian calves 300 days old were first tested to establish that they were not infected by anaplasmosis or babesiosis. They were then injected with 1.0, 2.0, or 2.5 mg/kg of imidocarb dihydrochloride as well as 5 ml of blood containing 2×10^9 per cm^3 of *Anaplasma marginale*. Also injected were similar quantities of two other parasitic organisms, *Babesia bigemina* and *B. argentina*. The dosages of 2.0 and 2.5 mg/kg of the drug rapidly inhibited acute ascending concurrent parasitaemias of *A. marginale*, *B. bigemina*, and *B. argentina*. However, 1.0 mg/kg had a minimal effect on *A. marginale*, though it was very effective against the other two organisms. All three dose levels of the drug inhibited the development of immunity of the acute *Babesia* spp. infections, making the calves more susceptible to babesiosis upon challenge. The inhibition of *A. marginale* parasitaemias was directly related to increasing doses of imidocarb dihydrochloride. However, recrudescing and persisting post-treatment parasitaemias also occurred more frequently at higher doses.

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(065) THE DEVELOPMENT OF AN INDIRECT FLUORESCENT ANTIBODY TEST FOR TRYPANOSOMA VIVAX IN COLOMBIA

Platt, K. B.
1974, 160p.

Tex. A&M (CSD-1947 Res.)

An indirect fluorescent antibody test (IFAT) for *Trypanosoma vivax* infections was developed for a survey involving over 2000 cattle distributed throughout 11 departments and territories in Colombia. Antigen for the IFAT was derived from a strain of *T. vivax* isolated from a cow in the Department of Cordoba, Colombia. The strain was maintained via serial passage in hemoparasite-free calves. Inoculation of approximately 2×10^9 trypanosomes into splenectomized, triamcinolone acetonide-treated calves resulted in parasitemias suitable for IFAT antigen production at 66 to 69 hours post-inoculation. In field cases of trypanosomiasis, the IFAT was up to 21 times more effective in detecting *T. vivax* — positive cattle on the basis of antibody presence than the thick blood smear technique. Results of the survey revealed the presence of *T. vivax* antibodies in cattle from the department of Boyaca, Cordoba, Meta, Sucre and Valle. No *T. vivax* IFAT antibodies were detected in serums obtained from cattle in the departments of Antioquia, Cauca, Caqueta, Cundinamarca, Tolima and Vichada.

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(066) A BABESIASIS CARD AGGLUTINATION TEST

Todorovic, R. A.; Kuttler, K. L.
1974, 4p.

Tex. A&M (CSD-1947 Res.)

AGRICULTURE AND NUTRITION

In Am. J. Vet. Res. Vol. 35, No. 10

A babesiasis card agglutination test (BCT) has been developed for detecting specific antibodies in cattle infected with *Babesia bigemina*. The agglutinating antigen was isolated from the blood of a splenectomized calf having 22% *B. bigemina* parasitemia. The antigen was preserved with 0.02% formalin and stained with fast green dye. The BCT was performed by adding 1 drop of antigen and 2 drops of plasma or serum on a card and mixing for 5 minutes by rotation. Agglutination was visible in instances of positive reactions immediately after rotation. In cattle intentionally exposed to *B. bigemina*, the BCT detected agglutinating antibodies simultaneously with the onset of first parasitemia. This reaction was observed to persist as long as 3 months, or long after the disappearance of parasitemia. Because of its simplicity and apparent specificity, the BCT may have use as a field test to aid in the diagnosis of *B. bigemina* infections. The BCT results showed 100% agreement with the complement-fixation (CF) test on those serums prepared from blood collected within 3 months of infection.

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(067) *BABESIA BIGEMINA*, *BABESIA ARGENTINA*, AND *ANAPLASMA MARGINALE*: COINFECTION IMMUNITY IN BOVINES

Todorovic, R. A.; Gonzalez, E. F.; Adams, L. G.
1975, 14p.

Tex. A&M (CSD-1947 Res.)

(In *Experimental Parasitology*, v. 37, p. 179-192)

Results of experiments on the effects of chemotherapy on cattle infected with *B. bigemina*, *B. argentina*, and *A. marginale*. Forty-eight intact and eight splenectomized cattle were used to evaluate different systems of coinfectious immunization against these infections. Coinfectious immunity was induced by two methods: (1) blood of cattle acutely infected with three organisms was used as the source of inoculum and the post-vaccination reactions were controlled with Imidocarb, Ganaseg, Gloxazone, and Liquamycin; (2) by artificially inducing babesiosis with the blood of carrier cattle with chronic infections of *B. bigemina*, and *B. argentina* without chemotherapy. The degree of resistance was determined by blood-borne and tick-borne challenges. Ticks were collected from cattle and identified as *Boophilus microplus* and *Dermacentor nitens*. Vaccinated cattle demonstrated a high degree of resistance to babesiosis and anaplasmosis; however, cattle without coinfectious immunity were treated chemotherapeutically to prevent death losses.

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(068) SEROLOGICAL DIAGNOSIS OF BABESIOSIS, A REVIEW

Todorovic, R. A.
1975, 14p.

Tex. A&M (CSD-1947 Res.)

(In *Tropical Animal Health and Production*, v. 7, p. 1-14)

A review of research on the diagnosis of babesiosis. In the last three decades some fundamental knowledge concerning the immunoserology of *Babesia* spp. infections has led to development of serological techniques which provide a means of studying the pathogenesis of babesiosis and the detection of animals with subclinical infections. The antigens used in the serological procedures originated from the parasitized erythrocytes, plasma, and tissues of animals with acute babesiosis. Parasitic and serum soluble antigens were applied in a variety of serological tests,

e.g., complement fixation, gel precipitation, agglutination, and fluorescent antibody, for detection of *Babesia* spp. antibodies. This review summarizes and discusses the recent advances in the serodiagnosis of babesiosis, together with conditions where the use of serological methods may be valuable.

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(069) THE EFFECT OF IMIDOCARB TREATMENT ON *BABESIA* IN THE BOVINE AND THE TICK (*BOOPHILUS MICROPLUS*)

Kuttler, K. L.; Graham, O. H.; and Trevino, J. L.;
1975, 3p.

Tex. A&M (CSD-1947 Res.)

Published in *Research in Veterinary Science*-Vol. 18, 1975

Treatment of calves with 5 mg/kg Imidocarb (3,3 - bis - (2-imidazolyl) carbanilide dipropionate) given intramuscularly 14 days before and 14 days after exposure to *Babesia* infected *Boophilus microplus* larvae rendered the next generation of larvae incapable of transmitting *Babesia* infection. When administered to calves 14 to 28 days before tick exposure, the drug prevented the development of clinical babesiosis; the larval progeny of ticks reared on the calf which was treated 28 days before infestation were infective. Treatment of a calf 42 days before exposure to infective larvae did not prevent the development of *Babesia* parasitaemia but appeared to reduce the severity of infection.

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(070) PROGRESS REPORT, 1969/1970 THRU 1974/1975

Tex. A&M Univ. Institute of Tropical Veterinary Medicine
1970-1975

Tex. A&M (CSD-1947 Res.)

The Institute of Tropical Veterinary Medicine was established at Texas A&M in 1967. Its research program on control of hemotropic diseases in cattle in the tropics was begun that year at Bogota, Colombia, as a cooperative effort with the Instituto Colombiano Agropecuario (ICA). With support by AID and the Rockefeller Foundation, research and graduate training programs were conducted from 1968 to 1975 in both Texas and Cali, Colombia. The purpose of the research was to develop means of protecting cattle against blood infestations by such parasitic organisms as *Anaplasma* and *Babesia*. These infections, which are similar to malaria in humans, are transmitted by ticks and flies. Their effect on cattle and other domestic livestock is to limit growth and weight gain, and, in severe infections, cause early death of the infected animals. While no final solution for *Anaplasma* and *Babesia* was found, significant progress was made in developing means of reducing cattle losses and increasing the productivity of cattle in such highly endemic areas as the north coast of Colombia, where about 80% of the cattle are infected. Controlled field studies using premunition or vaccination to prevent losses have been successful. Vaccinated cattle, as a group, gained almost three times as much weight over a ten-month period as did unvaccinated cattle. Chemotherapeutic studies yielded variable success. *Anaplasma* infections can be eliminated temporarily with two injections of the drug Imidocarb (5 mg/kg), but this level of medication was found to be dangerously near the toxic level. Moreover, one year after treatment, the incidence of infection was essentially as high as seen originally.

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In contrast, the use of as little as 1 mg/kg of Imidocarb against *Babesia* consistently eliminated it from infected cattle. In research on diagnostic techniques, useful serologic methods were developed, using complement-fixation, a rapid card agglutination test, and an indirect fluorescent antibody test. These tests have been used in identifying *Babesia* infections in Haiti, the Mariana Islands, Nicaragua, Mexico, and Texas.

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PESTS OF ANIMALS (TSETSE FLIES)

(071) REPORT ON TSETSE RESEARCH PROJECT, TANGA, TANZANIA, 1974-1975

Williamson, D. L.; USDA/ARS, Tsetse Research Project 1975

USDA/ARS (PASA RA 1-00 Res.)

The project set out (1) to establish a thriving tsetse fly colony, Tanga strain *Glossina morsitans morsitans*, in Tanzania; (2) expansion of the colony to produce excess pupae for sterilization, release, and ecological studies, and to supply field test operations; and (3) to conduct a large-scale field trial to evaluate the sterile-male-release method against tsetse flies. Two fully operational laboratories were staffed with trained personnel, and construction of the third and final insectary unit was begun. The first irradiation tests on Tanga strain *G. m. morsitans* using the Cesium unit were performed on April 24, 1975. A useful technique for irradiating flies in a nitrogen atmosphere was developed. Efforts were continued in improving goat-host animal herds to overcome the shortage of hosts while simultaneously striving for maximum efficiency in the fly feeding process and use of animal housing facilities. Finally, preparation of a test site for sterile male releases was continued at Mzeri Hill Ranch.

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- PN-AAB-643 1975 (19p.) Paper copy \$2.00
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PESTS OF ANIMALS (VAMPIRE BATS)

(072) CHEMICAL CONTROL OF VAMPIRE BATS

Mitchell, G. C.; Burns, R. J. 1973, 82p.

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

Two different chemical methods for reducing populations of vampire bat populations are described. Both methods are based on an anticoagulant, diphenadione. The chemical is either injected into the rumen of cattle or applied directly to the back of vampire bats captured near livestock. The blood of treated cattle is poisonous to vampire bats for about three nights following treatment. Vampire bats with the anticoagulant applied to their backs return to their roost where the chemical is passed from one to several others by contact and mutual grooming. One treated vampire bat can carry sufficient chemical to poison 20 other vampire bats. (Available in English and Spanish)

- PN-AAA-168 Paper copy \$6.80
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(073) VAMPIRE BATS: RABIES TRANSMISSION AND LIVESTOCK PRODUCTION IN LATIN AMERICA; ANNUAL PROGRESS REPORTS, 1969 THRU 1975

Denver Wildlife Research Center 1970-1976

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

Begun in June 1968 this project was funded by the Agency for International Development (AID) and the Mexican Government under a Participating Agency Service Agreement with the U.S. Fish and Wildlife Service (FWS), and the Instituto Nacional de Investigaciones Pecuarías (UNIP) to develop techniques for controlling vampire bats. In 1974 AID continued to fund this program with the objective that Denver Wildlife Research Center biologists would help Latin American countries develop and initiate control campaigns through training and technical assistance. Because vampires commonly fed upon cattle without climbing upon their victims, control agents could not be easily applied directly to cattle. But TV observations of vampire grooming behavior indicate that grooming is intense and thorough and that control agents made to adhere to the vampire's appendages and hair would be ingested during grooming activity. Tributyltin sulfide showed some degree of repellency at the .006 level concentration. Vampire toxicity levels for 1080, strychnine, and diphacinone (an anticoagulant) were determined. It was found that repopulation rates vary according to geographical location and that the differing rates are due to a combination of climatic factors and available habitat. Of three breeds of cattle observed, only Holstein showed sufficient vampire-to-prey contact to consider applying control agents directly to cattle. DRC-4033 showed excellent promise in the laboratory with 100% mortality for vampire bats having multiple feedings on cattle treated with this compound, and was just as effective as strychnine in this method of control. Results of a study applying a control agent to vampire roosts showed this method to be a selective and effective means of controlling the roost population without secondary hazards for other cave-dwelling animals. A pilot project reducing the quantity of drug in the topical control method indicated that treating a bat with 6.0 mg of dipenadione gave equal or better results than treatment with 50.0 mg of chlorophacinone. Recommendations were made to modify the control method of topically treating captured bats — fewer bats can be treated with equal results. During the latter years of this project, field demonstrations of bat control methods were conducted in Brazil, Argentina, Bolivia, British Honduras, Costa Rica, and Nicaragua. Vampire bat control programs were initiated in other regions of Mexico, in Brazil, Colombia, Guyana, Nicaragua, Panama, and Venezuela. Vampire bat control workshops were held in Nicaragua, Panama, Colombia, and Brazil, and training sessions were conducted in Guyana and Ecuador.

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- PN-AAC-786 1975 (28p., English only) Paper copy \$2.30
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AGRICULTURE AND NUTRITION

FISHERIES

(074) A RESEARCH PROGRAM RELATED TO THE DEVELOPMENT AND MANAGEMENT OF SMALL-SCALE FISHERIES IN DEVELOPING COUNTRIES

Sutinen, J. G.
1975, 14p.

R.I. (CSD-2455 211d)

(Presented at meeting on Small-Scale Fisheries, Paris, 1975)

A comprehensive, formal body of knowledge on small-scale fisheries in developing countries does not currently exist. Research results that do exist relate to individual components of the fishery system, and usually cannot be effectively combined with research on another component. This is why the International Center for Marine Resource Development at the University of Rhode Island recently began a program of research designed to fill many of the gaps in our knowledge of small-scale fisheries in developing countries. The five categories of research are biological, economic, food technology, institutional, and technology transfer. The objective of the biological research is to develop a system of data collection and of stock assessment that is administratively feasible for fisheries in developing countries. The economic research focuses on the harvesting sector, marketing systems, and consumers of fish and fish products in developing countries. The objectives of the food technology research are to develop a quantitative assessment of existing food technology, determine the effects of this technology, and assess the feasibility of developing new technology and fish products in particular locations. The institutional research is designed to identify aspects of existing organizational and legal frameworks that impede fisheries development. The research on technology transfer focuses on three issues: (1) determinants of success and failure of fishermen's organizations; (2) designing messages for effective communication; and (3) the goals and methods of fishermen's training programs. The objective of this research is to determine the most effective means for carrying out a development project.

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(075) ARTISAN FISHERIES: CHARACTERISTICS, PROBLEMS, NEEDS, AND RELATIONSHIPS TO AQUACULTURE

Marshall, Nelson; Adriasola, L. A.; Griffin, James; Lampe, H. C.; Pollnac, R. B.
1975, 58p.

R. I. (CSD-2455 211d)

A portrayal of artisan fisheries with elaboration on Costa Rica, Chile, Tanzania, and South Vietnam. Common denominators of artisan fisheries also are discussed. In the concluding section, it was seen that artisan fisheries and aquacultural development have the following goals: 1) to provide additional high-quality protein at lower prices; 2) to improve incomes of artisan fishermen; 3) to provide additional employment; and 4) to earn foreign exchange through exports. To achieve these goals, three aspects of development were found to merit special consideration: 1) resource assessment and fishing technology; 2) marketing and distribution systems; and 3) institutions, organization, and management. These three areas are detailed in the final chapter.

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FARM EQUIPMENT

(076) SURVEY OF MANUFACTURING POTENTIALS FOR IRRI-DESIGNED MACHINERY IN THE DOMINICAN REPUBLIC

Davis, D. D.; Parets, G. A.
1976, 12p.

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

At the request of the AID Mission in the Dominican Republic, a research team from the Industrial Development Division of the Georgia Institute of Technology traveled to the Dominican Republic to assess the feasibility of manufacturing IRRI-designed agricultural machinery in the country and financing its sales to D.R. farmers. Over the past six years, the International Rice Research Institute, located in the Philippines, has developed simple, sturdy, economical power tillers, threshers, dryers, and seeders through financial assistance from USAID. The machines are now being produced, sold and used in the Philippines and other countries in Southeast Asia. The questions to be explored in the Dominican Republic were these: What is the government's attitude toward farm mechanization? Is the Dominican farmer ready and willing to adopt mechanized means of cultivating and harvesting crops? What is the potential market for such equipment? What are the potential resources for manufacturing such equipment? What are the alternative means of financing production and sale of the equipment? What are potential distribution and service channels for the machines? The study results showed that government officials are enthusiastic about the prospect of introducing IRRI equipment. All lending institutions visited assured the team that they are willing to make purchase loans for the IRRI-type machines. Raw materials for the manufacture of the equipment will have to be imported. Briggs & Stratton representatives assured the team that there would be no problem in importing the required power units. The consensus of government officials and agricultural extension agents is that the Dominican farmer is ready and willing to mechanize if the proper machines are available and means of financing them exist. A demonstration program will be necessary. The potential distribution channels and production shops are discussed. Recommendations for followup action are made. These concern importing specialists who can set up a training school for operators and a demonstration program for developing a market for the machines. AID funds would support a loan for initial production of demonstration machines and training of operators.

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NATURAL RESOURCES

(077) PROCEEDINGS, AID PRE-STRATEGY FOR ENVIRONMENT AND NATURAL RESOURCES DEVELOPMENT SYMPOSIUM, UNIV. OF ARIZONA, 1976

Paylore, Patricia; Haney, R. A.
1976, 147p.

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

The goal of this symposium was to produce information for AID use in developing strategies and plans for assisting natural resource development programs in the lesser developed countries. Key discussions focused on considering the impacts of possible development schemes in LDCs. Some excerpts from the summation and closing remarks: The discussions have emphasized the need to develop institutions within LDCs. That means having available in the LDCs people capable of handling the everyday problems of technology transfer. While many LDCs have classical universities of long and deep traditions, they are not the kind of schools, bureaucracies, agencies, and research institutes

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needed. Almost every group that formulated recommendations seemed to be basing them on the assumption that AID and each LDC should have an overall statement of goals or policies or strategies or plans, and that those should be and can be in agreement with each other. But this is not realistic; we need to recognize that fact of life. We in the U.S. seem to be expecting more of developing countries than we do of our own country. We expect multidisciplinary actions and cooperation between ministries and LDCs. But we do not even practice this concept in our own country. We talk about searching for the goals of rural populations and being responsive to them. This is illusory. There is no one set of goals in a country, no one set of values. We have to work through the governments. The group interaction methodology tested in this symposium has worked quite well; participants have interacted freely, intensely, and enthusiastically.

PN-AAC-746

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WATER RESOURCES AND MANAGEMENT

(078) ECONOMIC OPTIMIZATION FOR WATER ALLOCATION SYSTEMS

Andrew, J. M.
1976, 225p.

Colo. State (CSD-2460 211d)

(Diss.—Colo. State)

This dissertation develops a model for allocating water between competing users to maximize net economic returns to the basin. Water users within the basin are aggregated into sectors, with the net economic returns to each producing sector treated as sole functions of the water consumed, excluding economic returns from other resource inputs. The use of economic input-output analysis affords a method of determining sectoral changes within the net economic returns caused by modification of the final demand. Within the model, the total net monthly economic return for the entire basin is maximized through a process of static iteration, with incremental modifications being made to the final demand sector through developed distribution multipliers. An initial water allocation policy is required to determine the initial net income return to the basin. This policy has been established through development of a simple water allocation program, incorporating arbitrary allocation criteria under water restriction conditions. To illustrate how the model operates, synthetic natural inflow and sectoral demand data have been tabulated for a natural catchment area located in the midwestern U.S.. Real economic data obtained from a literature review indicate the potential economic value of water for the described area. From operation of the model, comparative net economic returns are computed, with the resulting increases validating the optimization process.

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(079) GROUNDWATER MANAGEMENT AND SALINITY CONTROL, A CASE STUDY IN NORTHWEST MEXICO

McFarland, J. W.
1975, 7p.

R. I. (CSD-2455 211d)

(In Am. J. or Agr. Economics, v. 57, no. 3, p. 457-462)

Policy issues associated with the management of a coastal groundwater aquifer and soil salinity are examined for an irrigation area in northwest Mexico. The primary policy issues are the intertemporal rate of use of the groundwater stock, the allocation of water between irrigation and leaching, and the selection of

crops. A management model, cast in a dynamic programming format, indicates that the aquifer should be mined at a rapid rate near the beginning of the planning horizon, gradually decline through time, and converge to safe yield after twenty-nine years. Further, a larger percentage of total water use should be allocated to leaching to maintain soil salinity of lower levels.

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(080) JOINT MANAGEMENT OF WATER RESOURCES IN IRRIGATION AND LAGOON ENVIRONMENTS

Cummings, R. G.; Lampe, H. C.; McFarland, J. W.
1976, 27p.

R. I. (CSD-2455 211d)

When river waters are diverted for use in irrigated agriculture, this can have a negative effect on coastal lagoons into which those rivers normally flow. Along Mexico's northwest coast, for example, lagoons are the habitat for a valuable food source: shrimp. The Mexican government has become increasingly concerned about the effects on the lagoons and shrimp populations as a result of diversion of the river waters for irrigation projects in the northwest coastal areas. This paper suggests a conceptual model that captures the major physical and economic interrelationships relevant for the management problems described above. It also describes the optimal decision rules that follow from the conceptual model, with particular attention to the irrigation vs. lagoon-management problem existing in northwest Mexico. The systems model consists of, among other things, the hydrologic system, the bio-ecologic system, and the economic system. The authors conclude that since the shrimp are a wild population that inhabit the lagoons during only part of their life cycle, the conflict between agricultural irrigation upstream and preservation of proper water conditions in the lagoons (sufficient fresh water, no excess of nutrients, no dangerous concentrations of pesticides) is not nearly as sharp as it would be, were the attempt being made to grow shrimp within a completely closed system. There is no evidence that the productivity of the lagoons has been reduced as a result of pesticide levels in the fresh water. By the time the shrimp have entered the lagoons, they have passed through their pre-juvenile stage, in which they would be most susceptible to pesticides and other pollutants. Moreover, the toxic materials they may ingest are evidently stored in their cephalothorax (head and chest), and these parts are not normally eaten by humans.

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(081) RETURNS TO PUBLIC INVESTMENT IN WATER CONTROL IN SOUTHEAST ASIA: A CASE STUDY OF THE GREATER CHAO PHYA PROJECT OF THAILAND

Small, L. E.
1972, 105p.

Cornell (CSD-2823 211d)

Although the Chao Phya water control project was completed in the early 1960s and is the largest single government project of its kind in Thailand, this study is the first attempt to evaluate the returns from the investment in water control facilities in the project area of 660,000 hectares. The study was limited to an examination of the effects of the system on crop production. From a national point view, the water control project has increased exports of milled rice by an average of about 90,000 tons per year. This is roughly 9 percent of Thailand's total exports of

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AGRICULTURE AND NUTRITION

rice in recent years. The system has thus contributed both to increasing the average foreign exchange earnings and to reducing the annual fluctuations in these earnings. At the farm level, the risk of complete crop failure has been greatly reduced in the areas that do not flood deeply. Furthermore, the average increase in production made possible by the system has increased the net cash returns earned by the farmers of the area by an estimated 25 percent. In spite of these benefits, the return to the investment in the original system has not been particularly high. Considering the effects of the system on crop production, the internal rate of return is estimated to be a modest 6 to 9 percent. The basic factor preventing a higher rate of return is the limited potential the system offers for changes in production techniques. The varieties of rice grown are tall varieties that either show little response to fertilizer, or, with large applications of nitrogen, tend to lodge. The short, photoperiod non-sensitive varieties which are responsive to fertilizer cannot be produced successfully without considerably better water control than the system generally affords.

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(082) OPTIMUM UTILIZATION OF WATER RESOURCES; ANNUAL TECHNICAL REPORT, 1975/1976

Colo. State Univ.
1976, 129p.

Colo. State (CSD-2460 211d)

The primary focus of the Colorado State University grant during the reporting year has been on delivery and removal components of the water chain with emphasis on practices applicable to the small farmer and on drain-systems. A secondary focus also was maintained on other elements of the water chain in cooperation with the CID universities. Response capabilities have been augmented resulting in notable increases in the utilization of water resource information, education and training, expanded knowledge base, advisory capacity, and linkages and networks. More specifically, the utilization activities included training at lower levels, i.e., on-site in LDCs, distribution of publications on practices applicable to LDCs, faculty and student exchange, joint advisory and research teams, building and maintaining a nationwide talent banking function for water delivery and removal, and maintaining linkages with selected international agricultural institutes and LDCs. This year major progress was made in state-of-the-art studies in water delivery and removal systems and practices concentrating on identification of simple systems easy to operate and maintain and best adapted to the varied conditions of LDCs. With regard to the above, special attention was given to cost/benefit analyses and social and political constraints as well as energy saving practices.

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(083) CALIBRATION AND APPLICATION OF THE JENSEN-HAISE EVAPOTRANSPIRATION EQUATION

Clyma, Wayne; Chaudhary, M. R.
1975, 21p.

Colo. State (AID/ta-C-1100 Res.)

(In Water management tech. rpt. no. 40)
(In Pakistan field rpt. no. 4)

To estimate the consumption use of various crops using climatic data, a summary of the procedure for determining evapotranspira-

tion after calibrating the Jensen-Haise equation is as follows: 1) Determine mean daily temperature (T) from daily maximum and minimum temperatures for the season and region under consideration. 2) Convert the corresponding radiation values to equivalent depth of evapotranspiration in inches/day (R_s using the relation Langley's/day $\times 0.000673 =$ inches/day. 3) Substitute the values of T and R_s in the equation, calibrated for that region and compute potential evapotranspiration, E_{06tp} . 4) Actual evapotranspiration E_t can be obtained by combining E_{tp} with K_c in equation. Since plants have very poor cover just after planting, E_t is much less than E_{tp} . However the two values tend to approach each other as the crop grows. When plants are assumed to have attained full effective cover and K_c approaches 1, E_t and E_{tp} are nearly the same until maturation begins. During maturation the two curves diverge since E_t goes down because of reduced photosynthetic activity and/or a limited supply of water.

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FOOD PROCESSING

(084) EMPLOYMENT, EFFICIENCY, AND INCOME IN THE RICE PROCESSING INDUSTRY OF SIERRA LEONE

Spencer, D. S. C.; May-Parker, I. I.; Rose, F. S.
1976, 89p.

Mich. State (CSD-3625 Res.)

(In African rural economy paper no. 15)

An examination of the economics of rice processing in Sierra Leone, with emphasis on employment. To measure the effect of the choice of rice processing technique on employment and incomes in Sierra Leone, a linear programming model was developed, which incorporated five techniques of rice milling ten regional locations. The following major conclusions were reached: 1) Large rubber roller mills dominate other techniques. 2) Rice prices have more of an effect on the number of large mills in the optimum solution than does the shadow price of capital. 3) The number of large mills in the optimum solution is highly dependent on the efficiency of their operation. 4) The small steel cylinder mills and the large disc-sheller mills are not included in any of the unconstrained optimum solutions because they are not competitive with either small rubber roller mills, large rubber roller mills, or hand pounding. Employment and incomes of the rural poor will be reduced drastically if the government pursues policies which make capital available at interest rates lower than the social opportunity costs of capital, in the range of 20 to 35%. Finally, location costs as well as input costs and output prices must be included in public decision-making about the choice of technique in rice processing.

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(085) MOISTURE ABSORPTION OF BULK STORED GRAIN UNDER TROPICAL CONDITIONS

Caro Greiffenstein, Axel; Pfof, H. B.
1974, 83p.

Kan. State (CSD-1588 GTS)

(Thesis M. S.—Kan. State)

(In Grain storage, processing, and marketing research rpt. no. 6)

Discussion of problems of grain storage in tropical areas. Conclusions can be summarized as follows: 1) There is no adsorption of moisture of practical significance from the surrounding atmosphere in bulk stored grain, unless the moisture reaches beyond the first layers of kernels in the surface of the grain as a consequence of some kind of air flow through the product. 2) Air currents are the main cause of moisture migration and moisture interchange within the mass of grain. 3) Stored grain reacts

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rapidly to air currents even if such currents are very low. Consequently, an active heat and moisture interchange takes place. 4) By controlling air flow through grain either caused by natural convection currents or by mechanical aeration, a better production conservation can be attained. 5) Special care has to be taken in controlling air flow in areas where temperature and relative humidity are above that in equilibrium with the grain in order to avoid insect infestation and fungi growth.

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(086) CAUSES OF GRAIN LOSSES IN STORAGE IN URUGUAY AND RECOMMENDATIONS ON PROGRAMS TO REDUCE THESE LOSSES

Harris, K. L.
1975, 71p.

AID/Mission to Uruguay

(Appen. in Spanish)

This study involved a review of grain storage operations with Uruguayan officials and technicians, field trips inspecting storage facilities, and observations and discussions of grain storage operations and conditions. Discussions were held with officials and technicians on fumigation, proper use of grain protectants and drying. The main thrust of a program to reduce losses will have to come through the three larger concepts of moisture control, grain standards (to enforce moisture control and other sanitation requirements) and a separation of long and short-term storage requirements. Political and marketing considerations are involved perhaps as much or more than technical details. However, technical training is absolutely essential to the problem of moisture grading, and the separation of better and poorer quality grains (especially wheat) for long and short-term storage. Training needs should be met before the next grain harvesting season.

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(087) DAMAGE TO STORED MAIZE INFESTED WITH SITOPHILUS ZEAMALS MOTSCH

Mora, M. A.; Pedersen, J. R.
1976, 57p.

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

(In Grain storage, processing, and marketing research rpt., no. 9)

Maize (*Zea mays* L.) with 12.5 and 14.2% initial moisture content (M.C.), both uninfested and infested with *Sitophilus zeamais* Motsch, was stored in variable (outdoor) and constant (indoor, 25±0.5°C, 70±4% r.h.) environments. Samples from top and bottom sections of containers (761) were analyzed every 4 weeks for 24 weeks. Moisture contents and temperatures of infested maize increased because of insect activity. Development of weevil populations outdoors was slowed by cool temperatures. Indoors, insect populations were higher than outdoors, however differences between populations in low and high initial M. C. maize were not consistent. Predominant storage fungi were *Aspergillus glaucus* and *A. restrictus* groups. Weevil damage and fungal invasion decreased seed viability. Weight loss correlated highly ($P < 0.01$) with weevil populations and weevil damage. No obvious changes in proximate analysis (protein, fat, fiber, and ash) were noted during the 24-week period.

PN-AAC-649

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(088) HIGH TEMPERATURE AND HIGH HUMIDITY GRAIN STORAGE

Rengifo, Gabriel; Pfost, H. B.
1976, 53p.

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

(In Grain storage, processing, and marketing research rpt. no. 10)

The study was undertaken to test the practicality of using heated air for grain aeration. The investigations involved corn, wheat, rice, sorghum, beans, and soybeans stored in sacks and aerated bins for 12 weeks at 44°C and 55% relative humidity. The purpose was to determine whether these conditions would inhibit mold growth. The results should be useful to grain storage engineers and others involved in storage management under humid tropical conditions. The conclusions: The temperature inside the grain sacks (at their center) increased to room temperature in the first two weeks of storage. There were no significant losses in test weight between aerated and unaerated grains. Molds grew under high storage temperatures and at low equilibrium moisture content levels (and relative humidities) where mold growth has not been previously reported; this finding raises doubts concerning many past recommendations for safe storage. The storage conditions tested produced no grade change and little change in visual appearance. High storage temperatures with high relative humidity reduced the germination of all seeds. Artificial drying causes more kernel damage than does natural drying through storage time. The high storage temperature used was fatal to most insects in six days. Wheat milling yields were not greatly reduced. Physical dough tests showed an increase in malt requirements. Baking tests showed no effect of storage on wheat quality.

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(089) AN APPRAISAL OF THE FOOD PROCESSING INDUSTRY OF URUGUAY; AGRI-INDUSTRIAL SUB-SECTOR ASSESSMENT AND DEMAND ANALYSIS

Warner, G. K.
1975, 58p.

AID/Mission to Uruguay

This study was undertaken to assist the AID Mission/Uruguay to prepare a loan proposal for development of the Agri-Industrial subsector concerned with food processing. Uruguay has a large unrealized potential for agricultural production. Less than one percent of the agricultural land is used for fruit and vegetable growing; there are large opportunities for expansion. Most of the fruit and vegetables are grown on small farms of less than 50 hectares. Although Uruguay is virtually self-sufficient with respect to food production and is exporting significant quantities of non-traditional foodstuffs, there is considerable scope for improvement in production efficiency at the farm level. The constraints upon increasing agricultural output and exports are small farms, poor farmers lacking in capital, poorly organized farms, lack of motivation for increasing production, and lack of an organized marketing capacity. Steps are being taken by fruit and vegetable processors to encourage increased production under contracts supplying technical field services, seeds, and fertilizers. Dairy industries are also improving milk handling and are instituting a bonus system for dairy farmers. Since 1970 fruit exports have increased from U.S. \$749,000 to U.S. \$4,440,000 in 1974, and output can be quickly increased by better orchard management and improved techniques. No labor problems are anticipated. Most fruit and vegetable processing plants are poorly equipped, but CONAPROLE dairy plants are excellent in all respects. Fruit and vegetable processors are in need of investment programs to improve capacity, efficiency, and quality.

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AGRICULTURE AND NUTRITION

HUMAN NUTRITION

(090) FOOD CONSUMPTION BEHAVIOR BY INCOME CLASS IN RURAL AND URBAN PHILIPPINES

Goldman, H. W.; Ranade, C. G.
1976, 17p.

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

(In Occasional paper no. 90)

The effect of income on rural and urban household consumption in the Philippines. To determine this, the expenditure elasticity of demand and marginal propensity to expend for food as the criteria of changes in consumption were used. The approach was to estimate demand functions for food items and to choose the most appropriate demand function on the basis of statistical and economic criteria. Then the two criteria for different income groups using the selected demand function were computed. This study found that the magnitude of income effect on change in consumption varied among different income classes as well as between rural and urban areas. Cereals are the main source of calories for low income families: the bottom 40% of the population spends more on cereals and seafoods than on fruits, vegetables, meat, eggs, milk, and dairy products. The top 10%, in contrast, spends maximum incremental income on meat and eggs. This indicates that nutritional policies should be different for poor and rich people.

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(091) THE A.I.D. NUTRITION PROGRAM STRATEGY

AID/TA/N
1973, 57p.

AID/TA/N

This paper states the rationale and strategy for A.I.D.'s nutrition program and describes the recommended approaches. In substantial measure they already are reflected in ongoing programs, but further strengthening is needed, particularly at the individual country program level. The A.I.D. strategy will concentrate on the following activities: In agriculture, to support work to expand low-cost protein sources in crops and to encourage consideration of the malnutrition problem as a major factor in agricultural planning. Efforts to expand total food production continue to be essential to the attack on malnutrition. In health, to study and combat the problem of nutrient malabsorption and the synergistic effects of infection, disease, and poor nutrition; and to integrate nutrition, health, and family planning delivery systems where feasible and desirable. In education, to find the most effective means of overcoming nutritional ignorance and low motivation in order to improve food behavior. In new food technology, as a major goal, to develop low-cost protein staple foods. In child feeding, to make programs an integral part of a broader nutrition strategy. And in family planning, to develop integrated health, nutrition, and family planning delivery systems where feasible and desirable, and to determine more specifically the relationship between population growth and nutrition as a basis for future program guidance.

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(092) NUTRITION AND FERTILITY: INTERRELATIONSHIPS, IMPLICATIONS FOR POLICY AND ACTION

National Research Council. Food and Nutrition Board
1975, 67p.

NAS (CSD-2570 GTS)

A report of a workshop convened by the Subcommittee on

Nutrition and Fertility, Committee on International Nutrition Programs, National Research Council. Participants from more than a dozen countries represented such disciplines as economics, social science, medicine, public health, nutrition, education, and communication. The closely interrelated phenomena of malnutrition and uncontrolled fertility are of worldwide concern. General malnutrition in a population group usually calls for action that is beyond the capacity of an individual or family. Supplementary feeding programs will be most effective when they focus on stages in life most vulnerable to nutritional deficits: the infant at weaning, the nursing mother, the pregnant woman, and the adolescent and postadolescent female who is soon to become a mother. Relatively modest supplements, provided at those stages, can have substantial impact. But unless fertility can be modified, there is little that can be done to improve nutrition for the marginal family. To persons living in an economically marginal state, few arguments for fertility control are perceived as cogent. Many factors support the argument for an integrated attack on malnutrition and high fertility. Needs in these areas transcend the usual domains of existing organizations, suggesting that a concerted effort by national and international agencies is essential.

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(093) PLANNING NATIONAL NUTRITIONAL PROGRAMS, A SUGGESTED APPROACH; V. 1, SUMMARY OF THE METHODOLOGY

Cooke, T. M.; Am. Technical Assistance Corp.
1973

ATAC (CSD-2978 GTS)

This manual is a simple, practical guide to national nutrition planning. It was developed in Ecuador by the staff of the American Technical Assistance Corporation with the support and cooperation of the government of Ecuador. The methodology set forth is intentionally geared toward use by existing planning staffs, using existing country data. It presents an approach to nutrition planning which will assist nutritionists as well as national planners in evaluating nutrition implications of current development projects and designing new interventions to meet some part of the nutrition problem. This manual emphasizes that the power and resources to deal with nutrition problems on a national basis are in the hands of the Ministers of Finance and Planning and the ministers of the operating agencies such as Health, Education, Agriculture, and Commerce, although the actual coordination of a national nutrition program may be most efficiently conducted by a single agency. A national nutrition institute, for example, would influence planning decisions and resource allocations within the traditional ministries, so that nutrition goals become a part of the planning process, even though the management of nutrition-oriented food production programs might be best left with the Ministry of Agriculture. Nutrition planners and advocates must be ready to cut across traditional bureaucratic boundaries to make claims on the attention of national development policy planners and on the resources of existing agencies. The five sections of this manual describe the systems approach to analysis of a nutrition system; the consumer, food supply, and food distribution subsystems in a national nutrition system; selection of target groups and tentative goals; selection of types of intervention and evaluation of nutrition intervention programs; and the strategy and tactics of nutrition planning and programming. Volume 2 of this study, subtitled Case Study and dealing with Ecuador, is also available.

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(094) CARE PRESCHOOL NUTRITION PROJECT; PHASE I REPORT, 1975/1976

CARE, New York
1976, 78p.

CARE (AID/ta-G-1233 GTS)

A report of CARE's involvement worldwide with pre-school nutrition programs. This report presents the results of the first phase of a three-phase study begun in June, 1975, and planned for completion in December, 1978. CARE is in a unique position to begin developing guidelines to help enhance pre-school nutrition programs. The present project was designed to evaluate pre-school nutrition programs and provide guidelines for future planning. A review of all CARE programs designed to improve the nutritional or health status of pre-schoolers was made from documents available in the New York headquarters. This included 31 programs in 18 countries. Reports consulted for each country included the Multi-Year Plan, Annual Program Plan, Annual Implementation Plan, Quarterly Program Implementation Evaluation Reports, and Questionnaires sent to the countries involved. The total annual budgets of all programs add up to \$66.7 million, including the cost of PL 480 food commodities. The average cost per child per year is \$17, with a range from \$1 to \$109. Of the total 5.45 million pre-school beneficiaries enrolled worldwide, 4.14 million are in India; 0.29 million are in other Asian countries; 0.92 million are in Latin America; and 0.10 million are in Africa and the Middle East. Twenty-three of the thirty-one programs have Health Ministries as counterparts. The majority of children are reached through MCH, Day Care, Community, or Primary School centers. There are 47,670 such centers with a calculated average of 114 beneficiaries enrolled at each. Eighty percent of the worldwide programs are predominantly geared toward the rural areas.

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(095) PROCEEDINGS OF THE THIRD AFRICAN CONFERENCE ON NUTRITION AND CHILD FEEDING

Conf. on Nutrition and Child Feeding. 3d, Tunis, Tunisia, 1970
1970, 420p.

HEW/PHS (PASA AFR (HA) 8-70 GTS)

The Third African Conference on Nutrition and Child Feeding, held in Tunis, May 25-29, 1970, was sponsored by the Republic of Tunisia and USAID, with participation of the FAO, UNICEF, the UN Development Program, and the WHO. The conference activities recorded in these proceedings include country reports on nutrition in Algeria, Burundi, Cameroon, Central African Republic, Chad, Kinshasa, Gabon, Morocco, Rwanda, Tunisia, and the United States. Also included are thematic presentations and committee reports on nutrition and health, nutrition, and agriculture, nutrition and child feeding, nutrition and education, nutrition and industry, and coordination of nutrition programs. The general discussions which followed the thematic presentations reflect the sharp focus of attention on such key questions as health and mental development, the relative importance of food crops versus cash crops, the value of nutrition surveys in providing a basis for agricultural and trade

policies, the enormous need for nutrition education, and the critical need for coordination of nutritional and agricultural policies. Recommendations generated by conference participants include these: That governments organize new services for prevention of childhood malnutrition, and reinforce existing services; that they take steps to integrate the science of nutrition into agricultural programs; that they recognize the importance of food crops for national health and development; that they integrate infant nutrition into preventive medicine, and conduct surveys of the nutritional needs of children, by age group and region; that they encourage breastfeeding as the only nursing method that provides total hygienic security; that they encourage the spacing of births; that they institute new programs of nutrition education; that they inventory local foods with a view toward their use in preparation of weaning foods; that they establish agencies to control prices and quality of foods; that they study the nutritive value and acceptability of industrial by-products that could provide nutritious foods at low prices; and that they give high priority to creating an interministerial coordinating mechanism to conduct nutrition budget and consumption surveys, nutrition education, food technology improvement, and improved planning in food economics.

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PN-AAC-676 (373p., Spanish) Paper copy \$30.95
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FOOD COMPOSITION

(096) DEVELOPMENT, ACCEPTABILITY, AND PROXIMATE ANALYSES OF HIGH-PROTEIN, RICE-BASED SNACKS FOR THAI CHILDREN

Siegel, Alvin; Lineback, D. R.
1976, 5p.

Kan. State (CSD-1931 211d)

(In J. of food science, v. 41 p. 1184-1188)

Urban and rural Thai children are fond of deep-fat-fried crispy chips made of rice flour. They eat them as snacks. The problem is that these snacks contain very little protein. To test whether preschool children would eat protein-enriched snack items, several kinds of deep-fat-fried crispy chips were made from a combination of rice flour and soy flour or rice flour and fish protein concentrate. The protein contents of the new snacks ranged from 17 to 24%. Their acceptability was tested with 198 first-grade children. The children found them more acceptable or just as acceptable as two commercially available snack items. Costs per unit were substantially lower than those of the commercially available control snacks. Subjective evaluations of protein-enriched snacks stored three to six months indicated no significant changes in acceptability.

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DEVELOPMENT ASSISTANCE

INSTITUTION BUILDING

(097) INSTITUTION BUILDING, FEASIBILITY AND TECHNIQUES

Siffin, W. J.
1976, 25p.

MUCIA (CSD-2958 211d)

A discussion of the meaning of institution building, factors affecting its feasibility, and techniques for accomplishing it. Development must include the idea of institutional development. Performance capabilities in a social system are largely determined by

DEVELOPMENT ASSISTANCE

its institutions, its resources, and the external constraints under which it functions. This paper examines three aspects of institution building, within the boundaries of a concern with bureaucracy and the public sectors of the least developed countries. In those countries new public agencies remain to be built and old ones to be changed. No powerful theories or precise recipes exist to guide these efforts. There are, however, some concepts and lessons from experience that can be applied. This information includes knowledge about (1) the basic meaning of institution and institution building; (2) factors which effect the feasibility of institution-building efforts; and (3) techniques by which to help build and reshape the kinds of institutions needed. There is a large gap between this knowledge and effective action. There are no computer programs for doing institution building. Knowledge can be used to identify practical strategies and tactics, and thus minimize mistakes. The effectiveness of that knowledge will, however, depend considerably upon the talents of the user—and his good fortune as well.

PN-AAC-930

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(098) INSTITUTION BUILDING, A READER

Mann, A. G.
1975, 161p.

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution-building and technical assistance methodology, Publication)

A collection of 17 papers on institution-building. The papers were originally presented at five international conferences conducted between 1969 and 1971 at Purdue, Washington, D. C., Utah State, Kathmandu, and El Salvador. This reader both supplements and complements the annotated bibliography of IB literature, *Institution Building: A Source Book*, by Melvin Blase, 1972 (PN-AAB-985, 161p.; paper copy \$13.35, microfiche \$2.00). The first section of this reader deals with the context in which institution-building emerged and some of the broad considerations to which IB responds. The second section presents an extended discussion of the conceptual aspects of institution-building and the formulation, development, and refinement of the IB model. The discussion presents the model against a background of the needs of developing countries. Section III moves to the lessons of practical experience, including the problems of planning, operating, and evaluating the IB perspective in technical assistance activities. The fourth and final section contains two case studies of institution-building efforts. Included in the appendix are explanations of various IB terms and concepts. Contributors to this book of readings are George H. Axinn, Ira L. Baldwin, Joel Bernstein, Melvin Blase, Sol H. Chafkin, Arthur J. Coutu, Milton Esman, Cesar Garces, W. Warren Haynes, Abraham Hirsch, Erven J. Long, Prachanda P. Pradhan, Jagadis Sharma, Wm. J. Siffin, Mohan Man Sainju, D. Woods Thomas, and Wm. N. Thompson.

PN-AAC-927

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Microfiche \$ 2.00

(099) NIDA, A CASE STUDY IN INSTITUTION DEVELOPMENT

Karnjanaprakorn, Choop; McKibben, L. E.; Thompson, W. N.
1974, 144p.

MUCIA (CSD-2958 211d)

(In Program of advanced studies in institution-building and technical assistance methodology, Publication)

A report of a study of the National Institute of Development Administration (NIDA) of Thailand—its origins, development, functions, and status. NIDIA was established in 1966, although

six of its seven schools and centers have institutional roots in earlier organizations. It is concerned with promoting institutional development in Thailand. The thirteen chapters in this volume deal with NIDA's origin and development, the professional staff, the instructional program, NIDA students and their goals, characteristics and employment of NIDA graduates, the research program, the training center, the development documentation center, the administrative structure of NIDA, the operating budget and support of the Thai government, support from the Ford Foundation and MUCIA, NIDA linkages to other national and international agencies and organizations, and the overall success of NIDA in institution development efforts.

PN-AAC-926

Paper copy \$11.95
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(100) MUCIA PROGRAM OF ADVANCED STUDY IN INSTITUTION DEVELOPMENT AND TECHNICAL ASSISTANCE METHODOLOGY; ANNUAL REPORT, 1974/1975 - 1975/1976

MUCIA
1975

MUCIA (CSD-2958 211d)

The basic aim of the A.I.D. grant is to strengthen competence within the Midwest Universities Consortium for International Activities (MUCIA) to (a) perform R&D work concerning the process of institution building; (b) perform R&D concerned with adapting the experimental method to technical assistance; and (c) perform R&D leading to better working relations between technical assistance advisors and their counterparts, including better selection and training of technical assistance personnel. During 1974-1975 results of research and analysis began to appear. The Documentation and Analysis Center was reorganized. A newsletter was established and a Design Notes series was started. The MUCIA schools were surveyed to determine what, if any, impact the project has had so far upon their academic efforts. At least eleven courses or seminars have been established or adapted at three MUCIA schools as a result of the grant. In 1975-1976 this grant moved into its final phase.

PN-AAC-947 1974/1975 (38p.)

Paper copy \$3.15
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PN-AAC-962 1975/1976 (28p.)

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PRIVATE/VOLUNTARY ORGANIZATIONS

(101) THE ROLE OF VOLUNTARY AGENCIES IN INTERNATIONAL ASSISTANCE, A LOOK TO THE FUTURE

AID/PHA
1974, 156p.

AID/PHA

For the past 28 years, the Advisory Committee on Voluntary Foreign Aid, an appointed public-membership body established by Presidential directive, has served as a liaison between the U.S. government and U.S. voluntary agencies engaged in foreign assistance activities. During those years, voluntary agencies have recorded a remarkable record of service in their efforts to alleviate human suffering. In this "Look to the Future," the Advisory Committee has attempted to examine the environment in which voluntary agencies can expect to perform their future mission, and to identify the ways in which their

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important work can be facilitated and their commitment to serve be enhanced. Twelve recommendations are made. Chapters in this report discuss and elaborate upon the reasoning behind those recommendations. Excerpts from the recommendatory statements: 1.) The Foreign Assistance Act should be amended to enable voluntary agencies registered with and approved by the Advisory Committee to apply for the use of U.S. government resources or facilities to assist their programs overseas. 2.) Efforts to strengthen the partnership between government and voluntary agencies should include greater participation in program initiation and development, and not just project implementation. 3.) A Program Initiation Fund should be established to facilitate innovative pre-project field research by voluntary agencies. 4.) The voluntary agencies and government should recognize that the strengthening of indigenous voluntary organizations can be an act of development in itself. 5.) A conference should be called to bring together representatives of the UN Development Program and voluntary agencies, to promote closer collaboration. 6) New Congressional legislation should be enacted to assure the availability of U.S. food for overseas emergency needs and development assistance programs in the developing countries. 7.) Voluntary agencies and the U.S. government should jointly give attention to revising the regulatory and administrative processes governing food distribution programs. 8.) A Task Force on Refugee and Disaster Services should be established under the auspices of the Advisory Committee. 9.) The provision of services in foreign disasters, by the U.S. government, voluntary agencies, and the U.N., should be better coordinated. 10.) Voluntary agencies should emphasize long-term development in the design and conduct of their overseas activities, and A.I.D. should provide them funds for such purposes. 11.) Voluntary agencies should collaborate in efforts to broaden the base of public support for the principle of voluntarism and the relief such activities overseas provides. 12.) The subject of registration of voluntary agencies with the U.S. government should be kept under continuous review, taking account of evolving needs, different categories of registration, and criteria suitable to the different types of service provided by registered agencies.

PN-AAC-669

Paper copy \$12.95
Microfiche \$ 2.00

(102) EXPANDING THE ROLES OF PRIVATE HUMANITARIAN AGENCIES IN DEVELOPMENT ASSISTANCE: MANPOWER AND MANAGEMENT ISSUES
MUCIA
1976, 24p.

MUCIA (CSD-2958 211d)

Private humanitarian agencies (PHAs) need larger and better trained staffs if they are to play a larger role in development assistance activities. Training experts from MUCIA universities could be of assistance in training PHA staffs. PHAs must be aware that a shift in strategy to emphasize direct training of indigenous staff members represents a significant investment and a shift from the direct-action projects that have heretofore been the basis for their appeal to public contributors. PHAs should increase the participation of local target populations in local projects. When they do so, this will change the style or emphasis of many PHA interventions from technology delivery to building local capacity in project skills. Attention must therefore be given to identifying intermediate technologies and management tools that can be used by target populations. PHA also need enlarged analytic skills in project design and evaluation: organization theory, evaluation procedures, means of identifying local social structures. Some of the present patterns of PHA activity, developed over many years, are not compatible with project approaches that emphasize management control systems, evaluation methodologies, and project formalization in

general. The proposed changes could threaten the combination of minimal central control and local field initiative which accounts for the flexible, direct-action character of PHA projects.
PN-AAC-946

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(103) PRIVATE VOLUNTARY ORGANIZATIONS AND APPROPRIATE TECHNOLOGY, A REPORT PREPARED FOR THE AGENCY FOR INTERNATIONAL DEVELOPMENT
MUCIA
1976, 38p.

MUCIA (CSD-2958 211d)

A study of the role Private Voluntary Organizations (PVOs) play in the development of appropriate technology (AT). More than 30 PVOs involved in AT-related activities have contributed to this study. The study provides a set of informed answers to these questions: (1) What are the PVO experiences and contributions to generating and disseminating AT? (2) What weaknesses or limitations can be isolated from PVO experiences in AT? (3) What kinds of support and assistance would best promote effective PVO involvement in generating and disseminating AT? (4) What specific types of assistance should AID undertake to best improve PVO use of AT? Concerning that last question, PVOs as a group are weakest in back-up assistance in identifying and shaping appropriate technological responses to field-situation needs, and in documenting and disseminating the results of their own experience. USAID could provide assistance in these areas. AID might enhance the effectiveness of PVOs at facilitating AT in several ways: by funding the establishment or expansion of technical consultancy services available for field assistance to PVOs; by underwriting one or more arrangements for enhancing the documentation and analysis function as it applies to PVO field experience with AT; and by undertaking or underwriting one or more arrangements for enhancing the documentation and analysis function as it applies to PVO field experience with AT; and by undertaking or underwriting the dissemination of selected and tested materials on appropriate technology among PVOs likely to find it of use. Means might range from field-oriented conferences and seminars to a publications program.

PN-AAC-928

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ECONOMICS

(104) PRODUCTION CHARACTERISTICS IN FOREIGN ENCLAVE AND DOMESTIC MANUFACTURING: THE CASE OF INDIA
AID/PPC
1976, 19p.
AID/PPC

(In AID discussion paper no. 33)

Cobb-Douglas production functions for U.S.-owned and Indian-owned manufacturing concerns in India were estimated. They showed that U.S.-owned manufacturing affiliates employ a less capital-intensive technology but a higher fixed-capital intensity than Indian firms. The inference is that the technology imported by or developed for Indian firms would be more capital-using to produce the same output as that produced by the U.S.-owned firms. Moreover, U.S. firms in India face a higher wage-interest ratio than domestic firms. Thus they adjust the ex ante technology, so that on average they utilize more fixed capital per man ex post than counterpart Indian firms.

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Paper copy \$2.00
Microfiche \$1.00

ECONOMICS

(105) DEMOGRAPHIC PRESSURE AND ECONOMIC CHANGE: THE CASE OF KENYAN LAND REFORMS

Herz, B. K.
1974, 338p.

AID/PPC/PDA

(Diss.—Yale)

An historical analysis of Kenya's population and land reform problems. As public health measures in Kenya lowered infant and maternal mortality rates, population growth outstripped economic growth. In many tribal areas, the land rapidly became overcrowded, but the crowding failed generally to induce the traditional culture to change. Evolutionary technical changes in agricultural and pastoral production could not keep up. The resulting Mau Mau rebellion brought land reforms—the Swynnerton reforms and the Million Acre Scheme (involving return of land owned by Europeans). The Swynnerton reforms, involving creation of new African farms with a high ratio of labor to land, have been high yielding and successful. Their success demonstrates that a developing nation can establish efficient small farms through land reform with only limited resources. If Kenya's experience is any guide, labor-intensive crops and labor-intensive technology are a key. But the land reform has warded off the Malthusian spectre only for a time. Kenya had a population of more than ten million in 1969. It is growing at a rate of 3.5% a year, so the current population already exceeds thirteen million, and could reach 25 million by the year 2,000—an increase of ten-fold in a century. Where are the new landless to go? A possible answer is to the vast, underused land of the Masai. But much of this land is reserved for Kenya's national treasure—its game parks. To plow under these lands would endanger a major Kenyan foreign exchange asset. Reliance on technical change as the panacea seems increasingly chancy. The implications are that the long-term solution is to couple improved technology with educational and technical efforts to achieve significant reductions in the birth rate. The aim of development, after all, is to raise the marginal product of labor, not just to keep it from collapsing.

PN-AAC-823

Paper copy \$28.05
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(106) THE INTERNATIONAL MONETARY SYSTEM AND THE DEVELOPING NATIONS (PROCEEDINGS)

Leipziger, D. M., ed.; Conf. on the Int. Financial System and Concerns of Developing Nations, Washington, D.C., 1975
1976, 214p.

AID/PPC

The purpose of this conference was to bring together interested persons in government, international development institutions, and the academic community to discuss international monetary issues as they affect developing countries. Participants included representatives from the International Monetary Fund, the International Bank for Reconstruction and Development, and Organization of American States, the United Nations Conference on Trade and Development, Georgetown University, the Federal Reserve Board, the U.S. Senate staff, the Department of State, and the Agency for International Development. This volume of proceedings, containing the papers, comments, and discussion of the conference, has been prepared as a reference for policy-oriented research. The papers and discussions in this volume are presented in seven sections headed by the titles of the major papers: Exchange Policies for Less Developed Countries

in a World of Floating Rates (Stanley W. Black, with comment by William R. Cline); Generalized Floating and the Reserve Needs of Developing Countries (John Williamson, with comment by Danny M. Leipziger); Terms of Trade and Transfers: The Relevance of the Literature (Ronald W. Jones, with comment by Thomas D. Willett); The Oil Price Increase, Stabilization Policies, and Less Developed Countries (Paul De Grauwe, with comment by Peter B. Clark); International Transfers and Non-Traded Commodities: The Adjustment Problem (Ronald I. McKinnon, with comment by Charles R. Frank); and Financing Needs of Developing Countries: Proposals for International Actions (Constantine Michalopoulos, with comment by Guy Erb).

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(107) PROCEEDINGS AND PAPERS OF THE REGIONAL AND INTERNATIONAL ECONOMIC DEVELOPMENT PLANNING CONFERENCE, VA. STATE COLLEGE, 1975

1976, 170p.

Va. State (CSD-3415 211d)

The purpose of this conference was to assemble experts in economic planning and development to present, discuss, and assess the state of planning for economic development on both the domestic and international levels. Objectives were: to re-examine some of the important and practical methodologies and techniques for economic planning and development; to relate rural development problems of the developed world to those of the LDCs, particularly in Africa; to generate a clearer understanding of the factors to be considered in economic planning; and to exchange views of the Bureau of Economic Research and Development (BERD) and Virginia State's Research Staff with experts from other research institutions and organizations. The conference addresses give a broad overview of the development issues at the regional and the international levels. The papers are concentrated on specific issues and problems of development and planning relevant to the contemporary scene, and while not technical, they are aimed at both specialists and non-specialists. There are no general conclusions or recommendations.

PN-AAC-966

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(108) THE IMPACT OF EXPORT INCENTIVES AND EXPORT-RELATED POLICIES ON THE FIRMS OF THE LESS DEVELOPED COUNTRIES, A PILOT STUDY

Staelin, C. P.; Jurado, G. M.
1976, 89p.

Mich. (AID/CM/otr-C-73-241 Res.)

This study of 193 exporting firms and potential exporting firms in the Republic of the Philippines sought to answer three questions: (1) How do firms view the export activity itself; (2) How do firms view and react to government policies in terms of their perceptions of exports; and (3) How do these views of both exports and export policies depend upon the economic and political environment of the firms. The Philippines was chosen for this study for several reasons. First, it has recently begun an export promotion drive after more than 25 years of import substitution. Second, the recent export experience in the Philippines has been quite positive. Third, the Philippines offered excellent opportunities for effective collaborative research. Fourth, there is little evidence to indicate that government incentives themselves led to the firms' consideration of exports or that incentives were even crucial to the outcome of these deliberations. Extensive and detailed questionnaires were employed in the study. Some of the major findings: The export incentive schemes of the Philippines are relatively straightforward in comparison to those of many

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LDCs, and they offer relatively modest subsidies. The major incentive provided exporters is an income (profits) tax deduction figured on local production costs. As a proportion of export revenues, the incentive may well be the Philippine exchange rate; it is one of the few in the less developed world which is not substantially overvalued. This has allowed exporters to receive relatively high export prices (in terms of domestic currency) without the need for substantial, direct export incentives. Moreover, the steady change in the government's tariff and exchange rate policy, in favor of exporters and away from the highly import-substituting bias of the 1950s and 1960s, has no doubt had a substantial psychological impact on exporters, in addition to its obvious financial benefits.

PN-AAC-732

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EDUCATION

GENERAL EDUCATION

(109) KNOWLEDGE NETWORKS FOR EDUCATIONAL PLANNING, STRATEGIES FOR THE BETTER USE OF UNIVERSITY RESOURCES

Hudson, B. M.; Davis, R. G.; Mason, David; Siembab, Walter 1976, 172p.

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

An investigation of better ways of linking producers and potential users of educational planning knowledge. It sought to explore (1) the potential for establishing various forms of "knowledge networks" to achieve better utilization of existing knowledge; (2) cost-effective roles for universities in these networks; and (3) the sensitivity of such networks to the distinctive needs of "primary groups." Several sets of variables affect the design of an effective knowledge network. First, there are very different meanings of knowledge "utilization," each making different demands on network design and the role of a participating university. Second, much depends on how one defines the "distinctive needs" of primary groups, particularly among rural poor. Third, the design of networks must take into account not only their functional educational mission but the more tacit, intrinsic goals of the organizations involved. It is not realistic or effective to define "effectiveness" with exclusive reference either to the single mission of knowledge utilization or the needs of primary groups alone. The study indicates a need to recognize situations where potential conflict may arise between the goals of primary groups, the goals of the university, and the goal of maximizing knowledge flows. Explicit attention must be given to the *appropriateness* of conflicting views. In short, it appears unlikely that there exists a single "optimal" strategy for improving the utilization of educational planning knowledge.

PN-AAC-664

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Microfiche \$ 2.00

(110) A SOCIOECONOMIC MODEL OF SCHOOL ATTENDANCE IN RURAL INDIA

Shortlidge, R. L. 1976, 23p.

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

(In Occasional paper no. 86)

To determine the factors influencing school attendance by Indian children, an analysis was made of social and economic data collected in a household survey conducted by Cornell University and G. B. Pant University of Agriculture and Technology in 14 villages located in two districts of western Uttar Pradesh state between March and August of 1971. The analysis was restricted

to a sample of 295 households containing 570 persons who were between five and 21 years of age, and who were either enrolled in school or had never attended school. In low-income Indian families, children are often not sent to school because their labor contributes to the economic welfare of the household. They work in fields, or care for livestock, or care for younger brothers and sisters. The value of primary-school-age children was estimated in this study to be 135 rupees annually; the value of intermediate-school-age children was estimated at 672 rupees. This opportunity cost accounts for more than half of all schooling costs through the 12th grade. Regression analyses were conducted on 19 different characteristics relating to sibling position, sex, land owned, caste, income, parental education, attitudes and preferences, community characteristics, and so forth. The findings showed that the ability of a family to purchase labor-saving equipment and to absorb the costs of sending a child to school were major determinants of school attendance. Sex was also important; four times as many boys as girls attended school. However, this ratio was much lower (3:2) in households in which both parents had attended school. The study results show that while more than two-thirds of all India's villages have primary schools, universal literacy may hinge more on economic reforms than on the presence of schools and teachers.

PN-AAC-744

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NON-FORMAL EDUCATION

(111) NON-FORMAL EDUCATION: THE DEFINITIONAL PROBLEM

Kleis, R. J.; Lang, C. L.; Mietus, J. R.; Tiapula, F. T. S.; Ward, T. W.; Dettoni, John; Mich. State Univ. Non-Formal Education Information Center 1974, 48p.

Mich. State (CSD-3279 GTS)

(In Program of studies in non-formal education. Discussion paper no. 2)

Three essays on problems of defining non-formal education. Unlike formal education, non-formal education has no single institutional base on which a definition can be constructed. Formal education, when construed as a schooling function, can always be "defined" as what is done in school. But non-formal education has no single locus or single institutional context. Definitional statements thus tend to involve considerations and dimensions that do not get treated when "formal education" is defined within the schooling context. The three essays presented here are fairly complex, in that all three present ways of laying out a fairly comprehensive structuring of the domain of the concept. While there are several similarities among the treatments, the essays differ in terms of programmatic perspectives. Taken together, they provide a fairly complete exposition of questions involved in defining non-formal education, along with a few tentative resolutions of those questions. The essays are entitled "Toward a Contextual Definition of Non-Formal Education," by Kleis, Lang, Mietus, and Tiapula; "Non-Formal Education: Problems and Promises," by Ward and Dettoni; and "An Operational Approach to the Definition of Non-Formal Education," excerpted from "Planning for Non-Formal Education: An Interim Report," of the Program of Studies in Non-Formal Education, Michigan State University.

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EDUCATION

(112) NON-FORMAL EDUCATION AND AN EXPANDED CONCEPTION OF DEVELOPMENT

Grandstaff, Marvin
1974, 61p.

Mich. State (CSD-3279 GTS)

(In Program of studies in non-formal education. Discussion paper no. 1)

A discussion of the relationship of non-formal education to an expanded conception of development. A reconstruction of the concept of development would seem to involve accommodating existing theory to at least these six variables: (1) greater effort in the "humanitarian" or "survival" domain; (2) a shift, by developed nations, from a proactive to a reactive construction of their role; (3) the building in of measures specifically geared to the more equitable distribution of wealth; (4) an emphasis on comprehensive and fundamental rural development; (5) efforts directed toward employment per se, rather than just to employment as a corollary of economic growth; and (6) acceptance of some measure of decentralization of planning and decision-making. How that concept of development relates to non-formal schooling is shown by a critique of the problems associated with formal schooling efforts in developing countries: the erroneous demand for schooling, diplomas, degrees, rather than education as such; the formidable costs of formal schooling; the wastage in sequential schooling systems; the plight of the educated unemployed. Next discussed are the contrastive merits of non-formal educational programs: their authenticity and applicability; utilization of the oral tradition; reliance on local resources; the need for revision of reward structures. In conclusion the discussion focuses on the need to give special attention to non-formal educational programs that are low-cost, short-duration, need-based, aspiration-accommodating, employment-linked, decentralized, and highly distributive.

PN-AAC-839

Paper copy \$5.05
Microfiche \$1.00

(113) WOMEN, FAMILIES, AND NON-FORMAL LEARNING PROGRAMS

Paolucci, Beatrice; Bubolz, Margaret; Rainey, M. C.; Andrews, Mary; Boyd, Virginia; Ferris, Maxine; Nelson, Linda
1976, 111p.

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

(In Program of studies in non-formal education. Suppl. paper no. 6)

An examination of the role of women and families in social and economic development, for purposes of identifying learning needs and developing appropriate non-formal learning programs. Summarized are some of the critical functions of the family in social and economic development, its educational role, and its contribution to human resource development. The status and role of women in social and economic development is briefly reviewed. The report is directed to educators in both formal and non-formal systems, policymakers, program planners, and practitioners in non-formal education. Increased attention needs to be given to supporting and undergirding education within the family system, for it is here that the foundations for learning are established. The family is a pervasive and influential educator. All of its members, male and female, need to be prepared to function productively in the larger social and economic systems. Because of the nature of learning in the family, non-formal educational delivery systems are critical for supplementing and

complementing family learning. Those interested in enhancing development need to look closely at the contributions the family can make, for the quality of life achieved by individuals in their family settings directly affects the total society.

PN-AAC-838

Paper copy \$9.20
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(114) NON-FORMAL EDUCATION FOR WOMEN IN BANGLADESH, WITH EMPHASIS ON AGENCY FOR ORGANIZATIONAL PROGRAMS SERVING ECONOMICALLY DISADVANTAGED WOMEN

Hoque, Naseem
1976, 69p.

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

(In Program of studies in non-formal education. Suppl. paper no. 5)

A survey of non-formal education programs for women in Bangladesh. The activities of 35 organizations involved in non-formal education of educationally and socially disadvantaged women were scattered, uncoordinated, and had little impact. Nevertheless, such attempts represented first steps in generating a movement for women's emancipation in an environment restricted by cultural biases and socioeconomic conditions. The war and its aftermath brought new urgency and new resources into the movement. National and international concern was aroused at the plight of some 300,000 widowed women who lacked the education and skills to support themselves and their children. Social, political, and financial support was generated. The post-war activities have been more organized, more concerted, and more productive. Most important among these new programs is the National Board of Women's Rehabilitation Programs formed by the government of Bangladesh in February, 1972. It opened a large number of centers all over the country, offering clinical programs, vocational and professional training, production centers, marketing facilities, and special student-support projects. In Dacca the Board has arranged for the Women's Career Training Institute and the Polytechnique Institute to create job opportunities and job training facilities for all classes of women. An important program in literacy training is being conducted by the Bangladesh Rural Advancement Committee, a voluntary organization begun in 1972. Other organizations conducting important programs include the Integrated Rural Development Program and the Christian Organization for Relief and Rehabilitation, which operates 52 women's centers throughout Bangladesh.

PN-AAC-837

Paper copy \$5.75
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(115) NON-FORMAL EDUCATION IN NEPAL: A SURVEY OVERVIEW OF EDUCATION ACTIVITIES TAKING PLACE OUTSIDE THE FORMAL EDUCATION SYSTEM

New Educational Reform Associates, Kathmandu, Nepal
1974, 133p.

(USAID/N-367-378)

Nepal faces some pressing problems in agricultural development, health care and nutrition, preservation of the environment, population growth, and rising hopes and expectations. Effective solutions to those problems depend upon non-formal educational approaches to providing information, skills, and attitudes. These efforts are necessary as supplements to the formal school system in Nepal. The objective of the survey described in this report was to collect information about non-formal education in Nepal, and to identify educational problems for which non-formal solutions show promise of being appropriate. The report presents a descriptive inventory of Nepalese training activities, materials development activities, extension agencies and their programs,

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media activities, and coordination of non-formal educational efforts. Among the authors' conclusions and recommendations: A great deal of worthwhile non-formal education is under way in Nepal. New inputs in this field should be focused on supporting these existing activities, rather than generating new programs. Some new techniques of non-formal education should be tested within the context of existing programs, and steps should be taken toward achieving a higher level of coordination of non-formal educational efforts. However, non-formal educational efforts should maintain an identity distinct from the traditional formal educational system. Certain experimental projects should be researched in some depth: (a) the Radio Listening Group experiment of the Agriculture Information Section; (b) the activities of the Field Audio-Visual Units of various agencies; (c) the Functional Adult Literacy Program of the Ministry of Education; (d) the Village Midwife Training activities of the MCH/FP Project; and (e) the Model Farmer Training courses of the Agricultural Farms and the Institute of Agriculture and Animal Science.

PN-AAC-671

Paper copy \$11.05

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HEALTH

GENERAL

(116) SOME HEALTH SECTOR ANALYSIS METHODS FOR DEVELOPING NATIONS

Stiffman, L. H.
1974, 185p.

Mich. (AID/CM/ta-C-73-43 GTS)

A catalog of methods for analyzing health sectors. It presents a selection of past analyses of health sector components and evaluates those analyses according to three criteria: (a) how well the analysis identifies choices in applying scarce resources among competing objectives; (b) the consequences of decisions in terms of health, economic improvement, and cost; and (c) the preferred alternatives, given the available information, skills, and resources. Those criteria are applied in settings widely varied in terms of the potential for successfully undertaking such studies and applying the results. Thus the catalog attempts to identify weaknesses where they exist, and offer some remedies. The reader is referred to cited literature where specified problems are analyzed and specified techniques applied. This catalog does not serve as a "cookbook" for directly solving health sector problems, but directs the reader to references where others with similar problems have analyzed them.

PN-AAC-828

Paper copy \$15.35

Microfiche \$ 2.00

(117) SYNCRISIS, THE DYNAMICS OF HEALTH: 18.

PAKISTAN

Furnia, A. H.
1976, 164p.

HEW/OIH (RSA HEW 1-74 GTS)

(In DHEW pub. no. (OS) 76-50036)

Health conditions in Pakistan have not improved much since the nation was established in 1947. Malaria, Tuberculosis, and cholera continue to constitute threats to health. Gastrointestinal, infectious, and other parasitic diseases continue to contribute to morbidity and mortality. These diseases are exacerbated by primitive water supplies and waste disposal, bad housing, nutritional problems, and an increasingly heavy population growth. The three fundamental causes of Pakistan's poor health environment are widespread infectious and communicable diseases; poverty and sociocultural attitudes that inhibit improving the

environment; and ineffective policies administered by limited numbers of inadequately trained health workers, affecting both the urban poor and the rural population. Diseases of an ancient primitive society, continue, while those of an emerging urban civilization are being added. These is pervasive ignorance of western medicine, and fatalistic acceptance of the inevitability of morbidity and mortality. People rely on the traditional *hakims*, most of whom cannot administer effective treatment. Life expectancy is currently estimated at 47.5 years for males and 45.1 years for females. Infant mortality is approximately 111 per 1,000 population. Approximately 26 percent of children born alive die before age five. Except in malaria eradication, little progress occurred in the delivery of health services during the Second and Third Five-Year Plans of the 1960s. Government expenditures for health services during 1970-1975 were still wholly inadequate, at 2.47% of total expenditures. In the Fifth Five-Year Plan, 1975-1980, there is increasing attention to health. The government hopes to extend health services from the present 15% to 50% of the rural population by 1981. The increase in health manpower trainees, physicians, nurses, and technicians augurs well for the long term. The five principal health problems now a challenge to Pakistan's socioeconomic progress are:

Excessive population growth; it exceeds 3.0% and may be as high as 4.2%.

The effect of morbidity upon the productive population, in both urban and rural Pakistan.

The competition of the health services for skilled manpower required for other sectors.

The need for much of the foreign assistance under the Fifth Plan to be devoted to health care.

Serious deficiencies in environmental sanitation.

PN-AAC-653

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(118) SYNCRISIS, THE DYNAMICS OF HEALTH: 19.

SENEGAL

Menes, R. J.
1976, 163p.

HEW/OIH (RSSA HEW 1-74 GTS)

(In DHEW pub. no. (OS) 76-50037)

This study of the interactions of health and socioeconomic development in Senegal discusses the Republic itself (geography, climate, political structure, education, transportation, communications, language, religion, economy); the population; health status; nutrition, environmental health; health facilities and services; health manpower; national health policy and planning; contributions of international organizations; and the situation in the Sahel. Excerpts from the thirteen conclusions presented in the author's summary:

1. Several of the most serious diseases formerly prevalent in Senegal have been suppressed by mass immunizations programs. Those include yellow fever and smallpox. However, diseases still present at high levels include malaria, measles, tuberculosis, trachoma, and venereal diseases.

2. Senegal's population is relatively small, compared to the potential carrying capacity of the nation's resources. But short birth intervals, high dependency ratios, and rapid population growth create health hazards for the individual, economic problems for families, and development problems for the nation. There is little overt national concern for family planning or demographic problems.

3. High levels of infant and childhood mortality exist, especially in rural areas. Such illnesses as diarrhea, respiratory complications, and neonatal tetanus contribute significantly to this mortality. Basic health services are dramatically lacking in rural areas.

4. Environmental sanitation services are almost non-existent outside the major cities.

HEALTH

5. Senegal is developing its water sources through irrigation projects, dam construction, and well-digging, but the work is not well integrated with the planning and implementation of health service programs.

6. Average nutrition in Senegal appears to be good, but seasonal and local variations create conditions for undernourishment, particularly among the young, pregnant women, and lactating mothers. Food storage facilities are inadequate. Health education in basic nutrition is needed.

7. An acceptance of lowered fertility rates would reduce infant and maternal mortality and morbidity. The government now has no policy on this.

8. Health services are inadequate and inefficient, and are not available in rural areas. Mobile health teams lack manpower, vehicles, gas, and passable roads.

9. There is an obvious shortage of all levels of health manpower, particularly in rural areas, where doctor-population ratios reach as high as one to 44,000. The government is taking steps to solve this problem.

10. Senegalese standards for education of physicians are high, but the standards and teaching are oriented toward cures and not prevention, do not promote training of medical auxiliaries, and have not attracted sufficient numbers of Senegalese students. Health and manpower planning is handicapped by an inadequate data base, and the planning ministry lacks sufficient professional staff.

12. The Ministry of Health and Social Affairs plays almost no role in health or development planning, partly because of problems of administrative structure. The government is committed to a central reorganization of the Ministry of Health to solve this problem.

13. The fourth Four-Year Plan has a commitment to improving and expanding rural health services; however, implementation has been slow for lack of funds and an uncertain plan of action.

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HEALTH DELIVERY SYSTEMS

(119) DESIGN, IMPLEMENTATION, AND EVALUATION OF HEALTH DELIVERY PROJECTS, A PASITAM STRATEGY PAPER

MUCIA
1975, 19p.

MUCIA (CSD-2958 211d)

A strategy paper on organization of resources for meeting health needs of disadvantaged populations. Health care delivery projects should be community-centered. They need to be carefully designed to assure that populations in rural areas are served. PASITAM can assist in this by drawing up models of alternative patterns of project organization. If such models are to be useful to practitioners, they must include information about key issues faced in designing, implementing, and evaluating projects, including (1) project-client interfaces and community involvement in provision of services, (2) integration of health services and of these with other development efforts, and (3) evaluation of impact to learn what works best under what conditions. Such PASITAM and MUCIA services might serve several user groups: first, MUCIA participants who undertake overseas health projects on a contract basis; second, major donor organizations such as USAID, the World Bank, and WHO; third, numerous private voluntary organizations. Some 25 such organizations have received development program grants. The first task of PASITAM is to develop models and tools. Some relevant work has already been done. A two-week analytical skills training program has been developed for AID and host country program personnel. With appropriate adaptations, elements of this course are likely to be appropriate to training in the health area. The second task is choosing and implementing the mode of delivery of models, tools, and knowledge. PASITAM is producing *Design Notes* and *Design Studies* in keeping with that task, and can organize workshops and training activities in collaboration with clients.

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MALARIA

(120) DELAYED DERMAL HYPERSENSITIVITY IN RHESUS MONKEYS (MACACA MULATTA) IMMUNIZED AGAINST PLASMODIUM KNOWLESI

Cabrera, E. J.; Speer, C. A.; Schenkel, R. H.; Barr, M. L.; Silverman, P. H.
1976, 12p.

N.M. (CSD-3689 Res.)

Eighteen Rhesus monkeys were immunized with a fresh or lyophilized antigen preparation obtained from erythrocytes infected with *Plasmodium knowlesi*. Sixteen of these monkeys showed a positive delayed hypersensitivity response when subsequently skin tested with the immunizing antigen. Ten of the 16 positive reactors survived a *P. knowlesi* challenge, the remaining

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6 showed several indications of protection. None of the 18 control monkeys gave a positive skin reaction or survived the challenging inoculum. Macro- and microscopical evidence suggests that the dermal reaction is of a delayed type. Preliminary biochemical analysis of the antigen used in this experiment is included and its significance is discussed. Hematological data also is presented.

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SCIENCE AND TECHNOLOGY

(121) STUDY OF THE USE OF SUBSTITUTE MATERIALS IN LESSER DEVELOPED COUNTRIES, FINAL REPORT

Funnell, J. E.; Wolfe, E. J.; Southwest Research Inst. 1976, 170p.

SWRI (AID/ta-C-1245 Res.)

A review of possibilities for substituting indigenous raw materials for imported materials in six LDCs: Bolivia, Ghana, Guatemala, The Philippines, Tanzania, and Thailand. The candidate materials discussed include energy materials, paper and paperboard, concrete, iron and steel, fertilizer materials, gypsum-based materials, ceramics, animal feed materials, and bamboo. All of those are producible through established technologies, using resources indigenous to the countries. However, their production depends on many unanswered questions related to technical, economic, societal, and political factors. This initial identification of candidates for substitution is but a short first step. Questions of feasibility and benefits/costs need to be included in a plan for identifying and assessing specific import substitutions. This will provide a system or procedure for jointly assessing the substitutions desirable and undesirable features with appropriate groups, institutions, and decision-makers.

PN-AAC-818

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(122) APPLICATION OF ERTS IMAGERY TO GEOLOGY IN AFGHANISTAN

Milton, D. J. 1975, 21p.

Geol. Sur. (PASA TA (IC) 02-72 GTS)

(In [IR] AF-3)

A report of a demonstration and training project conducted in Kabul, Afghanistan, in May and June, 1974. Objective of the project was to demonstrate application of ERTS-1 data to geologic mapping and analysis, and to train Afghan scientists to make such applications. ERTS-1 data were employed in an experiment in map editing. The greatest value of ERTS imagery in tectonic mapping is its broad coverage, which allows a synoptic overview. The 40 ERTS frames that cover the entire country display the tectonics of Afghanistan much better than it could be displayed by working with several hundred photomosaics. As for mineral exploration, the USGS is engaged in an effort to detect iron oxides by computer processing of ERTS data tapes. Iron deposits of the Hajegak type would seem to be an obvious target. The basic geologic structure, the arid climate, the difficulties of field work in the more remote areas, and the current stage of geologic knowledge make Afghanistan an unusually favorable country for the use of ERTS in geology. The country provides problems that can be useful as test studies for advanced technology now under development in the USGS.

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

National Research Council. Board on Science and Technology for Int. Development 1976, 319p.

NAS (CSD-2584 GTS)

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

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

The study panel proposed the following activities:

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

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

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

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

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

NAS (CSD-2584 GTS)

The workshop brought together engineers, scientists, administrators, and businessmen, and gave them an opportunity to exchange their views on ferrocement and their experiences with it. Fourteen workshop papers included in this report discuss ferrocement research, development, and construction applications in India, Korea, the Philippines, Fiji, Thailand, New Guinea, Bangladesh, Sri Lanka, Malaysia, and Singapore. Ferrocement is a highly versatile form of reinforced concrete made of wire mesh, sand, water, and cement. It possesses unique qualities of strength and serviceability, can be constructed with a minimum of skilled labor, and uses readily available materials. It has been

SOCIAL SCIENCE

proven suitable for boatbuilding, and has many other tested or potential applications in agriculture, industry, and housing. Ferrocement is particularly suited to the developing countries because its basic raw materials are available in most countries; it can be fabricated into almost any shape; its construction does not require heavy plant or machinery; it is more durable than most woods and cheaper than imported steel; its construction is labor-intensive; it is durable, has high impact resistance, and can easily be repaired if damaged. Its main applications in the Asian-Pacific region have been in constructing boats, roofs, and silos.

PN-AAC-648

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(125) THE ROLE OF U.S. ENGINEERING SCHOOLS IN DEVELOPMENT ASSISTANCE

National Research Council. Board on Science and Technology for Int. Development
1976, 37p.

NAS (CSD-2584 GTS)

The most important role U.S. universities can play in present and future development of LDCs is that of facilitators. They should seek innovative ways for their faculty to perform this role and expedite the transfer of technology through LDC institutions and industries. AID and other technical assistance agencies should find ways, especially by new funding, to increase applied research on LDC development problems at both U.S. and LDC institutions, and particularly at regional graduate/research centers. Bilateral research projects involving transnational cooperation should be encouraged. Funding agencies should adopt impartial award procedures that will ensure quality research work, such as the peer review system long used by the National Institutes of Health and other U.S. agencies. AID should also strengthen institutional capabilities by such means as its 211(d) program, including extension of this kind of support to additional engineering colleges. Innovative work-study programs are needed for students at both U.S. and LDC institutions, including co-op programs with U.S.-based multi-national companies in LDCs. Programs should be generated to encourage U.S. faculty members to take short-term assignments abroad in advisory and consulting capacities. U.S. schools should also develop short courses, workshops, and seminars for presentations in the LDCs by high-grade visiting U.S. faculty. Past programs involving "sister" schools and consortia of U.S. schools that assist LDC institutions should be evaluated against original objectives and new priorities, so that better future programs can be designed.

PN-AAC-819

Paper copy \$3.05

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(126) SCIENCE INFORMATION PROGRAMS: 1. ARGENTINE TELEX NETWORK FOR SCIENTIFIC AND TECHNICAL INFORMATION; 2. COMPUTER-BASED INFORMATION SERVICES FOR SCIENCE AND TECHNOLOGY

National Research Council. Board on Science and Technology for Int. Development
1976, 130p.

NAS (CSD-2584 GTS)

(Summary of NAS/CONICET)

Between 1970 and 1972, the U.S. National Academy of Sciences and the Argentine National Council for Scientific and Technical

Research (CONICET) sponsored two projects designed to improve the dissemination of scientific information within Argentina and between Argentina and other nations. The first project involved development of a telex network for linking libraries within Argentina with each other and with five selected scientific libraries in the U.S. The other project involved developing a computer-based information services program in Argentina. The major purpose of the telex project was to expedite the processing of inter-library loans so as to stimulate more use of the system and provide better service. The initial nodes of the network were established at the libraries of the eight national universities outside of Buenos Aires and at CONICET's central scientific documentation center. The telex network has been accomplishing its stated objectives. Details of its components and activities are discussed in this report. The major purpose of the computer-based literature information services project was to provide Argentine scientists and engineers with more rapid, selective, and comprehensive information services. Chemistry was chosen as the initial field in which to provide such services, because chemistry in Argentina is so diversified and well developed, compared to other disciplines. However, because of financial and organizational reasons, the computerized information project was not implemented. Reasons for this are discussed in detail. Included in this report is a section that describes information-processing developments in Argentina during the period 1972-1975.

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SOCIAL SCIENCE

(127) POPULATION, HEALTH, NUTRITION AND DEVELOPMENT: THEORY AND PLANNING

Correa, Hector
1974, 429p.

Johns Hopkins (CSD-3320 211d)

A treatise on quantitative analytic models for studying relationships between population, health, nutrition, and development. The only reasonable approach to the study of the interaction between population, health, nutrition, and development is a general model of the process of development. To construct such a model, several successive approximations are needed, beginning with intuitively accepted concepts and their relationships, and proceeding towards the precise definition and measurement of the concepts and relationships involved. Development is defined as an increment in the personal well being of all the members of a community. It is equivalent to what economists call "welfare" or "quality of life" or "standard of living." A static model of individual well being is presented in Chapter 1. In Chapter 2 a method for estimating social welfare functions is presented. Chapter 3 presents a study of the influence of population size and growth, health, and nutritional conditions on physical and mental capacities. Chapter 4 considers interactions among determinants of well being—population, health, nutrition, and education. Chapter 5 substitutes employment for education, and Chapter 6 considers all five determinants together. Chapter 7 considers interactions of population and economic growth. Chapter 8 considers interactions among population, health, nutrition, education, production, and interpersonal relations. Chapter 9 presents simulation models for population planning; Chapter 10 discusses optimum use of contraceptive methods. Remaining chapters discuss simulation models for health planning, optimization models, integration of population and health planning, nutritional planning, and integrated planning with a simulation model.

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(128) EVALUATING ALTERNATIVE MODELS AND STRATEGIES OF MANAGEMENT TRAINING

Siffin, W. J.
1976, 17p.

MUCIA (CSD-2958 211d)

(Presented at Conf. on Public Management Education and Training, Bellagio, Italy, 1976)

An analysis of the conceptual and practical problems associated with management training. The "control" and "management science" approaches to executive training, along with "motivation and incentive" approaches, are dubious and dangerous, because they are based upon false and/or incomplete premises about the inherent nature of organization and management. They are particularly undesirable as the substance of "management training" in the public sectors of poor countries, where it is often exquisitely difficult to challenge and constrain expertise and pseudo-expertise. There is an enormous amount of balderdash in the broad field of so-called management training. The reasons are many, and some of them go rather deep into the past while managing to be quite shallow in dealing with the present. Management training tends to be imbued with fad and convention. It is difficult to systematically and specifically falsify various premises incorporated in such training. When certain conventions do fall before challenges, such challenges usually come from other, newer, more alluring, but equally vulnerable conventions. The conventions rooted in technologies become almost a mundane equivalent of magic. The legerdemain of quantitative analysis, of "systems," of recipes for human manipulation and organizational development, have the appeal of tangibility and superior power, plus novelty. Yet management in the final analysis is not a technology. It uses technology, and must make judgments of it.

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(129) WOMEN IN DEVELOPMENT, PROGRESS REPORT TO MEMBERS OF AID SENIOR OPERATIONS GROUP AID/WID

1976, 107p.

(Summary of activities 1975/1976)

In response to a Congressional mandate expressed in a 1973 amendment to the foreign assistance Act, AID has been giving particular attention to programs that tend to integrate women into the national economies of foreign countries, so as to improve their status and assist the total development effort. The Agency has made some notable progress in implementing the Congressional mandate. However, much has to be done in both policy and implementation lines if the Agency is to provide adequate guidance and if field offices are to respond more vigorously. New lines of communication must be sought, awareness within local governments must be developed, and interests in project success must be extended beyond material components. Sensitizing needs to be continued at the higher levels of AID administration, and intensified at the technical and program levels. Mechanisms need to be developed for more effectively monitoring, reporting, and evaluation Women in Development activities. There is also a need for development of sector guidelines for design and revision of Projects.

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(130) THE CHANGING ROLE OF WOMEN IN RURAL SOCIETIES, A SUMMARY OF TRENDS AND ISSUES

Castillo, G. T.
1977, 11p.

ADC (CSD-2813 GTS)

(In RTN sem. rpt. no. 12)

This summary draws upon research done in: German Democratic Republic, Poland, USSR, Yugoslavia, Hungary, Romania, Bulgaria, Czechoslovakia, Denmark, France, Federal Republic of Germany, U.S., Lebanon (and other areas of the Middle East), Nigeria, Kenya, Peru, Mexico, India, Pakistan, Bangladesh, Philippines, Indonesia, and China. Issues and trends covered are: 1) rural women in general; 2) impact of industrialization on women's role in agriculture; 3) socialism and the position of women; 4) training, educational attainment, and employment of rural women; 5) effect of economic development and modernization on the status of women; 6) economic independence and participation in decision-making; 7) agricultural mechanization, modernization, and employment for rural women; 8) women, research and development; 9) the "value" or ethical question.

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

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

Iowa State (CSD-3642 GTS)

(In Sociology rpt. no. 116)

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

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

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

Iowa State (CSD-3642 GTS)

(In Sociology, rpt. no. 121)

An outline of the initial framework of a health information system for developing countries. The components of this system are simple indicators which relate to both stocks and flows and incorporate measures of health status based on mortality, life expectancy, morbidity and disability, and malnutrition. Consideration is given also to measure of health facilities, services, finances, and personnel, and to the access and distribution of these from the perspective of various socio-demographic categories of the population. Such health-related factors as popu-

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lation, environmental quality and resources, agriculture and food production, income and consumption, education, housing, and shelter are discussed, and brief mention is made of suitable procedures which may be used to generate simple indicators of health status where demographic and health statistics are incomplete.

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URBAN DEVELOPMENT

(133) PERU SHELTER SECTOR ASSESSMENT

AID/SER/H
1975, 115p.

AID/SER/H

In May of 1975 a four-man team of consultants from the Foundation for Cooperative Housing was sent to Peru by the Office of Housing, AID/Washington, to assess the possibility of a new Housing Guaranty program focused on the needs of the lower-income sectors in Peruvian urban centers. The new program would place special emphasis on the squatter areas ("Pueblo Jovenes") to provide essential infrastructure and basic utility services, home improvement loans, and other alternatives, including lots and core housing. On the basis of its observations, the team made four recommendations: 1.) The several Peruvian government agencies involved in providing shelter and services should be more intensively coordinated and centrally directed in the planning, programming, and implementation of the proposed program; otherwise, as past experience has shown, the proposed large-scale program cannot be efficiently implemented. 2.) Institutional mechanisms for reaching into the marginal settlements are needed. A large gap exists between the type of housing that is needed and the type presently being financed. Moreover, the BCH and the "mutuales" make almost all of the long-term housing finance in the country with average loans several times larger than what can be afforded by the average family. As for the credit cooperatives, their operations are limited by restrictions on the amount of interest they can pay on savings or shares. 3.) The government should review its interest rate structure and consider permitting higher interest rates to be paid on savings, particularly for those institutions willing to extend credit to lower income groups. 4.) Program design is an extremely important consideration in meeting the need for shelter and services in the "Pueblo Jovenes." Whenever possible, programs should utilize a maximum amount of local inputs and neighborhood control through participation of neighborhood associations, credit cooperatives, housing cooperatives, and other local organizations.

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PN-AAB-510	Zaire (113p.)	Paper copy \$ 9.40 Microfiche \$ 2.00

(134) A.I.D. HOUSING GUARANTY PROGRAM; ANNUAL REPORT, 1976

AID/SER/H
1977, 45p.

AID/SER/H

A description of the A.I.D. Housing Guaranty Program and FY 1976 activities. This is a unique A.I.D. program in which U.S. private-sector investors provide long-term financing for low-income housing programs in developing countries. Since inception of the HG Program, 116 project loans amounting to almost \$900 million have been authorized in 36 nations. Nine new housing guaranty projects totaling \$125 million were authorized during FY 1976. Investors signed \$131 million of long-term loan agreements with government-supported institutions. Housing

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

loan programs authorized in various countries included Portugal \$30 million), Israel \$25 million), Korea \$25 million), Chile \$30 million), the Central American Bank for Economic Integration \$11 million), Paraguay \$4 million), Peru \$5 million), Zambia \$10 million), Botswana \$2.6 million), and the Ivory Coast \$8.4 million). A.I.D. continues to stress the importance of assisting national efforts to develop and implement national housing policies. The policies of A.I.D. have continued to reflect the Congressional mandate to concentrate its programs on the "poor majority"—projects benefiting low-income groups that constitute the poorer half of the urban population of a given country or city.

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(135) GUIDELINES FOR FORMULATING PROJECTS TO BENEFIT THE URBAN POOR IN THE DEVELOPING COUNTRIES: V. 1, BACKGROUND, GOALS AND PROJECT OPPORTUNITIES

PADCO, Inc., Washington D.C.
1976, 47p.

PADCO (AID/ta-C-1107 GTS)

These guidelines provide a basis for development of AID projects for benefiting the urban poor, with special emphasis on urban employment, water and sanitation, health, education, housing, and urban management and finance. Primary users of the guidelines are expected to include the technical staff of AID, Washington, AID Missions, and host country agencies. Primary uses are likely to be the evaluation of ongoing projects, preparation of requests for project assistance, and scrutiny of requests for assistance. This first volume of the Guidelines reviews the scale of the urban poverty problem, analyzes underlying causes, identifies varieties of urban poverty, and indicates the goals presumed for the undertaking of projects to benefit the urban poor. It also identifies the role of projects in each sector in economic and social development, their policy implications, the characteristics of projects likely to have high beneficial impact on urban poverty groups in the developing countries, other types of impact they are likely to have, and complementary actions that may be necessary in undertaking the projects. A very large part of national and international resources should continue to be allocated to rural development. At the same time, however, it should be recognized that urban populations of the developing countries are growing much more rapidly than rural populations, and that the absolute numbers of low-income urban households are very large. The continuing shift from rural to urban in population proportions is a shift that cannot be reversed by rural investment. Sustained improvements in the conditions of all of a nation's people, rural and urban, is likely to depend on the quality of its urban growth at least as much as it will on development of rural areas.

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(136) GUIDELINES FOR FORMULATING PROJECTS TO BENEFIT THE URBAN POOR IN THE DEVELOPING COUNTRIES: V. 2, PROJECT SELECTION, SUMMARY PROJECT CHARACTERISTICS, AND CASE STUDIES

PADCO, Inc., Washington, D.C.
1976, 398p.

PADCO, (AID/ta-C-1107 GTS)

Volume I, which contains Part I of the guidelines, reviews the scale of urban poverty, identifies varieties of urban poverty, analyzes underlying causes, and indicates the goals presumed for the undertaking of projects to benefit the urban poor. This second volume of the two-volume document contains Parts II, III, IV, and V of the guidelines, together with an appendix for U.S.

AID users. Part II identifies the roles of projects in each sector in economic and social development, discusses the policy implications of such projects, describes the characteristics of projects likely to have high beneficial impact on urban poverty groups in developing countries, identifies other types of impacts they are likely to have, and indicates complementary actions that may be necessary in undertaking such projects. Part III reviews the potential uses of the Guidelines in identifying and undertaking projects. Part IV presents a summary of project characteristics in tabular form. It is intended to be, along with Part V, the most frequently used part of the Guidelines. Part V is intended to contain case study data that will be built up gradually by users of the Guidelines. An illustrative case study is presented to suggest how information in that section might usefully be organized. The appendix indicates how the Guidelines relate specifically to AID procedures and documentation requirements in project identification, project preparation, project review and appraisal, and project evaluation.

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(137) PARTICIPATION, PLANNING AND ADMINISTRATIVE DEVELOPMENT IN URBAN DEVELOPMENT PROGRAMS

Bryant, Coralie; Colarulli, G.C.; White, L. G.; Satterthwaite, George
1976, 105p.

Bryant (AID/CM/ta-C-147-490 GTS)

A review of postwar theory relating to participation of the urban poor in development planning. Tradeoffs between equity and growth have been debated in the past, but will be increasingly central in the future. Many different groups within populations will demand to be participants in the debate over distribution. If the urban poor are to participate in resource allocation in developing cities, there will have to be effective channels through which they might be heard. Community development programs that build upon self-help appear to be most successful in providing methods as well as skills for participation. If a government is seriously interested in developmental urban programs, the support and training for the lower-level administrator, upon whom so much of the interface between government and squatter comes to rest, must be substantially improved. The pivotal importance of administrative skill at these lower levels must be acknowledged and provided for in budgets and programs. More careful evaluation of urban development schemes needs to be undertaken so that learning from these experiences can be more cumulative. More attention in those evaluations needs to be paid to measuring the impact of alternative participatory arrangements in the development of the planning process and its implementation.

PN-AAC-829

Paper copy \$8.70
Microfiche \$2.00

(138) URBAN FUNCTIONS IN RURAL DEVELOPMENT: AN ANALYSIS OF INTEGRATED SPATIAL DEVELOPMENT POLICY

Rondinelli, D. A.; Ruddle, Kenneth
1976, 314p.

Syracuse (AID/ta-C-1282 GTS)

A discussion of the problems of modernization and development in developing countries, centering around the fundamental issue of how to reallocate resources to create an articulated network of

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development centers, integrated into a national system of production and exchange that provides access to economic and social opportunities for a majority of the population. Covering the various aspects of these problems, chapter topics include: spatial planning and development policy; international assistance policy for integrated rural development; implementing integrated rural development; national political and administrative support; technical components of rural development; local organization for project implementation; the spatial context for integrated development strategy; the roles of spatial centers in national development; and urban functions in rural development; transforming spatial structures in developing countries.

PN-AAC-748

Paper copy \$26.05
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BIBLIOGRAPHIES

PLANT PROTECTION & PEST CONTROL

(139) REFERENCE BOOKS IN THE PLANT PROTECTION SCIENCES

Koehler, C. S.; Smith, R. F.
1974, 12p.

Calif.—Berkeley (CSD-3296 GTS)

This list itemizes eighty-five reference books in English which are considered an important part of a plant protection laboratory. The compilation is divided into five sections: 1) Entomology, 2) Plant Pathology, 3) Nematology, 4) Weed Science, and 5) Vertebrate Pests. The postal addresses of the publishers of these books and their prices are found following the book list. Mention is not made of libraries or other facilities in which these books may be available.

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Paper copy \$2.00
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(140) A PARTIAL BIBLIOGRAPHY OF WEED RESEARCH AND CONTROL PUBLICATIONS FOR SOUTH AND CENTRAL AMERICA, THE CARIBBEAN AND MEXICO 1942-1972

Fisher, H. H.; Locatelli, Eduardo
1974, 193p.

Or. State (CSD-1442 - Res.)

(In English, Spanish and Portuguese)

The bibliography has been arranged (and color coded) in four general geographic areas: South America; Central America; the Caribbean; and North America (essentially Mexico). There is also an additional unclassified section. Countries within each geographical region are arranged in alphabetical order. The entries were further separated into four categories within each country: I. Taxonomy; II. Biology; III. Weed Control and Physiology; and IV. Poisonous Plants. Listings appear alphabetically by author under each category. Category I covers weed identification, classification, recognition, description, and flora of different environments, etc. Such topics as ecology, life cycles, competition, etc., were included under Category II. Since I and II are quite interrelated, many references will appear in both of them. Category III is relatively clear cut, and as its title suggests, deals with weed control and physiology. All aspects of poisonous plants—taxonomy, biology, control, and

physiology—are grouped under category IV and do not appear in any other category.

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(141) A PARTIAL BIBLIOGRAPHY OF THE VAMPIRE BATS (DESMODUS, DIPHYLLA, DIAEMUS)

Linhart, S. B.

1971, 57p.

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

This extensive bibliography and reprint file contains 626 citations dealing with all aspects of the ecology, behavior, physiology, and disease relationships of vampire bats. Citations are arranged alphabetically by author. An asterisk preceding the citation indicates that the contents were reviewed, and that the citation details (volume, pagination, etc.) were verified. Indexing of the contents of each verified reference was not complete but should serve as a helpful guide. Some articles that were not available in local libraries were indexed solely on the basis of their titles. Several incomplete citations are included because of their possible importance. This bibliography is not annotated nor is it complete, since no particular effort was made to include all references of the following types: 1) popular articles; 2) reports and mimeographed articles by such organizations as the World Health Organization, the Pan American Health Organization, or various governmental agencies; 3) publications dealing with distributional records in which vampire bats were only one of many species collected; 4) early papers on taxonomy; 5) publications in which only casual or superficial reference is made to vampire bats and/or rabies; 6) early historical accounts of vampire bat folklore, vampire bat attacks, or disease outbreaks subsequently believed to have been vampire bat-borne rabies; 7) references cited in various publications, which, on the basis of the title alone, could not be verified as to their contents; 8) general books on the natural history of mammalian fauna of a geographical region or country. Coverage of the literature in English is more complete than that in other languages (primarily Spanish).

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DEVELOPMENT ASSISTANCE

(142) THE TECHNICAL ASSISTANCE PROCESS, AN INTRODUCTORY BIBLIOGRAPHY

AID/TA/PPU

1974, 51p.

AID/TA/PPU

(In AID bibliography ser.: Technical assistance methodology no. 3)

This bibliography classifies the material in each of its sections into 5 categories: survey, manual, bibliography, subdivision, and theory. An item may be listed in more than one category. In general, however, surveys review the entire field; manuals tell how to do it; bibliographic items have good references; subdivisions treat only a part of the subject area; and theoretical items have models or proposed theoretical structures. The eight subjects included are: 1) advisor-counterpart, 2) institution building, 3) program evaluation, 4) sector analysis, 5) social indicators, 6) sociocultural components, 7) team leaders, and 8) technical assistance personnel.

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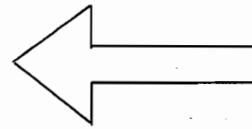
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